



**University of
Nottingham**
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**Understanding the Relationship
Between UK Food-Related Obesity
Prevention Policy and
Socioeconomic Inequalities in
Obesity**

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Abstract

Background: Since 1992, 14 obesity prevention strategies for England have been published. Despite their publication obesity rates continue to rise and socioeconomic inequalities in obesity continue to widen. About two-thirds of adults in England are now classified as overweight or obese. Furthermore, adults living in the most deprived quintile of neighbourhoods are almost twice as likely to be obese as those living in the least deprived quintile of neighbourhoods. Among 10–11-year-olds and 4–5-year-olds, children in the most deprived areas are approximately twice as likely to be obese as their least deprived counterparts.

689 policies for obesity prevention have been proposed in prevention strategies for England. The most recent strategy was published in 2020, Tackling Obesity, indicating a new government commitment to tackling obesity and an acknowledgement of the importance of health inequalities related to obesity. This strategy proposed several flagship policies, including a restriction of the placement of high-fat, salt, and/or sugar (HFSS) products in stores' prime locations. Over the past three decades, many of the proposed policies have been abandoned, delayed, or watered down. The legislation to restrict the placement of HFSS items in prime locations of stores in England came into force on October 1st 2022. This policy is explored in this thesis. Overall, there is a significant problem in the UK food policy landscape, where ample policies are proposed but few are implemented, and few target the structural drivers of obesity that are likely to have the most effective policy outcomes by favouring agentic policies.

The food environment is central to obesity causation and prevention. Yet, obesity causation has frequently been attributed to individual behaviour, justifying the adoption of individual responsibility framing. Throughout the prevention strategies for England, there has been a preference of high agency policies. Agentic policies have been established to have lowest impact among the most deprived groups. Although the prevailing discourse on obesity continues to focus on individual responsibility and individual empowerment, there is growing recognition and uptake of structural policies that intend to influence the environment.

Limited research has explored how recent prevention policies are perceived in terms of impact and effectiveness and how socioeconomic status may influence these perceptions. Additionally, exploring the perspectives and experiences of policy stakeholders within the obesity prevention policy process is uncommon, and is most often survey data, focused on specific policies or strategies or out of date. This PhD project offers the first study to investigate the impact of the legislation to restrict the placement of HFSS items in prime locations of stores in England. It is well established that the socioeconomic level of an environment influences the nature of the food environment. As a result, the outcomes of policies intended to influence the environment may differ. There is limited research addressing how policies intended to change the default environment may result in different outcomes determined by the socioeconomic status of an area.

The overarching aim of this PhD project is to understand the relationship between food-related obesity prevention and inequalities in UK obesity rates. This overarching aim is underpinned by three core objectives: to understand UK-based adults' experiences, attitudes, and future outlooks in relation to food-related obesity prevention policy; to explore how socioeconomic inequalities in obesity are considered in the obesity prevention policy process in the UK; and to investigate how the implementation of the restriction of the placement of HFSS products in stores' prime locations influences the nature of the food environment.

Methods: This thesis includes three studies: two sets of qualitative semi-structured interviews and an observational survey of the food retail environment in different socioeconomic areas of Nottinghamshire. The first study involves 31 semi-structured interviews with UK adults. The second study involves 14 semi-structured interviews with policy stakeholders, categorised into government officials, academics and knowledge brokers, and members of civil society and advocacy groups. Braun and Clarke's thematic analysis was used for these studies. The third study is an observational survey of the food retail environment before and after the restriction of HFSS products in prime store locations. A total of 132 observations were conducted in supermarkets, chain convenience stores, and independent convenience stores in Nottinghamshire's highest and lowest socioeconomic areas. Products were classified by type, policy inclusion criteria, the Food

Standards Agency's Nutrient Profile Model's Nutrient Profile Score, and Nova classification. Analysis includes descriptive statistics of the quantitative data from the observational survey, examining changes in product exposure in prime locations from 2022 to 2023 by the outlined classifications.

Findings: Study 1: The main findings of this research reveals that UK adults view obesity as a major societal issue with multifaceted causes. Key themes include understanding obesity, nutritional literacy, experiences with the food environment, barriers and facilitators to maintaining a healthy weight, attitudes towards responsibility for obesity prevention, and perspectives on food policy. The most cited cause of obesity was the modern food environment's accessibility and affordability of unhealthy food. Maintaining a healthy weight in the UK is seen as unequal, with a healthy diet often considered a luxury. Lower socioeconomic groups face greater barriers, such as financial constraints and material conditions. Most participants believed responsibility for obesity prevention is shared between individuals and the government, but ultimately, individuals hold primary responsibility. Policies with the highest support were child-focused or involved educational or nudge-style approaches, with changing default environment policies favoured. However, participants expressed limited trust in government actions and doubted that obesity prevention policies would impact their lives. This perceived disconnect between the impact of obesity prevention policy and the participants' lived experiences was most common among lower socioeconomic participants and higher weight classification participants.

Study 2: In study two, the primary themes identified in study two were perceptions of obesity drivers in the UK, attitudes towards current and future obesity policies, barriers and facilitators to food policy implementation, considerations of inequalities in obesity prevention, and policy impact mechanisms. Stakeholders generally considered the food environment as the main cause of obesity in the UK, characterised by the high availability and affordability of energy-dense, nutrient-poor, ultra-processed foods, and the low availability and affordability of fresh products, especially in deprived urban areas. The food and drink industry's influence on the food environment was also highlighted. Stakeholders acknowledged progress in obesity policy but questioned its rate and sustainability, citing issues like policy proposal failures, silos, and loopholes as barriers to effectiveness. Key

policy gaps, such as addressing weight stigma, were noted. Barriers to effective policy implementation included inconsistent government commitment, resistance to state intervention, and competing political priorities.

Although stakeholders recognised the importance of addressing inequalities in obesity, most doubted the feasibility of targeting these inequalities due to the widespread prevalence of obesity and the limited impact of existing prevention policies. Many suggested adopting a health equity lens in policy design and implementation to better consider inequalities. Additionally, some stakeholders emphasised considering individual agency to understand its effect on intervention outcomes. The findings suggest that combining these approaches with population-level policies could more effectively address inequalities without specifically targeting them.

Study 3: The third study found that restricting HFSS product placement from prime store locations reduced exposure to restricted products in supermarkets and chain convenience stores in both socioeconomic districts in Nottinghamshire. Exposure refers to a product's presence in prime store locations. The study observed significant adherence in supermarkets and chain convenience stores, with no notable change in independent convenience stores excluded from the policy.

In supermarkets, across both socioeconomic areas exposure to products restricted by the policy was reduced from 39% of all exposures to 14%. In the chain convenience stores, the reduction in exposure was more than 26-percentage points in the lower socioeconomic area and more than 10-percentage points in the higher socioeconomic area. In comparison, the independent convenience stores that were not required to adhere to the policy, increased exposure of products restricted by the policy in the lower socioeconomic area by 8-percentage points. The policy also led to reduced exposure to high-sugar products such as treats and snacks. However, many restricted products remained in prime locations, indicating policy limitations. An unintended consequence of the policy was increased alcohol exposure, as evidenced by a 20-percentage point rise in alcohol exposure in supermarket checkout areas in both districts post-policy. This suggests alcohol products

replaced removed items. Additionally, exposure to ultra-processed and less healthy items remained higher than exposure to restricted products due to exemption criteria.

Conclusion: The research provides critical evidence on the link between food-related obesity prevention policies and obesity inequalities. The findings from two qualitative studies show that socioeconomic disparities in obesity are well-recognised among UK adults and policy stakeholders. It reveals that maintaining a healthy weight in the UK is unequally challenging, with barriers to healthy diets and weight being stronger among lower socioeconomic groups. Both studies described the food environment in lower socioeconomic areas as more obesogenic. This indicates the urgent need for equitable policy actions across all socioeconomic groups and values integrating lived experiences into policymaking.

The research recommends including community voices in the policy process, bridging policy silos within food policy, and applying a health equity lens. Observations of the food environment show that policy can significantly shape exposures to unhealthy foods in retail environments, irrespective of socioeconomic status. However, the unintended rise in alcohol exposure due to restricting HFSS items highlights the need to consider bridging silos through including other unhealthy commodities in food policy design.

Overall, the research emphasises the urgent need for action and the complex relationship between food-related obesity prevention policies and obesity inequalities. It suggests that existing policies are insufficient and perceived as failing to help the public maintain a healthy diet and weight in the modern food environment. The study highlights the challenge of prioritising inequalities amidst policy delays and shortcomings. It calls for moving inequalities to the centre of policymaking, building an evidence base on policy effectiveness among different social groups, incorporating a health equity lens, ensuring lived experiences inform policy development, and challenging assumptions about 'normal' environments and food behaviours for better future policy considerations.

Training, Publications, and Presentation

University of Nottingham Training Courses

- Research Data Management (2020)
- Research Integrity: CONCISE (2020)
- Research Integrity: Comprehensive (2020)
- Qualitative Methods in Practice (multiple sessions) (2021)
- Introduction to the Code of Research Conduct and Research Ethics (2021)
- Qualitative Observational Studies (2021)
- Understanding and Expressing Criticality and Argument in Your Writing (2021)
- Strengths Profiling Webinar for all PGRs (2021)
- Open Access for Researchers (2021)
- Researcher Profiles: managing your online identity and promoting your research (2021)
- Twitter for Academic Networking (2021)
- Literature Searching and the Literature Review (2021)
- Using Posters to Communicate your Research (2022)

University of Nottingham MSc Public Health Modules

- Tobacco control interventions (EPID4020) (2021)
- Research Methods for Public Health (EPID4031) (2020-21)
- Qualitative Methodology and Analysis (EPID4012 UNUK) (2021)
- Medical Statistics (EPID4030 UNUK) (2021)
- Further Medical Statistics (EPID4017 UNUK) (2021-22)

Summary of Spectrum Workshops

- Writing a grant application
- Narrative Framing and Writing a Policy Brief: Poverty Alliance
- Engaging with civil society partners
- Research integrity and conflicts of interest
- Managing Freedom of Information Requests

Additional projects and publications

- Public acceptance of obesity policy recommendations in the Obesity Health Alliance (OHA) Healthy Weight Strategy. In collaboration with other Spectrum academics and the OHA, I worked on a Spectrum project that received a Research and Innovation grant. In this project, I worked with the research lead in data collection, analysis, and manuscript writing. This paper is expected to be submitted for publication in May.
- Cancer Research UK: I worked part-time on an explorative project for CRUK to conduct an in-depth quantitative analysis of Youth Obesity Policy Survey data. This analysis aimed to explore significant shifts in youth perspectives across two waves of the CRUK survey. Statistical tests were conducted in line with the analysis plan developed by the organisation to produce an internal report summarising any meaningful findings from the dataset.
- Commercial Determinants of Health Workshop and Report: Another project I worked on during my PhD aimed at understanding how to bring stakeholders in the commercial determinants of health together. This included a workshop comprising public health registrars, representatives from the Office for Health Improvement and Disparities (OHID) and local authorities and academics, among others. The key takeaways from the workshop were used to compile a comprehensive report. This report encapsulated essential elements such as defining the problems associated with commercial determinants, establishing a vision principle, and outlining future aims and objectives for addressing commercial determinants moving forward.
- Alcohol Free Scotland: The effect of alcohol marketing on people with, or at risk of, an alcohol problem: A rapid literature review. I conducted a rapid review of the grey literature on the impact of alcohol marketing on the following populations: those with alcohol dependence, those in recovery from alcohol problems, and hazardous and harmful drinkers.

- I was the postgraduate research representative of the Population and Lifespan Sciences unit in the School of Medicine between 2021-2024.

Submitted manuscripts and manuscripts in preparation

Rachael L Murray, Jo Leonardi-Bee, Alexander Barker, Olivia Brown, Tessa Langley: A rapid literature review of the effect of alcohol marketing on people with, or at increased risk of, an alcohol problem.

Lauren Carters-White, Olivia Brown, Imogen Bevan, Caroline Cerny, Keith Syrett, Linda Bauld: Public acceptability of the obesity policy recommendations in the OHA's healthy weight strategy

I am currently developing manuscripts from the three studies that comprise this PhD.

Presentations

Post-presentation UKPRP Conference 202. Public attitudes towards food-related obesity prevention policies: Inequalities and Policy Disconnects. Olivia Brown, Manpreet Bains Ilze Bogdanovica Tessa Langley, Rachael Murray.

Poster Presentation and Presentation at Research Impact Symposium, University of Nottingham. Public attitudes towards food-related obesity prevention policy: Inequalities and Policy Disconnects. Olivia Brown, Manpreet Bains Ilze Bogdanovica Tessa Langley, Rachael Murray.

Presentation: Spectrum Annual Meeting, Understanding the Relationship Between UK Food-Related Obesity Prevention Policy and Socioeconomic Inequalities in Obesity. Olivia Brown, Manpreet Bains Ilze Bogdanovica Tessa Langley, Rachael Murray.

Presentation: Sue Watson Oral Presentation, University of Nottingham. Olivia Brown, Manpreet Bains Ilze Bogdanovica Tessa Langley, Rachael Murray.

Presentation Spectrum Research Academy: Understanding the Relationship Between UK Food-Related Obesity Prevention Policy and Socioeconomic Inequalities in Obesity. Olivia Brown, Manpreet Bains Ilze Bogdanovica Tessa Langlely, Rachael Murray.

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Abbreviations

BHF	British Heart Foundation
BMI	Body mass index
CBD	Choosing a Better Diet
CCS	Chain convenience stores
CDOH	Commercial determinants of health
CHD	Coronary Heart Disease
COP2	Childhood Obesity: A Plan for Action Chapter 2
COP3	Childhood Obesity: A Plan for Action Chapter 3
COPA	Childhood Obesity: A Plan for Action
DFE	Digital food environment
DHSC	Department of Health and Social Care
EDNP	Energy-dense nutrient poor
FSA	Food Standards Agency
FSM	Free school meals
GBD	Global burden of disease
GDP	Gross domestic product
HFSS	High fat, sugar and/or salt
HLHP	Healthy Lives, Healthy People
HOTN	Health of the Nation – A Strategy for England
HSEA	High socioeconomic area
HWHL	Healthy Weight, Healthy Lives
ICS	Independent Convenience stores
KG	Kilograms
LSEA	Lower socioeconomic area
M	Meters
MHCE	Choosing Health: Making Healthy Choices Easier
NCD	Non-communicable disease
NHS	National Health Service
NPM	Nutrient Profile model
NPS	Nutrient Profile Score
ODP	Online delivery platforms
OFCOM	Office of Communications
OHID	Office of Health Improvement and Disparities
PHE	Public Health England
PPI	Patient and Public Participation Groups
RHI	Reducing Health Inequalities: An Action Report
RSPH	The Royal Society of Public Health
SDIL	Soft drink industry levy
SES	Socioeconomic status
SLHN	Saving Lives: Our Healthier Nation
TA	Thematic analysis

TFL	Transport for London
TOFC	Foresight Tackling Obesities: Future Choices
UCI	Unhealthy Commodity Industries
UPF	Ultra-processed foods
WHO	World Health Organization

1 Introduction

Obesity is a major threat to global public health. Global obesity rates have more than doubled in adults, and more than quadrupled in adolescents since 1990 ^[1]. Its impact on health, the economy, and the individual is extensive. Obesity is a known risk factor for a range of non-communicable diseases (NCDs), including type 2 diabetes, cardiovascular disease, liver disease, hypertension, cancer, and respiratory disease ^[2,3]. It is also a known risk factor for increased severity of communicable diseases, including severity of Covid-19 cases ^[4,5]. Furthermore, a bidirectional relationship between excess weight and mental health illness such as depression, anxiety, eating disorders, and substance abuse has been well established ^[6]. Societal stigma and discrimination around excess weight are also major drivers of mental health problems such as depression and anxiety ^[7]. Furthermore, childhood obesity has significant implications for children's physical and psychological well-being. Childhood obesity increases the likelihood of living with obesity throughout adulthood, increasing the risk of the health conditions above ^[8].

In 2016, 650 million adults were estimated to be obese, and 1.9 billion were classified as overweight and obese ^[9]. Across the European Region, with 59% of adults and almost one in three children classified as overweight or obese ^[10]. There is an inverse socioeconomic gradient in obesity rates in high-income countries; those living in more deprived areas are at greater risk of obesity than those in least deprived areas ^[11]. Within this socioeconomic gradient, women and children from deprived areas are most at risk ^[12,13]. The relationship between obesity and lower socioeconomic status (SES) has remained consistent since obesity was first recognised in the 1970s ^[14]; UK and global policies in recent decades have failed to successfully address them.

Globally, in 2017, high body mass index (BMI) was estimated to have caused 2.4 million deaths ^[15]. The impact of obesity is not limited to fatalities; and has substantial impact on quality of life. Disability-adjusted life years (DALYs) are the sum of years of potential life lost due to premature mortality and years of productive life lost due to disability ^[16]. The leading causes of high-BMI – related deaths and DALYS were cardiovascular disease, diabetes,

kidney disease, and neoplasms, accounting for 89.3% of these deaths. Additionally, the global number of high-BMI-related DALYs more than doubled for both sexes between 1990 and 2017.^[15]

The burden of obesity is not limited to human health; there are significant global economic costs. The global economic impact of overweight and obesity is estimated to reach US \$4.3trillion annually by 2035. This figure is comparable to the impact of Covid-19 in 2020^[17]. As well as the cost to healthcare, the economic burden also includes indirect costs to society, such as productivity loss, disability pensions, work absenteeism, and reduced productivity^[13].

1.1.1 Obesity in the UK

The UK has some of the highest rates of obesity in Europe^[18]. In 2022, the WHO found the UK to be the third most obese nation in Europe, with one of the world's fastest growing obesity rates^[19]. The UK's adult obesity and overweight prevalence is comparable to that in countries such as the US, Australia, and New Zealand, with 64.3% of adults in England classified as overweight or obese^[20]. Adult rates are consistent throughout the UK: 66% of adults in Scotland, 61% in Wales, and 65% in Northern Ireland^[21-23]. Figure 1 demonstrates how UK obesity rates (excluding overweight) are projected to increase between 2020 and 2035^[17].

PROJECTED TRENDS IN THE PREVALENCE OF OBESITY (BMI $\geq 30\text{kg}/\text{m}^2$)

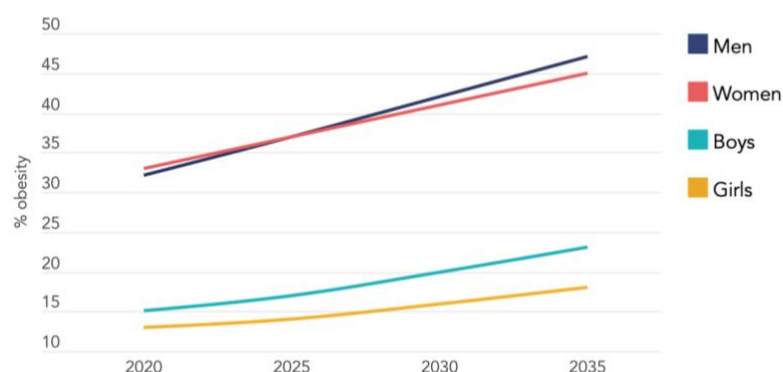


Figure 1 World Obesity Atlas 2023 - Projected trends in the Prevalence of Obesity in the UK^[17]

In regard to childhood obesity, in Scotland in 2021 20% of children aged 2-6 and 22% of children aged 7-11 were obese ^[20]. Data from 2018/19, showed that 12.6% of Welsh children aged 4-5 were obese and 14.4% were overweight ^[20]. In Northern Ireland, 7% of children aged 2-10 and 4% of children aged 11-15 classified as obese ^[20]. Lastly, in England, 10.1% of reception-aged children (aged 4-5) and 23.4% of year 6-aged children (aged 10-11) classified as obese ^[20]. Childhood obesity is associated with a high risk for obesity, premature death, and disability in adulthood ^[24].

1.1.2 The Impact of Obesity on Health and the Economy in the UK

The impact of obesity on UK mortality has worsened; between 2003 and 2017, deaths attributable to obesity and overweight were estimated to have increased from 17.9% to 23.1%. Of these deaths more than half were caused by heart and circulatory problems such as heart attacks and stroke ^[25]. The British Heart Foundation (BHF) estimated that this equates to 31,000 deaths annually ^[25]. In 2019-20, there were more than 1 million hospital admissions linked to obesity in England, a 17% increase on the previous year ^[26]. Furthermore, a clear relationship was found between Covid-19, obesity and higher rates of mortality. The rate of death involving Covid-19 was 2.12 and 2.22 times greater for men and women, respectively, with obesity compared with those without obesity after adjusting for age, ethnic group, geographical factors, socioeconomic characteristics, smoking status, and COVID-19 vaccination status ^[27].

The economic burden on the NHS is significant, and it is estimated that UK-wide obesity costs NHS £6.5 billion per year ^[28]. By 2050, it is projected to increase to £9.7 billion ^[29]. The economic impact across devolved nations varies due to population size among other factors. The Royal Society of Public Health (RSPH) estimated that obesity-related ill health costs NHS England £4.2 billion a year ^[30]. Obesity-related ill-health cost NHS Wales more than £73million a year and was predicted to reach £465 million per year by 2050 ^[31,32]. The cost of obesity to NHS Scotland was estimated to be a maximum of £360–£600 million annually ^[33,34].

The cost of obesity is not limited to healthcare. However, estimating the total cost of obesity is difficult due to the consideration of cost to the health care system, the individual,

wider societal costs and the additional cost from Covid-19 ^[35]. UK data from 2022 estimated that the costs of obesity to a wider society were around £58 billion per year ^[35]. Furthermore, Northern Ireland estimated that obesity costs its economy £370 million annually, 25% of which is direct healthcare expenditure, consisting of 2.8% of the total annual healthcare expenditure in Northern Ireland ^[36]. Factors such as informal and formal social care, productivity loss, impaired quality of life, direct healthcare costs, and investment to mitigate the impact of obesity are considered within the societal costs of obesity ^[37].

1.1.3 Socioeconomic Inequalities in Obesity in the UK

Socioeconomic inequalities are found in all areas of health and society. It is well established that factors such as education, employment status, income level, gender, ethnicity and so forth have considerable influence on shaping health ^[38]. Socioeconomic status (SES) measures an individual's place in the social hierarchies built around education, occupation and income as well as to measure the impact of social and economic inequalities on various outcomes such as health and overall quality of life ^[38]. In the UK, socioeconomic disparities in health are significant. For instance, in England, the difference in healthy life expectancy between the most and least deprived areas is greater than 18 years ^[39]. In the UK, income inequality, as measured by the Gini Coefficient, increased by 1.3-percentage points to 35.7% between 2021 and 2022, largely due to the reduction in disposable income among the fifth-poorest households resulting from reduced original income and cash benefits ^[40]. From 2013 to 2022, disposable income inequality for non-retired households has increased by 0.8-percentage points ^[40]. Covid-19 has exacerbated inequalities in the UK; as more households are pushed into poverty. The Resolution Foundation estimates that in the UK, approximately 730,000 more children will be living in poverty by 2024–25 and relative poverty will be at its highest in 2021–22 since 1987 ^[41].

The socioeconomic gradient of obesity rates in the UK is persistent, with a consistent widening of the inequalities gap since 1995 ^[42]. In England, adults living in the most deprived quintile of neighbourhoods are almost twice as likely to be obese as those living in the least deprived quintile of neighbourhoods ^[11]. In England, childhood obesity follows the same pattern: among the 10–11-year-old and 4–5-year-old age groups, children in the most deprived areas were approximately twice as likely to be obese ^[20]. The inequality worsened

in severe cases of obesity, where rates were around four times higher in the most deprived areas than in the least deprived areas ^[20]. In Year 6 (ages 10-11), only 13.5% of children living in the least deprived areas were obese, compared to 31.3% in the most deprived areas ^[20]. As Figure 2 clearly shows, the inequality gap in childhood obesity has widened since the 2006/7 survey data.

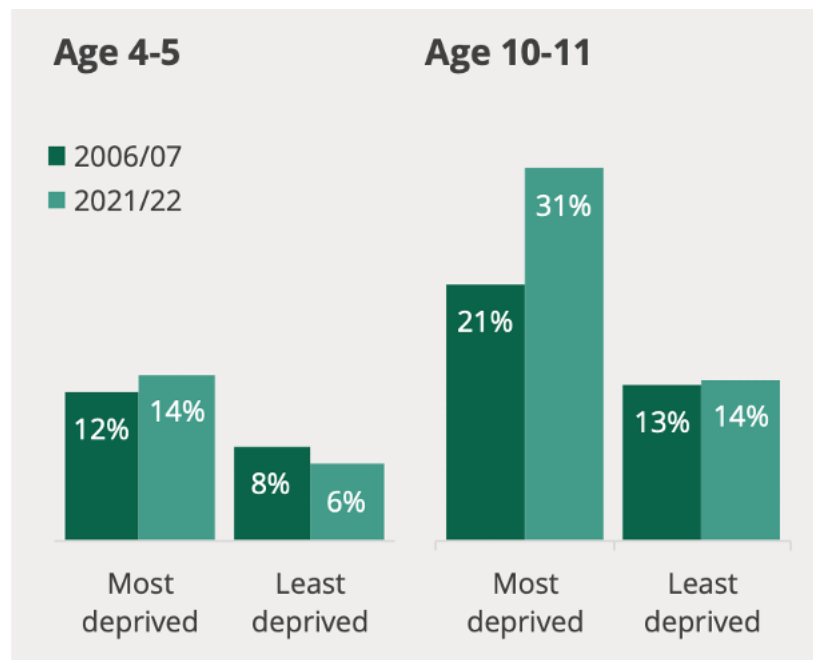


Figure 2 Childhood obesity in England: Deprivation gap in obesity rates among aged 4-5- and 10–11-year-olds

In Wales, 34% of adults from the most deprived quintile are classified as obese compared to 20% of adults from the least deprived quintile ^[43]. Additionally, 28.4% of children living in the most deprived areas of Wales are either overweight or obese, compared to 20.9% of children in the least deprived areas ^[44]. In Scotland, obesity rates are higher in the most deprived areas (33%) than in the least deprived areas (26%) ^[45]. Scottish childhood obesity rates follow the same trend, with 22% of children in the most deprived areas classified as obese compared to 13% of children in the least deprived areas ^[46]. Northern Ireland had a similar pattern. Data from children in Year 8 (12-13 year-olds) showed that 8.7% of those from deprived areas were classified as obese, compared to 3.8% of Year 8 children from the least deprived areas ^[47].

1.2 Overview of the key determinants of obesity: a case for food policy

This section provides an overview of causal arguments regarding obesity, followed by a justification for focusing this research on food-related obesity prevention rather than policy promoting physical activity in the UK. It then provides a summary of key drivers of obesity regarding diet, and the interactions between these established drivers and inequalities in obesity rates.

Diet, Physical Activity and the Cause of Obesity

The energy balance model provides a simple way to conceptualise weight gain at the individual level. This model states that weight change occurs when the balance between input (food and drink) and output (physical activity) becomes unequal over a sustained period ^[48]. Many drivers affect this balance through interactions with the host (individual), environment (external factors beyond the individual, for instance, extensive marketing of unhealthy food and drink), or vector (food and drink) ^[48]. This simple conceptualisation demonstrates how drivers of obesity interact at an individual level, resulting in rising obesity rates at the population level.

In simple terms, the high-level determinants of obesity are diet and lack of physical activity. In the twenty-first century, sedentary lives have become the norm, for instance the UK is estimated to be 20% less active than in the 1960s ^[49]. Improving population-level physical activity levels is vital for public health, due to the multitude of health benefits of physical activity beyond weight management, including sleep, mental health prevention, and diet-related diseases such as hypertension and coronary heart disease (CHD) ^[49]. However, in public health diet is widely regarded as the key determinant of obesity ^[50,51]. This is justified due to the complexity of the multitude of factors that influence diet from the individual to the food system. The following section provides an overview of some of the key causal arguments of obesity followed by an overview of the key drivers of obesity related to food and diet.

Defining Healthy Diets

In this thesis, diet and dietary behaviours refer to the combination of foods and drinks consumed on a regular basis. This thesis adopts the WHO's description of a higher quality of diet; one which includes high quantities of fresh products such as whole grains, foods from animal sources (lean meats, fish, dairy products), vegetables, and fruits ^[52]. A low-quality diet refers to the frequent consumption of energy-dense, nutrient poor (EDNP) foods or high quantities of ultra-processed foods (UPF), which often contain high quantities of synthetic and artificial ingredients, sugars, starches, and oils that make the products highly palatable ^[53]. The term UPF was developed by Monteiro et al. (2019) to conceptualise this food and drink as products that have undergone an entire reformulation of their food matrix, resulting in the addition of artificial colours, emulsifiers, flavourings, and other additives, all with the aim of enhancing palatability ^[54]. These products tend to be pre-packaged and heavily marketed ^[55]. The thesis will also refer to healthier foods and less healthy foods, these terms are derived from the Food Standards Agency (FSA) Nutrient Profile Model (NPM) classification system used by the government, refer to Section 5.2.2 for further information ^[56].

1.3 An Overview of the Causal Drivers of Obesity

The purpose of this section is to outline the key literature regarding the causal concepts of obesity to provide a context for the nature of policy action and the primary studies included in this thesis. This section outlines the key causal ideas in the literature regarding diet as the key determinant of obesity, including genetic predisposition, socio-cultural shifts in food norms, the nature of the modern food environment and the global food system, and food and drink industry activity. This thesis acknowledges the complexity of obesity causation and its associated drivers; causal arguments accounting for the rise in rates have been highly contested, dominated the early literature in obesity prevention and have an important role in shaping the policy landscape ^[57].

Genetic pre-disposition

The genetic pre-disposition causal argument suggests that some individuals are more susceptible to obesity due to their genetic make-up ^[58]. However, the genetic predisposition

explanation has received considerable criticism for medicalising obesity causation and prevention, removing responsibility from the food and drink industry and governments, and placing responsibility on the individual and health care system ^[59,60]. The focus on genetic predisposition in understanding obesity risks shifting prevention towards pharmaceutical treatments instead of addressing broader causes of obesity. Despite the initial popularity of genetic explanations in the 1990s, few studies have successfully established a plausible genetic link to account for the population-level rise in obesity rates ^[58]. To an extent, genetic makeup can account for differences in weight change between individuals, but the literature suggests that there is no plausible genetic explanation that can account for the steady increase in national- and global-level obesity rates ^[61].

Socio-cultural Shifts in Food Norms

An interesting area of consideration relates to the social and cultural changes that have occurred over the past three decades, which align with the rising obesity rates. Modern society is characterised by a 24-hour, seven-day consumerist society ^[58]. Accordingly, there are key sociocultural and technological drivers that shape when, what and how people purchase and consume food and drink. Examples of socio-cultural changes includes the shift in traditional mealtimes, employment types, and work patterns, and the increase in female participation in the labour market ^[62–64]. These socio-cultural changes are associated with greater consumption on convenience foods and fast foods, which are disproportionately EDNP and UPF. Research suggests that the influence of these socio-cultural factors, combined with product accessibility, has reduced the requirement for home-cooked meals that traditionally include high proportions of fresh nutrient-dense items ^[65,66]. In 1980, almost two-thirds of the average household's food budget was spent on raw ingredients, but by 2000, it was less than one-third, which coincided with an increase in people's expenditure on out-of-home food ^[67]. Furthermore, the rise of television, the Internet, and smart devices and the emergence of the digital food environment (DFE) in the home have reshaped norms surrounding traditional mealtimes, where fewer households sit around a table for meals ^[68].

There has also been a clear shift in social norms regarding portion size ^[69]. Portion size is shaped by what the public routinely encounters in supermarkets, restaurants, and throughout the media through marketing ^[70,71]. There has been gradual growth in the accepted portion and package size since the 1970s ^[72]. The BHF published a study in 2013 that showed how food commodities had increased in size since 1993; for example, curry ready meals expanded by 50% ^[73].

The Nature of the Modern Food Environment

The nature of the modern food environment is the most popular causal argument for the rise of obesity throughout the international public health community and within literature from the UK ^[74,75]. The food environment refers to the physical, economic, policy, and sociocultural surroundings in which individuals make decisions about food choices and consumption. It encompasses various factors such as accessibility, availability, affordability of foods, and food information ^[76,77]. In the literature, a consensus supported by the WHO is that a food environment conducive to healthy food choices is essential to support populations in sustaining healthy weight and diet. At present, the food environment across high-income countries is increasingly referred to as an obesogenic environment, characterised by the accessibility and affordability of EDNP and UPF products, and low levels of availability of fresh items, in accordance with the high volumes of industry marketing and promotion ^[74,78].

Emergence of the Global Food System

The food system inherently shapes the food environment. Over the past four decades, the global transformation of the food system has coincided with rising levels of obesity. Food system refers to all the elements and activities related to producing and consuming food. Their effects, include economic, health, and environmental outcomes and how food production impacts the natural world, and the impact of food on the individual and population health ^[79]. The transformation of the food system was first recognised in the US and has since been observed globally ^[61]. The emergence of the global food system has been facilitated by globalisation, trade liberalisation, and the formulation of international trade regimes catalysed by technological developments ^[58,80,81]. The outcome of this

transformation has increased the supply and consumption of cheap, palatable EDNP foods that are particularly high in refined flour, saturated fats, sugars, and products that are low in fibre^[82]. Otero (2018) argued that this led to the emergence of the 'global diet'. The global diet, also referred to as the 'western diet', is characterised by EDNP and UPF. Otero claimed that this diet is the direct outcome of consolidated agribusiness and a food sector controlled by a small group of transnational business, along with industrial-scale farming of corn, sugar, and soy ^[83].

The food system is an economic system with multiple levels of financial interaction, from production to consumer purchasing behaviour ^[79]. The transformation of the food system has not only changed what foods people consume but also how and where they consume them. This is, in part, the result of the formation of a concentrated market, in which a small portion of corporations hold market power ^[84]. At present, a small group of powerful food and beverage companies account for a large proportion of the food and drink industry's market share. The shift from a competitive industry to a concentrated industry has a direct impact on individual consumers, as it leads to food prices being skewed to benefit industry profits and disadvantaging the consumer ^[83,85]. Furthermore, advanced distribution systems have modified the accessibility and convenience of foods and have led to the expansion of food industry marketing which has increased in prominence and persuasiveness over the years ^[13,86-88]. Swinburn et al argue that this transformation is the primary driver for rising obesity rates as it is the only driver that has simultaneously occurred around the world ^[89]. Consequently, they concluded that, although other drivers have accelerated the rising rates, the food system is the only plausible explanation for exponential rates ^[61,89].

The Obesogenic Environment

The food system has resulted in the formation of a food environment that is often referred to as obesogenic ^[80]. The obesogenic environment was coined to describe the existence of an environment that provides conditions for the overconsumption of EDNP and UPF ^[90]. People are highly responsive to subtle environmental cues, such as the placement of products in stores coupled with food and drink marketing in everyday life. Environments where UPF and EDNP products are accessible, affordable, available, and cleverly marketed result in overconsumption or a higher proportion of diet ^[91]. The current food environment

exploits people's vulnerabilities, whether economic, social, psychosocial, or biological, making low-quality diets an easier option ^[92].

The Food and Drink Industry and Obesity

The food and drink industry is central to the formation of the global food system and the obesogenic food environment. The food industry relies on food simplification (replacing ingredients with additives, synthetics, fats, salt, and sugars) to reduce costs, speed up production, and allow for a longer shelf life, resulting in highly profitable and palatable products ^[77,93,94]. The large UPF food companies prioritise raising profit margins on products and increasing the total volume sold to dominate the market. This has resulted in the food industry consistently launching new products, resulting in new diet norms such as the emergence of snack culture and the replacement of water with sugary soft drinks ^[95,96].

Marketing practices in the food and drink industry have received significant academic and policy attention. The size of the food and drink industry's marketing is significant. McDonalds and Coca-Cola's annual marketing budget is twice that of the WHO's annual budget ^[58]. The amount of industry funding on marketing demonstrates the importance and effectiveness of marketing for industry sales. Marketing practices have a notable impact on purchasing and consumption behaviours ^[97,98]. Marketing shapes food norms regarding the desirability of products, expected portion size, and nutritional literacy through health associations ^[99]. Accordingly, marketing has an important role in shaping food preferences, particularly in childhood. Food preferences refer to what people enjoy, how often they eat, and how much they eat ^[51,100]. Repeated exposure to the conditions in which consumption occurs develops habits and associations which ultimately lead to preferences ^[51,101]. Parents, caregivers, and peers heavily influence food preferences; however, food preferences are also heavily influenced by the environment and marketing ^[51].

Clever marketing creates brand loyalty, particularly for children ^[100,102,103]. Marketing is explicit on TV advertisements and social media platforms such as YouTube, radio, billboards, buses, and taxis. It is also implicit through stealth approaches, such as branding within movies and TV, and video games ^[77,104,105]. To demonstrate the extent of marketing exposure of high fat, salt and/or sugar (HFSS) products, Cancer Research UK recently

commissioned a study on 11–19-year-olds and reported that 86% saw advertisements for junk food on social media, 84% saw advertisements on TV, 82% saw advertisements on billboards, and 72% saw famous people in films, music videos, TV, or magazines with unhealthy food and drinks ^[106]. Children are more likely than adults to interpret marketing as fact; therefore, marketing risks shaping children’s preferences, consumption, and attitudes towards diet from childhood into adulthood ^[100].

Marketing also exists in the food retail environment. Product exposure through placement, in-store advertisement, volume-based promotions, such as buy-one-get-one-free and price reduction promotions, are common in most UK food stores ^[107]. These products have an extensive impact on purchasing behaviour; for example, promotions of this type result in consumers purchasing almost 20% more than usual and are disproportionately EDNP and UPF ^[108].

1.3.1 An Overview of Causes of Inequalities in Obesity, Dietary Behaviours and Food

Section 1.3 presented an overview of the primary causal explanations of obesity in the literature regarding food. This section provides and overviews of the key literature exploring the relationship between higher rates of obesity and lower SES. Inequalities in obesity rates are well reported internationally ^[12,109]. As discussed in Section 1.1.3, the socioeconomic gradient in UK obesity rates is significant. The factors contributing to the socioeconomic gradient are multifaceted, as a multitude of explanations have been put forth in academic literature. These explanations encompass experiences of food insecurity, dependence on food banks, and financial constraints that limit access to nutritious foods. Additionally, those from lower socioeconomic backgrounds often have lower levels of access to fresh produce and supermarkets, and higher access to UPF. Poorer quality environments also limit opportunities for physical activity, while inequalities in access to weight management services are prevalent throughout the UK. Reducing socioeconomic inequalities in obesity rates is key to reducing broader inequalities in health ^[110,111].

Inequalities and the Nature of the Food Environment

the transformation of the food system appears to particularly affect the quality of diets consumed by lower SES groups. The influence of SES on obesity rates and the influence of SES on the quality of diet has been consistently demonstrated in epidemiological studies [112–114]. SES affects the consumption of micronutrients, total energy intake, and risk of food insecurity [112,115]. In the UK, lower SES is associated with higher consumption of EDNP products, and UPF [116–118]. However, the high consumption of UPF is becoming increasingly normal: a recent study from the UK found that 56% of all calories consumed by older children and adults are from UPF [119]. Importantly, considerable differences were found between UK adults based on the level of deprivation with regard to high-quality, nutrient-dense foods: the most deprived fifth of adults consume 37% less fruit and vegetables, 54% less oily fish, and 17% less dietary fibre than the least deprived fifth [120].

The Affordability of Healthy Diets

Internationally and in a UK context there is evidence that a healthy diet is more expensive than a less healthy diet. The Eatwell guidelines are a UK policy tool that defines the government's recommendations for healthy eating [121]. Prior research has suggested that per calorie diets that meet the government's Eatwell Guidelines for fruit and vegetable intake are more costly than those that do not [113]. The fifth most deprived household would need to spend 43% of its disposable income to maintain a diet that meets the government's recommended healthy diet guidance, compared to only 11% of disposable income for the least deprived fifth of households [120,121]. Furthermore, due to the cost-of-living-crisis rising food prices have added pressure to all UK-households, most impacting lower SES households. A recent study found that, on average, more healthy foods are over twice as expensive as less healthy foods per calorie, with healthy food costing an estimated £10.00 per 1,000 kcal compared to £4.45 for less healthy products [120]. Alongside the difficulty of affording a healthy diet, lower socioeconomic groups face further barriers regarding possessing the time and resources to cook from scratch [107]. The perceived lack of time has been found to result in greater reliance on fast food and ready-made EDNP meals as well as deter individuals away from consuming fresh produce under the assumption that it requires a substantial amount of time-consuming preparation [122].

Lower SES groups face the double burden of a higher risk of obesity and food insecurity ^[123]. Food poverty is defined as the inability of individuals and households to secure an adequate and nutritious diet. Food insecurity is linked to food poverty but emphasises the uncertainty and risk to insufficiency of food availability, limited by resource constraints and inadequate access to nutritious food that meets the dietary needs of a healthy lifestyle ^[123,124].

In the UK, food poverty appears to have increased; in 2022/23, 7.2 million people in the UK were in food insecure households, an increase of 2.5 million people since 2021/22 ^[125]. The Trussell Trust stated that 1.5 million emergency food parcels were provided to people by food banks in the charity's UK-wide network between April and September 2023, marking a 16% increase from 2022 and the highest number of parcels that the network has ever distributed during this period of the year ^[126]. In 2023/24 the Trussell Trust reported that 3.12 million emergency food parcels had been supplied, the highest number of parcels distributed by the network in a year ^[127]. In the most deprived households, a lack of cooking equipment and low-quality housing can restrict cooking from scratch due to material conditions ^[112,125]. It is estimated that 1.9 million people in the UK live without a cooker, 2.8 million people without a freezer, and 900,000 people without a fridge ^[126]. In the UK and countries such as the US, there is a strong association between food insecurity and obesity, which is largely disregarded in policy ^[127].

Economic uncertainty can adversely affect people's food choices by forcing people to prioritise calorie quantity resulting in reliance on cheap EDNP foods ^[109,113]. Furthermore, studies have found that parents, mainly mothers, act as nutritional buffers for households, causing mothers to skip meals or eat poor quality diets to ensure that their children are fed ^[109]. Food insecurity is linked to irregular and uncertain meal patterns that are linked with unhealthy eating patterns, resulting in obesity and broader psychological impairments, such as anxiety and high levels of stress ^[128]. This is further affected by unemployment, poorer job quality, and unsociable working hours that disproportionately affect lower SES groups and influence diet quality ^[129]. In summary, the explanation for the double burden of food insecurity and obesity is linked to the outcomes of the global diet, in which the most affordable and accessible diets consists of a high volume of EDNP and UPF ^[130].

Inequalities and Nature of the Food Environment

Financial barriers are not the only drivers of obesity for lower-SES households, as the structural environment is heavily influential in shaping diets. The differences in the structural environments of high- and low-SES areas are consistent across high-income countries, including Canada, Australia, Germany, and the US [131]. In the UK, food environments in lower SES areas were found to be more conducive to excess weight and poorer quality diets than in higher SES areas [99,109]. Low-income areas have reduced availability of affordable fresh fruits and vegetables and have excessive accessibility to fast food and UPF [125]. In the UK, around 3.3 million people cannot reach any food stores providing healthy, fresh foods within 15 minutes of their homes by public transport [132]. Additionally, a recent study found that the average proportion of fast-food outlets was 21% in the least deprived local authorities, compared to 31% in the most deprived [120]. The accessibility to fast food outlets has been linked to increased fast food consumption and excess weight [133,134]. Studies have also shown that deprived areas are more exposed to food and drink marketing. For example, the more deprived areas of Newcastle upon Tyne, England, were found to have greater exposure to food advertisements on streets than the least deprived areas of Newcastle upon Tyne [135]. More recently, research has found that 82% of outdoor advertising is located in the most deprived areas of England and Wales [136]. This study did not investigate whether the outdoor advertising showed HFSS products; however, three fast food chains are among the top five largest spenders on UK outdoor advertisements, suggesting that deprived areas are more likely to be exposed to these advertisements than the least deprived ones [137]. Additionally, research utilising street-view images in Liverpool found clear clusters of unhealthy advertisements in more deprived areas and student populations than in least deprived areas in Liverpool [135].

Other factors shaping the socioeconomic gradient include lower health literacy and lack of nutrition knowledge in lower SES groups. In England, 42% of adults are unable to understand and use everyday health information, increasing to 61% when numeracy skills are required [138]. The lack of cooking skills and motivation to prepare healthy meals, linked to time constraints, has also been identified as a potential explanation for the socioeconomic gradient in rates [139,140].

1.4 Overview of UK Obesity Prevention Policy

Due to the extent of the obesity problem in the UK, effective population-level policy is required to influence the main drivers of obesity discussed throughout Section 1.3. Furthermore, as lower SES exacerbates the influence of these drivers, reducing socioeconomic inequalities in obesity is essential to reduce broader UK health inequalities. The following section provides an overview of obesity prevention policy in the UK. It first will outline the key terminology regarding food-related obesity prevention policy, it will then provide a broad overview of existing action in the UK, focusing on policy action from Westminster Government.

Defining policy terminology

There are two main strands of health policy: health care and public health ^[141]. This thesis focuses on public health which is concerned with the promotion of health, the prolongation of life and the prevention of ill health ^[142]. Food policy for obesity prevention is a strand of both food policy and obesity prevention policy. Obesity prevention from a population-level perspectives means reversing the trend in obesity by lowering the mean BMI level and decreasing the incidences of obesity at a population level ^[143]. Obesity prevention differs from obesity management, as management policies focus on access to professional support for those already living with obesity or those at a higher risk of obesity ^[144]. Food policy can be defined as ‘a concerted set of actions aiming at positively influencing the nutritional status of a given population, which are carried out by representative institutions or by those who are legitimate to represent the communities for which they are intended’ ^[145(p. s1)]. Commonly, the term ‘food policy’ encompasses all parts of the food system, including micronutrient deficiencies, undernutrition, food poverty and food insecurity, sustainable agriculture, food production and distribution, and obesity prevention ^[132]. In simple terms, food policy is how government actions, including legislation and regulations, shapes the food system ^[79,132].

In this thesis, obesity-related food policy is referred to as a food policy which encompasses all policies intended to improve population diet quality to influence population level BMI. Food policy encompasses many government departments; the Department of Health and Social Care (DHSC) and the Office for Health Improvement and Disparities (OHID) are the most responsible ^[146]. This thesis refers to obesity prevention strategies as published government documents detailing a prevention plan of action designed to achieve long-term aims.

1.4.1 Existing Obesity Prevention Policy in the UK

Obesity was formally recognised by the UK government as a threat to population health in 1991 ^[147]. Since then, 14 obesity prevention strategies have been published in England, amounting to 689 proposed policies across the four governments ^[141]. One of these strategies specifically focused on physical activity, while the other 13 ranged from broad health prevention strategies, including obesity prevention and obesity-specific strategies. Despite numerous strategies, obesity rates and inequalities in obesity have worsened (see Section 1.1.1) ^[20]. The introduction of obesity into the political agenda coincided with the devolution of the UK, including the devolution of health and social care ^[148]. Consequently, there is divergence in health policy across England, Scotland, Wales, and Northern Ireland; however, some policies remain UK-wide ^[149–151]. Policies have remained UK-wide when national institutions or organisations are involved in implementation; for example, the Office of Communications (Ofcom) regulates TV and radio marketing, and the Food Standards Agency regulates food labelling ^[150]. Although there is a divergence between strategies from the devolved nations, UK government strategies are relevant UK-wide and have considerable overlap to those published by the devolved nations. Due to the volume of prevention strategies published across the four governments, this section provides a summary of the strategies published by the UK Government. The following strategies summarised in the next section are published by Labour, Conservative and Conservative-Liberal Democrat coalition governments. The publications of strategies from each political party demonstrates how the importance of obesity prevention transcends political party lines. However, as discussed, no strategy, irrespective of the associated political party has effectively resulted in the reduction of obesity rates.

1.4.2 An Overview of England's Obesity Prevention Strategies Since 1992

This section provides an overview of 13 obesity prevention strategies published by the UK government for England. One of the 14 England-based obesity prevention strategies focuses on physical activity and is excluded from this overview. The overview provides a comprehensive summary of each strategy, its position on responsibility and a summary of the key policies proposed by each strategy (see Section 1.4 for the definition of policy). The overview provided in this section refers to Theis and White's (2021) study, which completed a document review and analysis of government obesity strategies in England ^[141]. Theis and White's analysis included prevention strategies that were both partially and entirely focused on tackling obesity. In the strategies partially tackling obesity, only policies that explicitly proposed a solution for obesity and overweight were included (See Figure 4 and Figure 5). In Theis and White's analysis, they divided each policy by its targeted behaviour; diet, physical activity, and nonspecific. There are policies included in the discussed strategies that are unrelated to these three behaviour groups and, are not accounted for in the figures provided throughout this section.

Throughout this overview, references are made to policy type. This section uses Theis and White's categorisation of policy type (See Appendix 8.1 for further information)^[141]. Regarding policy type, Theis and White developed 15 policy type categories with use of the Nuffield Foundations "Intervention Ladder". The Intervention Ladder consists of eight different policy types, which were expanded upon to account for the range of policies included in the strategies based upon the extent to which a policy enables or restricts choice ^[141]. Appendix 8.1 provides a description of the policy types developed by Theis and White and referred to throughout this section and in Figure 5^[141].

Conservative Government	Labour Government			Coalition Government	Conservative Government	
Health of the Nation: A Strategy For England (1992)	Saving Lives: Our Healthier Nation (1999) Reducing Health Inequalities (1999)	Choosing Health (2004) Choosing a Better Diet (2004)	Healthy Weight, Healthy Lives (2008) Food Matters: Towards a Strategy for the 21st Century (2008)	Healthy Lives, Healthy People (2010) A Call to Action On Obesity In England (2011)	Childhood Obesity: Plan for Action (2016) Childhood Obesity: Plan for Action, Chapter 2 (2018) Childhood Obesity: Plan for Action, Chapter 3 (2019)	Tackling Obesity (2020)
1990-1997	1997-2010			2010-2015	2015-Present	

Figure 3 Timeline of Obesity Prevention Strategies – England – 1992-2020

Health of the Nation: A Strategy for England (1992) ^[152]

In 1992 the Conservative government published ‘Health of the Nation – A Strategy for England’ (HOTN) ^[152]. The strategy had five priorities regarding the top causes of premature and avoidable death, including CHD, stroke, and cancer ^[152]. The strategy included a target to reduce obesity to prevent CHD and stroke rather than placing obesity at the centre of the strategy. The strategy framed obesity as a growing ‘wicked problem’ caused by poor lifestyle choices and placed responsibility for reducing rates in the hands of local authorities, the NHS, and the individual ^[153]. The HOTN proposed 43 obesity-related policies total, including 25 directly linked to diet. The strategy predominantly focused on evaluation, monitoring, research, guidance, and standards within health prevention more broadly, for example providing leadership for local health strategies by developing and implementing the Health Improvement Programmes. Other policy types included enabling and informing policies such as a pledge to ensure consumers have the information required to make informed decisions about what they eat (See Figure 5).

Saving Lives: Our Healthier Nation (1999) ^[154]

In 1999, New Labour published Saving Lives: Our Healthier Nation (SLHN), followed shortly by Reducing Health Inequalities: An Action Report. The strategy saw health improvements as the balance between reducing social, economic, and environmental barriers to health combined with individual responsibility to improve one’s health ^[155]. The strategy framed responsibility for health as a three-way partnership between government, communities,

and individuals, with the government as a facilitator for improved individual health ^[155]. SLHN proposed fewer policies than HOTN. Of the 19 policies proposed, 7 (37%) focused on diet, over 50% of policies proposed in this strategy were enabling policies (See Figure 5 and Appendix 8.1). Similarly, to HOTN, this strategy adopted a broader view of health prevention than more recent strategies. Examples of key policies included within SLHN are enabling policies such as the introduction of the Social Exclusion Unit's neighbourhood renewal programme to develop a strategy to improve shopping access for people living in deprived neighbourhoods, informing policies including NHS direct – the provision of rapid access to health information and help, and a £290 million pledge to Health Action Zones – 26 areas in England aimed to promote health partnerships and innovation in public health ^[155].

Reducing Health Inequalities: An Action Report (1999) ^[156]

Following the SLHN, Reducing Health Inequalities: An Action Report (RHI) was published. It was published in response to The Acheson Report, which was commissioned to provide the latest information on health inequalities in England and provide priority areas for policy engagement ^[157]. The government's strategy for addressing both food poverty and obesity demonstrates its commitment to tackling inequalities and focus on the wider social determinants of health. The strategy attempted to reshape the policy narrative for reducing inequalities as a collective effort that brought together all areas of society and government departments. RHI proposed 23 policies, predominately focused on diet (44%). The strategy's proposed policies mostly included enabling and informing policies and research and institutional policies (See Figure 5). Key policies proposed in this strategy included the introduction of a module on balanced diets into the national curriculum, the Healthy School Programme – a financial investment into healthy ethos in schools and school breakfast clubs – a scheme to ensure children from deprived areas have access to good quality breakfast ^[157].

Choosing Health: Making Healthy Choices Easier (2004) ^[158]

Choosing Health: Making Healthy Choices Easier (MHCE) was published in 2004 as part of a three-year plan, the initial whitepaper Choosing Health, followed by two separate papers the following year: Choosing a Better Diet and Choosing Activity ^[159,160]. Choosing Health

placed obesity at its core and included a clear commitment to reduce obesity rates. The strategy had an increased emphasis on individual responsibility through messaging describing the public's want to make decisions about their own health; therefore, the government's role was to provide them with information and guidance to do so ^[158]. MHCE was a significantly larger strategy than those that came before it, with 109 proposals, 28% of which were directed at diet. Examples of policies proposed by MHCE included informing policies such as the 5-A-Day and salt awareness social marketing campaigns to improve public awareness of diets, the introduction of easily understandable food labels and restricting choice policies such as industry voluntary codes for marketing practices to children (See Figure 5) ^[158].

Choosing a Better Diet: A Food and Health Action Plan (2005) ^[159]

Choosing a Better Diet (CBD) was published as an action plan for food and diet following the publication of Choosing Health. The aim of this strategy was to demonstrate the toll of poor-quality diet on public health and improve the sustainability of food supply, food guidance and information, and food across schools, the NHS, and other government institutions. This strategy relied heavily on information policies to educate the public. The strategy suggested shared responsibility and a collective response to food policy; however, its messaging maintained individual responsibility framing: 'the national engine for health improvement is to be found in the ambition of people themselves to live healthier lives' ^[159(p. 39),161]. This strategy included fewer proposed policies than MHCE, with a total of 86 policies, 62% specifically focused on diet. The policies included informing policies such as strengthening diet on the national curriculum to provide education and skill-based sessions on food and diet for pupils, non-fiscal incentives such as healthy eating awards for workplaces in England, guidance and standard policy including improved nutritional standards for government intuitions and authorities, and enabling policy like fruit and vegetable scheme - providing a free piece of fruit and vegetable to 4-6 year-olds in selected schools across England ^[159].

Healthy Weight, Healthy Lives: A Cross-Government Strategy for England (2008) ^[162]

Healthy Weight, Healthy Lives (HWHL) was published in 2008 following the publication of the Foresight Tackling Obesity: Future Choices (TOFC). This strategy is divided into three main strands of action: informing choices, creating an environment for healthy behaviours, and supporting management services. This strategy placed responsibility for obesity between the Department of Health and Department of Education yet, maintained an individual responsibility framing in line with the previous strategies and positioned the government as the facilitator of empowerment^[163]. HWHL included the proposal of 72 policies, 31% targeting diet. This strategy included well-known informing policies such as Change4Life and Start4Life, social marketing campaigns for families or new mothers to provide health and nutrition advice. Further informing policies included voluntary front-of-package labelling and restricting choice policy such as the restriction of food marketing on children's TV^[162].

Food Matters: Towards a Strategy for the 21st Century (2008)^[164]

Food Matters was published in 2008 as obesity rates were notably worsening and the debate surrounding climate change and sustainable agriculture increased. Food Matters is a similar strategy to CBD in its integrated approach to improving quality diets and sustainable food system policies. It intended to ensure that the future of food policy aligns obesity prevention, high-quality diets, sustainability, and climate change. The strategy also stated that the food environment and social norms surrounding food have changed considerably^[164]. The strategy noted that shifting values and preferences within the twenty-first century society was key to preventing rising obesity rates. The strategy is considerably smaller than the others, including 9 policies total, 100% focused on diet. Food Matters maintains individual responsibility framing and a high proportion of information and guidance-based policies^[164]. Examples of policies included within this strategy were a non-fiscal incentive policy, the Healthier Food Mark award, a voluntary scheme for caterers working in the public sector to encourage healthier food provision, an evaluation policy to formally assess existing policies and approaches and informing policies such as the advancement of the 5-A-Day campaign^[164].

Healthy Lives, Healthy People: Our strategy for Public Health in England (2010)^[165]

In 2010, the coalition government, Conservative party and Liberal Democrats gained power, with David Cameron as Prime Minister. The government shortly published Healthy Lives, Healthy People (HLHP) with the promise of an obesity-focused prevention plan the following year. HLHP, in part, is a response to The Marmot Review: Fair Society, Healthy Lives which highlights the striking impact of the social determinants of health across the UK ^[166]. HLHP adopted a whole-system approach between the NHS, Department of Health, and newly established PHE. The establishment of the PHE marked a key structural change in this strategy. HLHP included greater consideration of local action and freedoms for local governments and authorities to lead the impact, particularly regarding inequalities. The strategy emphasised the necessity of utilising the voluntary and private sectors in public health. The strategy continued emphasis on individual responsibility by stating the government core values as; ‘freedom, fairness, and responsibility by strengthening self-esteem, confidence and personal-responsibility; positively promoting healthy behaviours and lifestyles; adapting the environment to make healthier choices easier’ ^[165(p. 6)]. Overall, this strategy included 37 proposed policies, 30% targeting diet (See Figure 5). This strategy famously resulted in the introduction of the Public Health Responsibility Deal – a series of voluntary based agreements that aimed to bring together interest groups to prevent lifestyle diseases, including obesity ^[167]. Proposed policies included enabling and informing policies such as refocusing the Sure Start programme to ensure those who require it receive support and further development of Change4Life, including the expansion of Change4Life convenience stores that provide access to fruit and vegetables across the country. And the continuation of monitoring policies such as the Child Measurement Programme, to provide local authorities with data regarding children's health.

Healthy Lives, Healthy People: A Call to Action on Obesity in England (2011) ^[168]

A Call to Action on Obesity in England was published in 2011 as a supplementary paper to HLHP. This strategy acknowledges the failure of previous strategies. The strategy was characterised as a renewed strategy targeting individual behaviour change with a new recognition that the twenty-first century food environment brings new challenges to maintaining a healthy lifestyle ^[169]. The strategy adopted four key mechanisms for its intended success: the empowerment of the individual, building partnerships to form the

opportunity for stakeholders to play their part (the food industry), providing the local government with the lead role in driving health improvement and harnessing partners at local levels, and continuing the development of a policy evidence base ^[168]. The strategy continues individual responsibility messaging; ‘the solution lies in each of us taking responsibility for our health and taking appropriate action to manage our weight...’ ^[168(p. 26)]. The strategy proposed 69 policies, 19% focused on diet and 62% with a non-specific behaviour focus. The strategy reflects previous strategies in regard to its proposed policies and continuation of the PHRD, with a considerable focus on enabling policies (23%). The policies included, informing and enabling policies such as further expansion of the Change4Life, the introduction of voluntary traffic light food labelling, voluntary calorie information for food and non-alcoholic drink in out-of-home settings. Changing the default policies such as a voluntary calorie reduction and guidance and standard policies such as strengthened commitment to statutory nutritional standards for school meals were also included (See Figure 5) ^[168].

Childhood Obesity: Plan for Action (2016) ^[170]

The Childhood Obesity: Plan for Action (COPA) was published in 2016. Controversy surrounding COPA occurred before its publication, as the proposed was strategy leaked ^[171]. The development of this strategy occurred during the European Union Referendum and the Conservative leadership change between David Cameron and Theresa May. The formal publication of COPA came under May’s leadership and was significantly weakened compared with the leaked strategy earlier that year. The strategy focused on sugar as the lead determinant of obesity in children, linked to the announcement of the soft drink industry levy (SDIL) in George Osborne’s 2016 budget ^[172]. Unlike the previous strategies, the following strategy proposed a smaller number of policies, COPA included 30 policies, 43% targeting diet (See Figure 5). Some of the key policies included in COPA were fiscal disincentive policy, the SDIL, non-fiscal incentive policies like the Healthy School Scheme – a rating scheme for primary schools including an annual competition to encourage good practice within schools. Enabling policies such as a re-commitment to Healthy Start scheme and changing default policies such as voluntary sugar reduction target to encourage the reformulation of the nine food products most associated with children's sugar intake ^[170].

Childhood Obesity: Plan for Action, Chapter 2 (2018) ^[173]

Childhood Obesity: Plan for Action, Chapter 2 (COP2) was a continuation of COPA which lost political attention throughout the EU referendum ^[174]. The strategy emphasised that success in obesity prevention requires a collective response across the political divide, society, and public and private sector organisations. It maintains a local authority focus regarding the implementation of policies. The strategy continued the promising proposals within COPA that had failed to be implemented at that time. Importantly, COP2 was published shortly after another leadership change which saw Boris Johnson take leadership ^[175]. Johnson had a record of negative and dismissive perspectives towards the structural or deterrence-based obesity prevention policies and held strong preference for individual responsibility focused approaches; 'If we want people to lose weight and live healthier lifestyles, we should encourage people to walk, cycle, and generally do more exercise. Rather than just taxing people more...' ^[176(p. 1)]. This strategy proposed 33 policies, 73% of which targeted diet. COP2 proposed the consultation on restricting choice policies such as restricting the age of sale of energy drinks to 16, introducing a 9-pm watershed restriction on marketing of HFSS products on TV, restricting price promotions and volume-based promotions of HFSS products in stores as well as informing policies such as regulation on calorie labelling on restaurant menus ^[173].

Childhood Obesity: Plan for Action, Chapter 3 (2019) ^[177]

The third and final chapter of COPA was absorbed into a broader green paper on health prevention named 'Advancing Our Health: Prevention in the 2020s' (COP3), including other commercial determinants of health (CDoH), such as smoking ^[177,178]. The strategy promised a 'proactive, predictive, and personalised prevention' approach to the UK's major preventable public health problems ^[177(p. 1)]. Overall, the strategy consists of revisions and refreshed commitments to policies that the government had failed to implement from the previous strategies: COPA and COP2. The strategy actively acknowledged the necessity of tackling inequalities but did not include any clear action points to achieve this. Furthermore, the strategy sustained clear individual responsibility messaging; *'In the 2020s, people will*

not be passive recipients of care. They will be co-creators of their own health. The challenge is to equip them with the skills, knowledge and confidence they need to help themselves' [177]. COP3 proposed 24 policies, 42% targeted diet. COP3 proposed broad commitment to follow up on the consultation of the policies included in COP2. It also proposed consultation on informing policies such as nutritional labelling in the context of new opportunities in a post Brexit era. Consultations for changing the default policies were also included such as the advancement on voluntary salt reduction targets for industry [177].

Tackling Obesity: Empowering Adults and Children to Live Healthier Lives (2020) [179]

The most recent strategy published in England was Tackling Obesity (2020) in July 2020, several months into the Covid-19 pandemic [179]. The announcement of a new prevention strategy coincided with the Boris Johnson's hospitalisation for Covid-19, which he publicly blamed on his weight [178]. The strategy was met with concerns surrounding the policy related to governmental motivation and commitment to see the proposed plans through implementation, as the government's commitment appeared to be rooted in the PM's own Covid-19 scare and the political pressure regarding the association between excess weight and severe outcomes from Covid-19 [180]. Although the overarching messaging of this strategy maintained individual responsibility framing, as exemplified through messaging that encouraged people to lose weight to play their part to 'protect the NHS and save lives.' [179]. In this strategy, 17 policies were proposed, 54% of which focused on diet. The policies proposed included two restricting choice policies such as the 9pm restriction of marketing on TV and online, the restriction of volume-based promotions of HFSS products. As well as enabling policies including the expansion of NHS obesity weight management services and two changing the default environment policies such as the restriction of HFSS products in prime locations of larger stores. The policies included in the strategy were celebrated, as they reflected a movement away from information provision and appeared to demonstrate greater commitment to regulation and restriction-style policies seen in COP3 and COP2, which failed to be implemented.

Figure 4 shows a breakdown of the 13 strategies discussed in this section and presents each strategy's target population, obesity reduction target, inequality reduction target, and the breakdown of the number of policies included in each strategy that have relevance to obesity prevention ^[141].

Strategy Title	Target Population	Obesity reduction target	Inequality reduction target	Policy breakdown
Health of the Nation (1992)	Unspecified	To reach an obesity prevalence of 6% in men and 8% in women, by 2005	No target	Diet related: 25 Total: 43
Saving Lives: Our Healthier Nation (1999)	Unspecified	No target	No target	Diet related: 7 Total policies: 19
Reducing Health Inequalities (1999)	Unspecified	No target	Reduce health inequalities by 10% by 2010	Diet related: 10 Total: 23
Choosing Health (2004)	Unspecified	No target	No target	Diet-related: 30 Total: 109
Choosing A Better Diet (2005)	Childhood obesity	By 2010, halt the year-on-year rise of obesity in children under 11	No target	Diet-related: 53 Total: 86
Healthy Weight, Healthy Lives (2008)	Childhood obesity	Reverse the rising tide of obesity and reduce the number of obese and overweight children to 2000 levels by 2020	No target	Diet-related: 22 Total: 72
Food Matters (2008)	Unspecified	Reduce the rate of increase of obesity in children under 11	No target	Diet-Related: 9 Total: 9
Healthy Lives, Healthy People (2010)	Life course	No target	No target	Diet-related: 6 Total: 37
Healthy Lives, Healthy People: Call to Action on Obesity (2011)	Life course	Achieve a downward trend in the level of excess weight averaged across all adults, and a sustained downward trend in the level of excess weight in children by 2020	No target	Diet-related: 13 Total: 69
Childhood Obesity Plan for Action Chapter 1 (2016)	Childhood obesity	Significantly reduce England's childhood obesity rate within the next 10 years.	No target	Diet-related: 13 Total: 30
Childhood Obesity Plan for Action Chapter 2 (2018)	Childhood obesity	By 2030, halve childhood obesity rates	Significantly reduce health inequalities that persist by 2030	Diet related: 24 Total: 33
Childhood Obesity Plan for Action Chapter 3 (2019)	Childhood obesity	By 2030, reduce childhood obesity rates by 50%	No target	Diet related: 10 Total: 24
Tackling Obesity (2020)	Life course	By 2030, halve childhood obesity rates	Significantly reduce the health inequalities that persists by 2030	Diet-related: 9 Total: 17

Figure 4 National Obesity Prevention Strategies for England

As discussed in the introduction of Section 1.4.2, the overview of strategies to tackle obesity and overweight in England refers to policy types using Theis and White's identified policy types. Figure 5 portrays Theis and White's findings regarding the distribution of the proposed policy by the policy type included in each strategy discussed in this overview. Appendix 8.1 provides a detailed summary of each policy type developed by Theis and White which is referred to in this section.

Government Strategy	Institutional	Evaluate	Monitor	Research	Guidance or Standard	Professional Development	Eliminate Choice	Restrict Choice	Fiscal Disincentive	Fiscal Incentive	Non-fiscal Disincentive	Non-fiscal Incentive	Change Default	Enable	Inform
Health of Our Nation (1992)	6 (14%)	2 (5%)	2 (5%)	4 (9%)	8 (19%)	4 (9%)	0	0	0	0	0	0	2 (5%)	7 (17%)	8 (19%)
Saving Lives, Our Healthier Nation (1999)	5 (26%)	0	0	1 (5%)	0	0	0	0	0	0	0	0	1 (5%)	10 (53%)	2 (11%)
Reducing Health Inequalities	4 (17%)	0	0	5 (22%)	2 (9%)	1 (4%)	0	0	0	0	1 (4%)	0	1 (4%)	5 (22%)	4 (17%)
Choosing Health (1999)	13 (12%)	7 (6%)	1 (1%)	4 (4%)	24 (22%)	14 (13%)	0	4 (4%)	0	0	1 (1%)	3 (3%)	3 (3%)	17 (16%)	18 (17%)
Choosing a Better Diet (2005)	10 (12%)	11 (13%)	1 (1%)	9 (10%)	17 (20%)	14 (16%)	0	1 (1%)	0	0	0	2 (2%)	1 (1%)	11 (13%)	9 (10%)
Healthy Weight, Healthy Lives (2008)	8 (11%)	6 (8%)	2 (3%)	8 (11%)	8 (11%)	7 (10%)	0	1 (1%)	0	0	0	2 (3%)	2 (3%)	23 (32%)	5 (7%)
Food Matters (2008)	2 (22%)	1 (11%)	0	0	2 (22%)	0	0	0	0	0	0	1 (11%)	0	0	3 (33%)
Healthy Lives, Healthy People (2010)	6 (16%)	1 (3%)	1 (3%)	2 (5%)	4 (11%)	3 (8%)	0	0	0	0	0	2 (5%)	0	15 (41%)	3 (8%)
A Call to Action on Obesity in England (2011)	11 (16%)	3 (4%)	4 (6%)	6 (9%)	8 (12%)	5 (7%)	0	1 (1%)	0	0	0	6 (9%)	3 (4%)	16 (23%)	6 (9%)
Childhood Obesity: A Plan for Action (2016)	1 (3%)	2 (7%)	0	4 (13%)	6 (20%)	6 (20%)	0	0	1 (3%)	0	0	2 (7%)	2 (7%)	6 (20%)	0
Childhood Obesity: A Plan for Action Chapter 2 (2018)	1 (3%)	5 (15%)	1 (3%)	4 (12%)	7 (21%)	2 (6%)	0	5 (15%)	0	0	0	0	2 (6%)	4 (12%)	2 (6%)
Childhood Obesity: A Plan For Action Chapter 3 (2019)	1 (4%)	3 (13%)	1 (4%)	6 (25%)	2 (8%)	0	0	0	1 (4%)	0	0	0	2 (8%)	5 (21%)	3 (13%)
Tackling Obesity: Government Strategy (2020)	4 (23%)	0	0	2 (12%)	0	1 (6%)	0	2 (12%)	0	0	0	0	2 (12%)	2 (12%)	4 (23%)

Figure 5 Summary of Theis and White's Analysis of Policies Included in Strategies

1.4.3 The Implications of Policy Action on Health Inequalities

No country has successfully reduced obesity. As rates have continued to increase and prevention action remains insufficient, lower SES groups have remained disproportionately at risk, sustaining the wider problem of health inequalities in the UK ^[178]. Some countries have seen the implementation of policies resulting in promising change; however, this change often results in widening inequalities in obesity prevalence ^[181].

In a UK context, the nature of the strategies outline in Section 1.4.1 and the policies that result from them have been criticised by the public health community for failing to commit to tackling inequalities. The 1998 Acheson report, an independent inquiry into inequalities in health, highlighted that health interventions in the UK preferentially benefitted higher socioeconomic groups ^[182]. Of the 13 strategies included in Section 1.4.2, one primarily focused on inequalities and only three included explicit targets for tackling inequalities (see Figure 4). Furthermore, following Theis and White's analysis of the policies included in the strategies, looking at target behaviour type, policy type, implementation viability, regulation approach, and intervention agency demands, it was concluded that of 689 policies (including policies targeting physical activity), only 19% were deemed likely to be effective in reducing inequalities, largely due to the adoption of less-interventionist approaches and the implementation viability of more interventionist approaches ^[141]. This finding suggests low levels of consideration and commitment to inequalities within the obesity prevention landscape, highlighting a potential factor that may have caused inequalities to continue to increase. Furthermore, despite the inclusion of targets to address inequalities in three of the 14 strategies included in their analysis, strategies include weak or unclear plans to reach the targets ^[141].

The Adoption of High Agency Policy

Despite the acknowledgement of the importance of health inequalities in 12 of the 13 strategies inclusive of food-related obesity prevention policy, existing literature has explored the difficulty of developing political will for implementing policies that are expected to have the most meaningful impact on lower SES groups. The difficulty of developing political will is believed to be the result of political popularity of agentic policies

and political reluctance to implement structural policies ^[183]. Strategies and policies embedded in individual responsibility make considerable assumptions regarding individuals' levels of agency. This thesis will explore high agency and structural policies throughout the following chapters.

Considering agency in regard to obesity prevention is useful for exploring the benefit of policies for lower SES groups, as policies are at the population level and do not specifically focus on tackling inequalities. It is widely believed that high agency or agentic policies have the lowest impact on lower SES groups and risk widening existing socioeconomic inequalities ^[181,183,184]. High agency or agentic policies refer to interventions that require the individual to have considerable free will to consciously respond and act in line with the desired intention of a policy ^[183]. Structural policy represents the opposite end of the intervention continuum, whereby behaviour is understood to be the result of the structural environment rather than simply freewill ^[183]. Policies include regulatory changes, such as the restriction of HFSS marketing on children's TV. Therefore, a high agency policy assumes that individuals can make independent, purposeful choices in line with the policy's intention, irrespective of their lived experience or any social, economic, political, or material barriers ^[131]. High agency policies do not influence the structural environments that most often reflect obesogenic environments, resulting in difficulties for individuals to maintain a healthy weight in an environment that acts against them. Therefore, policies that do not challenge the socioeconomic and structural drivers of obesity that are most significant in lower SES environments are believed to have very limited effects on inequalities ^[185,186].

1.5 Application of Framing Theory and Target Population Theory to Obesity Prevention

The following section outlines framing theory and social construction target population theory. Both theories provide useful lenses for considering obesity prevention policy. The section first discusses framing theory and its relevance to obesity prevention, specifically regarding individual responsibility-framing. The section then outlines social construction population theory and its relevance to obesity prevention in terms of policy implications.

1.5.1 Overview of Framing Theory

Framing theory has many definitions, as it has been studied in multiple disciplines, including social psychology, cognitive linguistics, sociology, economics, and political science ^[187]. First proposed by Goffman (1974), framing theory refers to the frameworks in which people interpret what occurs in the world ^[188]. These frameworks are generated from previous experiences to place meaning in new events. They consist of natural and social frameworks. Natural frameworks interpret events as tangible occurrences, viewing nature in a literal manner and avoiding the attribution of social influences to event causation. For example, obesity, when viewed through a natural framework, is understood as a result of genetic predisposition or focuses on metabolism. In contrast, societal frameworks regard events as socially influenced phenomena stemming from people's motivations, aims, and interventions ^[188]. From this perspective, obesity is framed as the result of broader social determinants, such as the availability of affordable healthy food or socioeconomic inequality. These frameworks influence how information or data is interpreted, processed, and communicated. Goffman describes frames as "schemata of interpretation", enabling individuals to turn an otherwise meaningless sequence of events into something meaningful ^[188(p. 21)]. In health policy, framing determines how issues like obesity are understood and addressed. For example, if obesity is framed as a social issue shaped by the food environment, the focus shifts to systemic interventions, like regulating the food industry. These frames give meaning to rising obesity rates and shape the direction of policy responses.

Framing theory has been posited as a robust perspective from which to examine varying realities and how they emerge. Frames have been referred to as conceptual bedrock for understanding anything ^[187,189]. They can be considered as conceptual frames because they help organise and interpret cues received from the world.

"Framing essentially involves selection and salience. To frame is to select some aspects of perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described." ^[190(p. 53)].

Entman emphasised the importance of salience in framing theory. As exemplified by the above quotation, frames can promote a particular agenda through selection and salience. Entman also highlighted that framing can have intentionality behind it ^[190]. Goffman also emphasised the occurrence of subconscious framing when individuals interpret events and perspectives without deliberate intentions ^[188]. Framing theory is valuable in public policy as it helps to understand how different stakeholders, both within and outside policymaking, perceive and interpret policy issues. By examining the various frames employed, it becomes possible to understand how key components of policy debates are constructed and communicated, influencing public opinion and shaping policy outcomes ^[57,191,192]. Framing often involves identifying who is affected by a problem, who is impacted, and who is responsible for its solution. Some observers of the policy process have suggested that debates over public policy issues largely represent the dynamics of framing of an issue from the perspective of the public ^[191].

Framing is important as it is capable of dominating public or policy discourse on an issue which can result in substantial consequences for a particular group, whether positive or negative ^[193]. For instance, in the context of housing policy, framing homelessness as a result of individual failure can lead to a lack of support services, adversely affecting vulnerable populations. Conversely, framing homelessness as a systemic issue linked to affordable housing shortages can encourage the implementation of supportive policies, such as increased funding for social housing. Therefore, framing occurs both to intentionally fit with a particular agenda or stakeholder interest, and subconsciously when processing understanding and perspectives on something.

1.5.2 Framing Theory within Obesity Prevention

Since obesity entered both the global and UK political agenda, there have been key entrenched and competing frames resulting in harmful dichotomies to the policy landscape and pace of progress ^[181]. Examples of these frames resulting in dichotomies include individual versus collective responsibility for action, individual behaviours versus the nature of the food environment, structural versus agentic policy approaches, regulation versus

industry self-regulation, upstream versus downstream approaches to prevention, and clinical treatment versus public health prevention priorities ^[181].

One of the most influential examples of framing theory within the obesity prevention landscape is individual responsibility framing. Individual responsibility framing has dominated the obesity prevention space since 1991 ^[194]. As discussed, framing refers to how a problem or issue is portrayed; it can omit a particular ideology or interest and is often spread through the media ^[59,147]. Since the publication of HOTTN (1992), the framing of obesity causation has emphasised personal attributes, such as gluttony, laziness, and lack of willpower ^[92]. This same framing is dominant in the US, Australia, Germany, and other high-income countries with similar political backgrounds and obesity problems ^[131]. This framing was present throughout the strategies summarised in Section 1.4.2, and has important implications for policy outcomes, public attitudes, and governmental commitment to action ^[147].

There have been attempts to reframe obesity by presenting the environmental drivers, as demonstrated in the Foresight Project - Tackling Obesities: Future Choices (TOFC) (2007) ^[195]. TOFC challenged the over-simplistic narratives in obesity causation and prevention and dismissed the association between obesity, genetic predisposition, and personality traits ^[196]. TOFC (2007) emphasised that the main obesity drivers were found outside the healthcare system and adopted an environmental framing of obesity ^[169]. However, TOFC (2007) failed to have a significant influence over changing this framing, as individualised framing has remained present throughout prevention strategies, including messaging in Tackling Obesity (2020) ^[179].

The food and beverage industry has been found to endorse individual responsibility framing for solutions ^[57,197]. This framing advantages the industry's objectives by undermining the need for industry reform and redirecting the emphasis of policy initiatives towards individuals making healthier decisions to improve their weight status ^[57]. For instance, the food industry strategically emphasises individual responsibility in its messaging and encourages increased physical activity as a means of managing health. This places the

responsibility on individuals for their physical activity, shifting the focus away from the industry's role in influencing dietary behaviours ^[198].

Consequently, individual responsibility framing has important implications for policies. Individual responsibility framing is associated with favouring low-interventionist policies, such as informing and enabling policies like social marketing campaigns, over policies that challenge the structural drivers of obesity ^[141,147]. Individual responsibility framing is also associated with lower levels of support for these policies among the public and government and is also believed to increase and sustain societal weight stigma ^[199,200].

Individual Responsibility Framing and Neoliberalism

The popularity of individual responsibility by government and industry is rooted in neoliberalism. The rise in obesity rates coincides with the formation of a post-industrial consumerist society and the popularity of neoliberal ideology, which has significant connections to the transformation of the global food system (see Section 1.4) and the nature of food policy in the UK ^[18,58,194]. Neoliberalism assumes that the market knows best, and by allowing a free, open, and unregulated market, a country will prosper, develop, and become more efficient ^[201]. Neoliberalism perceives the consumer as a rational actor in the marketplace, with the ability and knowledge to act freely. Consequently, the aim of neoliberalism as an economic and political undertaking was to free the market from state restrictions ^[201]. Minimum regulations and privatisation have characterised the modern food system to create liberal business and trade. According to Moodie and Swinburn (2006), the rising prevalence of obesity is indicative of substantial commercial success but also represents a significant instance of market failure ^[202]. This failure arises from the widespread consumption of profitable EDNP and UPF products that are closely linked to obesity. Consequently, obesity becomes an unavoidable consequence of the commercial success of these products. Moodie and Swinburn argue that the market, as the primary determinant of choices, in this case, leads to negative health outcomes for the population, reflecting severe market failure ^[202].

As an ideology, neoliberalism has shaped broader political and economic contexts, prevention solutions, and public attitudes towards obesity prevention. Consequently, the neoliberal focus on obesity has resulted in an overreliance on industry self-regulation and individual responsibility framing. This ideology is thought to result in policymaking which gives greater policy importance to economic growth than social good ^[194].

Existing literature suggests that the popularity of neoliberalism and individual responsibility framing has a significant impact on what policies are proposed, whether they are implemented, and public attitudes towards the causation of obesity and its prevention policies ^[147,192,203,204]. As demonstrated by the distribution of policies proposed by policy type in Figure 5, the UK government has favoured a less interventionist approach across all strategies, irrespective of the political party ^[141]. The lack of interventionist policies is linked to political anxieties regarding being perceived as a nanny-state ^[205]. Policies that allow consumer choice have been favoured, for instance, enabling and informing policies, nudge-style policies, and industry self-regulation ^[141,147]. Deterrence-based interventionist approaches such as taxation and industry restriction, are the least frequently adopted interventions, despite the strong evidence base ^[141]. However, despite the dominance of individual responsibility framing, neoliberal ideology, and political anxieties regarding nanny-statism, both COP2, COP3 and Tackling Obesity (2020) suggest that policy may be adopting more interventionist deterrence measures, indicating a significant movement away from confining ideology ^[173,179]. However, the implementation of policies is speculated, as Tackling Obesity (2020) has notable overlap with COP2 (2018) and COP3 (2019), highlighting challenges of implementation after a policy's inclusion in a prevention strategy (see Section 1.4.2) ^[173,179].

1.5.3 Overview of Target Population Theory

The social construction target population theory was developed by Schneider and Ingram to explain how different factors or characteristics influence agenda-setting, design, selection, implementation, and evaluation of public policy ^[206,207]. The theory intends to draw attention to the conditions under which policies are designed, which those policies affect, and how policy choices impact the target group ^[206]. Schneider and Ingram identified four

target populations or groups: advantaged, contenders, dependents, and deviants ^[207]. These groups are viewed as deserving or undeserving and either hold power to influence policy or lack power. The advantaged group holds significant power and is expected to receive a disproportionate share of the benefits. The contenders hold notable power but often compete for resources and recognition, as well as for influence over the policy agenda. The dependents possess limited power yet are generally well perceived by society, often viewed as deserving of support. In contrast, the deviants have limited power and are not seen as deserving, frequently facing societal stigma.

The position and perception of these groups is based on socially constructed norms ^[206]. These perceptions shape the framing of policy issues, affecting which populations are prioritised or neglected in policy outcomes. Recognising the role of social constructs is essential for addressing biases and ensuring more inclusive policymaking ^[206].

The position of power has notable influence over policy, groups holding more power are often able to shape narratives that benefit their interests, while less powerful groups are more likely to struggle to have their needs met. The position of power and the power dynamics that occur can help policymakers create more balanced and equitable policies ^[206,207]. In consideration to improving the equitability of policy outcomes, target population theory drives awareness of the social constructions shedding light on the needs of different groups. By incorporating the insights derived from target population theory, policy makers are more likely to develop policies that promote equitable outcomes and enhance overall effectiveness of a policy.

1.5.4 Target Population Theory within Obesity Prevention

The following section applies social construction target population theory to the obesity prevention discourse. In line with the assumptions made by neoliberalism, whereby the consumer is a rational actor in the marketplace with the ability and knowledge to act freely, higher SES groups, who hold the most agency and resources, are likely categorised as advantaged. The nature of the food and drink industry categorises them as contenders, as they hold notable power but do not necessarily deserve it due to their profit-driven agenda. Children fall into the dependent category because of their lack of freedom and agency to

make decisions regarding their health. In some cases, lower SES group may be perceived as dependent due to the exacerbated drivers of obesity facing lower SES households. However, if individual responsibility framing holds the dominant perspective in society, this group can be categorised as deviant. Furthermore, the impact of individual responsibility framing, and societal weight stigma suggests that those living with excess weight could be placed in the deviant group, perceived as undeserving of support, and powerless in the policy process.

The implications of these socially constructed populations have notable influence on policy outcomes ^[207,208]. Based on Target Population theory, policies tend to allocate benefits to groups perceived as deserving and politically powerful, while imposing burdens on those deemed undeserving and powerless. For example, the food and drink industry, classified as contenders, are known to hold economic power as well as significant lobbying power, and can contribute to particular policies being implemented while others are weakened, delayed or abandoned. For example, the adoption of multiple industry self-regulation policy throughout many prevention strategies demonstrates the beneficial policy outcomes for industry. Furthermore, the popularity of information provision interventions such as food labelling, that emphasises personal responsibility, reinforced the categorisation of lower SES groups as deviant and higher SES as advantaged due to higher SES being most likely to have the knowledge and agency to adjust and adhere to these policies desired outcomes. High agency policy reinforces inequalities, risks further isolating lower SES groups and perpetuates weight stigma. Furthermore, the nature of these socially constructed populations risks the continued focus on individualised, behaviour-change-focused approaches, such as information provision, rather than policy targeting the structural drivers of obesity that are most likely to influence the dependent or deviant groups.

1.5.5 Framing Theory and Target Population Theory within Obesity Prevention

Framing theory and target population theory not only explain current shortcomings in obesity prevention policies but also provide a framework for rethinking future strategies. By shifting the framing from individual responsibility to structural factors, and by acknowledging the diverse needs and constraints of target populations, policymakers could design strategies that address inequalities more effectively. The frameworks allow

improved understanding of the importance of agency in policy impact and why the obesity prevention space tends to favour agentic policy. It is generally agreed that policies have most often adopted high agency approaches, such as informing policies like food labelling, requiring the individual to possess a significant degree of agency to reap the benefits of a policy ^[183]. Agentic policies favour higher SES groups who are most likely to possess the economic, social and cultural freedoms to reap the benefits in comparison to lower SES groups ^[209]. The framing of an issue has a substantial impact on policy action. Similarly, the portrayal of a prevention strategy or a policy's target population has a significant impact on the outcomes regarding what is implemented and its overall effectiveness.

1.6 Summary of Existing Literature: Establishing a Research Gap

This section provides an overview of key research on obesity policy in the UK, concentrating on public attitudes, stakeholder perspectives (excluding those from the food and drink industry), and studies evaluating policy implementation. Notable gaps in the existing literature are highlighted, particularly regarding the intersection of socioeconomic inequalities and obesity prevention efforts. This overview predominantly focuses on research conducted since 2010 in the UK and lays the groundwork for the rationale behind the thesis.

1.6.1 Public Attitudes Towards Policy: A Review of the Literature

Previous studies have examined the relationship between public perceptions of obesity causation and perspectives on obesity solutions. The majority of research in this area has been derived from survey data. This section first draws upon results from several UK-based studies. One study, using survey data from 500 UK adults in 2011, and a second study, based on face-to-face Omnibus survey data from 1,986 UK adults in 2013, both concluded that support for interventions was strongest when responsibility was attributed to factors beyond individual control ^[210,211]. However, in both studies, the highest attribution for excess weight was individual responsibility in regard to the lack of individual willpower ^[211]. Both studies identified limited acknowledgement of genetic causal arguments as having a significant impact ^[210]. In the second study, when causation for obesity was attributed to the

environment or genetics, the respondents were more supportive of government involvement, while support was lower among those who attributed causation to individual behaviour ^[210]. Certain drivers were found influence support, in the first study the accessibility to EDNP food was linked to food retailers' and manufacturers' responsibility and awareness of it increased support for action ^[211]. Whereas, awareness of structural drivers, such as time and cost, had much less impact on support for policy ^[211]. The study also identified the importance of the target population as support for policies targeting children was particularly high. In regard to policy preferences, fiscal policies received the lowest support and information provision, such as food labelling and health campaigns, received the most support ^[210].

More recent studies on this topic have been conducted, such as the Obesity Health Alliance survey exploring public perceptions of obesity and healthy weight policies in 2021 ^[212]. The respondents varied in their perception of the importance of obesity prevention, with many highlighting the economic impact of obesity, reflecting government and media framing of the issue. The food environment was identified as a key cause of obesity. The UK government was deemed responsible for providing education to sustain a healthy diet and access to physical activity ^[212]. However, no single category of policy was perceived to be sufficiently effective to reduce rates, suggesting that the respondents did not equate the nature of the policies as appropriate to solve the obesity problem as they perceived it. Although more recent, this study consisted of 16 participants and is derived from an online pre-tasked survey interview. Overall, in consideration to these three studies, the UK general public appears to be shifting away from explanations that attribute obesity to individual behaviours, suggesting greater support for future policy action ^[212]. However, the public appear to continue to favour policies that focus on providing information and empowerment and there remains a reluctance to support interventionist style approaches.

An additional study explored public acceptance of obesity prevention policies focusing on pricing, placement, and promotion policies through a cross-sectional survey of 3293 participants from 2016 ^[213]. Similarly, fiscal policies were found to have low support, whereby policies that regulate product positioning and promotions were the most favoured. For example, the study found over 70% support for incentive promotions of healthy foods,

and only 40% support for the introduction of a fat tax^[213]. This study also explored how SES influenced individual attitudes and found that individuals with lower SES had the lowest support for structural policies. The study also found that attitudes were very similar across the four UK nations. Furthermore, another survey study explored UK attitudes in comparison to the US and Germany. Similar to previous research, taxes were deemed an ineffective prevention measure for obesity. However, labelling was deemed to be very effective. Banning or limiting advertising was perceived as the second-most effective policy measure. This study also accounted for the influence of SES but found that SES had no influence on the attribution of responsibility and preference for policies^[214].

Other research has explored public attitudes towards specific policies through qualitative methods. One study explored UK based attitudes towards pricing policies through focus groups based in London in 2015^[215]. The study found that there was limited support for pricing policies; concluding that pricing made limited differences to behaviours, with individuals acting as they please, irrespective of financial barriers^[215]. The participants suggested that the government's intention behind the policies was not to promote health through improved diet quality, but to generate income^[215].

In summary, the studies reviewed in this section explored public attitudes towards obesity causation, responsibility for solutions and perspectives towards policy in the UK. Overall, the research found that attitudes toward causation were most often linked to the nature of the food environment and individual behaviour. All studies found that participants were most supportive of informing policies and some restriction policies such as regulation of food and drink marketing. Interventionist policies such as taxation were consistently found to be unpopular. Current qualitative literature has yet to explore public attitudes towards obesity prevention in the UK through the lens of inequalities and lived experience, particularly regarding their impact on causation, solutions, and personal narratives. One qualitative study has been discussed in this section, however due to recent events including the COVID-19 pandemic and the 2020 'Tackling Obesity' strategy, new research is required to understand how these events may have influenced public attitudes. While previous studies have used survey data to explore public attitudes, this approach often lacks the depth that qualitative methods can provide. Further qualitative work is required to understand the

motivations behind support for policy and how SES may influence attitudes. For instance, one study found that lower SES groups showed less support for interventionist policies but understanding the reasons behind this requires a more in-depth qualitative approach. This gap in the literature highlights the need for contemporary research, forming the rationale for this thesis.

1.6.2 Stakeholder Attitudes Towards Policy: A Review of the Literature

The following section summarises the key literature that has explored policy stakeholder attitudes toward obesity prevention in the UK. Overall, research has used stakeholders to explore the effectiveness, success, and failure of policies and strategies, beyond measurable indicators. For example, a 2009 study explored policy stakeholders working in health prevention and inequalities under the Labour government to assess how inequalities were being handled following the devolution of health policy through interviews ^[216]. Overall, limited research has explored policy stakeholder attitudes.

Policy stakeholders' perspectives have been explored to understand the implications of obesity prevention strategies. For example, the development and implementation of Healthy Weight, Health Lives strategy (HWHL) (see Section 1.4.2) was explored to understand the impact of the strategy and establish the implications for future prevention action. The study found through interviews that the stakeholders generally believed that the strategy had a positive impact, due to the creation of greater political buy-in, engagement of stakeholders, stimulation of action, enhancing knowledge, and changing attitudes regarding obesity ^[163]. The study also identified key areas where the strategy failed; for example, one key aim of the strategy was to establish a cross-government approach, yet accounts from the stakeholders suggest that this was not achieved. This research provides important insights into the activity that occurs after the publication of a strategy and its practical application, including the implementation of policies and governance structures ^[163]. This study exemplifies the importance of including policy stakeholders accounts to explore the implications of strategies that are challenging to monitor or evaluate, such as changing attitudes towards obesity among policymakers.

Another study conducted qualitative research with stakeholders to explore expert views on a particular policy area, HFSS marketing policies ^[217]. This study was conducted shortly after the publication of the 2020 Tackling Obesity, and despite focusing on marketing, the study found an overarching mistrust in government commitment to implement the policies targeting HFSS marketing included in the strategy ^[217]. The study also identified that among policy and advocacy stakeholder groups, the focus on marketing was important but also required further efforts to address the underlying drivers of obesity such as socioeconomic status and cultural norms, and the physical food environment.

Furthermore, a European-based study, including UK stakeholder specialists, explored policy options deemed most appropriate for addressing obesity across Europe, using semi-structured interviews ^[218]. This research combined policy and non-policy specialists from the food, sports, and health sectors. The findings indicated a strong emphasis on educational interventions, followed by the importance of physical activity spaces, such as sports facilities, food labelling, and the regulation of food and drink advertising. Policy stakeholder specialists, in particular, highlighted the need to balance efficiency with the economic impact on the public sector when shaping policy perspectives. Additionally, political differences and vested interests across sectors were identified as significant factors influencing stakeholder views ^[218].

These studies provide examples of how qualitative methods have been employed to explore the experiences and attitudes of policy stakeholders in the context of obesity prevention policy. While the studies discussed highlight the value of incorporating stakeholder perspectives, there remains a significant gap in understanding how inequalities in obesity are addressed within the policy process. To date, no research has examined how inequalities in obesity are understood and managed from the viewpoint of policy stakeholders, particularly regarding the challenges of addressing socioeconomic inequalities. Additionally, there has been limited focus on how these stakeholders perceive the effectiveness of current policies in reducing inequalities or the barriers they face in implementing more equitable strategies. Understanding these perspectives is crucial for developing more inclusive and effective obesity prevention policies that consider the diverse needs of different population groups.

1.6.3 Policy Implementation in the UK: A Review of the Literature

The following section provides a summary of existing literature exploring the implementation of policy for obesity prevention in a UK context. Research in this area is fairly diverse, some has focused on overarching prevention strategies. One study for example explored COPA, COP2 and COP3 ^[170,173] (See Section 1.4.2). This study used a social determinants of health lens and concluded that the focus on downstream, individual-level behaviour approaches to reduce calorie intake and increase physical activity does not account for the social determinants of health and lacks sufficient action to influence inequalities ^[219].

Other research has evaluated policies, such as an evaluation of the public health responsibility deal ^[220]. Through interviews with responsibility deal partners including businesses, the public sector, and non-government organisations, as well as individuals with roles in implementing the deal, non-partners, and former partners ^[220]. While this study provided valuable insights into the policy process, the impact and effectiveness of the Responsibility Deal cannot be fully assessed through qualitative interviews alone, though the findings still offer important perspectives

Further research has specifically explored the implementation of a policy through alternative methods such as the assessment of the impact of the SDIL through the adoption of a time series analysis to measure amount of sugar per household per week from soft drinks purchased 19 months after implementation. A health inequality lens was also utilised to evaluate the impact of the policy on health inequalities in children and adolescents ^[221]. The study predicted that the SDIL would lead to medium-term reductions in dental caries, overweight, and obesity and long-term improvements in life expectancy, with the greatest benefits predicted to be felt by children and adolescents from the most deprived areas, suggesting that the policy would have a positive impact on health inequalities.

In consideration to this thesis, there are important gaps to consider in regard to previous research that has explored the store environment. To date, no research has explored the

impact of the restriction on HFSS items in prime locations of stores in England. However, studies do exist that have adopted observation methods to explore the nature of prime locations, namely checkout areas. These studies have used the FSA's NPM to categorise food and drink products as healthy or healthier and unhealthy or less healthy.

For example, studies have explored prime locations of stores through observations however these two UK based studies did not examine the impact of an intervention. One study used observation methods to explore foodstuff displayed in checkout areas in 2014. The study observed thirteen convenience stores from the three leading UK supermarket chains based upon their proximity to Sheffield. Overall, the study found that sugar free chewing gum was the most common healthy product, while 89% of all products displayed in checkout areas were less healthy items ^[222]. A similar study from 2014 explored food products displayed at non-food store checkout areas in a large indoor shopping centre in Gateshead. The study found that only 32 of the 219 non-food stores observed had food items at checkout, however of these 81% of products were less healthy ^[223]. Although these studies did not examine the impact of an intervention, they are important to consider for the rationale of this thesis.

One study has assessed the impact of supermarket-led, voluntary pledges related to improving the quality of products in prime locations of stores. This study was conducted before government had formally legislated on product placement. The study aimed to assess the quality of stores policies and store adherence to their policies. This study observed 69 supermarkets in east of England between February and May 2017 and observed the type of food and drink products present in each checkout journey. The results were then compared with store self-regulated policies which were analysed and categorised as 'clear and consistent', 'vague or inconsistent' or 'absent'. The study found that in stores with 'clear and consistent' policy, the product placement of less healthy foods was considerably lower (35%) than in stores with both 'vague and inconsistent' policies (57%) and 'absent' policies (90%). This research is the only UK based study to compare the product placement in stores with guidance to reduce product placements of less healthy products.

While research has been conducted to examine the impact of obesity prevention action in the UK, much of it has focused on overarching strategies, such as COPA and specific interventions, such as the SDIL. Some studies incorporated a health inequalities and social determinants lens providing valuable insights into the potential for policy to reduce health inequalities. However, the three studies that have used observations of the food environment to shed light on product placements in prime locations and provide an understanding of consumers experiences in their retail environments. The final study demonstrates that observations can be used to explore the impact of a policy whereby other methods like interviews would struggle to convey impact.

These studies were all conducted before the implementation of the restriction on HFSS items in prime locations which came into legislation in October 2022. They do not examine all prime locations of stores such as entrances and end of aisle, limiting their reflection of prime locations as a collective. They also tend to focus on one type of store, e.g., non-food stores or convenience stores. Furthermore, these studies did not consider how the socioeconomic status of different areas may influence the nature of the products placed in prime locations. Therefore, in consideration to existing literature, conducting research that assess the impact of a policy has notable benefit to the future policy process to contribute to the evidence base to motivate implementation, improve the design of a policy or expand a policy.

1.7 Research rationale

As outlined in Chapter 1, obesity is currently one of the largest challenges facing public health. Failure to prevent obesity has significant societal impacts, including economic and social costs, as well as detrimental effects on individual health and wider health inequalities [30,224,225]. Obesity prevention is not a new area for public health or policy; in the UK, obesity was first formally recognised by the government in 1992. Since then, 14 obesity prevention strategies have been published in England, amounting to the proposal of 689 policies [141]. Further prevention strategies have been published in the devolved nations. Despite the considerable number of policies proposed, prevention interventions have been largely ineffective as rates remain high and continue to rise. The most significant increase in obesity

is among the most deprived communities; the prevalence gap between females in the most and least deprived areas is a 17% difference and an 8% difference in men ^[226]. Accordingly, obesity prevention plays an important role in improving health inequalities in the UK.

Until recently, obesity causation was predominantly linked to individual behaviour, prompting prevention strategies that primarily held individuals responsible, denouncing governmental or industry responsibility ^[147]. This approach has led to policies favouring education through information provision ^[184,227]. Therefore, the policy landscape has been dominated by interventions that require high levels of individual agency for impact, as discussed in Section 1.5.3. Agentic policies have been established to have reduced effectiveness among more deprived groups ^[141,184]. In recent times, academic literature and the media have increasingly acknowledged the structural drivers of obesity, moving beyond individual behaviour. However, the prevailing policy discourse on obesity continues to centre on individual responsibility or individual empowerment, but with the growing acknowledgement of broader structural drivers and the influence of inequalities ^[179,180]. Nevertheless, there is a significant problem in the UK food policy landscape, where ample policies are proposed but few are implemented, and few target the structural drivers of obesity that are likely to have the most effective policy outcomes ^[141,180].

The drivers of obesity in the food system and political, sociocultural, and technological drivers play important roles in shaping an individual's ability to sustain a healthy weight. The food environment is central to obesity causation and prevention. The modern food environment often provides conditions for overconsumption of EDNP products or UPFs through the accessibility, affordability, availability, and marketing of products ^[90]. Furthermore, research from the UK and globally has established that the quality of a food environment is often determined by the socioeconomic level of an area ^[113,118].

Furthermore, Covid-19 may have influenced public awareness and engagement with public health. During this period, the Tackling Obesity (2020), was published ^[179]. It was believed that Covid-19 and the widespread discussion of how living with overweight or obesity placed individuals at greater risk of severe cases may have influenced the public's perspectives on prevention policies for obesity in the UK.

Limited research has explored how recent prevention approaches are perceived by different socioeconomic groups in terms of their perceived impact and effectiveness. Studies exploring public attitudes often use survey methods and of the qualitative studies that have explored this area, many are now dated or not based in the UK or do not explicitly consider inequalities ^[210,215,228,229]. Additionally, exploring the perspectives and experiences of policy stakeholders (PSH) within the obesity prevention policy process is uncommon, and is most often survey data, focused on specific policies or strategies or out of date ^[163,216,230,231]. Prevention strategies in the UK have been extensively criticised for failing to influence inequalities and structural drivers. This study aimed to explore PSH perspectives regarding the consideration of inequalities in obesity prevention. Lastly, as a result of the differences in the nature of the food environment found across the UK, the outcomes of policies intended to influence the environment may differ. There is limited research addressing how policies intended to change the default environment may result in different outcomes determined by the SES of an area. Similar observational surveys have been conducted to examine exposures in stores, such as in checkout areas ^[222,232–234]. To the researcher's knowledge, this is the first study to strategically examine the impact of the restriction of HFSS items in prime locations by completing the observational survey in stores before and after its implementation. This thesis aims to provide additional insights into the food environment by examining aspects that have not yet been thoroughly explored.

The purpose of this study was to add to the discussion on how food-related obesity prevention policies interact with different socioeconomic groups and provide policy recommendations. This research identifies the importance of the policy process, public attitudes and experiences, and nature of the food environment as critical aspects for examining the connection between obesity prevention food policies and inequalities in obesity rates.

During the development of this research, I engaged with advocates and stakeholder through the Spectrum Consortium to explore the research gaps from the perspectives of those working in policy area. This helped to ensure that the findings of the research would align with some of the key challenges within obesity inequalities and prevention policy and benefit the evidence base.

1.7.1 Research aims

This thesis aimed to understand the relationship between food-related obesity prevention policy and inequalities in obesity rates. The overarching aim is underpinned by three core objectives:

1. To understand UK based adults' experiences, attitudes, and future outlooks of food-related obesity prevention policy.
2. To explore how socioeconomic inequalities in obesity are considered in the UK obesity prevention policy process.
3. Investigate how the restriction on the placement of HFSS items in prime locations of stores in England may influence food retail environments in different socioeconomic areas.

2 Chapter 2: Philosophical Foundations and Mixed Method Approach

2.1 Introduction

As outlined in Chapter One, the research aim underpinning this PhD is to ‘Understand the Relationship Between Food-Related Obesity Prevention Policy and Inequalities in Obesity Rates’. Chapter Two provides a summary of the philosophical foundations that guide the research and overarching methodological approach adopted in this study. The chapter will then conclude by providing a summary of the researcher’s reflections and characteristics, followed by a summary of the key ethical considerations for the thesis. This thesis comprises of three studies. Study one explored public attitudes, experiences, and outlooks through semi-structured interviews. Study two, explored policy stakeholders’ attitudes and experiences regarding the consideration of inequalities in obesity throughout the obesity prevention policy landscape through semi-structured interviews, and the third study includes an experimental observation of the food retail environment that investigates the impact of a food policy restricting the placement of HFSS products from prime locations of larger stores.

2.2 Philosophical Foundations and Mixed Methods Approach

As outlined this study’s research rationale (see Section 1.7), there is a need to improve the understanding of how UK food-related obesity prevention policy influences obesity inequalities. To explore this, the research adopts a mixed method approach consisting of semi-structured interviews and experimental observations. This thesis adopts a convergence model of a mixed methods triangulation design, that is explored in further detail in this section. To meet the primary and secondary objectives, it is crucial to examine the lived experiences, opinions, and perceptions of adults and PSH in the UK. To achieve the third broad study aim, the study conducted an experimental observational survey of the food environment in alignment with the introduction of the 2022 restriction on the placement of HFSS products in the prime locations of larger stores. As explained in detail throughout this section, these methods were selected to complement one another to achieve the aims of this thesis.

Philosophical Paradigms in Research: Ontology and Epistemology

This research studies the understanding, experiences, attitudes and perspectives of the general public (GPP) and PSH. A pragmatist paradigm was utilised in this research. A pragmatist paradigm is based upon the premise of utilising the best methods to investigate real-world problems, it places emphasis on knowledge and belief as socially constructed [235]. The pragmatist stance is appropriate for solving research questions that are focused on the real world, due to its practical basis for research [236].

In social science and health research, methodological strategies most often classify as either qualitative or quantitative research [237]. These approaches are often seen as conflicting due to their differing philosophical foundations and corresponding methodological techniques; however, a mixed methods allow for the integration of these strategies. Regarding the philosophical paradigm, paradigms are defined as the underlying assumptions which guide actions and define the worldview understood by the research [238]. A paradigm provides a way of making sense of the complexities in which reality exists [177(p.[239(p. 69))]. Several types of research paradigms hold philosophical viewpoints: ontology, epistemology, and methodology. Ontology refers to the assumptions about the nature of reality, while epistemology refers to the theory of knowledge, which encompasses the methods and means through which knowledge about the world is acquired [238].

Generally, qualitative research takes a relativist ontological position. In relativism, reality is believed to exist through an individual's experiences and shared interactions [237,240]. This perspective rejects the notion of a universal objective truth, and instead emphasises the subjective nature of reality [241]. The relativist ontological position in qualitative research focuses on generating in-depth and rich data to comprehensively understand the intricacies of human experiences related to the intended research phenomena [242,243]. Quantitative research adopts a realist ontological position [237,240,244]. This stance claims the existence of objective truth and singular reality [245].

The following are four primary epistemological perspectives: positivist/postpositivist, interpretive/constructivist, critical, and postmodern/post structural. Regarding qualitative research, the relativist ontological position is rooted in social constructivism and interpretivism epistemology ^[246]. Within constructivism, the researcher relies as much as possible on the participants' view and develops subjective meanings of the phenomena. Generally constructivist research is shaped from the bottom up, from individual perspectives to broad patterns, and ultimately to broad understandings ^[245]. While realist ontology is widely associated with positivist epistemology, it is based on objectivism. Positivism is founded upon the existence of an objective reality governed by universal laws that are discovered rather than constructed ^[247]. Accordingly, constructivist and positivist paradigms occupy opposite ends of the research paradigm continuum ^[245].

This research is associated with pragmatism as it underpins mixed methodology and brings together quantitative and qualitative research and their respective strengths and limitations ^[248]. Mixed-methods approach was selected for this research as it understands that to build knowledge, a method should be chosen to address the specification of the intended research aims and objectives is essential ^[249]. Pragmatism in mixed-methods research attempts to generate knowledge by considering multiple perspectives, views of reality, and positions that neither quantitative nor qualitative methods achieve alone, reflecting the three sub-objectives of this research ^[235]. Under the pragmatist paradigm, objective reality does not exist separately from experiences but is grounded in the environment in which human experiences are encountered ^[250,251]. The paradigm takes the stance that although much of understanding is derived from unique experiences, much of knowledge is socially shared and created from a form of social shared experiences. Pragmatism prioritises practical outcomes and real-world solutions in line with the intention of this research to develop policy recommendations and generate implications for research and policy. It is inherently problem-solving oriented further providing an appropriate paradigm to achieve the study's aim to understand the relationship between food policy and inequalities in obesity rates. As this research intended to explore the lived experience of the general public and the experiences of policy stakeholders in the policymaking process and to examine the real-world impact of a food policy, pragmatism was believed the most appropriate paradigm to achieve the study's aim and objectives.

Methodological Triangulation

As outlined in Section 2.2, this research adopts a mixed-methods approach, consisting of two sets of semi-structured interviews and experimental observations. The methodological approach of semi-structured interviews provides the study with rich in-depth data, providing detailed and comprehensive data on the participants' experiences, understanding, and attitudes ^[252,253]. This method allows for the exploration of the contextual understanding that shapes participants' attitudes and experiences. There are some key limitations to this methodological approach, such as generalisability to broader populations, subjectivity, and bias, such as researcher bias ^[253]. For example, preconceptions influencing the analysis process and social desirability bias, whereby participants provide responses that adhere to societal expectations rather than a reflection of their true views.

The experimental observations utilised an observational survey and incorporated descriptive statistics analytical method. There are many strengths and limitations of this methodological approach too. The approach allows for greater external validity and generalisability as it is focused on a natural phenomenon in a natural setting, however, as the sample size was small and limited to one area in the UK, this strength may be limited. The study also has ecological validity because it was completed in a natural setting, meaning the researcher did not have any control over the environment, suggesting that the findings may reflect real-world experiences with the food environment, resulting in more applicable research findings. Observer subjectivity may affect the accuracy of data collection, which can be mitigated by reliability checks. Furthermore, observations risk being surface level as the observations only capture what can be seen within the environment, not how the consumers engage with that environment or feel about that environment. Therefore, although the method is strengthened by objectivity, it fails to develop an in-depth contextual account of the food environment that could be achieved through methods that generate consumer voice. However, the overall aim of this research allows for the interviews with the general public to converse with the limitation of the observations by exploring participants' perspectives on their retail experiences through study one.

In consideration to the methods' strengths and limitations, the combination of different methodologies strengthens the study by complementing each study's limitations. There are multiple benefits for adopting a mixed-methods study design, regarding this research, the benefits include convergence triangulation to increase validity and minimise bias, to enhance the strengths and minimise the weakness of individual methods, to use multiple studies to enhance findings and extend the scope of research [254,255].

Furthermore, the pragmatic paradigm lends itself to methodological triangulation. The purpose of methodological triangulation design is "to obtain different but complementary data on the same topic" in order to understand the research problem^[256(p. 122)]. The research approach acknowledges the strengths and weaknesses of both quantitative and qualitative research methods and seeks to address these limitations by integrating both approaches^[239]. This study adopted a convergence model of triangulation, whereby the studies were merged at the broad discussion stage of the research rather than during the analysis or data collection stage. The convergence model represents the traditional model of a mixed methods triangulation design. This model is used when the researcher intends to compare results or to validate, confirm, or corroborate quantitative results with qualitative findings^[249]. The purpose of this model was to provide valid and well-supported conclusions regarding a single phenomenon.

The research was designed concurrently; however, due to practical limitations, study one was conducted first, and the second two studies were conducted afterwards. However, each study was weighted equally. There was a greater quantity of qualitative data due to the two interview studies and field notes from the observational study. Regarding convergence, the studies were merged during the overarching discussion stage of the research. Consequently, triangulation was adopted to address the singular overarching research question. This triangulated design enhanced the reliability and validity of the findings, ensuring a nuanced understanding of the overarching research question.

2.3 Aims of Research

The aims and objectives of each study were developed to address the overarching research question: What is the nature of the relationship between UK food-related obesity prevention policies and inequalities in obesity rates?

2.3.1 Study one: Understanding adults' experiences, attitudes, and future outlooks of food-related obesity prevention policy.

To explore UK-based adults' experiences, attitudes, and future outlooks towards food-related obesity prevention, semi-structured interviews were conducted and analysed using thematic analysis. Further details regarding the methodology in study one can be found in Section 3.2. The study's three specific objectives were as follows.

1. To understand how adults from different socioeconomic statuses perceive their capacity to sustain a healthy weight in the UK context.
2. To explore how adults from different socioeconomic statuses experience and engage with the food environment and how these interactions shape their purchasing behaviours.
3. To evaluate adults' attitudes towards existing and future approaches for obesity prevention

2.3.2 Study two: Assess how socioeconomic inequalities in obesity are considered in the UK obesity prevention policy process

To explore the policy process, interviews with policy stakeholders were conducted and thematically analysed. Semi-structured interviews were conducted to collect qualitative data on the experiences and attitudes of these stakeholders, focusing on how inequalities in obesity were addressed throughout the policy process. Further information regarding the study's methodology can be found in Section 3.2.2. The sub-objectives of this study are as follows.

1. To explore policy stakeholders' perspectives on the key factors that influence the policy process in obesity prevention.
2. To uncover stakeholders' perspectives on the policy gaps within existing strategies and examine their impact on socioeconomic inequalities in obesity.
3. To understand how the policy process could improve its consideration of socioeconomic inequalities in obesity from the perspective of policy stakeholders.

2.3.3 Study three: To Investigate How the Food Retail Environment may be Influenced by the Implementation of the Restriction on the Placement of HFSS items in Prime Locations of Stores in England Included in the 2020 Tackling Obesity Strategy

To explore the nature of the food environment and the effect of the restriction of placement of HFSS items from prime locations of larger stores in the UK, observations of the food retail environment were conducted in two areas of Nottinghamshire, reflecting the highest and lowest socioeconomic regions of the county. Supermarkets, chain convenience stores (CCS), and independent convenience stores (ICS) were observed. This study investigates the consequences of the restriction of HFSS products in the prime locations of stores. This was completed by conducting observations in early 2022, and again in early 2023. A detailed description of the methodology of this study is provided in Section 5.2. The sub-aims of this study were as follows:

To examine the effects of restricting the

1. To examine the effects of restricting the placement of HFSS products in prime store locations by exploring changes in product exposures.
2. To assess the influence of socioeconomic level on the characteristics of food retail environments.
3. To investigate variations in the effect of a policy on different areas based on their socioeconomic levels.

2.3.4 Declaration of Ethics

This study was approved by the Ethics Committee of the University of Nottingham Faculty of Medicine and Health Sciences (FMHS-249-0421). No amendments were made to the initial

ethics application which consisted of one application inclusive of the three studies described in Section 2.3. Refer to Appendix 8.3 for the ethics certificate of this study.

2.4 Reflexive Statement

Reflexivity refers to the process by which a researcher continuously reflects on the research process to generate awareness about their own actions, feelings, and perceptions throughout each stage of the research process from study design to the interpretation of results ^[257–259]. An important component of research rigor is identifying researchers' beliefs and pre-existing biases ^[260]. Accordingly, these biases and beliefs must be considered during the research process ^[261]. Reflexivity is particularly important when interpreting the results of data in which the researcher plays an active role in generation and analysis, such as in qualitative methodology ^[257,262]. Reflexivity helps to promote the quality of research and enables the researcher to ensure credibility and dependability of the study as well as conformability of findings ^[263]. The following section provides a summary of the researcher's characteristics:

Characteristics of the Researcher

In summary, the researcher is a female, with an MSc in Global Health and Development from the University College London. The research is funded by the University of Nottingham through the SPECTRUM Consortium, a multi-university, multi-agency research consortium focusing on the CDoH and health inequalities, funded by the UK Prevention Research Partnership. The research consortia focuses on preventing NCDs caused by unhealthy commodities, such as tobacco, alcohol, and unhealthy food and drinks.

At the start of this research, the researcher held the belief that there were vital ethical considerations regarding the obesity problem in the UK. The researcher was particularly concerned about the perceived tendency of the public, media, and policy to attribute blame and the causation of obesity to individual responsibility, failing to consider the role of lived experience. The researcher was particularly interested in the moral implications of marketing unhealthy commodities to children. A strong view held by the researcher before

the research commenced was that an individual's SES should not determine their ability to sustain a healthy diet and overall quality of life. The researcher also maintained the perspective that the contemporary food system perpetuated social injustices by specifically influencing lower socioeconomic groups in making poor quality dietary choices due to a multitude of factors beyond the control of the individual.

In conducting research on the impact of SES on obesity and the role of policy, the researcher recognised their own limitations in terms of personal experience, as they had never lived in poverty or faced financial hardship. Additionally, they do not have experience living with overweight or obesity. Acknowledging these gaps in experience, this research aimed to minimise any preconceptions or assumptions about the topic through the practice of bracketing. Bracketing is a method used by researchers to mitigate the potential detrimental effects of unacknowledged preconceptions related to the research. It is an iterative approach, whereby the research is honest and reflective of how the effects of one's own experience may influence the study ^[264]. The use of bracketing increases the overall rigor of the study, particularly when there is significant closeness between the researcher and the research topic ^[265]. Following the guidance of Glaser, the researcher used bracketing from the preparation of the research process to the analysis, as it was believed that preconceptions and assumptions were important to acknowledge through the interviewing process, as well as the analysis process and discussion ^[266]. Bracketing was used throughout the reflexivity journal, during data collection by adopting open-ended questions to avoid leading participants. Pilot interviews were conducted to refine the topic guides and ensure the guides did not steer participants towards specific answers rooted from existing assumptions.

Throughout the research process the researcher completed a reflexivity journal to keep track of decision-making, key thoughts, assumptions and considerations that occurred throughout the research process. Maintaining a reflexivity journal throughout the research process is commonplace, particularly in qualitative research ^[267]. Journals promote greater transparency, validity, and research rigor as a significant portion of the data in this thesis comes from interviews, making the journal crucial to the research process^[267].

Along with bracketing and the use of a reflexivity journal, investigator triangulation was used, whereby second coders were used throughout the data analysis stage of the qualitative studies. Investigator triangulation is defined by Denzin as the use of multiple investigators in a single study ^[268]. There are many benefits for using investigator triangulation, particularly within mixed methods research, where the lead researcher may not hold expertise within each methodology ^[269,270]. The primary purpose of utilising investigator triangulation for this research was to ensure validity and rigor throughout the analysis of these studies ^[269]. The second coders for study one were Dr. Manpreet Bains (MB) (PhD) and Dr. Ilze Bogdanovica (IB) (PhD), whom are both associate professors from the Faculty of Medicine and Health Sciences, based at The University of Nottingham. For study two the second coders were Dr. Tessa Langley (TL) (PhD), an associate professor, and Dr. Rachael Murray (RM) (PhD), a professor, from the Faculty of Medicine and Health Sciences based at the University of Nottingham.

Both the qualitative studies included in this research involved sensitive issues. Study one aimed to explore the lived experiences and attitudes of members of the public regarding obesity prevention discussions regarding food environments, mental health, eating disorders, financial hardship and poverty, disability, as well as experiences related to body image and experiences with violence related to societal weight stigma all occurred. Furthermore, the interviews conducted with PSH in Study two also required sensitivity, as the participants discussed topics that were embedded in their professional experiences, including conflict with the food and drink industry. The researcher expected these themes to be raised during the research and took steps to mitigate any risk to the participants. Measures were taken to ensure the participants' comfort and security, such as taking steps to build rapport and develop interviewing skills. Building rapport with participants is seen as an essential step for gold standard interviews. This involved spending a few minutes before the interview began to become familiar with the participants, introducing researcher, and ensuring that the participant had had an opportunity to ask any questions ^[240,271]. This process is intended to build trust between the participant and interviewer with the intention of ensuring that the participant feels comfortable, trusted, and alleviated of any anxieties ^[272]. Furthermore, the researcher took steps, such as attending Masters modules, to develop their interviewing skills and understanding of interview practices. The researcher

had experience conducting interviews prior to the research and followed guidance from research methods literature to ensure rigor within my data collection practice.

3 Chapter 3: Understanding UK-based adults' experiences, attitudes, and future outlooks of food-related obesity prevention policies

3.1 Introduction

This chapter presents the first study of this thesis. The study's objective is to understand adults' experiences, attitudes, and future outlooks of food-related obesity prevention policies. The first section outlines the study's methodological and analytical decisions that were made. The second section provides the study's findings, followed by a discussion. The overarching objective was underpinned by three further study objectives.

1. To understand how adults perceive their capacity to sustain a healthy weight in the UK context.
2. To explore how adults experience and engage with the food environment and how these interactions shape their purchasing behaviours.
3. To evaluate adults' attitudes towards existing and future approaches for obesity prevention.

3.2 Methodology

Qualitative research

As introduced in Section 2.2, qualitative methodology can be described as an interpretative approach to data collection and analysis. It is concerned with developing an in-depth understanding of social reality and intends to generate knowledge about the meanings people attach to their experiences of the social world ^[246,273]. Public health challenges are believed to be rooted in the cultural context ^[240,246]. Qualitative methods were selected for this study for several reasons. First, the study's overarching objective is to explore adults' experiences, attitudes, and future outlooks of food-related obesity prevention policies. Experiences and the construction of attitudes occur within the social world and individuals' specific social contexts. Therefore, achieving this understanding through quantitative methods would fail to gain the required depth. Second, the study's objectives were to

understand the experiences of the food environment and explore their views on purchasing behaviours. Qualitative research is best suited for understanding how people experience and view their everyday lives. Exploring experiences and views may be possible through statistical-based methodology but would fail to capture the motivation and justifications for different behaviours.

3.2.1 Study design

In-depth, one-to-one, semi-structured interviews were conducted to explore adults' understanding, attitudes, and experiences. The study sample was intended to include a range of age, sex, BMI, and SES. The study was approved by the Ethics Committee of the University of Nottingham Faculty of Medicine and Health Sciences (FMHS-249-0421).

Sampling

A purposeful random-sampling approach was adopted in this study. Patton (2015) argues that “the logic and power of qualitative purposeful sampling derives from the emphasis on in-depth understanding of specific cases” [274(p. 230)]. Purposeful sampling was selected to build a sample population that varied in age, sex, geographical location in the UK, socioeconomic status (SES), and body mass index (BMI) weight classifications.

A Facebook advertisement was run for two weeks, closing on the 23rd of October 2022, advertising the opportunity to participate in the study (see Appendix 8.2 for advertisement and geographical reach). The advertisement linked Facebook users to the study's information sheet and survey questions. 98 respondents completed the screening questions. Each respondent of the Facebook advertisement was required to complete a survey to collect basic sociodemographic data. Sociodemographic data were used to group the participants based on their calculated BMI classifications. This study intended to use participant information on housing status, education level, and employment type to classify participants by SES. However, there was a lack of variation between the respondents' housing status, education level, and employment type when relying on these variables to stratify the sample. Weight classification was selected to form the sample as previous literature has determined how weight classifications can have significant influence on life experiences [275,276]. BMI classification was used to stratify the sample into five groups, and

participants were then randomly selected from each classification group. The classification of each respondent was calculated using the BMI calculation ($BMI = kg/m^2$). The BMI classification was based on self-reported weight, height, and age data and therefore risks error. The classification groups followed the NHS BMI ranges to assign the respondents to a classification group^[11]:

- Underweight (<18.5)
- Healthy weight (18.5-24.9)
- Overweight (25-29.9)
- Obese (30-39.9)
- Morbidly obese (>40)

Once the sample had been organised by BMI group, the participants were randomly selected one by one from each BMI group. Of these, 64 were asked to participate in the study. Six rejected the invitation due to the lack of incentive, while the remaining 27 did not respond to the study invitation.

Inclusion Criteria

A simple inclusion criterion was formed to ensure the sample met the requirements for this study. The inclusion criteria were as follows.

- Adults aged 18 years and older
- UK-based.
- English speaking.
- Access to phone or computer.
- Responded to the screening questions

All the respondents in the survey met the inclusion criteria.

Sample Size

There is much debate over what constitutes the appropriate sample size for qualitative research. Data saturation refers to the stage of data collection where further collection no longer yields new information and insight, it is often referred to as the gold standard by which purposive sample sizes are determined in health science research ^[277]. Qualitative

researchers often discontinue data collection once a desired degree of data saturation is met. This study looked for data saturation during the collection process to assess whether informational redundancy occurred. Informational redundancy refers to the point at which the researcher hears the same information repeatedly; at this point, it is deemed appropriate to end data collection [278]. Accordingly, assessing data saturation inherently relies on a researcher's assessment of the existing dataset. This study's approach to data saturation is summarised by Grady (1998), once 'the researcher begins to hear the same comments again and again, data saturation is being reached...' [279(p. 26)]. If the sample size were extended, the researcher could not confidently state that no new data would occur; however, extending the sample further is not necessarily beneficial to the study design due to factors like time constraints and study resources, therefore the researcher must assess when a satisfactory degree of data saturation has occurred [278,280].

The sample was intended to reach data saturation for each weight classification group. A satisfactory level of saturation was met across the dataset, and there was a significant overlap between the weight classification groups. Consequently, an iterative approach to sampling was used, requiring sampling and resampling to ensure that a certain degree of saturation has occurred [281]. After completing 25 interviews, the researcher assessed the areas of saturation within the dataset and continued sampling by group until they were satisfied with the degree of data saturation achieved.

Semi-Structured Interviews

One-to-one semi-structured interviews were conducted for this study. Brinkmann and Kvale define research interviews as "a conversation that has a structure and a purpose [282(p. 3)]. Interviews are interactive discussions interested in the social world and are useful when the subject or data the research is interested in cannot be observed, as Patton writes '*we cannot observe feelings, thoughts, and intentions... We cannot observe how people have organized the world and the meanings they attach to what goes on in the world*' [12(p.263(p. 341))]. Interviews allow the researcher to understand the relationship between participants and aspects of the real world. Semi-structured interviews were selected to meet the study aims. An interview guide was followed using probes to ensure that the subject remained focused while allowing the flexibility to explore participants' views. An interview guide is a

list of questions intended to be asked during an interview ^[283]. The guide was developed based on the study's aims and by bringing together previous work on public understanding of obesity and attitudes towards prevention approaches (See Appendix 8.4) ^[131,210,228]. To ensure that the topic guide used appropriate language for the public and did not use jargon, the researcher conducted five pilot interviews with peers. The pilot interviews did not contribute to the final dataset. The topic guide was divided into six sections.

1. Background awareness of obesity in the UK.
2. Experience with the food environment.
3. Experience of the food industry.
4. Attitudes towards existing policies for obesity prevention.
5. Influence of Covid-19 pandemic on attitudes and experiences with healthy weight and food environment.
6. Future outlooks of proposed policies for obesity prevention.

3.2.2 Data Collection

The interviews were conducted between the 25th of October 2021 and the 14th of January 2022. The interviews were conducted using Microsoft Teams videocall (n = 30) or via phone (n=1). The interviews lasted between 30 minutes and 1 hour and 40 minutes. Written consent was obtained prior to the interviews and verbal consent was obtained at the start of each interview. Participants were reminded of their right to withdraw and given a short summary of what to expect during the study, a summary of the interview structure and a reminder of overall intention of the study. All participants received an information sheet for the study before the interview which provided further information about the study.

Participants were also reminded that they could contact the researcher after the completion of the interviews with any concerns or questions they may have had. All interviews followed the same topic guide (See Appendix 8.4). Participants were reminded that they were free to stop the interview at any time or to skip questions without explanation. The topic guide was followed using pre-planned probes along with probes in accordance with the participants' responses.

3.2.3 Data Analysis

The interviews were recorded, and audio files were transcribed verbatim. Half of the interviews were transcribed by the researcher and the other half were transcribed using Microsoft Teams automated transcription and then checked by the researcher. All identifiable data were anonymised. The transcripts were analysed using a thematic analysis (TA). TA is the process of identifying and interpreting patterns of meaning within a dataset [284]. It is an accessible and systematic procedure for generating themes in a qualitative dataset. TA is a flexible approach that can be used to analyse datasets of all sizes [285]. TA is not tied to an epistemological or theoretical perspective [285]. Study one is underpinned by interpretivism, which seeks to understand the subjective world of human existence [286]. The interpretivist paradigm is appropriate for this study as a key element of interpretivism is that reality is socially constructed (see Section 2.2 for further information regarding interpretivism) [287]. The following section outlines the analytical approach adopted by the researcher.

The first phase of Braun and Clarke's thematic analysis is data familiarisation. This phase requires the researcher to read and reread the dataset to become familiar with the dataset. In this study, several steps were taken during the familiarisation phase. First, the researcher manually transcribed 15 audio recordings, which was perceived to be a useful activity for the researcher to fully immerse themselves in the dataset. The remaining transcripts were carefully checked by the researcher while listening to audio recordings. Once the researcher was satisfied with the quality of the transcript, each audio recording was listened to in its entirety using 'active listening', whereby no notes were recorded [288]. After this stage, each transcript was read numerous times and notes were produced on the general trends and ideas related to each transcript.

Phase two of thematic analysis involves generating the initial codes of the dataset. Codes refer to descriptive and interpretative labels for information within a dataset that may be significant to the research question [285]. Braun and Clarke (2019) describe the process of coding as flexible, organic, and iterative, as it can often evolve throughout the analytical process [285]. In this study, the researcher adopted an inductive data-driven approach. Codes produced during analysis were solely reflective of the dataset rather than based on any preconceived theoretical approaches. Therefore, the research took an 'open-coded' approach. This was felt to be most appropriate to ensure the researcher best interpreted

the attitudes and experiences recalled by the participants ^[284]. Latent coding was predominantly used, where the researcher intended to go beyond the descriptive nature of the dataset. Latent coding refers to coding that goes beyond the surface level and aims to uncover deeper meaning ^[288]. As a result, the analysis was more interpretive and required the researcher to play an active role in interpreting the meaning from the data.

All the data linked to the research question were coded using NVivo 1.7.1. Once the first round of codes was completed, the researcher produced mind maps to explore the codes and their links further. Further familiarity with the data was achieved through this phase of the analysis.

Phase three of TA involves generating themes. The generation of themes begins once all data are coded. Themes are typically understood to constitute 'summaries of what participants said in relation to a particular topic or data collection question' ^[289(p. 5)]. Using the codes and notes obtained by the researcher, an extensive list of candidate themes was generated.

Phase four, reviewing potential themes, involved revising candidate themes with the support of my supervisors. The supervisors of the research (MB and IB) reviewed and refined the candidate themes based on their own coding process. MB and IB double coded half of the transcripts, whereby they repeated step one and two of Braun and Clarke's TA. Once they had completed these steps, we came together to develop a final form theme list. Investigator triangulation was used to form a final list of themes. Investigator triangulation refers to the process in which two or more researchers provide observations and conclusions in the same study ^[290]. Including investigator triangulation in the analysis process is thought to bring confirmations of study findings and a range of perspectives on the dataset and analytical process (refer to Section 2.4 for further information) ^[291].

Additionally, multiple perspectives can provide an opportunity to sense-check ideas and further explore primary researchers' assumptions or interpretations of the data. When generating themes, it was vital that the researcher found an adequate number of themes that explored the breadth and depth of the data, while remaining concise and coherent.

In phase five of TA, defining and naming themes, in collaboration with my supervisor, clear and concise labels were generated to adequately summarise each theme and sub-theme.

The final list of themes was discussed extensively with my supervisors. Key themes and sub-themes were identified. The codes, themes, and subthemes were developed to ensure that the most meaningful interpretation of the data was achieved. It was important that the themes remained in line with the research questions, as the dataset was large. The researcher ensured that each theme had clear boundaries and were isolated from one another while being integrated to achieve the aims of the study. Once defined and named, the researcher ensured that the key extracts supporting each theme were identified. In the sixth and final stage, producing a report, the researcher tied together the five phases of analysis and produced a report reflecting the study's results and discussion.

3.2.4 Reflection on Role as Researcher

As addressed in Section 2.4, reflection is the process by which a researcher reflects on the overall research process from data collection to data interpretation ^[258]. The presence of the researcher is important in qualitative research; reflection is essential to account for the impact of the researcher on data collection and analysis and helps contextualise the research. Lincoln and Guba suggest that trustworthiness is important in research to reassure the reader that the research was of significance and value ^[286]. Credibility, transferability, dependability, and confirmability are the key criteria to ensure research is trustworthy ^[286]. Credibility refers to the fit between the participants' responses and the researchers' interpretations of them ^[292]. Transferability refers to the generalisability of inquiry this is achieved by providing thick descriptions of the research so those who may seek to transfer to their own site can judge transferability ^[292,293]. Dependability is achieved by ensuring the research is logical, traceable, and clearly documented ^[292]. Lastly, confirmability is concerned with establishing that the researcher's interpretation and findings clearly derive from the data. These criteria for trustworthiness are mutually reinforcing, as Guba and Lincoln (1989) believed that if a study has credibility, transferability and dependability then it likely holds confirmability ^[293]. This research focused on providing a voice to represent the public in the obesity prevention policy landscape. Therefore, ensuring that the research is trustworthy, credible, and error-free is essential for the researcher.

It was vital to the quality of the interviews that the participants felt comfortable throughout the interviews and trusted the researcher. The interviewer built a rapport with the participants ahead of the recording by engaging in small talk, explaining their research

background, and providing the opportunity to ask questions. The researcher ensured that jargon-free language was used to avoid appearing as an expert to further ease the participants and reduce the risk of social desirability bias ^[271,272].

Throughout data collection, some participants were interested in understanding the researcher's perspective, particularly when a participant offered a controversial perspective. When this occurred, the researcher remained neutral and reminded participants that the goal of the research was to understand their perspective rather than the researcher's perspective. The participants were then reminded that there were no wrong answers, and the interviews were continued. Another consideration was that the participants often discussed personal problems related to their diet and weight. This included experiencing financial hardship, mental health conditions, and eating disorders. The researcher expected these topics to arise and felt equipped to navigate these discussions by reminding the participants that they did not have to discuss anything that made them uncomfortable and ensured that the participants were happy to continue. Furthermore, some participants expressed concerns that there were wrong and right food behaviours that the researcher was interested in or may judge. Some participants showed embarrassment or guilt when discussing food behaviours that they deemed unhealthy. The participants were reminded at the beginning of the interview of their right to withdraw and were reassured throughout the interview.

Furthermore, the research aimed to explore the lived experiences of different socioeconomic groups, which required discussion with individuals who have experienced financial hardship. Discussing SES can be sensitive due to social injustice and moral judgments attached to class ^[294]. As outlined in Section 2.4, as the researcher has no experience of financial hardship or poverty, it was important that personal assumptions were not added to the research design or analysis.

Throughout the data collection and analysis, a research diary was maintained by the researcher, including decisions made and reflections from each interview conducted. Documenting these steps was useful in demonstrating the interviewer's decision making throughout the research process. Double coding was used to establish rigour and reliability within the analysis process. By utilising double coding, the researcher demonstrated that the broad themes established in the early stage of analysis are representative of the data.

As the researcher was familiar with key ideas from similar studies on public attitudes, the researcher consciously avoided interpreting the data in line with these findings to ensure that the analysis reflected the data set, which was assisted by double coding. Furthermore, double coding helps to ensure trustworthiness within the analysis process, and the themes are reflective of the dataset rather than the researchers' own assumption ^[236,248] The codebook was developed and shared with the research supervisors.

3.2.5 Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee of the University of Nottingham Medical School. No amendments were made to the initial application (FMHS-249-0421). All participants approved the recording of the interviews for transcription and analysis purposes and were comfortable with me taking field notes through written consent ahead of the interview and verbal consent at the start of the interview. As the interviews were conducted online, there were no issues regarding my safety while conducting the interviews. No incentives were provided for participation.

The screening questions required potential participants to submit their weights; for some participants, this may have been an area of sensitivity. The researcher suspected that participants may have had strong feelings or personal links to the research topic. For example, many participants discussed their personal experiences of eating disorders. Furthermore, participants from higher weight classifications commonly discussed stigma experiences which required sensitivity. To avoid issues surrounding sensitive topics, the participants were assured that responding to the questions was optional. The researcher built a rapport with each participant, ensuring that the participants had opportunities to ask questions and express any concerns about the study before and after the interview.

As SES was discussed at length throughout the interviews, some participants described their experiences and their peers' experiences of financial hardship, which also required sensitivity. No participant became distressed during the interviews, and when it was clear that the participants were discussing sensitive themes, the researcher ensured that they were comfortable continuing.

3.3 Results

In total, 31 participants took part in the interviews. Of the participants, 11 were men, 19 were female and one was non-binary. Figure 6 provides a summary of the sociodemographic profile of the sample. All participants were between the ages of 19-49. The findings section outlines the broad themes that were identified in this study as shown in Figure 9. These themes included understanding of obesity, participants' perceptions of and confidence in nutritional literacy, consumer experiences with the food environment, participants' views towards the barriers and facilitators to sustaining a healthy weight, attitudes towards responsibility of obesity prevention in the UK and past, present and future food policy for obesity prevention.

The themes in this chapter align with its three objectives (see Section 3). For Objective 1, themes such as participants' understanding of obesity, perceptions of and confidence in nutritional literacy, and barriers and facilitators to sustaining a healthy weight reveal how adults perceive their ability to sustain a healthy weight in the UK. Objective 2, exploring adults' engagement with the food environment, is covered by themes related to consumer experiences with the food environment and barriers and facilitators to sustaining a healthy weight. Lastly, themes on attitudes towards responsibility for obesity prevention and past, present, and future food policy for obesity prevention provide insights into participants' views on existing and future approaches to obesity prevention, meeting Objective 3.

Summary of Sociodemographic Profile of the Sample	
Gender	
Males	11
Females	19
Non-binary	1
Age	
18-29	11
30-39	14
40-49	6
BMI Group	
Underweight	1
Healthy Weight	10
Overweight	8
Obese	3

Morbidly Obese	9
Educational Attainment	
Degree-level or higher qualifications	24
A & AS level or equivalent qualifications	7
House Ownership Status	
Housing association or local authority housing	3
Private rented: Private landlord or letting agency or other	18
Other	1
Owned with mortgage	4
Owned without mortgage	5
Employment status	
Full time employment	20
Student	8
Unemployment or out of employment	3

Figure 6 Summary of Sociodemographic Profile of the Sample

Themes and Sub-themes

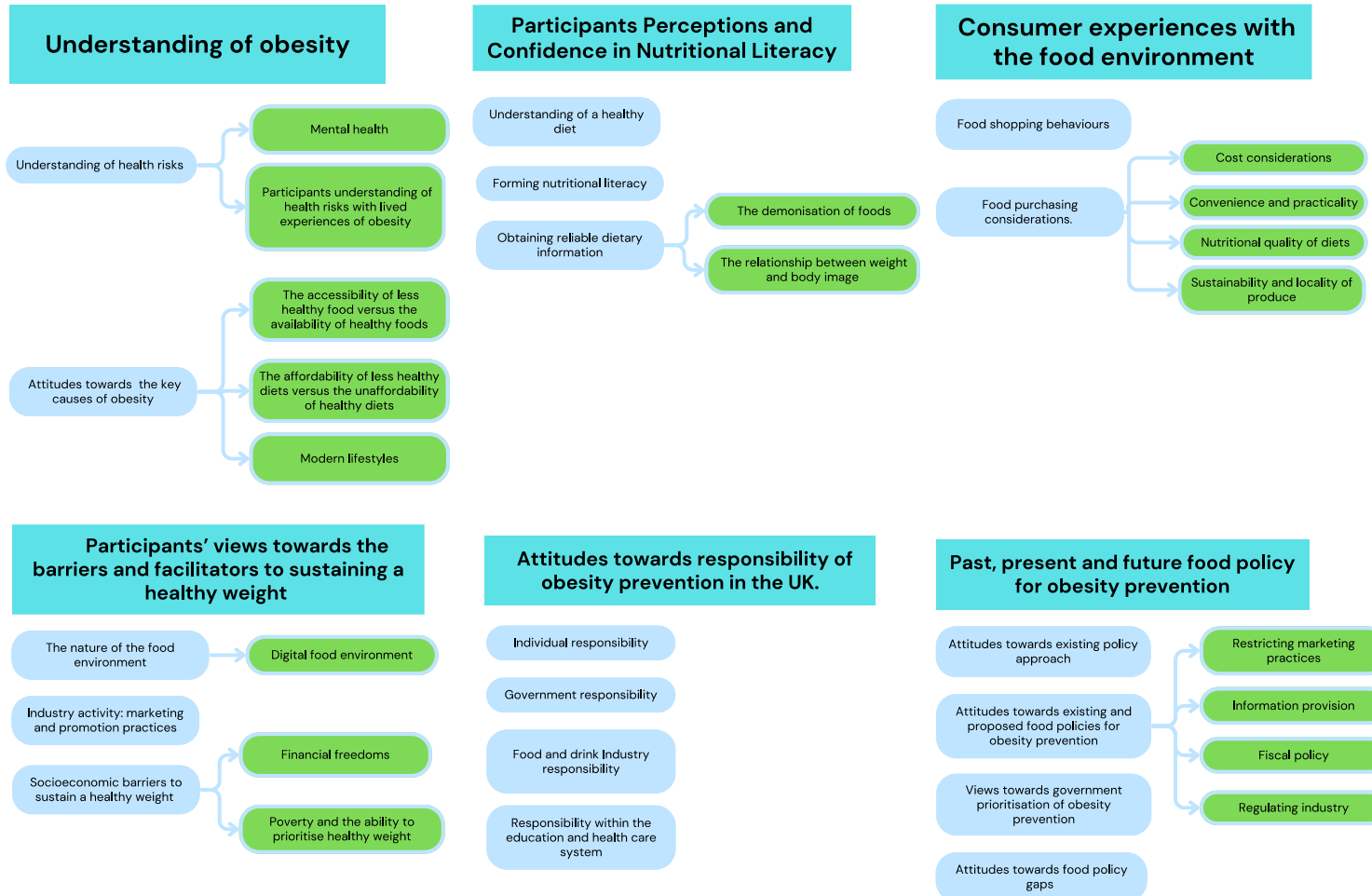


Figure 7 Themes and sub-themes, Study 1

Understanding of health risks

The relationship between excess weight and poor health outcomes was widely understood and included descriptions of both physical and psychological conditions. Approximately one-third of the participants felt that obesity increased risk to all disease.

“Heart disease, increased risk of pulmonary complications, so huge comorbidity for many diseases. So yeah, there's it's not an isolated problem. It's not just obesity. it's this thing, it's a web of so many different things and risk factors that it's not so easy to be teased out”
(Participant 6, 30-39, Male, Overweight).

The most frequently identified physical health conditions were type 2 diabetes, cardiovascular disorders, joint pain, and mobility problems. Problems with eyesight, dementia, and cancer were less frequently discussed. A high number of participants associated obesity with worsened Covid-19 outcomes; moreover, over half of the participants felt Covid-19 increased their awareness of the seriousness of obesity. For some participants, Covid-19 was the first time that they had considered obesity as a risk factor for infectious diseases.

“I have friends that are extremely overweight or obese, and I was very worried for them. Uh, in case they caught covid because I knew that if your BMI is over a certain amount that you are at higher risk.” (Participant 3, aged 30-39, Female, Healthy Weight).

Mental health

Mental health was discussed extensively by many participants, and most felt that obesity posed a huge risk to mental health due to depression, anxiety, self-esteem, body dysmorphia, and eating disorders. Approximately one-third of the participants described the bi-directional relationship between obesity and mental health: how mental health conditions could exacerbate weight gain and living with obesity exacerbated poorer mental health.

“I've got PTSD and part of my... punishment for myself is to overeat...I was back with doctors and so forth. I feel... ignored...So, you can think why bother?... sometimes you feel like a second-class citizen” (Participant 14, 30-39, Female, Morbidly Obese).

Participants with lived experiences of obesity perspectives on health risks

Participants who classified as obese or morbidly obese described concerns over their personal health and included more severe health outcomes than conditions discussed by those from other weight classifications. The health conditions most discussed by these participants included severe health risks such as cancers and premature death, debilitating mobility issues, and poorer mental health. Many individuals reported feeling additional stress as a result of their weight, which they believed increased their risk of experiencing severe health consequences such as strokes and cancer.

“I'm overweight myself... I've had...heart arrhythmias, I've developed asthma. A lot of my family are overweight...I'm aware that...my family members who've passed away, I'm aware that their weight probably did have a factor in it” (Participant 1, 18-29, Female, Obese).

Participants from the obese and morbidly obese weight classifications reported mobility issues and joint pain, sharing personal stories of the distress and limitations they experienced. In some instances, individuals described how mobility difficulties stemming from their weight affected their capacity to perform routine activities.

“...because of my chronic back problem, I find it quite difficult to get around the big supermarket without pain... I just about get around the shop floor... I collapse” (Participant 10, 40-49, Female, Morbidly obese).

Excess weight was reported to cause mobility issues, which in turn made it more challenging to move without pain, resulting in further weight challenges. This cycle was described as enhancing feelings of helplessness stemming from the inability to improve mobility and reduce weight. Additionally, these participants faced difficulties in obtaining supportive healthcare, particularly weight-management services. However, concerns about being

overlooked or not taken seriously by healthcare professionals diminished the confidence of many obese and morbidly obese participants in seeking care.

“...people go for knee surgery until they can't do it because their BMI is too high...that just makes them frustrated because they're told to go and lose weight. And they think... “I can't lose weight, I can't do any exercise because I can't move” ...they leave very frustrated because they're not getting the support” (Participant 9, 40-49, Female, Morbidly Obese).

3.3.1 Participant Perspectives on the Key Causes of Obesity

Overall, the participants attributed obesity to diet, physical activity, and lifestyle factors. Participants rarely discussed genetics causes. Most participants felt that poorer quality diets were the largest attributor of obesity.

“Food, so what you eat, how much you eat. And then physical activity... I think that's the two factors” (Participant 28, aged 30-39, Male, Healthy Weight).

It was felt that the UK was becoming progressively less active. Participants described shifts in lifestyle as linked to changes in childhood behaviours, such as a transition from outdoor play to video gaming, shifts in employment patterns, and, more recently, the impact of Covid-19 prevention measures.

“... we seem, as a general population, to be getting more and more sedentary. Especially in this last year, we've all been working from home” (Participant 8, 18-29, Female, Healthy Weight)

The participants discussed multifactorial causes of obesity, and no participant felt that obesity could be isolated as a singular cause. The findings suggest that the participants perceived the food environment to be a key cause, as it was described as becoming more conducive to the overconsumption of energy dense nutrient poor (EDNP), cheap foods. Consequently, most of the participants felt that it was easier to sustain an unhealthy diet than a healthy diet. Three subthemes emerged from the participants' perspectives on the

primary causes of obesity: the accessibility of EDNP food versus the availability of healthy foods, the affordability of unhealthy diets versus the unaffordability of healthy diets, and the impact of modern lifestyles on the obesogenic food environment.

The Accessibility of Energy-Dense, Nutrient Poor Food Versus the Availability of Healthy Foods

Access to cheap EDNP foods through food retailers, such as supermarkets, local convenience stores, restaurants (full-service restaurants, fast food and take-away restaurants), and online food delivery platforms, was identified as a key cause of obesity. The excessive and unbalanced availability of UPF and EDNP foods was negatively perceived by participants due to its harmful impact on people's dietary choices at the population level. Many participants expressed frustration towards their food environment, which was perceived to be more conducive to sustaining an unhealthy diet.

“... the sheer amount of processed food is probably having a huge impact... just even for lunches ... there's just huge amounts of processed food. There's not much fresh stuff. I think that's probably a big factor in it” (Participant 23, 18-29, Male, Obese).

Excessive access to UPF and EDNP foods was said to influence many participants' dietary behaviours. A number of participants who were classified as morbidly obese explained how the nature of the food environment created difficulties in attempts to maintain healthier behaviours, particularly when in vulnerable positions. The food environment was felt to encourage binge eating behaviours due to consistent, easy access to UPF. One participant felt that the increased presence of the digital food environment (DFE) added to this challenge as the virtual environment provided a faceless form of food purchasing.

“When I was a child, the only time you could go to a McDonald's was in a shopping centre ...It is so easy for overeaters... myself included, to buy food anonymously for drive throughs, through deliveries or the delivery places...” (Participant 9, 40-49, Female, Morbidly Obese).

The Affordability of Less Healthy Diets Versus the Unaffordability of Healthy Diets

Most participants felt that healthy fresh food was not only less available, particularly in areas of higher deprivation, but was also more expensive. The affordability of healthy diets was not always viewed as a cause of obesity; although some felt that cost was not a cause but an excuse for making unhealthy choices, other participants felt that affordability was a fundamental cause.

“I get very frustrated when people say... it's cheaper to eat healthier, because I just find it isn't... I don't get paid that well... And I find it difficult to budget to get healthy food... I have a science degree...I know vaguely what is healthy, but I... find it really difficult to afford to do it... if you think it's easy to live healthily on minimum wage, then you've never done it...”

(Participant 10,40-49, Female, Morbidly Obese).

The Impact of Modern Lifestyles on Obesity

The study indicated that the participants frequently described that multiple factors acted together to amplify their influence and often emphasised the influence of modern lifestyles. Many participants pointed out that the availability, affordability, and convenience of EDNP food made it more appealing. Additionally, participants described the pressures and responsibilities of modern lifestyles as exacerbating the appeal of these food types to save time and avoid additional tasks such as cooking. Several participants described how stress stemming from job obligations and other tasks, such as childcare, leads to excessive workload, exhaustion, and burnout. This, in turn, was believed to prompt reliance on easy-to-prepare meals that are most often less healthy. Healthy convenience foods were considered rarely available, and when available, they were unaffordable. Therefore, the nature of modern lifestyles was seen to attract people towards quick, cheap food options that tend to be EDNP and UPF.

“I think the availability of convenience, fast food massively so... I found this that sometimes it is easier just to...get something in that is easier to cook or just get a takeaway if you're feeling really tired... sort of like the strains of modern life... working, looking after children

and doing everything... sometimes you just you burnt out. So, convenience is a big thing”
(Participant 13, 30-39, Male, Healthy Weight)

3.3.2 Participants’ Perceptions and Confidence in Nutritional Literacy

Nutritional literacy was a prominent theme in this study. Nutritional literacy refers to the extent to which individuals have the capacity to obtain, process, and understand nutritional information and skills to make appropriate nutritional decisions ^[295]. Several sub-themes emerged, including understanding what a healthy diet is, developing nutritional literacy, the influence of diet culture on nutritional literacy, the demonisation of foods, and weight stigma and body image.

Understanding of a Healthy Diet

Few participants felt that they possessed a comprehensive level of nutritional literacy. These participants regularly cooked from scratch were confident about their understanding of what constitutes a healthy diet and were often aged 30+. In comparison, most participants were not confident about their nutritional literacy, which was most pronounced in the higher weight classifications. Participants in this subgroup generally had a good understanding of nutritional education resources and had taken weight loss and/or nutrition courses. However, despite their knowledge, they still felt confused or uncertain about their nutritional literacy.

“The government guidance on what constitutes a healthy diet needs to just be... a bit easier to understand...I’ve got quite an interest in trying to understand it. But I find it quite difficult”
(Participant 16, 30-39, Female, Overweight).

The participants most often defined a healthy diet as a diet that was ‘varied’ and/or ‘balanced’. A balanced diet included a range of different food groups consumed in moderation, including a balance of healthy and unhealthy products. Around a quarter of the participants defined a healthy diet in relation to recommended daily calorie intake. Participants who had attempted to lose weight often associated a healthy diet with lower or desirable calorie intake and understood the healthfulness of foods by its calorie content. Some participants believed calorie intake to be important for sustaining a healthy diet yet

did not have a clear understanding of caloric intake. The interpretation of caloric information was described as confusing and misleading. The lack of standardised nutritional labels and guidance around portion size was felt to add to the difficulties of relying on caloric intake:

“I don’t have any perception of how much I should have, I will just cook as much as I want and I will eat all of it because I absolutely love it” (Participant 3, 30-39, Female, Obese).

Participants Experiences of Forming Nutritional Literacy

There was a general belief among participants that the public’s level of nutritional literacy was declining. The decreasing level of cooking skills in the population was viewed as problematic. The family unit and school settings were described as the core factors in the formation of nutritional literacy. The breakdown of the intergenerational transmission of cooking skills at home was thought to be a large contributor to reduced nutritional literacy. Participants, especially those with children, were sceptical about the level of nutritional literacy among young people. One participant made the following point when talking about her children’s friends.

“There were lots of her friends who didn't know, for example, that potatoes made chips... they thought chips were a thing that was just... fresh vegetables and things like that weren't so commonplace” (Participant 29, 40-49, female, Healthy Weight).

While schools were viewed as essential places to develop nutritional literacy, few participants felt that they had received adequate education on nutrition while in school. Furthermore, opportunities to develop nutritional literacy in school were thought to have reduced.

“I just feel like it was a massively missed opportunity... learning about how to cook... It’s not just like a one-off tick box...maybe like a cooking class every week. So, they learn what fresh ingredients look like... how they can be prepared...they can grow up...becoming more independent with what they do” (Participant 14, 30-39, Female, Healthy Weight).

Furthermore, a handful of participants explained that their children were taught to bake a cake rather than the skills to form a nutritious meal.

“I don’t think when I was at school, I was taught what was healthy and what was unhealthy, but I don't think I was taught how to make balanced diet or anything like that” (Participant 3, 30-39, Female, Healthy Weight).

Challenges in Obtaining Reliable Dietary Information

Understanding nutritional literacy was heavily linked to the participants’ perceptions of diet culture. There is no single definition of diet culture; the term is generally linked to diet, body image, and exercise ^[296]. Diet culture appeared to shape several participants’ understanding of healthy diets and created confusion regarding the trustworthiness of dietary guidance. Diet culture appeared to have a considerable impact on the lived experiences of some participants.

“Social media feeds into it, fashion industry feeds into it, food and marketing, diet clubs, Weightwatchers, Slimming World’s, because its reinforcing all of these ideas of you can have this but you can’t have that and skinny means happy and it doesn’t always mean that way.” (Participant 2, 30-39, Female, Obese).

The quantity of guidance and contradictions between different sources were described to leave participants uncertain about the trustworthiness of resources. Even participants who felt that they had high nutritional literacy saw the contradictory content of many sources. Furthermore, participants who had used weight-loss services such as Slimming World and Weight Watchers described uncertainty in the quality of the guidance provided, leaving the participants feeling helpless and sometimes in worse positions than when started.

“I have tried lots and lots of diets. I know that Slimming World and Weight Watchers, despite what they say, do not work. Because every time I have left there, I've ended up fatter than when I started every time now” (Participant 9, 40-49, Female, Morbidly Obese).

The Demonisation of Foods

Participants often had binary views of foods, referring to them as either 'good' or 'bad, healthy', and 'unhealthy'. For example, some participants labelled carbohydrates as 'bad' or 'fattening'.

"I think probably a healthy diet often is lower in carbohydrate and higher in protein and to some extent fats, I suppose a low carb diet trend is...probably influencing me... they don't necessarily fill people up and they eat more" (Participant 16, 30-39, Female, Overweight).

These labels were often associated with narratives of popular dietary culture. Foods were labelled 'bad' due to a high calorie count and associations with behaviours, such as gorging and weight gain. Participants explained how consuming some food items caused feelings of guilt, failure, and shame, in particular participants from higher weight classifications described sensations of shame when consuming 'bad' foods, especially when in public. These foods included confectionary and treat products such as 'donuts' as well as fast food such as 'McDonalds'. Other diet culture narratives were discussed by participants including 'earning' 'bad' foods through physical activity. Participants felt that these narratives strengthened toxic ideas about eating, which were central to popular diet culture. Fad diets were also described by a handful of participants to account for popular diets in society, for example, high protein, low carbohydrate, or Atkins. Of the participants who discussed these culturally popular diets, the diets were felt to be designed to fail to keep individuals in a consistent cycle of dieting.

"There's a colleague of mine, he is probably in like a morbidly obese sort of category... he's either on a diet or is off the diet. And when he's on a diet, he'll be like...I can't have diet coke because it's got sweeteners in it and sweeteners trick your body into gaining weight... He doesn't understand... it's really easy to focus on something that's been sensationalised" (Participant 29, 40-49, Female, Healthy Weight).

The Relationship Between Weight and Body Image

Throughout the interviews, some participants discussed their personal relationships with their diet and weight. The participants' concern over diet and its effect on weight differed according to sex and weight classification. Only one healthy weight male (who worked in the health and fitness industry) and two male obese/morbidly obese participants discussed their relationship with diet and weight status, whereas the majority of female participants expressed concern about their diet and weight, specifically in association with body image.

Body image and the body positivity movement was discussed in several interviews. Female participants were more likely to discuss their body image than male participants. The desire to look a particular way had a large impact on many female participants' relationships with diet, as many described periods of restrictive eating to lose weight.

"I was like, eight or nine... actively restricted what I ate, because I felt not happy in myself... I can't imagine any eight-year-old nine-year-old boy doing that" (Participant 13, 30-39, Female, Healthy Weight).

The body positivity movement was believed to have damaging effects on people's awareness of the health risks associated with obesity. Five participants discussed the body positivity movement: two classified as morbidly obese, one as obese, and two as healthy weight. All five participants, irrespective of weight classification, felt that the body positivity movement was nested in a positive agenda towards self-acceptance; however, the participants felt that the movement risked creating too much acceptance at a detriment to individuals' health, and risked undermining individuals attempt to change their weight status.

"I think there's a huge notion of in sort of body positivity of it being healthy to be any size. And that is something that really frustrates me because I, I completely disagree with that. I think if you're overweight, it is going to catch up with you and you are going to become ill from it, you are going to end up with a health condition if you're not careful with it."
(Participant 1, 18-29, Female, Obese).

3.3.3 Consumer Experiences with the Food Environment

Overall, the participants identified the food environment as the largest cause of obesity. Section 3.3.3 explores participants' personal experiences with the food environment in relation to their shopping habits and the factors that affect their purchasing decisions. In addition, it provides insights into their perspectives on the nature of these environments. The theme is split into two sub-themes: interactions with the food environment and food purchasing considerations.

Food Shopping Behaviours

Regarding access, none of the participants felt that they had restricted access to stores, as all were able to choose between a variety of different food vendors in their local environments. Participants described food shopping as a central part of their weekly routine, where most participants visited supermarkets at least once a week and at least one visit to a convenience store or alternative vendor including newsagents, off-licences, local petrol stations, farmers' markets, green grocers, butchers and street stalls, fast food outlets, takeaways, cafes, and restaurants. A small number of them relied on farmers' markets and local vendors, such as butchers and green grocers, to supplement their main shop. Only two participants described utilising their personal allotment as a source of food.

"I've got an allotment at the minute so stuff from there... everything that grows in the UK... we've got tonnes of lettuces, potatoes, courgettes. Yeah, it's a wide selection actually."
(Participant 28, 30-39, Male, Healthy Weight).

Food Purchasing Considerations

Cost Considerations

Overall, cost was the largest consideration. For some participants, the cost of products led them to shop in certain stores, select specific items, and in some cases influenced the time of day they would shop in the hope of further reduction.

“If you're feeding a family, you have to work to what you've got and buy what we can afford... we tend to choose to buy... lots of fresh ingredients so that we can make meals throughout the week.... if I could buy anything... I'd do all my shopping in Marks and Spencer's but can't afford to.” (Participant 29, 40-49, Female, Healthy Weight).

Smaller supermarket stores were felt to result in less spending due to reduced choices and opportunities for impulse purchases. Accordingly, larger supermarkets were felt to expose individuals to a huge number of products that were attractively displayed, creating temptation for additional purchases, most often EDNP products like chocolate. Participants who were trying to be careful with money opted for these stores to avoid further expenditures.

“Every time I go to Tesco I spend a lot more money and I find that Lidl has the basics without having too much stuff to tempt me that I don't need.” (Participant 10, 40-49, Female, Morbidly Obese).

Cost was rarely considered alone, as most participants described balancing these against quality. All participants felt that poor-quality food was often a cheaper option, naming UPF, freezer foods as examples of affordable but poor-quality products.

“Cost is a massive one. And then just availability of the products and the quality as well. And because... you obviously want to keep your budget low, but still don't want to compromise on taste or quality” (Participant 14, 30-39, Female, Healthy Weight).

Furthermore, the participants' assessments of costs were personal. For example, one explained how they considered cost more in relation to healthy foods than less healthier products. When the participant saw a food item as a form of a treat or stress relief, for example, fast food takeaway or confectionary items, cost was less of a consideration.

“... I realised that a lot of my unhealthy eating is due to stress, I probably don't think at that time about price. But when it's healthy eating... I would consider price more for healthy eating.” (Participant 11, 30-39, Female, Morbidly Obese).

A minority of the participants discussed their ability to prioritise the healthfulness of their diets and acknowledged that they chose to pay a higher price in order to achieve a higher quality diet.

“I do believe healthy food is overpriced. But it's a cost I choose to bear because it's more important than that. I believe it should be far cheaper than and the crap food should probably be more expensive or just removed” (Participant 30, 30-39, Male, Healthy weight).

The majority of participants, however, felt that the cost demotivated and deprioritised their efforts to eat well, and in some cases, priced individuals out of healthy options. Some of these participants expressed irritation at the expense of healthy foods due to these factors.

Convenience and Practicality

Convenience was linked to the practicality of food items, time constraints, pressures of modern lifestyles, and cooking skills. Some participants discussed how food preparation time determines their food choices. A large proportion of the participants favoured grab-and-go foods. Often, participants felt that they lacked time to cook from scratch.

Participants under 30 years of age were most likely to rely on convenience, grab-and-go food, and takeaways. Preparation and cooking time influenced all participants, irrespective of whether they regularly cooked from scratch. Dedicating time to cook was positioned in conflict with the pace of life and responsibilities of the participants. Shelf life and food waste were also thought to deter the participants from purchasing fresh products.

“I don't eat enough fruit and veg...That's because a lot of veg you have to have take time to prepare it. And that's just not something...I just don't have the time” (Participant 10, 30-39, Female, Morbidly Obese).

Nutritional Quality of Diets

Despite participants emphasising calories as a key factor in determining a healthy diet, they rarely discussed calories when considering purchasing decisions regarding the nutritional quality of foods. Participants generally tended to assess the health of foods based on the degree of processing involved, which was also a factor in many of their purchasing decisions.

“I definitely do consider health... I do try not to rely on processed food. We do use it when it's got a place...but we tend to try and stick with simpler food... making our own using, fresh ingredients.” (Participant 29, 40-49, Female, Healthy Weight).

Sustainability and Locality of Produce

Only a small number of participants discussed the sustainability and locality of food production. Fears of food contamination, genetic modification, and the perception that local produce is of higher quality were described by the participants in this sub-group. Sustainability and locality of produce were only considered by participants in the 30-49 age range. Participants described being more aware of the locality of food production throughout the pandemic because of greater reliance on the local environment and a desire to support local businesses. These participants commented on the enjoyment of the interactions shopping locally provided them.

“I'll also potentially look to buy my meat at the butchers, definitely will be doing this in the future, not just for nutritional reasons... sourcing more locally... where there's less hands touching the food throughout the process, because things seem to be getting more and more tampered with.” (Participant 30, 30-39, Male, Healthy Weight).

3.3.4 Participants' Views Towards the Barriers and Facilitators to Sustaining a Healthy Weight

In this section, the broad theme 'the barriers and facilitators to sustaining a health weight' will be outlined. Participants shared their thoughts on various barriers and facilitators that affected their ability to maintain a healthy weight, drawing from their personal experiences, societal understanding, and insights from others. The influence of SES was relevant to participants' perspectives on the barriers and facilitators of healthy weight. The study found a consensus that the public did not have equal access to or the ability to sustain a healthy weight. Individuals with lower SES are believed to face more barriers or exacerbated barriers in this regard. On the other hand, higher SES was thought to eliminate these barriers, making it more likely for individuals to adopt lifestyles that support and prioritise healthy weight.

The Nature of the Food Environment

Overall, the participants' perspectives suggested that sustaining a healthy weight required acting against the cues in their local food environments. Most participants felt that there was excessive access to EDNP and fast food in most areas around the UK, coupled with low availability of fresh, raw products, particularly in lower-income areas. This observation also included settings such as hospitals, service stations, and workplaces.

"It's fast food chains and the Wetherspoons?... I don't know where you would go for a healthier meal along my high street... So no, I don't think it lends itself for healthy lifestyle at all." (Participant 31, 30-39, Female, Overweight).

Several participants described the perceived differences between areas based on their socioeconomic levels. Areas of higher deprivation were perceived as more likely to have food environments with a reduced variety of food products and a higher concentration of fast food outlets and convenience stores.

Barriers to healthy weight were described as mutually reinforcing such as the pressures of modern lifestyles and the nature of the environment. These factors can make it difficult for individuals to resist tempting foods when tired or stressed.

"If you're working 6AM-8PM you come home, you don't necessarily want to cook and the speed in which McDonalds can get you a burger and chips, it saves time, and at that point in time when you're knackered and all you want to do is eat something and go to bed" (Participant 2, 30-39, Female, Obese).

Based on the descriptions of the participants, those living in urban environments had less access to healthy food than those living in rural environments. In rural environments, participants described having fewer food vendors but a high variety of food products, including a balanced availability of fresh products along with EDNP foods. Furthermore, some participants described the challenges of accessing larger stores due to transportation limitations. Lack of access to a car, reliance on public transport, or walking was felt to act as an additional barrier due to additional costs and required time. Consequently, participants felt that it incentivised individuals to use local vendors which were likely to limit individuals' ability to source a balanced diet, particularly in areas of lower socioeconomic levels.

“There are housing estates in this in the UK, where the only shop is a shop that does not sell fruit and veg. And if you want to go to a shop that does... it's going to cost you a couple of quid on a bus. And if you're on a low income, a couple of quid is like your budget for the day. So, I'm not surprised that people don't do fruit and veg and that kind of stuff.” (Participant 10, 40-49, Female, Morbidly Obese).

Digital Food Environment

The digital food environment (DFE), which refers to the online food environment, including social media, digital food marketing, online food retail, and online delivery platforms (ODP) [297,298], was predominantly discussed by participants living in urban settings, from the 18-29 and 30-39 aged groups. These participants described the temptation of having access to vendors, in some cases 24 hours a day, through platforms such as Deliveroo, Just Eat, and UberEATS. Although the participants explained that there were many food vendors available on these apps, they were predominantly believed to be fast food retailers, such as McDonalds and KFC.

Industry promotions, discount codes, and branded push notifications were described to tempt participants further. The participants also described the regular temptation of the DFE through social media marketing and push notifications on phones. Covid-19 lockdowns led to many participants regularly using the virtual food environment as a treat.

“It's like you can't really escape it...there's a huge problem... with food delivery companies like Deliveroo and UberEATS and it... entices you in with these deals... for me at least it spiralled to the point where I last year was spending so much money on these apps that I actually had to ask them to ban my account” (Participant 1, 18-29, Female, Obese).

Industry Activity: Marketing and Promotion Practices

The marketing of HFSS food and drink was also deemed an important barrier to healthy weight. All participants demonstrated awareness of HFSS food and drink marketing, and each listed several brands marketed across different media. Participants recalled marketing on high streets, billboards, bus stations, and social media (Facebook, Instagram, YouTube, and Tiktok), TV advertisements, sporting events, stores, and apps. The companies named by

the participants were consistently the same fast food chains irrespective of the marketing medium, including McDonalds, KFC, and Subway. Participants also discussed health claims made on product packaging and through marketing campaigns, such as high-protein and low-fat content. These were described as confusing participants and as misleading purchasing considerations. Some participants also discussed how other food industry tactics were used to attract sales, such as colourful packaging, positioning in stores, and promotions. Despite the number of marketing campaigns named by participants, over half felt that they were uninfluenced or minimally influenced by exposure to marketing.

“I guess my Uni there's always so much. Even in the vegan cafe, they've got like McDonald's adverts. It's like all the kind of advertising campaigns tend to be like Domino's, McDonald's, fast food, stuff like that. I don't see a lot of advertising for healthy stuff there. For events, again, a lot of them are sponsored at the Uni by like Red Bull, or things like that” (Participant 11, 40-49, Female, Morbidly Obese).

Conversely, some participants felt that personalised marketing on social media platforms can improve their awareness of products offering healthier alternatives than those available in the wider food environment. However, because personalised marketing is dependent on algorithms, only certain participants were exposed to this content. Therefore, the impact of personalised marketing was largely dependent on the individual.

“If I watch sports or something, it's obviously sponsored by McDonald's other brand... I get quite a few Facebook adverts for things like what the meal prep companies like Gousto and... HelloFresh” (Participant 6, 30-39, Male, Overweight).

Socioeconomic Barriers to Sustain a Healthy Weight

Financial Freedoms

As discussed in Section 3.3.4, all participants believed SES to play a fundamental role in shaping the barriers and facilitators of healthy weight. Lower SES groups were believed to face greater barriers and fewer facilitators than their counterparts. The participants believed that individuals with higher incomes had more freedom and resources to prioritise health by affording private healthcare, gym memberships, personal trainers, nutritionists, high-quality food, and household support such as cleaners and childcare. In contrast, lower

SES groups were perceived to have limited freedoms and fewer resources, which made it more challenging for them to prioritise healthy weight. Most participants described how healthy products are considerably more expensive than EDNP foods, and price-saving promotions were described as being more often attached to UPF and EDNP products, adding a further financial incentive to less healthy products.

“...fruit and veg are more expensive than a microwave meal or 10 pack of fresh burgers are more expensive than frozen burgers. For people to feed a family of four with some chips is cheaper than shepherd's pie and salad with veg in it.” (Participant 4, 40-49, Female, Healthy Weight).

Factors such as less household support, lower-paid jobs, and more demanding employment schedules, such as working longer hours or on a rota, were also cited as contributing to the perceived socioeconomic differentiation amount to differences in freedoms.

“The deprived person doesn't have the same amount of time in a day than someone who isn't” (Participant 2, 30-39, Female, Obese).

Poverty and the Ability to Prioritise Healthy Weight

Furthermore, some participants described their awareness or personal experience of poverty in relation to the difficulty in sustaining a healthy weight. These participants described many additional barriers that arise from living in poverty or confronted with financial hardship, such as reliance on food banks. Many felt that food banks unintentionally caused individuals to rely on less healthy food, such as UPFs, with long shelf-lives. Several participants explained how they personally faced financial hardships, which caused them to turn to food banks. Participants described how the effect of poverty on maintaining a healthy weight goes beyond financial limitations in providing food and encompasses other aspects of material conditions.

“Not only have they gone to the food bank saying I need food, but they also actually have no way to cook. So it isn't just about food, it is about the people don't have a way to cook, they don't have a home.” (Participant 3, 30-39, Female, Healthy Weight).

One participant expressed concerns about the importance of material conditions, which they attributed to their experiences with financial hardship. The participant described instances of individuals being provided housing without essential amenities, such as cooking utensils or appliances, limiting their ability to prepare basic meals. The participants cited various material conditions, including access to an equipped, secure, and reliable kitchen, as well as addressing housing-related issues to ensure safe and sanitary spaces for food preparation and storage.

“It's just the assumption that everybody's got access to basic amenities... one of my families who was pregnant and then had her baby in a Travelodge?... she's got other children. Obviously, she's got access to a kettle and that's about it... how could you expect her to be giving her children a nutritious breakfast, a nutritious lunch or nutritious tea, when she's living in a Travelodge” (Participant 5, 18-29, Female, Overweight).

The sub-group of participants who discussed the lived experience of poverty described a sense of hopelessness stemming from a disconnect between the lived experience of poverty and public-wide messaging and support provided by healthcare services and the government. The guidance was believed to lack an understanding of managing financial insecurity and the realities of living on a pay-check-to-pay basis.

“And I think the problem is, is a lot of times when people are going oh...feed your family for 30 quid, everybody who's suggest that has got more than 30 quid.” (Participant 5, 18-29, Female, Overweight).

These participants felt that the expectations of people in the most deprived positions to follow health guidance were unfair and made significant assumptions about their capabilities.

“It is the most deprived who are struggling and benefits like Universal Credit is not a lot at all. It is not enough for people to live on, but the government give you this and expect you to make the right choices, but the right choices are out of your ability to afford.” (Participant 3, 30-39, Female, Healthy Weight).

Participants identified several social and cultural factors that contribute to unhealthy dietary behaviours. Some individuals noted that unhealthy foods, such as fast food takeaways, desserts, and confectionary products, are used as an affordable treat for themselves and their children. This behaviour was believed to be more prevalent in lower-SES households, as it provides an affordable reward system.

“I think that if your parents are working all the time, which a lot of like very poor kids the parents are working all the time, or they're just in really low-income jobs... chocolate become a way to kind of reward your kids for...the fact that they're not there all the time”
(Participant 7, 30-39, Non-Binary, Morbidly Obese).

3.3.5 Attitudes Towards the Responsibility of Obesity Prevention in the UK.

This section explores participants’ attitudes towards responsibility for obesity prevention in the UK. The study’s findings showed some variation among the participants’ perspectives; however, most participants felt that responsibility was shared among several groups. The government, individuals, NHS, schools, and the food and drink industry were all considered to hold some degree of responsibility. 45% of participants felt that responsibility was shared between a combination of these groups. 34% of participants felt that responsibility lay with the individual. The remaining 21% of participants felt that responsibility fell predominantly to the government.

Individual Responsibility

In isolation, individual responsibility was the most common perspective held by participants. Individual responsibility was linked to individual willingness to change behaviours and improve health due to laziness or lack of personal accountability. This view was found among participants from all weight classifications. Participants attributed responsibility to the individual, but their perspectives on the causes of obesity, the food environment, and socioeconomic disparities in obesity rates were not focused on individual behaviours or traits such as laziness. Nevertheless, when asked to assign responsibility, most often, they believed that the individual was primarily responsible.

“I think everyone needs to take their own responsibility over their own lives and get a grip of themselves...People are pure lazy and it’s the blame culture. People want to blame everyone else for things” (Participant 4, 40-49, Female, Healthy Weight).

Individual responsibility was strongly associated with the parents’ role in childhood obesity. It was felt that parents, alongside schools, are at the forefront of creating poorer dietary behaviours that continue into adulthood. Placing responsibility on the individual was viewed as a sensible approach to avoiding this pattern of behaviour. Furthermore, individual responsibility was linked to participants’ feelings towards protecting the NHS. This perspective saw the individual as having a responsibility to ensure that their own health does not burden the health service.

“If a patient accesses the NHS and they’re type 2 diabetic.. and they’re given the support to do that. And then they returned to the NHS with a weight related health complaint because they’ve not taken the education and the steps that have been given to them. I think people should be charged for that second access, third access, and fourth access.” (Participant 31, 30-39, Female, Overweight).

Government Responsibility

21% of the participants felt responsibility primarily fell to the government due to the power and influence held by government to reduce the barriers to healthy weight. The participants felt that the government’s influence and funding abilities placed them as the logical authority on the issue. Some participants felt that the government had an obligation to take responsibility for and ensure public health. The participants in this subgroup felt that the government would have the greatest impact on the food environment to ensure that a healthy choice was the easy choice for the public.

“I think it (responsibility) would be with the government... they have the ability, just to try and influence people's choices away from that (ultra-processed foods) and try and create initiatives where it's easier for people to buy, to make healthier choices.” (Participant 16,

30-39, Female, Overweight).

Other actors were thought to have ulterior agendas, require support from other actors, or lack the ability to facilitate significant change. For example, the government have the capacity to improve the quality food in schools.

“And I think it sort of has to be a top-down method... the government providing funding ... for teachers, for parent classes... making sure there's funding available for all areas of the country really” (Participant 13, 30-39, Female, Healthy Weight).

Some participants felt that the government is responsible for reducing obesity, as reducing rates is economically logical, referring to cost savings by reducing the pressure on the NHS. It was seen that the government have a responsibility to ensure that people can adhere to the health advice provided by the government by ensuring that members of the public had the financial security to prioritise diets alongside other essential costs.

“If we don't spend it to help people make good choices and then people gain weight and then end up with health problems, we are spending it in the NHS, so it's about prevention of health conditions... the government has a responsibility to make sure that we have enough to live on” (Participant 3, 30-39, Female, Healthy Weight).

Some participants discussed the significance of refraining from assigning responsibility for obesity prevention to the government due to political beliefs. These participants described how government intervention could result in limitations on personal freedom and the perception of a "nanny state." These participants felt strongly against nanny state action and messaging, arguing that the public would not respond well to the government telling them what to do and had no place to control their behaviour. As a result, some participants felt that placing responsibility elsewhere would be more effective in reducing obesity rates and changing behaviours than government action.

“Some people's perception is... with the government's role in things that they don't want to be controlled, they feel like they're being preached at. So, then there's that automatic

reaction of, I'm not going to listen to you, because you're telling me what to do.” (Participant 13, 30-39, Female, Healthy Weight).

Food and Drink Industry Responsibility

A few participants discussed the food and drink industry. The industry was seen to hold a portion of responsibility. The participants felt that the food industry had a responsibility due to their marketing and promotions tactics that were sometimes deemed manipulative or misleading, particularly in relation to children and health claims. Therefore, participants felt that the industry was responsible for protecting consumer health through marketing and promotional practices. Some participants believed that placing responsibility on the industry was unrealistic due to their focus on maximising profits, whereas other participants felt strongly that the industry should not be absolved of responsibility for this reason.

“So, if even if you're the CEO of a fast food company like us, just because you're making those money, it doesn't absolve you of responsibility that what you're doing is negatively affecting loads of people. I think they had responsibility” (Participant 24, 18-29, Female, Overweight).

Responsibility within the Education and Health Care System

Due to the perceived role of schools in informing nutrition literacy and cooking skills, schools were believed by some to hold responsibility for prevention. Ensuring comprehensive lessons on nutrition and cooking was considered by some participants to overcome the knowledge gap between children. However, of the participants who discussed schools, they were clear that this would not be enough to change behaviour but felt empowering the public through education was essential to developing new behaviours.

“If we give children and young people the skills, they might not necessarily learn at home. I didn't learn any skills at home. I grew up on ultra-processed food. I think that is a good opportunity to give people the skills.” (Participant 3, 30-39, Female, Healthy Weight).

The NHS and health professionals were also felt to hold a degree of responsibility; however, responsibility was limited to weight management support in relation to accessible and effective services. Participants who had experience with weight management services through the NHS often described how the failure of accessible effective services around the country created huge barriers for members of the public struggling with weight and weight-related health conditions. On the contrary, some participants felt strongly about not placing responsibility on the NHS due to the mounting pressures the healthcare system is facing due to the ramifications of Covid-19 and funding cuts.

3.3.6 Past, Present and Future Food Policy for Obesity Prevention

This section explores the theme participants' attitudes towards past, present, and future food policies for obesity prevention. This broad theme is split into four subthemes, attitudes towards existing policy approach, attitudes towards existing and proposed food policies, views towards the governments prioritisation of obesity prevention and perceived gaps in obesity prevention.

Attitudes Towards Existing Government Approach to Obesity Prevention

Overall, the participants were not convinced that the current prevention approach would effectively reduce obesity rates. Although the participants widely agreed upon this, the justifications for this perspective differed significantly. Firstly, some participants believed that the prevention approach currently adopted reflects a nanny state approach, which was generally believed to be ineffective because of the perception that the public dislikes being told what to do by the government. Accordingly, restrictive policies were firmly disapproved by around a quarter of the participants. Among these participants, it was believed that policies should encourage behavioural change through the empowerment of individuals.

"...you...kind of feel that you're being got at... the government says you shouldn't be eating Mars Bars...And the population goes, who are you to tell me what to do?" (Participant 10, 40-49, Female, Morbidly Obese).

A different perspective held by many participants was that due to the scale of obesity, the government needed to adopt a stricter approach. Participants in this subgroup felt that healthier diets should be easier to adopt, and policies should be in place to ensure that this is the case. Some participants held a blend of these viewpoints, where the individual's responsibility for their health was acknowledged, while also recognising the government and authorities' critical role in supporting public health.

“People need to take their own responsibilities on... what they're doing with their life ... this processed stuff that shouldn't even be allowed to be sold by the EU, by the government... You know there should be lesser choice on the shelf that will help them understand the difference” (Participant 13, 30-39, Female, Healthy Weight).

Furthermore, other participants welcomed any type of policy as long as they believed it would support the public and was evidence-based. Participants who held this perspective often compared food policies to tobacco control. If the participants understood a public health measure to be successful in influencing smoking behaviours, this provided them with a degree of confidence that similar policies for obesity prevention would be effective, irrespective of whether they were restrictive in nature. This sub-group argued that it was unrealistic for the public to change their behaviours without effective policies. Some participants felt that the key to shifting rates started with regulations in the food industry by ensuring that nutritious food was easily affordable and accessible.

“I think it needs to be much easier for people to make the right choice than the wrong choice...I said I'm slightly towards nanny state but not so much that you're giving them the solutions, making sure the solutions are there for them... Making sure that it isn't substantially cheaper to buy the crisps and the Mars bar for lunch than it is to buy... an apple” (Participant 10, 40-49, Female, Morbidly Obese).

The minority views believed that the government should influence industry behaviour directly through policy action. The regulation of the industry was believed to have the greatest impact, as approaches that target public behaviour were viewed to be ineffective among these participants.

“(Taxation) needs to be looked at more is that has managed to incentivise industry to change a little bit... getting a population to change by government legislation is not a good idea. I think getting industries to change by government legislation is a better idea”
(Participant 23, 18-29, Male, Obese).

Attitudes Towards Existing and Proposed Food Policies for Obesity Prevention

Participants were asked to describe their views on seven food policies for obesity prevention. Three of these had already been implemented and four were proposed as part of Tackling Obesity (2020) strategy for England published in July 2020 ^[179]. The policies discussed include the following:

1. Marketing restrictions on children’s TV
2. Traffic light food labelling
3. The soft drink industry levy (SDIL),
4. 9pm watershed marketing restriction
5. Restriction on HFSS products in prime locations of supermarket
6. Volume-based promotion restrictions
7. Mandatory calorie labelling in the out-of-home food sector

Marketing restriction: Children’s TV and 9pm watershed

The restriction on marketing HFSS products on children's TV and before the 9pm watershed was met with a positive response, as it was believed that this would limit children's exposure to marketing and protect them from manipulative marketing tactics.

“Children don't have the intellectual capacity yet to establish that bright, shiny things aren't necessarily always good for them. And if they don't...see them, then are less likely to want them.” (Participant 10, 40-49, Female, Morbidly Obese).

Most participants felt that marketing normalised and glamorised unhealthy products due to celebrity endorsements, bright colours, and familiar cartoons/animations. Some participants viewed marketing as labelling unhealthy products as trendy among children, while making healthier options seem unpopular. Additionally, they believed that limiting marketing could help reduce pester power. Almost all the participants who thought restricting marketing was beneficial wanted policies to go further, extending the watershed restriction past 9pm, or restricting HFSS marketing entirely.

“Get rid of that pester power. You know, it's hard when they're when they're going on because they want something? I mean, it's one of the reasons I do online shopping.”
(Participant 13, 30-39, Female, Healthy Weight).

Some participants felt restricting marketing would not influence behaviour. Around one-third of the participants were against the policies or felt indifferent, generally due to the dislike of restrictive style policies. Three participants viewed the policies as an infringement on free speech, arguing that industry marketing should not be regulated. Another participant felt that over-regulation of marketing to children creates a false sense of reality which in turn misleads them.

“We need to teach kids to make informed choices and be able to resist when things are trying to be sold to them. That is a good life skill to be able to resist when things are trying to be sold to you.” (Participant 23, 18-29, Male, Morbidly Obese).

Furthermore, there was considerable speculation over the relationship between marketing exposure and individuals' behaviour. It was felt that the policy was unlikely to affect people's daily behaviours and distracted the government from real problems, such as the affordability of healthy diets.

Information provision: Traffic Light Food Labelling

The majority of participants felt that the premise of traffic-light food labels was important; however, the execution of the policy was heavily criticised due to confusion and misleading

consumers. The lack of standardisation was frequently condemned, this included differences in the format of labels between stores and the lack of consistency in units used between products.

“Sometimes you buy something, and it says, each biscuit is 30g and that equals 100 calories. But if you were to actually weigh that biscuit, its eighty grammes, so that is not 100 calories that suddenly jumps up... I think we have to have more accurate standards...” (Participant 7, 30-39, Non-Binary, Morbidly Obese).

Less than a quarter of the participants described using labels to guide their purchasing decisions. Even the participants who used the labels felt that a level of nutrition literacy was required. Often the participants felt that the information meant little regarding their own diets as a result participants described how products with all ‘red’ labels were easy to ignore and would not influence their purchasing decisions. Furthermore, some participants felt that the labelling system fuelled the narrative of ‘good’ and ‘bad’ foods.

“People will argue... ‘put it clearly labelled on the packet and I won't eat It’... if they want to eat it, they will eat it. Regardless of what's in the packet, I'm guilty of that sort of thing. And I'm in the mood for it, and I'll see. Red, red, red, red, red.” (Participant 13, 30-39, Female, Healthy Weight).

Information provision: Calorie labelling on restaurant menus

Of all the proposed policies from the Tackling Obesity (2020), calorie labelling on menus was the most familiar to participants due to the high level of contestation in the media that was recalled by participants ^[179]. Around a quarter of the participants welcomed the policy and felt it would be a useful guide, particularly in consideration of hidden calories in foods while eating out. For example, one participant explained that vendors sometimes mislead consumers into thinking that an option is healthy despite being an EDNP food. Amongst this subgroup, the provision of this information was perceived as a tool for empowerment.

“To me the most deceiving is salads, I don't get salads outside (the house). But I see that people associated vegetables with healthy, but then they really don't know how much the dressing is in it and everything” (Participant 12, 18-29, Female, Healthy Weight).

Many participants supported greater food transparency, and one participant felt that this would lead to consumer market change by creating a demand for healthier options within a market saturated with EDNP products.

“I think I'd definitely be in favour of that... it will... hold these restaurant accountable... why are all your dishes over 1000 calories...it will then drive a demand for these lower calorie options which are probably healthier... I think that the dissatisfaction of lower calorie option availability would then drive this change” (Participant 1, 18-29, Female, Obese).

A small number of participants felt indifferent towards policy noting fast food chains that already used labelling, with limited perceived impact. Furthermore, some participants felt unsure of the policy due to the usage of calories, as public understanding of caloric information was perceived to be low.

Some participants felt very strongly against the implementation of this policy, naming it as intrusive, inescapable, and risked exacerbating eating disorders. Participants with personal experiences of eating disorders generally felt strongly against this policy as they felt eating out would become triggering rather than enjoyable.

“It's just going to make things even harder for people with anorexia, it is just going to really... sort of help trigger relapse, it definitely makes it harder for people to recover” (Participant 18, 30-39, female).

On the contrary, one participant struggling with an eating disorder contradicted this fear and felt that caloric information provided them with a greater sense of control.

“When I don't know what it is, I usually just say well it's probably over 1000. So I just won't eat anything and that can actually kick my binge eating” (Participant 7, 30-39, Non-Binary, Morbidly Obese).

Fiscal policy: The soft drink industry levy

Around a quarter of the participants thought that the soft drink industry levy (SDIL) had a positive impact on people's behaviours. Others felt that the policy was nonsense, had its own agenda, and would not benefit their health. The remaining half of the participants were unsure of the policy. Of those who supported the SDIL, it was deemed that companies were being held accountable for the high quantity of sugar in their products. Some supported the policy, citing their understanding of how it has led to the reformulation of products and expansion of the market through the introduction of sugar-free alternatives to all major drinks. Some of these participants did not feel that the tax was high enough to price people out but rather acted as a nudge. Furthermore, due to the introduction of sugar-free alternatives, consumers were able to purchase alternatives at the same price prior to the introduction of the tax.

“There are obviously there's the alternative of the low-calorie sweetened drinks which are fairly similar. So people don't really lose out because they can make a different choice.” (Participant 16, 30-39, Female, Overweight).

In contrast, several participants felt that SDIL punished the whole public for the actions of a few. As a result, they felt that taxation would have minimal impact on behaviours while annoy the general public.

“Why should I have to pay a premium for something that if I had a Diet Coke, I wouldn't need to, Yeah, I don't have problem with my weight. Why should I take responsibility for that?” (Participant 6, 30-39, Male, Overweight).

Some felt that they would be more inclined to support the policy if they could see how the generated income was being utilised. Some participants discussed expanding the tax to

other products, such as a fat tax. Others felt that for SDIL or further taxation to work, incentives that support healthier behaviours were necessary, particularly due to the fear that taxation may punish lower SES

“Taxation I think that's a hard one, because...don't want to make things difficult for people that are on a low income anyway. So, it has to be balanced in some way by making other things accessible...” (Participant 16, 30-39, Female, Overweight).

A select group of respondents entirely disapproved of SDIL, deeming it a regressive policy. These participants likened the tax to levies placed on tobacco and alcohol, which were seen as ineffective in altering behaviour and detrimental to low-income groups who had to make more significant sacrifices to afford these items.

Regulating Industry Activities: Restriction on volume-based promotion

Regarding the restriction on volume-based promotion, approximately half of the participants felt that the policy would positively influence their diet. These promotions were associated with increased purchasing and consumption. One participant explained how VBPs influenced their purchasing behaviours.

“...because normally when stuff is buy-one-get-one-free, you'd get four because you're like I'm getting... four for the price of two and I know if they're not on offer I'm only going to buy one bag.” (Participant 2, 30-39, Female, Obese).

The other half of the participants were more sceptical about the impact of the policy, some felt that they rarely saw volume-based promotion and concluded that the policy would have limited impact on behaviours. Furthermore, participants in this group questioned the aim of the policy because of its perceived tokenistic nature. One participant described the policy as *“a bit weak... It just sounds a bit like wishy washy.”* (Participant 13, 30-39, Female, Healthy Weight). Around a quarter of the participants felt that the policy would unfairly affect low-income groups that rely on these deals; consequently, some felt that the policy would punish vulnerable groups. Other participants rejected the policy due to the arbitrary

measurement of HFSS, and similarly to other policies, felt that labelling products as HFSS encouraged the demonising of certain products.

Restrictions on placement of HFSS products in prime locations in stores

Overall, restricting the placement of HFSS products in stores was the policy that was most positively received. More than half of the participants saw that removing exposure to products in prime areas would impact purchasing behaviours by reducing the number of impulse decisions. As discussed in Section 3.3.3, the participants felt that they were influenced by the layout of the stores and placement of products. This view fuelled participants' support for this policy.

"...If you're shopping and you haven't eaten and you look around, you see all this kind of sugary stuff... Whereas if you had to actually go down a specific aisle for that, which is often a bit more hidden away. I think overall... people would buy less." (Participant 16, 30-39, Female, Overweight).

One participant who felt strongly against the other policies felt that this would be successful due to its clear evidence base.

"This is a whole huge area of research...like product placement in store... I think that could work. Especially as I know, there is an evidence base for that." (Participant 6, 30-39, Male, Overweight).

Alternatively, the participants who rejected the policy continued to describe the policy as tokenistic by presenting it as government action, while the key causes of obesity remained uninfluenced. Furthermore, the overall impact was strongly questioned by some participants who felt that it so long as the products were in store they would be purchased, irrespective of location.

"I don't think it makes any difference at all. Wherever they're going to put it, folk are going to find it and folk are going to buy it" (Participant 4, 40-49, Female, Healthy Weight).

Views Towards Government Prioritisation of Obesity Prevention

As previously discussed, many participants did not believe that the government held central responsibility for obesity prevention. Obesity rates was felt to put the NHS under increasing pressure. The impact of Covid-19 on the NHS was frequently discussed by participants, and there was a general sense of anxiety surrounding its ability to move forward. As a result, most participants felt that obesity had to be prioritised by government to protect the future of the NHS.

“I think that we have to understand that because we have the NHS, which is has to cope with the health implications of people with obesity, then the government has to have some kind of policy against that.” (Participant 7, 30-39, Non-Binary, Morbidly Obese).

Furthermore, several participants felt that the government should prioritise obesity because of its growing economic burden. Preventing obesity was perceived to be economically logical, as failure to prevent was thought to require further economic expenditure through the cost of treatment.

“The NHS will actually, in my opinion, spend a lot less money, preventing obesity, and treating obesity, rather than treating sort of the comorbidities of obesity.” (Participant 1, 18-29, Female, Obese).

However, other participants felt that it was unrealistic to expect the government to prioritise obesity due to competing political priorities such as Brexit. Furthermore, around one-third of the participants felt that the government would not prioritise obesity due to the implementation of publicly unpopular policies. However, other participants felt that the Conservative Party under the Boris Johnson’s leadership would not prioritise obesity, as the government was viewed as not caring about public interests, particularly regarding lower-income groups. Within this sub-group, there was considerable distrust and a lack of faith in the government.

“...They want to get voted back in. So they will do things to pacify people with...the appearance of doing something... which is what I feel this, all of these policies are doing that... ‘we are doing something, look at what we're doing’, but actually they're not.”
(Participant 13, 30-39, Female, Healthy Weight).

As a result, some participants felt that the policies proposed by the government were tokenistic, lacked belief in government actions, and questioned the legitimacy of the government’s agenda. The lack of public support for the government was linked to its management of Covid-19. As a result, participants felt that they or other members of the public lacked trust in government messaging, strategies, and policies.

“If people didn't distrust the government as much as they do...because they're incompetent in one thing means they're obviously incompetent in another thing, so people aren't gonna trust whatever advice they're given” (Participant 6, 30-39, Male, Overweight).

Attitudes Towards Food Policy Gaps

Several key policy gaps were identified in the data. Firstly, tailored education throughout childhood was thought to improve the level of literacy among young people and provide them with the best possible start, irrespective of their socioeconomic level or household food culture.

“I think if you gave people a bit more education earlier on, and opportunities to learn skills... doesn't maybe always make people behaviour different, but at least it gives you a chance”
(Participant 16, 30-39, Female, Overweight).

Some participants felt that obesity prevention, particularly in lower-income groups, requires policies that affect individuals' ability to financially prioritise healthier diets. Furthermore, some participants felt that the government failed to consider how external policies might influence individuals' ability to sustain a healthy diet. Some participants recalled the impact of government cuts on universal credit had on individuals’ financial freedoms regarding diet.

The government was seen to be too focussed on HFSS products rather than the multitude of factors that drive obesogenic behaviours.

*“...they are focused on food so much; they're not focusing on the cause of it. If they're slashing money for Universal Credit, and slashing the ability for people to kind of buy foods...crippling their ability to buy any foods, then where does that leave them?”
(Participant 7, 30-39, Non-Binary, Morbidly Obese).*

Furthermore, several participants alluded to the problematic nature of policies that were described as disconnected from lived experiences, such as food labelling, while the affordability and availability of food restricted individuals' ability to utilise the information. Government messaging, interventions, and policies were thought to make assumptions about individuals' physical abilities, material conditions, and existing weight status. As a result, participants felt frustrated by approaches aimed to support the public as following the information was beyond some participants' abilities.

“If you're homeless, living in a bed and breakfast, you probably don't have access, you probably have a microwave...I have a cooker, but I can't stand up very long to use it...I tend not to cook... the government assumes that everybody has access to... a park for walk...fresh fruit veg in the supermarket...a cooker...full mobility. There's no kind of resources available for people who don't have.” (Participant 10 40-49, Female, Morbidly Obese).

3.4 Discussion

3.4.1 Summary of Key Findings

The main results of this research show that obesity is widely recognised as a major societal issue, with its health consequences (both physical and mental) and susceptibility to high-risk groups being broadly acknowledged by participants. The participants identified the main cause of obesity as being largely influenced by dietary behaviours, which were attributed to the nature of the modern food environment. Specifically, the accessibility and affordability of EDNP foods and the lack of affordability of healthy foods. Respondents acknowledged that obesity is a complex issue with interconnected causes, such as the pressure of modern lifestyles, which can exacerbate the impact of the food environment. The participants encountered comparable food environments that represented a food swamp; lower-income and urbanised areas were believed to be the least healthy food environments. The study revealed that individuals consider various factors while making purchasing decisions, demonstrating the complexity of the food environment. Cost and practicality were among the most common considerations, whereas the healthfulness of food items was among the least considered factors.

The research found that the participants were concerned about the public's level of nutritional literacy, particularly among young people. While the majority of respondents were able to describe a healthy diet, not all were confident about their own nutritional literacy. A considerable number of participants sought dietary advice but described difficulties in finding reliable and trustworthy nutritional information, as there were an overwhelming number of sources, many of which were believed to mislead people and were associated with diet culture and weight loss for aesthetic purposes. The findings of this study suggest that diet culture significantly affects participants' nutritional literacy, particularly in relation to food demonisation.

The study demonstrated that all participants had a strong desire to maintain a healthy diet and healthy weight. Participants' perceptions regarding the barriers and facilitators of sustaining a healthy weight were consistent. Participants perceived the food environment as the primary barrier to achieving a healthy weight, as they believed that it was more

challenging to resist the numerous cues that encouraged an unhealthy diet. The DFE and promotional and marketing activities for food and beverages were recognised as significant barriers to maintaining a healthy weight as they amplify these cues.

The consensus among respondents was that the opportunity to sustain a healthy weight in the UK was unequal. The participants perceived that the barriers to achieving a healthy weight were intensified by lower SES. Financial freedoms were believed to facilitate healthy weight in higher-income groups and act as a significant barrier to lower-income groups. This encompasses aspects such as the affordability of food, quality of employment, and ability to outsource household tasks. Moreover, material conditions were identified as a barrier to healthy weight among lower socioeconomic groups, particularly with regard to factors such as access to kitchen equipment, capacity to cook meals, and ability to store food. Poverty was recognised as a significant barrier to achieving healthy weight. Additionally, the study found that advice and messaging related to obesity were difficult to receive when experiencing financial hardship or poverty, as messaging was described as being disconnected from lived experiences.

The participants generally believed that the responsibility for obesity prevention was shared. In isolation, individual responsibility was the prominent view. Moreover, the participants perceived the government as having a significant role in obesity prevention due to the expected impact on the NHS, which was considered particularly vulnerable in the post-Covid era. In general, the respondents expressed a desire for policy action, but their opinions on specific policy types varied. Overall, child-focused or nudge-style and changing the default environment policies were favoured by the participants. Fiscal policies and industry regulations received mixed responses. The provision of information was deemed essential for addressing participants' concerns regarding societal nutritional literacy. However, their support for information provision measures, such as calorie labelling and traffic-light system, was limited.

Overall, the participants believed that obesity had worsened to such an extent that government prioritisation was necessary. However, there was a lack of trust in government action, stemming from the belief that the government was not committed to protecting the

public's health. Participants questioned the quality and intention of government policies and their willingness to implement policies that could compromise political popularity or economic gains. Furthermore, there was a significant disconnect between participants' beliefs about the key barriers to achieving healthy weight and prevention strategy goals. Participants often discussed the perceived weak and tokenistic actions taken by the government in recent years. This was particularly evident in the disconnection between the lived experiences of individuals with lower SES and those living with obesity and policy focus.

3.4.2 Strengths and Limitations

Overall, the study was strengthened by the sample size of 31 participants which is considered a relatively large sample for qualitative research. The intention of the study was to understand public views towards obesity prevention policies. The researcher concluded that the sample reached a satisfactory standard of data saturation given the sample availability and time constraints. The sample size was consistent with that of similar existing studies [299–301].

This is one of the first qualitative studies to explore public attitudes towards obesity policies and the food environment since the Covid-19 pandemic. As the interviews were conducted shortly after the third wave of the pandemic, the findings offer a unique insight into attitudes towards obesity at a time of political turbulence, economic instability, an increase in unemployment, and changes to working norms, followed by the fuel crisis (September 2021) and the rising rates of food insecurity in the UK. Furthermore, the timeliness of this study was a strength that coincided with the publication of Tackling Obesity (2020), allowing participants to be familiar with the action in obesity prevention at that time [179].

Importantly, the interviews were completed prior to the Ukraine and Russian War, the fruition of the cost-of-living crisis, and major changes in the government. These events have had a significant impact on society and the political landscape, including providing justification for the government U-turn and delay of prevention policies from Tackling Obesity (2020) [179].

The study directly addresses justifications for greater inclusion of public voices throughout the policymaking process to ensure that the lived experience of lower-income groups and higher-weight classification groups is understood and represented in policy design. Bridging the disconnection between existing actions and lived experiences is essential for the success of future action. Policy in this area has been consistently criticised for falling short and failing to consider inequalities and the lived experiences of the individual ^[175,178]. Including the public voice in the policy process has been found to improve public support and policy sustainability ^[302].

Due to Covid-19 measures, time constraints, and available resources, the interviews were conducted using a videocall rather than face-to-face. Using video calls allowed flexibility and accessibility for participants, meaning that individuals from across the UK participated in the study, strengthening the transferability of the sample. The initial sample consisted of self-selected participants who were not offered any form of incentive. Six respondents refused to participate in the study after completion of the recruitment survey. This may have caused a natural bias within the sample, as many participants struggled with eating disorders and weight problems. Although this may reflect society, it is likely that the lack of incentive to participate in this study attracted individuals who felt passionate towards the topic.

A strength of the study was that the sample had a large breadth of geographical locations across the UK and BMI classifications, providing accounts of individuals with a variety of lived experiences. The study did not capture all views and attitudes that exist within the UK, yet the study has used a rich description of the study's design and findings which helps the reader understand the research process and the nature of the participants' responses through in-text quotations. Furthermore, investigator triangulation was used to demonstrate rigor and improve the transferability of the study.

The sample was that it consisted of more females than males and excluded participants above the age of 65 years. A limitation was that the sampling design relied on all participants having a Facebook account to view the recruitment advertisement. Furthermore, this required participants to have access to the Internet, smartphones, or computers, and individuals without access were excluded from the study. This design may

have excluded older members of the population or lower-income groups that experienced technological deprivation.

Furthermore, each participant was required to answer basic sociodemographic questions along with their height, weight, and age, allowing for the calculation of the body mass index (BMI). BMI is a highly contested weight classification unit ^[303]. Additionally, BMI calculation relied on the accuracy of self-reported weight and height measurements, previous research has shown a large margin for error in self-reported weight status ^[304,305]. However, self-reported weight status was the only practical and non-invasive method for obtaining participants' BMI in this study. To further counteract this problem, participants who described themselves as obese, severely obese, or struggling with weight problems were recorded.

A key limitation of this study is the decision to group participants by BMI rather than SES. Although SES was initially intended as a key variable, there was insufficient variation in the SES distribution within the sample, raising concerns about the robustness of any analysis based on this factor. Additionally, minor errors in the screening process further compromised the quality of SES data. BMI was therefore selected as a more consistent variable for analysis. However, this choice does have implications for the research, as not sampling by SES may limit the applicability of the findings regarding socioeconomic inequalities. Future research should address this limitation by ensuring greater variation in SES during the sampling process

The sample reflects a range of socioeconomic backgrounds, particularly in terms of housing and employment. However, there is a clear skew towards higher educational attainment, with most participants holding degree-level qualifications. While education is a useful indicator, it does not provide a full picture of someone's socioeconomic status. For example, participants in housing association or local authority housing, or those who are unemployed, may still face significant socioeconomic challenges despite having higher education. Their accounts offer valuable insights into how policy affects lower SES groups, even though their educational background might suggest a different SES category.

A further limitation of the study was the failure to collect data on participants' ethnicity, which may have influenced their experiences, attitudes, and perspectives related to the topic. The absence of ethnicity data is a key limitation as the study cannot account for any cultural differences in nutritional literacy and dietary behaviours that may have substantial impact on the participants' understanding and perspectives.

Furthermore, part of the study explored participants' purchasing behaviours, and there is much research suggesting that self-reported dietary behaviours are unreliable ^[306]. Participant bias may have occurred in response to these questions, meaning that some participants may have given answers they deemed desirable to the researcher rather than reflective of their day-to-day behaviours or understanding. Therefore, some of the findings related to this section must be critically interpreted.

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3.4.3 Relevance to Previous Literature

Participants Views Towards the Obesity Problem in the UK

The study's findings showed that the UK obesity problem was perceived as a societal-wide issue, predominantly associated with childhood obesity and burdening the NHS. These associations have overlapped with the core themes of government messaging, strategies, and media coverage since the early 2000s^[191,203,307]. Furthermore, throughout the Covid-19 pandemic the media regularly reported the burden of obesity on the NHS^[308,309]. Therefore, this study suggests that narratives that dominate society have a significant impact on how members of the public shape their awareness of obesity. In line with previous qualitative and quantitative studies, such as the Obesity Health Alliance survey on public perceptions of obesity policy, living overweight is known to be a risk factor for both physical and mental health conditions. This study suggests that an individual's weight status may influence their awareness of the severity of the health risks posed by obesity. The study's findings corroborate evidence that demonstrates the public's high awareness of the implications of excess weight on health.

The study's findings regarding the causal interpretation of obesity generally emphasised the nature of the food environment. As defined, causal interpretation is the process of attributing causes to a particular problem^[310]. In this context, the food environment was widely regarded as the primary cause of obesity. Since the early 2000s, a substantial body of literature has explored public views on the causation of obesity^[211,228]. Initially, individual behaviour, specifically the lack of willpower, was commonly cited as the primary cause of obesity by the public^[211,214,311]. However, more recent research has demonstrated how this has shifted to focus on the food environment^[312]. This shift is reflected in the findings of this study, which indicate that personal attribute-related causal interpretations have significantly decreased, whereas beliefs related to the food environment have become more prevalent^[312].

A novel finding from the study is related to participants' perspectives on the influence of SES on sustaining a healthy weight. The study found that all participants believed the

opportunity to sustain a healthy weight was socially stratified. To the researcher's knowledge there is no qualitative research exploring public attitudes and awareness of the influence of SES in obesity as found completed in this study. This finding is particularly valuable because public attitudes and beliefs about causation influence public support for prevention policies ^[200,313].

Adults' Experiences with the Food Environment

In this study, the increase in accessibility, affordability, and convenience of EDNP and UPF was widely accepted to have transformed consumer food choices and, as a result, overall dietary behaviours ^[314–318]. Most participants lived in 'food swamps', areas with high-density of establishments selling EDNP, fast foods and junk foods relative to healthier food options ^[319]. Accordingly, accessibility to EDNP products disproportionately outweighs the availability of high-quality nutritional alternatives. The existing literature is limited in its exploration of public experiences and understanding of food environments, particularly regarding the effect of an area's socioeconomic level. The findings of this study support previous research that established a relationship between an area's income level and access to EDNP foods such as fast-food outlets ^[318–320]. The study found that many participants described that accessing high-quality, affordable food in low-income urban environments was particularly challenging, highlighting the impact of an area's income level on its food environment.

With regard to the study's findings related to participants' food-purchasing behaviours, the study exposed the effect of a range of pressures and decision-making processes made by participants on a regular basis. Cost, convenience, and practicality were the most dominant considerations in food purchasing; in line with findings from Maubach et al. (2009), pragmatic factors were the most influential on behaviours^[321]. The findings demonstrate the importance of ensuring that an individual's ability to sustain a healthy diet is not hindered by pragmatic factors, such as cost or practicality. Pragmatic factors were prioritised more by participants than nutritional quality and the desire to maintain a healthy diet. Sustainability and food ethics were found to be an emerging consideration, suggesting a growing demand for food options that promote sustainability and reduce environmental impact. Furthermore, the study's findings suggest that consideration of food behaviours may have

been more restricted by the lack of freedom of choice rather than the lack of desire to maintain a healthy diet.

Participants' Views Towards Industry Activity and the Digital Food Environment

The influence of store layout, price promotions, both digital and physical marketing (TV, online platforms such as YouTube, bus stops, and motor billboards), as well as colourful packaging and on-pack health claims, were known sales techniques to participants. The study found that despite previous research demonstrating how the promotion of UPF and HFSS food adversely affects dietary behaviours, a considerable portion of the participants felt they were uninfluenced by the effects of advertising ^[322]. In line with previous research, the products and brands recalled by the participants were largely limited to UPF and HFSS products ^[135,323,324]. This study suggests that individuals may be unaware of the extent of marketing influence on their behaviour. However, the study cannot draw conclusions on how exposure to marketing influences participants' consumption of products.

Furthermore, the study found that participants were often exposed to food and drink marketing which can be referred to as 'health washing', whereby marketing cues create associations between a product and health-related concepts such as the healthfulness of a product's composition, health benefits, or connotations with healthy lifestyles ^[325]. Health washing often makes inappropriate and misleading health claims through marketing practices ^[326–328]. Food and drink marketing has increasingly used terminology such as 'high protein' and 'low fat' to encourage consumers to buy foods under the pretence that the products are 'health'. Health washing can further mislead consumers, undermine individuals' nutritional literacy, and affect confidence. The participants commented on these techniques both as an example of industry tactics as well as in shaping purchasing decisions and the assessment of products.

The emergence of the DFE is still relatively new, and its impact on dietary behaviours requires further research. The DFE provides a broad definition that accounts for the increased use of technologies to improve food production and distribution, the rise of food delivery platforms, and the abundant health and nutrition information (and misinformation)

found online and on social media platforms ^[329]. The increase in the accessibility of products through ODP is expected to increase food consumption, particularly for EDNP products or UPF, as these products have the highest availability on ODP ^[330,331]. Usage was higher among young people in urban environments, which may be because of the quantity of food outlets available in urban areas ^[332,333]. Importantly, the study demonstrates how the DFE has created a dimension of the food environment in which some individuals have access to all hours of the day. DFE appears to offer new routes for industry marketing and promotional campaigns through push notifications, award systems, and various other sales strategies, as described by participants and existing literature ^[334]. The participants' discussion of DFE contributes to evidence that perceives the food environment as increasingly inescapable and powerful in shaping consumer behaviours ^[330].

A novel finding from this study is that few participants saw fast food, or takeaways as limited to a treat or a special occasion. Amongst a considerable number of participants, fast food outlets and the DFE were central to their weekly or bi-weekly food purchasing behaviours. Furthermore, participants often used fast food outlets rather than cooking when they were short of time or felt exhausted from work. In these cases, behaviours that have been more associated with a treat or infrequent food habits appear to be more associated with convenience and ease. This finding contradicts previous studies demonstrating the modern aspects of the food environment ^[321,335]. Many participants discussed changes in their behaviours surrounding the usage of ODP throughout the pandemic, and it is likely that this period helped normalise these behaviours. Previous research has also suggested that although opportunities for the consumption of EDNP foods or UPF have increased, there is a risk that the presence of these apps can exacerbate inequalities in obesity due to further consumption of EDNP products ^[330]. To date, limited research has been conducted on public attitudes and experiences with the DFE. Further research is required to explore differences in user attitudes; however, future research should seek to understand how different sociodemographic factors interact with the DFE.

Views on the Development of Nutritional Literacy, Dietary Misinformation, and the Role of the Digital Food Environment.

An important finding of this study related to the lack of understandable, reliable, and trustworthy nutritional information. Sources often caused confusion and lowered levels of confidence in nutritional literacy among participants. Previous research has established that social media platforms, blogs, online forums, and mainstream media are frequently used to obtain dietary and health information, including dietary and weight loss advice ^[336–340]. Information across these media tends to be disseminated through highly engaging, visually appealing formats and often emphasises a desirable physical appearance ^[341]. The existing literature has found that online dietary content is created by a range of individuals, including celebrities, self-made influencers, and self-proclaimed experts ^[342]. Consequently, sources are regularly authored by individuals without medical, nutritional, or health experience, and are unregulated ^[343]. In support of previous research, the findings of this study suggest that participants were frequently confronted with dietary misinformation. The impact of dietary misinformation on these media is largely unknown; however, previous research has raised concerns about the quantity, quality, and safety of dietary information found online and across social media ^[343]. Dietary misinformation can undermine an individual's nutritional literacy and efforts to maintain a healthy weight, can cause or exacerbate disordered eating, and can feed diet culture narratives, which were well documented in this study. The study's findings highlight the vitality of improved regulation of dietary information online and across social media platforms, as well as creating reliable and trustworthy platforms for individuals to find accessible dietary information.

Adults' Views Towards the Impact of Socioeconomic Status on Sustaining A Healthy Weight in a UK Context

A convincing finding of this study was that the respondents all felt that the opportunity to sustain a healthy weight in the UK was unequal. Low SES was perceived to exacerbate barriers to healthy weight. Individuals with higher SES were viewed as having greater means to mitigate the impact of barriers to healthy weight; for example, possessing greater material conditions encouraging cooking from scratch. Although the relationship between obesity and inequalities is well established in academic research, there is limited qualitative research on public awareness and attitudes towards these inequalities. The study participants believed that the food environment differed according to its healthfulness, as determined by the SES of the area. As a result, the area in which an individual lived was

agreed to impact the overall ability to make food-purchasing decisions in alignment with a healthy weight.

In regard to other barriers reported in this study, the relationship between time scarcity and obesity has been well researched. It is understood that the pressures and responsibilities of modern lifestyles have caused a greater reliance on convenience, on-the-go foods rather than food preparation at home, and consequently increased the risk of obesity ^[344,345]. In this study, convenience foods were often described as offering attractive, affordable, timesaving, and stress-free options. Employment status, stress, family situations, and responsibilities such as childcare were found to influence an individual's ability to prioritise healthy behaviours. Individuals with lower SES were perceived to be particularly at risk for these barriers, in line with previous research findings ^[344,345].

Regarding the barrier of financial freedom that emerged in this study, existing literature found that cost was perceived to be a considerable barrier facing low-income households and caused individuals to make significant compromises on food behaviours ^[229]. Furthermore, the cost of healthy foods and the requirement to balance economic priorities have been found to undermine individuals' desire and motivation to sustain a healthy diet ^[346]. This study supports these existing findings, as cost was perceived to be a vital barrier; the affordability of EDNP encouraged consumption of these products and, in some cases, left participants reliant due to the lack of financial freedom to maintain healthy food choices. Furthermore, financial insecurity has been found to have a greater influence on an individual's likelihood of living with obesity than absolute income ^[347,348]. The types of financial insecurity discussed by participants included changes to employment, unpredictable work schedules, turbulence in benefits, such as universal credit and disability benefits, redundancy, and unemployment. Previous research has proposed that financial insecurity can cause individuals, particularly those with children, to utilise strategic adjustment, whereby some costs are sacrificed to afford others ^[229]. Meaning fixed bills and absolute essentials, such as heating costs and rent, are prioritised over budgeting for healthy foods. The disproportionate accessibility of cheaper and more convenient alternatives encourages this decision. The study's findings demonstrate that the quality of diets is quickly compromised to allow individuals to afford other costs, irrespective of their

desire to maintain a healthy weight. Furthermore, financial insecurity places individuals at greater risk of food insecurity, there is a paradoxical relationship between food insecurity and obesity ^[123,127,349–351].

An important finding from this study was that despite strong awareness that an individual's ability to sustain a healthy weight was unequal, assumptions were made about the lived experiences of lower-income groups. There were important distinctions between the lived experiences of respondents facing financial hardship, instability, or low income and respondents without these lived experiences. Material conditions demonstrated stark differences between people's assumptions of individual ability and lived experience. Existing literature found that material conditions were an important barrier to sustaining healthy behaviours ^[229]. Furthermore, in this study, pragmatic barriers, including material conditions, were found to be more influential in shaping consumption patterns than individual nutritional literacy levels or the desire to sustain a healthy weight, in line with similar research ^[229]. Respondents with lived experiences of low income or poverty demonstrated important barriers to sustaining a healthy weight which are rarely discussed in literature and policy, including the lack of equipment, cooking utensils, pots and pans, working hobs, fears over buying food in bulk due to inconsistency in pay, the inability to safely store foods due to the lack of freezers or working fridges, and the requirement to hold onto as much money as possible in case of emergency or unexpected costs. This finding is particularly important because the cost-of-life crisis has caused an increase in financial and food insecurity ^[352,353]. Ensuring that the policy discussion surrounding obesity adequately reflects barriers that are unique to the lived experiences of low-income groups is fundamental to reshaping existing inequalities in obesity rates.

Exploring Views on Responsibility and the Food Industry's Role in Obesity Prevention

Previous literature suggests that exploring public views towards responsibility can help to understand attitudes towards existing and future policies and gauge the likelihood of public support for different policy types ^[228,313]. In accordance with previous research, the study found that in isolation, the individual was most often viewed as holding responsibility ^[210,312]. Individual responsibility regarding solutions has dominated discussion over the past

several decades ^[147,200,228,312]. The study, however, found that the majority opinion was that both the individual and the government held responsibility.

Previous literature has established a relationship between perceptions of obesity causation and the allocation of responsibility ^[210,214,228,312]. The distinction between the attribution of responsibility and cause is an intriguing result of this study, and there are several reasons why many participants may have assigned responsibility to the individual. Firstly, causal beliefs around individual behaviours are likely to be deeply entrenched in society. Previous literature explored US attitudes towards obesity and found that individual behaviour dominated causal explanations and was deeply engrained in societal attitudes which were perceived to be difficult to shift ^[312]. Furthermore, government messaging has maintained individual responsibility framing throughout the decades of prevention strategy publications ^[147,178,354]. For example, *Tackling Obesity (2020)* demonstrated the continuation of this narrative through reliance on individual empowerment framing within its messaging ^[179]. Additionally, analysis of media coverage on obesity and prevention policy suggests that it is often oversimplified, fails to reflect the complex interactions that cause obesity, and overly focuses on individual personal choices related to diet and exercise ^[355].

An interesting finding from this study relates to the participants' perspectives on the role of the food and drink industry. Generally, the study found the industry to be perceived as having limited responsibility. However, study participants believed that industry activity often resulted in less healthy behaviours, as noted in a previous study ^[211]. Despite this, the findings suggest that there was little belief or expectation for the industry to adopt behaviours more in line with public health due to its profit-driven agenda. The focus on individual responsibility might stem from a lack of faith in the government and the capacity of the food and beverage industry to bring about change. Accordingly, some participants questioned the feasibility of placing responsibility on the industry, previous studies suggest that public attitudes demonstrate mistrust in the industry's willingness to protect the public, particularly in relation to protecting children from HFSS marketing ^[103]. Furthermore, the lack of responsibility placed on the food industry supports the finding that the food and

drink industry has successfully promoted a discourse of personal responsibility rather than industry responsibility, in line with the behaviour of big tobacco ^[356].

Adults' Views on Government Mistrust and Policies for Obesity Prevention in the Post-COVID Landscape

An important finding of this study relates to mistrust of the government's agenda and actions. Government mistrust in public attitudes has been found previously, predominantly in association with effective government spending, specifically related to the use of finance generated from the SDIL ^[172,357–360]. However, a new insight into public attitudes demonstrated the extent of government mistrust among the participants, not only in relation to spending but also the overarching willingness of the government to act in the public interest. In this study, the participants often believed that obesity was deprioritised, as prevention policies were felt to risk political popularity or economic growth. Accordingly, within the study, the government was often referred to as self-interested, clueless, and unwilling to act in public favour, particularly regarding issues that were deemed to require a long-term response. This feeling was most apparent in lower SES participants and participants with a higher weight classification, yet mistrust was discussed across all demographics. Confidence in the UK Government has reduced since the beginning of the pandemic ^[361]. The interviews were conducted shortly after the third wave of Covid-19 after a period of unusual closeness between public and government action. Furthermore, the government's handling of Covid-19 was heavily speculated by the media, healthcare professionals, advocacy groups, the private sector, civil society, and the public themselves. Further research is required to explore public mistrust in the government to improve policy support.

It is well documented that public support is a strong indicator of the likelihood of a policy's success ^[302]. Certain factors shaped whether respondents felt positive or negative towards existing policies, assurance in the evidence base, feasibility and transparency of policy outcomes, assessment of effectiveness, level of intrusion, and the risk of regressive policies. The extent to which the implementation stage affected respondents' support for policy was also significant, consistent with prior research ^[362]. Feasibility and perceived effectiveness

have been found to have a significant influence on public attitudes towards policies, as in previous literature [363,364]. Overall, the findings suggest that although the respondents demonstrated an overwhelming demand for prevention policy, there was a significant amount of dissatisfaction with government action. Policies were often labelled tokenistic or falling short of having the capacity to make a real impact. Generally, there was greater support for agentic policies, such as information provision, to develop nutritional literacy. Interestingly, the demand for these policies contradicts the respondents' causal attitudes which emphasised the need to change the structural environment to improve ease in maintaining a healthy weight. However, this finding is in line with previous literature exploring public attitudes and the degree of intrusiveness, as agentic policies tend to place fewer constraints on individual behaviour [362,365]. Understanding the respondents' attitudes towards specific policies is complex because of the extensive dialogue relating to government mistrust; consequently, the lack of support for certain policies may be the result of mistrust rather than related to the specific policies and their design.

Exploring Adult's Acceptance of Food-Related Obesity Prevention Measures

Regulatory and Fiscal Prevention Measures

The study found that restriction-style policies received mixed responses. Fears of nanny-statism are well documented in public attitudes toward obesity prevention, as government involvement in individual food choices was often seen as an infringement of individual liberties [210,215,228]. An interesting finding of this study was that fears of nanny-statism could be overpowered by clear communication of expected impact and a strong, publicly known evidence base for policy. The findings also showed how some respondents felt a paternalistic approach to obesity prevention was required, which has rarely been documented in previous literature. The restriction of volume-based price promotions on HFSS products was the most associated with nanny-style policy. As previous research has demonstrated, restriction-based policies targeting children were well received in this study [200,211,300,313,366]. However, the proposed ban on HFSS marketing on TV before the 9PM watershed received more resistance based on queries over effectiveness due to its design.

The respondents were all aware of the SDIL, more often referred to as the sugar tax, and existing literature found that members of the public generally supported the introduction of the policy ^[363]. The findings from this research suggest that most participants felt indifferent towards its existence. Despite the policy being heavily speculated in the media, as it was seen to constrain choices, there was limited association between the policy and fears over the nanny state, as expected; in fact, many respondents appeared open-minded towards fiscal levers. Previous research has shown that highly intrusive policies, including taxation-based policies, are the least accepted when first implemented, yet once evidence of impact grows and taxation becomes normalised, the policy's popularity rises ^[365]. The acceptance of the tax may be due to its level of implementation, which allows respondents to gain confidence in the policy. The similarity between SDIL and tobacco control shaped some participants' acceptance, yet the suspected impact was still doubted despite awareness of the success of tobacco taxation ^[172]. As discussed, the study found mistrust in the agenda and specifically in the usage of the finances generated by taxation, as found in previous studies; however, this view reflects a small portion of participants. Support for the policy may increase if respondents were more familiar with the usage of income generated from the tax ^[231,365,367]. The expansion of food taxation received some support under the premise that it would be appropriately balanced with subsidies on healthy alternatives, ensuring that low-income groups are not priced out of food access. This finding complements previous research which found that taxation was accepted among lower socioeconomic groups when combined with other policy actions such as subsidies for community-based health programs ^[367].

The relationship between support for policies and the degree of intrusiveness of each policy was complex and depended on each participant's personal beliefs. Often, respondents appeared to feel as though they had a greater sense of freedom of choice than they perhaps do. Previous literature suggested how the freedom of choice is shaped by many factors including the social, historical, cultural, political, economic, and environmental factors^[227]. Regarding the restriction of individual liberties, it was generally perceived that the restriction of individual behaviours came through regulations and restrictive policies rather than the nature of the food environment restricting individual liberties through the dominance of UPF and EDNP products and the lack of accessibility and affordability of

healthy, fresh products. It is widely agreed that the nature of the environment limits choices by being more conducive to unhealthy eating ^[74]. Assuming that regulation and restriction directly cause the restriction of liberties is to overlook their role in protecting individual freedoms against the industry's agenda ^[368]. Therefore, the focus on restricting liberties in relation to these policies failed to acknowledge the complex power dynamics that shape individual freedom of choice in an obesogenic environment.

As discussed throughout this chapter, nutritional literacy has received significant attention, and information tools, such as the traffic light system food labels, intend to provide information as a basis for voluntary, informed, and conscious consumer decision-making ^[369]. Despite the respondents' focus on nutritional literacy, labels were rarely utilised by respondents. Previous findings suggest that traffic light labels can help to improve individuals' accuracy in estimating the nutritional value of products; however, the relationship between labels and purchasing behaviour is unclear ^[370–373]. Problems with font size, lack of standardisation between products, and lack of understanding of the metrics used in relation to dietary requirements accounted for the lack of use by many participants. This finding suggests that technical knowledge is required to utilise the information communicated through these labels. In line with existing findings, the provision of nutritional information through labels is not sufficient to influence purchasing behaviours ^[374]. Furthermore, labels are only effective if consumers are provided with reasonable product alternatives, and in some cases, it appeared that food labels simply highlighted the limited choice available due to the nature of some food environments.

Environmental default preserves the freedom of individuals to expose themselves to unhealthy substances or environments but makes changes which make unhealthy options easier to avoid ^[375]. The 2020 Tackling Obesity strategy proposed the removal of HFSS products from the prime locations of large stores. Changing the default environment policies are often referred to as 'soft paternalism' or 'nudge' policies which are popular with the public, the study's finding supports this ^[376,377]. The support for this strategy is in line with the participants' perceptions of their food environment and purchasing behaviours, as many respondents regularly recalled impulse purchasing and resisting temptations in the

food environment. Furthermore, the essence of soft paternalism caused respondents to be driven by an ideological perspective to be generally accepting of the policy.

Perspectives on Policy Gaps and Future Directions in Food-Related Obesity Prevention

Effective and efficient food policies for obesity prevention are required to reduce obesity rates and to protect public health. However, despite decades of action, existing approaches have failed to achieve their aims. Public demand and support are essential for the implementation and sustainability of a policy ^[302,378]. The findings show that there is considerable understanding of the role of inequalities in obesity and how socioeconomic position influences barriers to healthy weight. Previous research has not documented such high levels of understanding and awareness of inequalities that contribute to obesity among members of the public. These findings suggest that the atmosphere for policy implementation is positive, implying that action would be supported.

Rebuilding Trust in Government to Develop Public Demand for Policy Action

This study uncovered a significant concern regarding the public's lack of trust in the government. Many participants were hesitant to accept policy recommendations or support government advice because of their suspicions about the government's true intentions or their belief that the government did not prioritise the public's well-being. Improving public support and belief in the government appears to be a significant challenge in the current political climate. Since the completion of these interviews, there have been two leadership changes and the cost-of-living crisis, likely damaging public support and trust in the government. For example, data from the 2023 Trust in Government Survey found only 27% of respondents reported high or moderately high trust in the UK government ^[379]. The study's findings suggest that the policy is well received, even if it is deemed restrictive, when there is a well-known evidence base and intention of the proposed policy. Participants struggled to support policies that they did not believe to be impactful in their lives, suggesting that the design policies must ensure they are relevant to the lived experience and ensure that the policy is appropriately framed and disseminated in the media.

Improved dissemination of the aims and the expected impact of policies before and after implementation would likely benefit support ^[172,367].

Improved Nutritional Literacy for Future Generations

Concerns over the level of nutritional literacy among the population, specifically young people, were rooted in fears over the quality and consistency of formal education at schools. From the participants' perspective, schools do not provide young people with the skills and knowledge required to sustain a healthy weight and diet throughout adulthood. Educational opportunities were also felt to be important for adults; although many doubted the uptake of such options, there appeared to be a demand within the sample, particularly in lower-income areas. Furthermore, expanding on research exploring the use of nutritional labels, it appears that it would be beneficial to provide educational opportunities that empower individuals to utilise these tools. The requirement for policies that challenge the structural drivers of obesity was not within the participants' conceptualisation of future policy. For example, the nature of the food environment and the role of the industry was perceived to be static, whereas individual behaviour was viewed as more dynamic and, consequently, more realistic to influence. This may account for the significant concern regarding nutritional literacy.

Incorporating Weight Stigma Prevention within Obesity Prevention

Weight stigma is well documented in the literature and has important implications for public health ^[276,380,381]. Although the study respondents did not hold strong stigmatic attitudes of their own, participants' experiences of societal stigma were common, suggesting that weight stigma remained common. Furthermore, this study found that stigma was the most common in the healthcare context. Previous research has found that weight-stigma amongst healthcare workers is common ^[380,381]. The study found that morbidly obese and obese participants experienced weight-based stigma in healthcare, causing reluctance to seek professional help generally and specifically regarding weight-related problems. This finding contributes to an increasing body of academic research demonstrating the vitality of challenging weight stigma in healthcare through policy in order

to remove stigma as a barrier to accessing healthcare [276,300,380,381]. Furthermore, diet culture and online misinformation were heavily linked to weight stigma in this study, and previous research has explored how diet culture can perpetuate societal stigma surrounding undesirable body image and encourage disordered eating to reach an unattainable body image [382]. This study contributes to this evidence.

Inclusion of the Lived Experience in the Policy Process

Participants with lived experiences of low SES, financial instability, and poverty offered a notably different perception of the future of policy [229]. Existing policy was described as feeling removed from day-to-day life. It is well documented that the past focus on individual behaviours has created a policy landscape which requires individuals to possess a significant level of individual agency to adhere to policies and reap the benefits of policy outcomes [175,184]. The participants most often saw solutions to inequalities in obesity rates to be nested in community interventions, for example, community services to ensure that individuals have access to a fully equipped kitchen. Similarly, educational opportunities that suit the cultures of communities as well as workshops for financial literacy to support individuals with budgeting and provide a sense of security when confronted with financial insecurity were discussed.

The apparent disconnect between lower-SES individuals and policies suggests that this group requires a louder voice in policymaking to stop the cycle of ineffective policy outcomes. A crucial action is to examine the presumptions about an individual's agency included in policymaking [383]. The findings suggest that for individuals to adhere to health advice, the cost of a healthy diet and the material conditions required to maintain a healthy weight should be reflected in the financial support provided to them (universal credit, disability benefits, etc.).

Similarly, food insecurity support from food banks is often run by charities with limited resources that restrict the quality of the foods offered, further encouraging the consumption of low-quality foods. The lived experiences of participants with lower SES are even more important in consideration of the cost-of-living crisis and the rise in food

insecurity in the UK. The relationship between food insecurity and obesity has already been overlooked in policy and will likely worsen, as recent data released by the Food Foundation show a continued increase in food insecurity. Nearly 10 million adults and children live in households struggling to afford or access sufficient food and households with children in the poorest fifth of the population would have to spend 70% of their disposable income on food to afford the government-recommended healthy diet ^[384]. The impact of lower SES on economic and individual freedom to follow through with government guidelines on diets requires greater policy attention.

One of the most important findings of the study was that there was a strong sense of policy disconnection between the lived experiences of individuals with lower SES and policy aims. The findings also showed a similar disconnect between lived experiences of higher weight classification and policy aims. Previous research by Attree (2006) found considerable divergence between the experiences of low-income mothers and obesity prevention policies, suggesting that little improvement has occurred since ^[229]. Assumptions over individual agency and individual circumstances in policies were felt strongly by participants, causing some to believe that policies would fail to impact their behaviour. In line with the clear sense of government mistrust, lower SES respondents felt that the government did not care specifically about them. The unwillingness to maintain or implement policies to relieve pressure on low-income households during and after the pandemic further led to respondents questioning the government care, consideration, and awareness of the lived experiences of low-income groups. Government actions such as removing the universal credit increase and the role of the high-profile footballer, Marcus Rashford, to cause a U-turn in the expansion of the free school meals (FSM) vote during the Boris Johnsons government, were used to exemplify short-term thinking, lack of care, and awareness of the lived experiences of individuals with lower SES.

3.4.4 Conclusion

In conclusion, this study provides important insights into how adults perceive their capacity to sustain a healthy weight in the UK context. Participants expressed that maintaining a healthy weight is often seen as more of a luxury than a feasible goal. This directly responds

to the first objective, highlighting the perception that the current environment does not easily support the maintenance of a healthy weight for many individuals.

In exploring how adults experience and engage with the food environment, as per the second objective, the findings reveal that the food environments, marked by the disproportionate availability of EDNP, UPF and the rise of ODPs, strongly shapes purchasing behaviours. Despite awareness of these influences, participants noted that the existing policies have not adequately challenged the nature of these food environments, leaving them to experience food swamps.

Lastly, in line with the third objective, this study evaluated adults' attitudes towards current and future obesity prevention strategies. Participants were critical of existing policies, finding them insufficient, especially for lower SES groups and those living with higher weight classifications. They emphasised the need for future policies to effectively reflect the lived experiences and address the structural barriers in the food environment that hinder healthier choices.

4 Chapter 4: Assess how socioeconomic inequalities in obesity are addressed in the design and implementation of food policy for obesity prevention in the UK

This chapter explores the second study that forms the basis of this thesis, which intends to reach the second objective: to assess how socioeconomic inequalities in obesity are addressed in the design and implementation of food policy for obesity prevention in the UK. The chapter will first outline the methodology of this study, then explore the study's findings and provide a discussion. The main objective is underpinned by the following three subobjectives:

1. To explore the key factors that influence policy design and implementation of food policy for obesity prevention
2. To identify gaps within existing strategies and how they influence socioeconomic disparities in obesity
3. To understand how food policy could be adapted to reduce socioeconomic disparities of obesity

4.1 Methodology

As the same methodology was used in Chapter Three (see Section 3.2), there will be several signposts to further details regarding the methodological decisions made throughout this section. A qualitative study design was selected for this study, as the study's overarching aim was to explore stakeholders' perspectives on food policy, inequalities in obesity, and the policy process. Qualitative research was deemed most appropriate for gaining in-depth insight, exploring experiences, developing an understanding, and construction of attitudes, all of which occur within the social world and are shaped by the specific social contexts of an individual.

4.1.1 Study design

In-depth, one-to-one, semi-structured interviews were used to explore policy stakeholder (PSH)' perspectives on food policy, inequalities in obesity, and the policymaking process.

Semi-structured interviews included a balanced sample of stakeholders from members of national and local governments, civil servants, academics, knowledge brokers, advocacy group members, and non-governmental organisations. These stakeholders were then divided into three groups: members of national and local governments and local authorities, academics and knowledge brokers, and members of civil society. To develop the sample, a master list of appropriate stakeholders was constructed (110 potential participants), which was reviewed by the research supervisors and a representative of the Obesity Health Alliance. Once participants expressed an interest in completing an interview, they received a participant information sheet and a consent form. Consent forms were obtained prior to the interviews. Interviews were conducted using videocalls on Microsoft Teams. Participants were reminded at the start of the interviews that the interview transcripts would be anonymised and that they were free to withdraw from the study at any point. All interviews were digitally audio recorded. The study was approved by the Ethics Committee of the University of Nottingham Faculty of Medicine and Health Sciences (FMHS-249-0421).

Sampling

Similar to the sampling approach adopted in Chapter 3 (see Section 3.2.1), this study adopted a purposive sampling technique and a convenience sampling technique. Purposive sampling is outlined in Section 3.2.1 and was selected for this study because its logic is based on the requirement for a sample that possesses particular characteristics ^[385]. Convenience sampling was adopted as participants were selected based on accessibility ^[386]. This combined sampling method was required to fulfil the sample to account for recommendations of potential participants from the SPECTRUM research consortium network and to account for recruitment difficulties.

Screening questions were not required before the study. Each participant's professional background was established through their employer's website. The participants were asked to summarise their professional involvement in obesity prevention policy during their interviews. The sample inclusion criteria included professional experience related to one of the three stakeholder groups identified, at least two years of experience working specifically

in the UK context, and fluent English speaking. The initial list of potential participants did not include individuals who did not meet the specified criteria.

Sample Size

As discussed in Section (3.2.1), there are no defined criteria for what constitutes an appropriate sample size. The gold standard by which purposive sample size is determined in health science research often focuses on data saturation. In qualitative research, it is common for the researcher to determine when an appropriate degree of saturation is achieved [278]. Given the diversity of professionals who can be considered PSH, each with their own unique experiences and perspectives, it is impractical to develop a sample that encompasses all of them. Regarding data saturation, the aim of data collection was to reach a satisfactory level of saturation regarding broad themes across each stakeholder group.

Semi-Structured Interviews

One-to-one semi-structured interviews were conducted for this study (see Section 3.2.1 for further information on semi-structured interviews). This method was appropriate for the study design as it allowed flexibility to explore participants' experiences and attitudes while maintaining a clear focus through the development of a topic guide (refer to Section 3.2.2 for summary of topic guides). A topic guide was established and reviewed by the research supervisors. The guide is divided into the following eight sections:

1. Professional background and experience in obesity prevention.
2. Understanding of key concepts in obesity prevention.
3. Perspectives on prevention policies and their consideration of inequalities.
4. Role of ideologies in the policy process.
5. Food insecurity and obesity prevention.
6. Covid-19 and policymaking for obesity prevention.
7. Policy gaps and future outlooks.
8. Mechanisms for policy impact.

4.1.2 Data Collection

The interviews were conducted between the 22nd November 2021-12th October 2022 via videocall using Microsoft Teams (14 interviews). The interviews lasted between 30 minutes and 1 hour. Written consent was obtained prior to the completion of interviews, and verbal consent was obtained at the start of the interviews. Participants were reminded of the voluntary nature of the interviews and were provided with an opportunity to ask questions. They were then provided with a summary of the study's aims and intentions and a summary of the interview structure. Participants were reminded that all questions were voluntary, that skipping questions at any point during the interview was acceptable, and that they could contact the researcher after the completion of the interviews with any concerns or questions they may have. All interviews followed the same topic guide as described above (refer to Appendix 8.5). The topic guide was followed using probes, some of which were included in the topic guide, and other probes were used in accordance with the participants' responses.

4.1.3 Data Analysis

The interviews were audio recorded and transcribed verbatim. All interviews were transcribed by the researcher and an automated transcription service, and then checked by the researcher. The identifiable data were anonymised. The analysis process for this chapter followed the same process as outlined in Section 3.2.3. The transcripts were analysed using Braun and Clarke's thematic framework analysis (TA) ^[284], which was deemed an appropriate analysis framework for this study due to its flexibility as an analysis approach for datasets of all sizes and its ability to provide a systematic procedure for generating themes. Furthermore, as the research adopts an interpretivist paradigm because of its emphasis on reality as socially constructed ^[288,289]. The researcher closely followed Braun and Clarke's six phases of thematic analysis that are outlined in detail in Section 3.2.3. NVivo 1.7.1 software was used to support the analysis process. Two of the research supervisors (TL) (RM) double-coded a sample of transcripts to assure the reliability of coding and improve the rigor of the study.

4.1.4 Reflection on Role as Researcher

As outlined in Section 2.4, reflection is the process by which a researcher reflects on the overall research process from data collection to data interpretation ^[258]. Ensuring the comfort of interviewees in any interview context is a necessary consideration not only to ensure the safety of the participants but also to gain rich in-depth data. The interviewer (OB) ensured that before the audio recording started, there was an opportunity to ask questions and engage in small talk between the interviewer and interviewee to build a rapport. Although the participants held specific expertise, the researcher attempted to use limited jargon to ensure the participants understood the questions and to avoid any misunderstandings. Furthermore, the researcher often asked the participants to outline the acronyms used to ensure full comprehension of their responses.

Due to the nature of the study, the participants often expressed strong political opinions or views related to industry activity. To ensure that the researcher did not influence the participants' perspectives, the interviewer remained neutral throughout the discussions. A research diary was kept by the researcher to record any notes the research made during the interview itself, as well as a log of notes made immediately following the interviews to ensure research reflection through the research process.

An important step in this research design was to ensure that a sample of transcripts was double coded by TL and RM. Double coding helped ensure that the themes established by the research were representative of the dataset. Furthermore, double coding is advised to ensure reliability and trustworthiness within the analysis process, and the themes are reflective of the dataset rather than the researchers' assumptions. A codebook was developed and shared with TL and RM after the first stage of the double coding. This codebook was then used by TL and RM on a different set of transcripts to cross-reference and ensure that the themes reflected the dataset in its entirety.

4.1.5 Ethical Considerations

The study was approved by the Ethics Committee of the University of Nottingham Faculty of Medicine and Health Sciences (FMHS-249-0421). No amendments were made to the initial application. Following the same steps outlined in Section 3.2.5, all participants approved the recording of the interviews for transcription and analysis purposes and were comfortable with the researcher recording field notes throughout the interviews. Any personal safety risks were mitigated by conducting online interviews rather than in-person interviews. The participants predominately discussed their professional experiences and perspectives; therefore, there were limited sensitive topics discussed in the interviews. The personal anecdotes shared by the participants were carefully anonymised to ensure that they could not be linked to the participants. Specific details regarding participants' professional histories were excluded from the study.

4.2 Results

The following section presents the study's findings from semi-structured interviews carried out with PSH. Fourteen participants participated in the interviews. The participants were divided into three groups: public sector official, academics and knowledge brokers, and civil society advocates and representatives. The findings section outlines the broad themes that were identified in this study as shown in Figure 9. These themes included perceptions towards drivers of obesity in the UK, attitudes towards existing and future prevention policies, barriers and facilitators to the implementation of food policy, consideration of inequalities to obesity prevention and mechanisms to enhance policy impact.

The study's themes align with its three objectives (see Section 4). For Objective 1, exploring factors influencing policy design and implementation, themes like perceptions towards drivers of obesity in the UK and barriers and facilitators to the implementation of food policy are addressed. Objective 2, identifying gaps in strategies and their impact on socioeconomic disparities, is covered by themes on attitudes towards existing and future prevention policies and consideration of inequalities in obesity prevention. Lastly, Objective 3, understanding how food policy could reduce socioeconomic inequalities, is met through themes on mechanisms to enhance policy impact and consideration of inequalities in obesity prevention.

Summary of policy stakeholder group	Policy stakeholder label	Number of participants
Members of national, local governments, local authorities, and civil servants	Public Sector Officials	5
Members of the academic community and knowledge brokers	Academics and knowledge brokers	4
Members of civil society; advocacy group representatives	Civil Society Advocates and Representatives	5
		Total = 14

Figure 8 Summary of Sample

Themes and Sub-themes

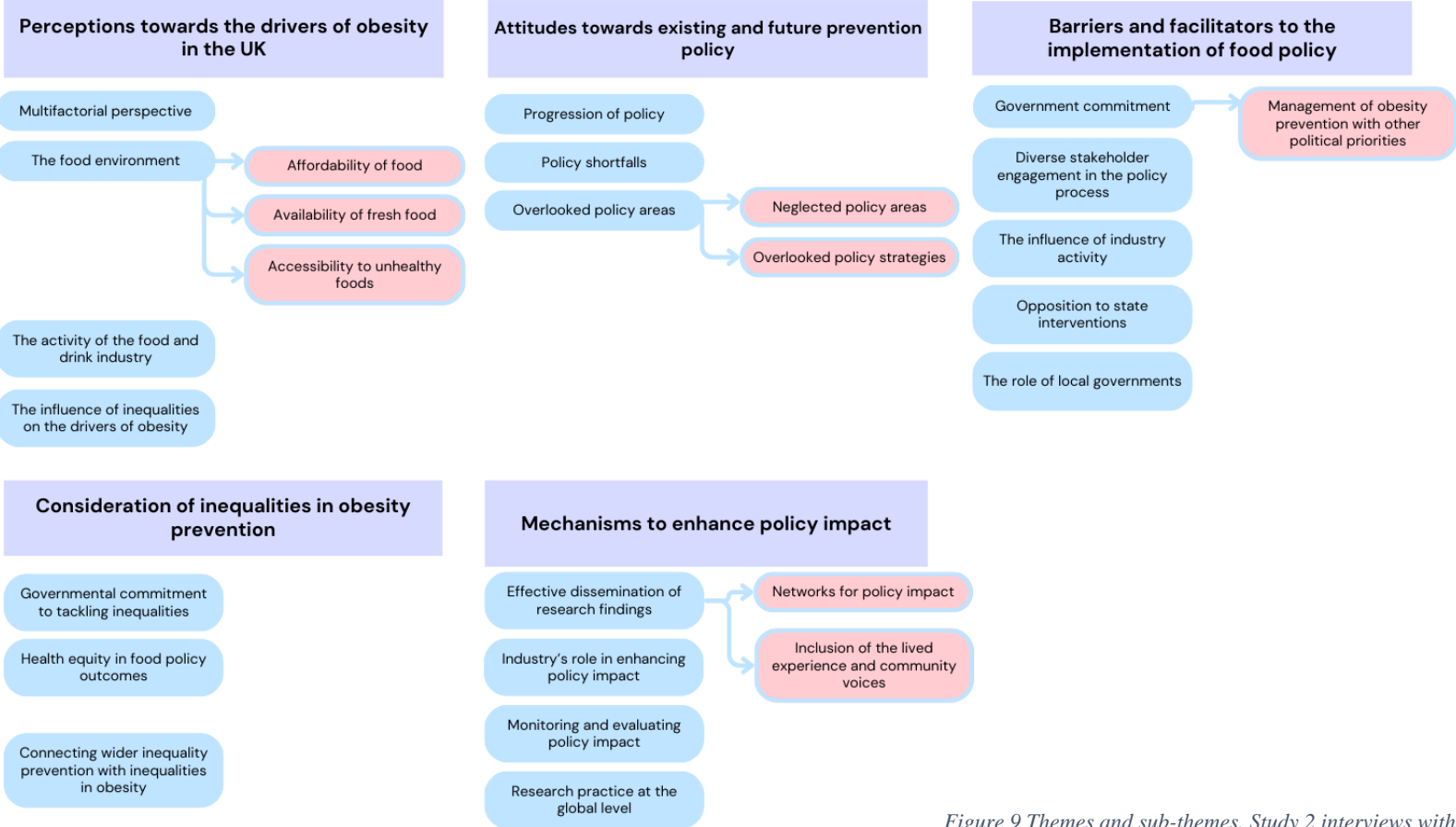


Figure 9 Themes and sub-themes, Study 2 interviews with stakeholders

4.2.1 Exploring Stakeholder Perceptions Towards the Drivers of Obesity in an UK context

The first theme emerged from the data related to stakeholders' perspectives on the key drivers of obesity. Overall, it was found that the participants shared similar perspectives on key drivers, although they differed in their opinions on which drivers were considered the most fundamental.

Multi-factorial drivers

The participants' perceptions of the drivers of obesity represented their complexity. There was limited differentiation between the participants' perspectives. Although all participants discussed the nature of the food environment as key drivers, some considered additional drivers as well as the food environment. A minority of participants acknowledged genetic predisposition and education-related drivers. Several participants identified additional drivers of obesity, including the food environment, such as the accessibility and quality of green spaces, individual behaviours, housing quality, and employment opportunities.

"I think there's complexity of obesity. When you look at both drivers and determinants, it's both maybe a genetic element and deprivation, but also cultural and place-based effects as well. But there'll be some tangential ones... access to green space... perceptions of safety of place..." (Participant 11, Public Sector Official)

Physical activity was addressed by the participants with a particular emphasis on the quality of an individual's environment. However, as the study focused on food and diet, the discussion of physical activity was not extensive. The participants generally agreed that the environment and lifestyle were not conducive to physical activity.

"I suppose there's this idea that... people are just not taking enough exercise, not moving as much as they used to, homeworking, it is definitely contributing to these kinds of factors." (Participant 13, Public Sector Official).

The Food Environment

All participants believed that the food environment was a core determinant of obesity. The participants considered the physical, social, cultural, and economic factors that formed the food environment. The modern food environment was characterised as encouraging dietary behaviours consisting of high consumption of EDNP, HFSS products, or UPF. Consequently, it is believed that healthy dietary behaviours result from overcoming cues within the food environment.

“We perceive it to be as sort of a systems failure. So, it’s about sort of everything within the food system to be rigged against healthier food, which is usually less affordable, less accessible, less appealing.” (Participant 4, Civil Society Advocate or Representative).

The Availability, Accessibility, and Affordability of Food.

During the analysis process, a subtheme emerged related to the availability, accessibility, and affordability of food within the food environment. This section elaborates on the participants' perspectives, highlighting the significant role these factors play in contributing to obesity and suboptimal dietary behaviours. The affordability of a healthy diet was a key factor identified by numerous participants. Examples provided by the participants were related to how the affordability of healthy food pushed some individuals to EDNP food to save money. The affordability of foods was also linked to impulse purchasing and incentivisation of EDNP food through promotions or discounts.

“I think it's probably the cost of food which is probably the most important thing. And it can be expensive getting fruit, veg, and which obviously we'd like people to eat more of. The healthiest often seems to be the most expensive” (Participant 8, Academic or Knowledge Broker).

The accessibility of EDNP products was discussed at length by the participants. The low availability of healthy, fresh products in contest with the accessibility of EDNP and cheap products were believed by many participants to be an inevitable trait of the modern food environment.

“You can't really go into almost any shop without there being some sort of high fat, high salt, high sugar products, even if you go into sort of clothing retailer, they'll be selling like chocolate bars” (Participant 11, Group 1).

Furthermore, the concentration of food outlets, branding, marketing, and promotion of food products were described to further intensify the influence of the food environment. The rise of online delivery platforms (ODP) was a concern for some participants due to the increased accessibility to fast food or calorie-dense meals at home, 24-hours a day.

“You've got the availability of fast food, or hot food takeaways, because the terms are sometimes interchangeable. You know, you see fast food outlets or hot food takeaways. You've got a Deliveroo, you've got all those kinds of things that make it so easy for people.” (Participant 13, Public Sector Official).

Although most participants described the food environment as similar across the UK, there was a consensus that the quality of the food environment was socially stratified. Low-income, urbanised areas were perceived as the most severe due to the low availability of fresh produce and high accessibility to EDNP products.

“The combination of availability, access, economic resource. So broadly speaking, the availability and access in large parts of the country, particularly urbanized areas, to buy unhealthy, cheap, sort of processed foods...is generally easier than a lot of steps that you might need to take to be able to access and consume the healthier foods” (Participant 1, Public Sector Official).

Participants often saw the food environment as a system in which drivers interact with one another to amplify their influence. For example, it was commonly believed that the affordability of diets was influenced by factors such as the availability, taste preferences, and convenience of foods. It was generally acknowledged that the factors promoting the consumption of low-quality diets surpassed the incentives and drivers encouraging the consumption of high-quality diets. As a result, the food environment was perceived to

possess numerous drivers, which, according to the participants, were unlikely to lead to the adoption of healthy behaviours.

“I really do believe that the food environment is to blame and there's no single cause of what the food environment looks like. But it's a collective where there's a ubiquitous... the promotion, the prominence of and the price of unhealthy foods is what makes them far more enticing and easier to purchase. And you see it, no matter where you go... you're going to a theme park, you go to a supermarket, you go to a sports ground, it's the same kind of thing” (Participant 2, Academic or Knowledge Broker).

The Activity of the Food and Drink Industry as a Driver of obesity

Some participants believed that the nature of the food environment was the direct outcome of the food and drink industry's activities. The stakeholders that addressed the industry's role in shaping the food environment believed that the corporate sector was responsible for fostering an environment that encouraged unhealthy eating habits to protect and drive profits. For some participants, identifying this distinction was essential for articulating their perspectives on the key drivers of obesity.

“The way I see it is that one of the main causes of obesity in the UK is... large corporate food companies. Both because I was tempted to say the food environment, but the reason I've not said the food environment is explicitly because I think actually, things that go on that are wrong in the food environment, are often a result of corporate actions...” (Participant 10, Academic or Knowledge Broker).

Some participants viewed the power of the food and drink industry as a significant contributor to obesity. Their understanding of industry practices that deliberately influence consumer purchasing decisions through marketing, advertising, and sales techniques reinforced this viewpoint. These tactics were believed to exacerbate additional drivers, including the convenience of products, accessibility, and affordability.

“We tend to think of them as kind of separate...entities like, oh, we need to tackle advertising, but ultimately, it's all related. It's all been strategized... somewhere down the line by a big company of how to get these kinds of products onto our plates... I think it's really the growth and power of these food companies” (Participant 7, Civil Society Advocate or Representative).

Several participants noted similarities between the techniques employed by the tobacco and food and drink industries. The widespread availability of unhealthy products was viewed as an echo of the tobacco industry's sales strategies as well as ongoing purchasing prompts within the food environment resulting from marketing and advertising efforts.

“It's difficult to stay away from them. And this is straight out of the playbook of the tobacco industry of having tobacco sold in every street corner, it means if you're trying to quit smoking, it's there enticing you to buy it, and it makes it harder to quit. And it's similar to high fat, high salt, high sugar products...it's difficult to go around sort of normal life without being exposed to these products” (Participant 11, Public Sector Official).

Marketing and promotion practices were frequently discussed in participants' perceptions of the drivers of obesity. Marketing was understood to be highly influential in shaping food behaviours, preferences, and awareness of products, and influential in forming food cultures. The participants described how marketing is found across many different channels and locations, with high levels of exposure to food and drink marketing among children and young people.

“it's interesting seeing these big events... people trying to attach whatever their product is to something else... “eat Snickers and play football”... eating Snickers, and playing football are two totally unrelated activities. And yet, we'll like sponsor something. So, I think it's this sort of sponsorship promotion.” (Participant 11, Public Sector Official).

Several participants discussed instances where the industry frequently exploits individuals' known vulnerabilities to influence their marketing and promotional strategies. Common

tactics used in marketing often involve misleading content that leverages specific factors, such as cost, convenience, and personal sentiments, to drive purchasing decisions.

“...things like a KFC bucket that can feed five people. It feels like it's such good value, and it is completely negating the need for you to prepare something for your family which can feel a really overwhelming task, I imagine, to parents who have kids that you need to feed, maybe on lower incomes. The reality is that they're not good value at all...” (Participant 7, Civil Society Advocate or Representative).

The influence of industry marketing on contemporary food culture was a topic of discussion for some participants. It was acknowledged that marketing has played a significant role in shaping dietary norms by, for instance, popularising certain food and beverage products as fashionable or trendy. Several participants expressed apprehension about the potential consequences of this form of marketing on the attitudes and future behaviours of children and young people.

“And then there are lots of other sort of... parallel issues like peer pressure, and what's perceived as cool and what they're seeing in popular culture... for example, energy drinks, and how it's actually much deeper than, for example, athletes promoting Lucozade it's actually now within music, as well as in places that sort of if you're not a teenager, you might not expect to find it” (Participant 4, Civil Society Advocate or Representative).

Additionally, a few participants recalled how the industry has shifted individuals' dietary behaviours over the past few decades. Participants cited the rise of snack culture as an example of how the industry can shape dietary behaviours by promoting the consumption of snack foods, which has recently become an addition to people's dietary habits.

“...the food industry has developed a whole product range market, that created a market for snacking. And they've created a market for snacks, which just did not exist before” (Participant 12, Public Sector Official).

4.2.2 The Relationship Between the Drivers of Obesity and Socioeconomic Inequalities

The final theme in Section 4.2.1 explored participants' perspectives on the factors contributing to obesity and socioeconomic disparities, as well as the interplay between these factors and their tendency to exacerbate one another. The participants concurred that existing social and economic inequalities exacerbate the drivers of obesity discussed throughout this theme. Furthermore, it was determined that the intensity of these drivers was most significant for lower-SES households.

“As we move to a system that allows more readily available cheap access to unhealthy food...it becomes harder for people to maintain healthy lifestyles and to adopt habits that are related to lower obesity prevalence... I think, this is obviously grossly socioeconomically stratified and all the other intersecting aspects of that reality to obesity and housing circumstances, employment circumstances”. (Participant 1, Public Sector Official).

The participants discussed how the drivers of obesity often undermine individuals' intentions to sustain healthy dietary behaviours. Most participants believed that the drivers discussed overpowered individual knowledge or desire to sustain a healthy diet.

“If you're on a limited budget and... depending on where you are, what your access to shopping is, and just the marketization of high of junk foods being more sustainable in terms of actually having food for longer... if you're on a limited budget and you get two things for the prices of one, even if that's an unhealthy choice, I can see why people would be attracted to that.. In my experience, people are well aware of what a healthy diet is, but whether they can actually see a way to manage that, to do that in practice is quite complex for some people.” (Participant 3, Civil Society Advocate or Representative).

Participants often described how drivers are disproportionately influential in lower SES areas; for example, exposure to marketing was believed to intensify in lower SES environments.

“I think that there is some evidence to show that food is advertised more heavily to people on lower incomes...especially kind of advertising boards as well are much more prevalent in area...” (Participant 7, Civil Society Advocate or Representative).

In addition, a limited number of participants viewed food insecurity as a crucial, yet overlooked, factor contributing to obesity. Financial constraints or limited resources were perceived to elevate the likelihood of food insecurity, ultimately resulting in suboptimal dietary habits. The constraint of financial and material freedoms necessary to maintain healthy dietary behaviours was believed to exacerbate the drivers associated with accessing and affording nutritious diets.

“...if you've got limited budget to spend on food, then you're reliant on two things. One is cheap food and second is some degree of handout or welfare or food bank or whatever else it might be to support that...” (Participant 1, Public Sector Official).

4.2.3 Stakeholders' Perceptions of Future and Existing Food-Policy for Obesity Prevention

The focus of this chapter's second theme was on participants' perspectives on food policies aimed at preventing obesity. Three subthemes were identified under this broad theme: the development of policy over time, areas where policy falls short, and neglected policy strategies, with the additional subtheme of overlooked policy areas.

The Progression of Policy

The participants expressed a unanimous opinion that policy has made considerable progress over the past decade. The SDIL was most widely perceived as the starting point for more promising action against obesity prevention in the UK. While the SDIL was undoubtedly the most discussed policy, the participants were able to describe an array of other successes across different settings, focusing on a variety of determinants at different levels of governance, such as embedding advertising restrictions into the Health Care Act, strengthening the front of package labelling policy, and the roll out of Transport for London (TFL) advertisement restrictions.

“There’s been one or two things that that have stood out... School Food Standards have improved... The positives I suppose are the sugary drinks Levy, which certainly seems to have had an impact.” (Participant 8, Academic or Knowledge Broker).

The majority of participants felt that the largest policy success was related to the impact on industry behaviour; accordingly, the SDIL was celebrated by almost all participants. *“The soft drink industry levy that was brought in by a Conservative government... And it had a direct impact on industry of reformulation without any huge amount of an impact on purchases.” (Participant 1, Civil Society Advocate or Representative).* The participants attributed the success of the SDIL to the reformulation of soft drinks, minimal impact on consumers, and limited economic implications for the industry. Moreover, some participants considered the SDIL to be successful because of the high level of support and acceptance of a fiscal policy in a policy landscape characterised by minimal regulation and an over-reliance on information-based and nudging-style policies.

“In response to the soft drinks industry... we've not found any evidence yet that they're having an impact on business...it was sort of demonstrated that we can public health policies that don't have to be an anti-business. And that feels like quite an important thing to be able to demonstrate if we want to introduce further policies in future that affect industry.” (Participant 10, Academic or Knowledge Broker).

Furthermore, some participants believed that parts of Tackling Obesity (2020) were a signpost to further policy progression ^[179]. Participants acknowledged that the strategy included policies that had been under discussion for a long time, but the strategy was felt to indicate greater commitment to implementing these policies, thereby demonstrating a stronger intention to effectively address the issue of obesity.

“In general... the 2020 strategy was just a repeat of what's been published before. But it did make commitments to actually put these things in place. Whereas before, they've said, oh, we'll consider or we'll consult on an 9PM watershed, they actually said that they would do

something. And so far, it looks as if these kind of measures are being put in place”
(Participant 7, Civil Society Advocate or Representative).

Despite the broad acknowledgment of policy progression, most participants expressed deep concern about the pace of progress specifically related to the implementation of a policy. The pace of action was described as insufficient to match the scale of the problem.

“It's just slow progress... I think it just becomes like a really slow, uphill battle for people to implement.” (Participant 10, Academic or Knowledge Broker).

Other participants, particularly those from civil society, suggested that a slow pace of progress was expected due to the nature of the policy process. This was attributed to the perception that obesity prevention can be politically unappealing, as well as the challenge of maintaining sustained political interest more generally.

“I think we also get really realistic when it comes to these thing. This is a bit of a snowball steppingstone kind of effect. So, it's policy moves really slowly. So, it's about... having a success and moving on to the next thing, I think around sort of healthy screens and thinking about marketing and advertising. I think we've only just started.” (Participant 4, Civil Society Advocate or Representative)

Policy Shortfalls

Overall, there was extensive discussion among the participants regarding their perceptions of policy shortfalls. Accordingly, participants frequently discussed the disparity between government messaging in forthcoming policies and the implementation of policies. The most significant problem identified within this theme was the failure to implement policies after their proposal.

“There's a huge failure in actually implementing the... policies once they've been consulted on and put in a strategy...” (Participant 1, Public Sector Official).

The participants commonly described their dissatisfaction with the national prevention strategies published by Westminster. Strategies' lack of ambition and narrow focus were most described.

"...The biggest failing was probably that it was just a bit narrow in its ambitions, it committed to these really strong actions, but it could have done more" (Participant 7, Civil Society Advocate or Representative).

Some participants also criticised the focus of UK Government's strategies due to their failure to acknowledge the broader structural drivers of obesity. These participants felt that strategies continuously allowed the underlying, deep-rooted structural drivers to remain uninfluenced, which ultimately limited their effectiveness and impact.

"They're very much surface level, looking at the food industry, looking at restrictions on the food environment, etc. But none of them go any deeper than... trying to address more of the sort of fundamental determinants of health and therefore obesity." (Participant 14, Public Sector Official)

Furthermore, many participants acknowledged that policies often appear well intentioned, yet the existence of loopholes and policy gaps cast doubt on their impact. These participants explained how gaps and loopholes in policy design significantly reduce policy impact in past prevention strategies.

"The policy coming on board in terms of advertising of foods high in fats, sugars, so before nine o'clock... there's these huge gaps in all of these things...sports sponsorship is usually not included in any usual... definitions of junk food marketing. And it's a huge way of putting out marketing brands to young people" (Participant 8, Academic or Knowledge Broker).

Several participants discussed the manipulation of loopholes by industry, which reduced the overall effectiveness of the policy. Participant 4 provided an example to illustrate this point.

“For example, thinking about brand advertising is in a massive one. So, the idea that brands like McDonald's can continue to advertise, and both outdoor and online and everywhere by using... just a logo or...cartoon of a burger or using a healthier food product. I think that's a massive loophole” (Participant 4, Civil Society Advocate or Representative).

Further policy shortcomings include the inadequacy of monitoring and evaluation plans for the existing policies. Participants highlighted how certain policies are often formulated with overly optimistic enforcement plans, such as the restriction of HFSS products in prime locations of stores, which was deemed unrealistic due the reliance on overstretched local governments for enforcement.

“It's (regulation of the placement of HFSS products in prime location of stores) got the real potential to be world leading. Unfortunately, there's lots of loopholes. And you know, it's not been very well enforced. And there's not the support there for local authorities to enforce it” (Participant 2, Academic or Knowledge Broker).

Participants views towards overlooked policy areas in existing prevention strategies

The following theme explores the broad theme: participants' views towards overlooked policy areas in existing prevention strategies. This theme comprises two sub-themes: neglected policy areas and overlooked policy approaches. This theme aims to explore participants' perspectives on elements of obesity prevention strategies that have not been adequately addressed, as well as areas that have been overlooked or require expansion

Neglected Policy Areas

Many participants described how certain policy areas have been disregarded in past prevention strategies. These participants' perspectives were linked to their area of expertise. The most common areas discussed included the lack of consideration of incentivisation policies, such as policies that incentivise the consumption of fresh foods, weight stigma, body image, and eating disorders, and infant formula. A small number of participants discussed how prevention policy is often focused on de-incentivising the

consumption of HFSS products, influencing the accessibility of a product, or reducing the fat, sugar, or salt content of a product. Policies that improve the consumption of nutrient-rich foods was believed to be important for policy development.

“...I also think there needs to be a lot of work around, like positive solutions. So how are we making the healthier options more appealing, more accessible, more affordable? And not just thinking about sort of not just leaning into that popular narrative of things being taken away?” (Participant 4, Civil Society Advocate or Representative).

These participants discussed multiple ways to achieve this, such as through policies targeting the affordability and accessibility of fresh food or introducing reformulation targets focused on improved nutritional value rather than being limited to the removal of certain contents. For example, participant 2 specifically mentioned the potential for expanding reformulation efforts.

“And I think... reformulation of less healthy nutrients is good, but actually reformulation to include healthy nutrients is also good.” (Participant 2, Academic or Knowledge Broker)

Infant diets were also discussed, and a small number of participants expressed disappointment regarding the regulation of industry activities in infant food. The participants who held expertise in the area felt that the division of infant foods from broader food policy and obesity prevention resulted in inaction resulting in continued misbranding and consumer manipulation by industry.

“We haven't talked anything about sort of commercial foods to toddlers and children, you know, that needs huge regulation... And parents honestly think they're doing the right thing. Because there misbranded thing, they miss-sold things in many sense of the word” (Participant 2, Academic or Knowledge Broker)

A small number of participants expressed concern regarding the lack of policies that target weight stigma. Incorporating policies to mitigate weight stigma was recognised as potentially transformative for the lived experience of individuals already affected by

overweight and obesity. These participants recognised that weight stigma was present in various settings, namely healthcare settings.

“There's growing awareness and understanding of the impact of stigma, and I don't think there's necessarily anything sort of formal policy, or even, I don't think it's on the agenda for addressing the impact... first of all sort of establishing what the impact...and how it's kind of can be addressed in various government policies...” (Participant 14, Public Sector Official).

Some participants emphasised the importance of addressing issues surrounding body image and disordered eating in prevention policies. The participants indicated how the introduction of calorie labelling in out-of-home vendors met significant resistance due to its potential impact on individuals living with eating disorders. These participants acknowledged the importance of information provision but believed that the impact of these policies would benefit from improved collaboration with experts from different areas of food policy and nutrition-related research throughout the design and consultation period. Incorporating obesity prevention with disordered eating and body image may have a greater impact than attempting to address these issues in isolation.

“There's been a really interesting conversation around body image and eating disorders... again, that's been talked about as completely separate to obesity and in fact, in conflict with it...a lot of this is seems to be in competition with each other, instead of actually just trying to find a way of talking about it together.” (Participant 4, Civil Society Advocate or Representative).

Overlooked Policy Approaches

Many participants often described how the local government could be instrumental in improving policy actions. Participants described how collaboration between national and local level governments and extended funding and support could help incentivise an area for prevention action that is currently being overlooked. The lack of leadership from the national government was felt to hinder local action by failing to provide a strategy that coordinated with national-level action.

“They (local government) need national government leadership and support...And I had a conversation with someone recently around how important it is that not only do we have a national food strategy, but we also have local foods strategies that are part of the requirement of that national food strategy. So, we have this consistency...” (Participant 2, Academic or Knowledge Broker).

Additionally, there was collective agreement among the participants that the requirement for a joined-up approach to obesity prevention was essential. The participants articulated their perspectives of a joined-up approach in different ways. Terms such as ‘cross-government, system-wide, cross-party’, and ‘cross-country governance’ were used to express participants’ perceived importance of greater collaboration and synthesis within the prevention approach. The participants’ views related to the need for a joined-up approach can be summarised as the requirement for greater collaboration, focus, and commitment between governmental departments and parties as well as between central and local powers to ensure that a clear long-term prevention approach is developed and implemented to reduce obesity rates.

“There is potentially something lacking in like a whole system's lens and approach to obesity prevention... the National Food strategy touched on it...bringing different sectors but like a kind of multisector, and... cross government buy in type policy is missing... because normally...these policies are quite are quite siloed” (Participant 14, Public Sector Official)

The participants often complained that policies are surface level and approaches narrow in focus. Multiple participants discussed the need for improved collaboration through a whole government, joint-up approach to facilitate the implementation of policies, particularly regarding policies with the capability to influence the structural drivers of obesity. For instance, engaging with government departments outside food and health that can influence the drivers of obesity beyond the realms of food policy.

“And that's everything from banning energy drinks to your 16-year-olds back in 2016... through to the more recent stuff around placement, advertising, and buy one get one free

deal. All those also focus on the relatively proximal factors that are driving obesity, they're not considering the wider system implications of the wide system drivers of obesity, and that will require a much more of a whole government approach that's coherent across different departments" (Participant 1, Public Sector Official).

Another overlooked policy approach discussed by a small number of participants indicated that there was a missed opportunity in failing to align the obesity prevention agenda with other issues that could be addressed through similar interventions. Combining obesity prevention with other societal challenges such as climate change and food insecurity was believed by these participants to maximise support, increase resources, and utilise political momentum from more than one policy area.

"It should be nutrition, insecurity, obesity, climate change... they're all very similar. And so, it is about aligning those strategies. And having that sort of whole government approach to policy development and policy implementation. And it needs to be economically viable. It needs to be commercially palatable; it needs to be palatable to society" (Participant 2, Academic or Knowledge Brokers).

One participant presented a distinctive point of view and argued that prevention initiatives do not consider those who already have obesity, leading to the participant's concern that as weight management strategies decrease and prevention measures persist, individuals with obesity will be overlooked. The participant emphasised the necessity of incorporating effective weight management techniques with prevention measures.

"...There is no consideration in any of the last 10-15 years in obesity policy of people with obesity...when you read it, they are all preventative actions... But they are focused on the one in three adults that do not have a problem and the two in three kids that do not have a problem...There's no funding, there's no investment. There's no research investment. There's no structural change" (Participant 9, Academic or Knowledge Broker).

4.2.4 The Barriers and Facilitators to the Implementation of Food Policy for Obesity Prevention in the UK

The third theme explores stakeholders' perspectives on the key barriers and facilitators of effective policy implementation. This broad theme is further divided into five main sub-themes: inconsistency in government commitment to obesity prevention, diverse stakeholder engagement within the policy process, industry activity in the policy process, and opposition to state intervention.

Government Commitment to the Obesity Prevention Agenda

Government commitment to obesity prevention was a reoccurring theme throughout the interviews with all participants and is integrated with the theme 'policy shortfalls'. The UK government's commitment to obesity prevention was perceived as a vital barrier and facilitator of effective policy actions. Most often, the participants described feeling that commitment was insufficient to address the obesity problem.

The participants frequently voiced their concerns about the inconsistency in the UK government's commitment to policy, with some noting an increase in commitment but acknowledging the inconsistency, whereas others viewed the inconsistency as evidence of a lack of genuine dedication from the government. Overall, inconsistency in commitment was perceived as a significant barrier to effective policy implementation. Several participants expressed concern that the surge in government commitment, as demonstrated in Tackling Obesity (2020), would be short lived ^[179].

"Basically, Boris nearly died of COVID linked to his obesity. And then suddenly, six months later, there's an obesity strategy that comes out... that is not a long-term commitment to one of the most complex public health issues that we face on our planet..." (Participant 9, Academic or Knowledge Broker).

The participants discussed how inconsistency in commitment was a significant barrier to policy implementation. Many described how the proposed policies have never reached

implementation, have been watered-down, or have been postponed. The participants thought that obesity prevention is often unattractive to the government because it is highly political, difficult to establish tangible indicators of policy impact, and requires a long-term lens that is at odds with short-term cycles of governmental power.

“(the approach to obesity prevention) It needs, in my view, a long-term strategy that people, you know, commit to, yes, it's going to have to change. But actually, it's some kind of long-term strategy and how do you develop that with government having short terms?”

(Participant 2, Academic or Knowledge Broker).

Furthermore, the participants also discussed how the popularity of individual responsibility framing over the past few decades indicates low levels of governmental commitment to obesity prevention policies. Individual responsibility framing was described to be entrenched in past action and was perceived to have a lasting impact on policy.

“I think the kind of legacy of that... focus on individuals is still being felt, and that is a very divisive narrative.” (Participant 11, Public Sector Official).

The participants agreed that the popularity of individual responsibility within the present and past governments' approaches to obesity has reduced pressure on governmental action, removing responsibility away from them and shifted the burden on to the individual.

“The political mindset of current government...their framing of the issue is all about individual and individual personal responsibility... if you frame things in that way the emphasis is always on the individual's change, not government” (Participant 8, Academic or Knowledge Broker).

A few participants discussed how they believed the responsibility for obesity prevention was avoided by the government. These participants explained how the government has placed responsibility on the individual and health care, followed by the food and drink industry, while failing to actively take ownership or responsibility themselves.

“If you actually read the obesity policies, it talks about the food industry's responsibility, and individual's responsibility to act appropriately in this obesogenic environment. And it's almost devoid, takes no responsibility for any actions at all”. (Participant 9, Academic or Knowledge Broker).

However, some participants described optimism towards government commitment at the time of the interview. These participants described how Tackling Obesity (2020) showed greater commitment to industry regulation and legislation of policies than previously seen, suggesting greater commitment by the government ^[179].

“And whilst the out of home calorie labelling is quite a controversial policy in itself, getting obesity prevention policy in law is extraordinary. And I think, I hope that it really sets a precedent for future policies that are coming through to be written into law. I think the momentum to get that through. I don't think it's been seen before” (Participant 14, Public Sector Official).

Management of Obesity Prevention with Other Political Priorities.

Many participants discussed how other priorities are often pitted against one another rather than being managed simultaneously. Some of these participants outlined the difficulty of sustaining high levels of commitment, while other crises and issues receive considerable political attention. For instance, a case from the data related to government focus on aspects of the healthcare system over prevention efforts due to governments' ability to introduce action in short-term timeframes, resulting in quick impact and concise indicators.

“The response side seems to always trump any sort of prevention...there's always something more immediate and in a response capacity and prevention is a long-term thing. It's trudging away in the background.” (Participant 14, Public Sector Official).

Political crises were described as a further barrier to political commitment: Covid-19, Brexit, the Ukrainian war, and the cost-of-living crisis were all discussed as examples that have led

obesity prevention efforts following Tackling Obesity (2020) to be deprioritised ^[179]. Some participants expressed frustration with government action failing to simultaneously commit to obesity prevention while other important challenges occur, for example, participant one described how the cost of living crisis was used as a justification for abandoning the restriction on multi-buy deals included in Tackling Obesity (2020) obesity prevention strategy.

“Because of the cost-of-living, price is being used as an excuse for going back on policies that have some kind of potential economic implication on your choices. ...” (Participant 1, Public Sector Official).

Some participants highlighted that Covid-19 has exposed the difficulty of maintaining government commitment, alongside other challenges. Covid-19 was thought to have resulted in the publication of Tackling Obesity (2020) and led to a greater discussion of prevention efforts ^[179]. However, some participants explained the difficulty of talking to policymakers and civil servants about obesity and food policy more generally, while they were focused on mitigating the impact of the pandemic.

“There’s less teams writing policy on these things. And then there’s less people, there’s less money for research, because covid has hoovered up lots of cash from the big funders. And then also, there’s less time for ministers and less parliamentary time to legislate on it. And so, you get this real combination of factors, and then also you get a sort of almost a regulatory chill from it” (Participant 11, Public Sector Official).

Diverse Stakeholder Engagement in the Policy Process

Many participants discussed the inclusion of a broad range of stakeholders in the policy landscape. Engagement from a broad range of stakeholders, including industry and non-governmental stakeholders such as NGOs and advocacy groups was generally believed to be a vital facilitator of policy implementation. The participants suggested that engagement had increased due to decades of policy development as well as greater societal awareness of the extent of the obesity problem. Participants often celebrated broad stakeholder engagement

in policy, some participants described how the quality of policies could be improved by utilising a variety of expertise and perspectives. In one instance, a participant described the inclusion of multiple stakeholders representing a variety of perspectives in workshops on developing prevention strategies. The inclusion of multiple stakeholders was not only believed to facilitate policy implementation but also assist in mitigating adverse policy outcomes.

“...there was a big workshop, and when we reviewed the draft strategy, a wide range of stakeholders from government, from local health bodies, nutritionists, dieticians, policy makers, it was really interesting, and they went through it, and they sort of said, we think this is positive, this could potentially be a barrier or unintended negative impact so that the wording could be amended and changed” (Participant 13, Public Sector Official).

Among the participants, there were various perspectives regarding the role of the food and drink industry in the policy process. However, some participants felt that greater engagement of the food and drink industry in policy development was an important facilitator of effective implementation. Some believed that industry engagement can act as both a facilitator and barrier. From this perspective, the engagement of industry stakeholders was a policy success.

“The voluntary reduction or reformulation program... I sat in meetings where the whole, you know, big players of breakfast cereals, or all the categories that are involved in the sugar reduction program, sat in one room, and had a conversation about how to go about reduction in the formulation... that is quite unprecedented to have all those key players in one room...it's not necessarily a measurable success. I think... that kind of engagement with industry throughout the reduction in formulation programs, has been a success.” (Participant 7, Civil Society Advocate or Representative).

As the quotation above outlines, participants discussed how engagement from non-governmental stakeholders has helped push through prevention efforts and legitimised obesity prevention, not only on the political agenda but also on the agenda for stakeholders that are central to effective implementation.

“... it does seem to be on everyone's radar. And it does seem to be often the top of health agendas at least.... it's not a case of reminding people to put obesity prevention on the agenda anymore. It seems to be more of a standard” (Participant 7, Civil Society Advocate or Representative).

The Influence of Industry Activity

The third theme explores the participants attitudes towards the influence of industry activity as both a facilitator and a barrier to effective policy implementation. The participants broadly believed that the activity of the food and drink industry acts as a barrier to policy implementation.

“I've been completely blown away by the influence that the food industry has on government's attempts to address the issue.” (Participant 14, Public Sector Official).

For some participants, industry activity was the largest barrier because of the industry's resources, power, influence on government decision-making, and ability to shape public opinion. Some of these participants clearly outlined the dichotomy between policy and industry aims regarding profits. Industry activities to protect and advance profits were described as motivating industry activity to block, delay, or water-down upcoming policies.

“Food companies make a vast amount of money out of selling us processed food and ultra-processed food, it's in their interest to sell us more and more and more... they will be an advocate against any policy that affects their sales when their sales are determined upon the population having more and more ultra-processed food” (Participant 8, Academic or Knowledge Broker).

Many participants drew parallels between the food and drink industry and other unhealthy commodity industries (UCI), such as the tobacco and alcohol industry, in their attempts to diminish the validity of research or manipulate evidence to support their agenda. Some participants felt that the industry would use any justification to stop or slow the

implementation of a policy that may have a negative impact. One participant discussed how the arguments used by industry often contradict one another.

“Kellogg's have sued government for... using the nutrient profile model for cereal. And that just comes down to such a petty technical technicality. And it's the circular arguments that they make, because they sort of say, 'Why bother with this policy is not going to have enough impact, disproportionate to the burden on businesses', in the same breath, 'We're suing you, because clearly, it's going to have an impact on our sales, and we're worried about it'... they'll poke holes” (Participant 14, Public Sector Official).

Participants also provided other examples, including instances in which the industry tends to inflate adverse outcomes resulting from policies. Additionally, they pointed to instances where industry presents economic claims regarding potential harm to the economy and logistical arguments concerning their inability to fulfil policy requirements.

“They're putting together things like cost-of-living argument saying that they can't prioritise reformulation policies or they can't because they can't afford the operational changes that are going to be necessary and of course that that's rubbish but... they then link that to increase use of food banks and they're feeding into this narrative that they know that constituents will be complaining to MPs about” (Participant 7, Civil Society Advocate or Representative).

Furthermore, a few participants described their frustration with industry engagement in policy areas due to their ability to position themselves as part of the solution and in doing so enhance their reputation. One example discussed was industry activity in interventions for food insecurity. The participants reported that the food industry donated products and provided financial aid to food banks but were uneasy with the industry's involvement in addressing food insecurity while also driving the obesity problem. This creates a complicated policy landscape in the broader context of food policy.

“Some of those food banks are perhaps less conscientious than I might be about where they get their food from, where they get their donations from, where they get their associates.

For now, I appreciate the pressure is to have food. But we need to think about health at the same time. So, we got things terribly, terribly wrong. If, you know organisations, for example, take money from Coca Cola in an effort to provide food and that's just simply wrong.” (Participant 8, Academic or Knowledge Broker).

The participants also discussed the resource gap between the industry and oppositional stakeholders, including the strength of the relationship between industry and government officials. Participants discussed how industry utilises these relationships and has the capability to provide support for officials through “*funding meetings, funding hospitality, and offices*” (Participant 7, Civil Society Advocate or Representative). The participants who discussed the resources of industry described how political will could be influenced as a result.

However, not all participants understood industry activity to be a barrier to implementation. Some participants, particularly those with experience with industry, suggested that the industry can comply and adapt to policy if the policy is well designed and well enforced. These participants saw existing industry activity as the natural outcome of business and considered the lack of government commitment to regulate industry as the barrier to implementation rather than industry activity itself.

“But we need to see much more effort by government to push on the food industry to reformulate, whatever the food industry says they can do it. And they can actually do it, when they have to, very quickly and fairly easily at much less cost” (Participant 8, Academic or Knowledge Broker).

Furthermore, some participants explained the problem of approaching the industry as a homogenous group and failing to consider the parts of the industry that may be more willing to adapt to public health aims. A minority of participants perceived the industry to be able to facilitate policy implementation, and they felt that if managed appropriately, the industry could facilitate policy implementation under appropriate circumstances. Introducing a clear, cross-party strategy to form a sustained level playing field was

considered the most appropriate approach, as most thought that relying on industry to act voluntarily or in the spirit of a policy was unrealistic.

“There's certain companies that are more willing to move. And then there's others that are much more reluctant.... But actually, I do believe companies want that (a long-term plan for prevention), because they want to know how to invest” (Participant 2, Academic or Knowledge Broker).

Opposition to State Intervention

Throughout the interviews, the discussion on the impact of political ideology on the policy landscape was extensive. The participants often discussed how public health can be labelled as restrictive of liberties, anti-choice, anti-economy, and anti-business. Furthermore, many participants described how governmental opposition to state intervention was often the result of popular ideology that aligned with political fears regarding nanny-state labels or the restriction of individual liberties.

“Especially in the context of regulating industry, because it's seen as really anti-competitive and anti-jobs and anti-economy to regulate an industry...And then I think they just get weaponized by like, the mostly the right to say... you're just going to cull jobs... and say things like it's anti-choice, which is proven to be rubbish, because after the soft drink industry levy we've actually had more variety of drinks than we did before.” (Participant 10, Academic or Knowledge Broker).

Some participants felt that this barrier was specifically associated with right-wing political standing. Participants frequently summarised Conservative doctrine as pro-market and anti-restriction. However, a small number of participants contradicted this view and argued that reluctance was present in all political parties' present doctrines. Furthermore, the implementation of the SDIL under Conservative leadership demonstrated that policies can still be implemented even if they are not considered consistent with the party's doctrinal stance.

“It was kind of a bit of a miracle that the soft drinks Levy ... the PM sort of essentially did a U-turn on his opinions on sort of more restrictive and state intervention type obesity prevention policies...And obesity is such a tricky one, because people still have the mindset of sort of free choice, and it should be all individual. And that's very much the conservative mindset... it's still such a tricky one to try to bring in more restrictive type policies in this current political environment” (Participant 14, Public Sector Official).

Consequently, implementing restrictive policies that confront barriers related to political ideology was described as an uphill battle. Policy implementation was perceived to be most affected by this barrier when political parties are at risk or under pressure. Some participants described how the government has used obesity prevention policies as a bargaining chip to protect popularity and, as a result, has relied on policies that fit within an ideological standpoint rather than relying on the evidence base.

“I genuinely believe that some of these U-turns are ideological, but...when under normal circumstances, political leaders wouldn't be under pressure and wouldn't have to make stupid decisions. But they are under pressure. And I think they're making stupid, ideologically forced decisions.” (Participant 9, Academic or Knowledge Broker).

The Role of Local Level Government in Obesity Prevention

Participants frequently cited the local government as underutilised for obesity prevention. They recognised the local government's position within local constituencies and familiarity with the population as valuable assets that could facilitate successful policy implementation at the local level.

“The value that it brings is to understand the population... that's the underlying thing. They've got some powers which relate to it as well... So, then it's how do you best utilize that local relationship knowledge understanding? That's hard” (Participant 1, Public Sector Official).

However, the participants agreed that there were significant financial barriers confronting local governments. Some participants described the wasted potential of the local-level policy impact due to the reduction in funding from the national government. Participants felt that the bespoke benefits of local level knowledge of communities are currently wasted.

“Local authorities who are in a better position in government to assess it on the ground, simply have no money” (Participant 8, Academic or Knowledge Broker).

Furthermore, some participants blamed the low levels of national government commitment to wider obesity prevention and Conservative adoption of austerity policy as the cause of the decline in the resources for local governments

“I believe that austerity has been incredibly damaging, and just a sort of rip the heart out of the infrastructure needed to have the right people to be able to really grapple with some of these issues. When I'm working with local government, people now, whereas 15 years ago, there'd be a collection of people all working on this one thing, now one person is working on it part time now.” (Participant 9, Academic or Knowledge Broker).

4.2.5 Participants' Perception of Consideration of Inequalities in Obesity Prevention Policy

The fourth theme in this chapter explores participants' views on the consideration and management of inequalities in the obesity prevention policy process. This broad theme is split into three distinct sub-themes: governmental commitment to tackling inequalities in obesity rates, health equity in policy and connecting wider inequality prevention with inequalities in obesity

Among the participants, there was a unanimous view that reducing inequalities in obesity rates was necessary to reduce wider health inequalities in the UK. Participants acknowledged the complexity of devising obesity prevention strategies that effectively address inequalities. The participants described the difficulty of influencing inequalities when prevention strategies at present struggle to influence absolute obesity levels.

“It's very hard sometimes, despite everybody wanting to do it, to actually reduce that gap between the more advantaged and the less advantaged. I think you can have an impact upon absolute levels of obesity. So, in other words, reducing them for everybody should be fine. But reducing that gap is very, very hard Indeed” (Participant 8, Academic or Knowledge Broker).

Governmental Commitment to Influence Inequalities in Obesity Rates

This theme will outline participants' perspectives on government commitment to tackling inequalities in obesity. The participants were reluctant to state their views on government commitment to reduce inequalities in obesity because of the common perspective that governments' commitment to obesity prevention was generally substandard. Among the participants, commitment and prioritisation of inequalities in the Scottish and Welsh governments were described to be more distinct in comparison to the UK Government. A small number of participants felt that UK Government's commitment had reduced under Conservative leadership. These participants discussed how inequalities more generally were no longer at the core of the parliamentary agenda unlike their perspective of the approach taken prior by the Labour government.

“The reason why the Labour stuff worked so well is because if any government department wanted to get any money at Treasury, they have to say what they were going to do in regard to equalities” (Participant 1, Public Sector Official).

A few public sector representatives and civil society advocates and representatives felt that the naming of the Office of Health Improvement and Disparities demonstrated reluctance to commit to tackling inequalities. Participants were concerned that the use of the word 'disparities' failed to acknowledge the significance of health inequalities in the UK.

“This new office that's been set up to replace PHE, they call themselves disparities, rather than inequalities. And what on earth does that mean?... And I do wonder if that's maybe a strategy from the government to kind of ignore that there are such huge health inequalities across the UK...” (Participant 7, Civil Society Advocate or Representative).

These participants named the ramifications of the 2008 recession and the nature of the political doctrine held by the Conservative government as potential reasons for the reduced focus on inequalities. Some of the stakeholders who had experience working with national- and local-level governments under both the Labour and Conservative governments described a stark difference in their experiences of working with civil servants.

“I spent a lot of time with people at local government and central government...it was almost like a switch change... if I'd have been in 2005, I'd have been sat with the civil servants who were all like, how do we collectively work together, tell us what we need, and we'll go and fight really hard for the money. And then we collectively will go on and do our best to solve this problem. And at the heart of it was people and citizens... five years later... the experience I had was people that very much were like, got no money, what do the population expect? ... They need to sort themselves out. And I'm sat there going, I was at with people that five years ago would have done everything in their power, like me to look after these people...” (Participant 9, Academic or Knowledge Broker).

Furthermore, the participants frequently linked the popularity of individual responsibility and the opposition to state intervention to the government's commitment to tackling inequalities. The popularity of individual responsibility and low levels of state intervention were prioritised over the reduction of health inequalities.

“I think they talk about the need to deal with inequalities and levelling up. However... particularly at a national level, it's at odds with that because it's about focus on the individual and personal responsibility and reduction of the state... they will have a view of minimal state and... it's about personal responsibility... But it's not recognising that culturally and educationally some people will need more support rather than an app or a leaflet...” (Participant 12, Public Sector Official).

Despite the majority view that inequalities do not receive adequate commitment from the government, one-third of the participants recalled an increase in the discussion of inequalities during and after Covid-19. However, some of these participants felt that the

dialogue around inequalities remained tokenistic and lacking in practical policy action. *“I don't think the policies that are implemented match with the rhetoric on inequalities...but I do think there is recognition that inequalities are important” (Participant 1, Public Sector Official).*

Lastly, throughout the interviews, some participants discussed the severity of food insecurity in the UK. These participants described how the use of food banks have become an increasingly normalised part of UK society, particularly as a result of the financial hardship faced by many due to Covid-19 and the cost-of-living crisis.

“It's the norm in British life that a certain percentage of people need food banks” (Participant 8, Academic or Knowledge Broker).

These participants voiced their disappointment with the government's apparent disregard for the widespread reliance on charity-run food banks and the absence of government initiatives targeting the underlying causes of this issue. They emphasised the tolerance of significant food bank usage as an indication of the government's complacency in tackling socioeconomic inequalities.

“They (food banks) are not a solution, and they shouldn't be a solution and the fact that they are being treated like that is not acceptable...” (Participant 4, Civil Society Advocates and Representatives)

Health Equity in Policy Outcomes

Most participants did not believe that existing population-level policies considered the structural drivers of obesity that are linked to inequalities. The study participants acknowledged the significant differences in the lived experiences and environments among individuals from various socioeconomic backgrounds and noted that these differences were not adequately addressed in policies. Participants described how the practical application of policies in diverse environments, coupled with the unique lived experiences of individuals

from different socioeconomic backgrounds, could result in discrepancies in the impact levels of the same policy, with varying degrees of effectiveness dependent on an individual's SES.

“I think there's that big issue as well around this... price and location promotions. And I know that there's a policy coming in place. But I just wonder, again, to the extent that that's going to actually deal with the issue... only dealing with those large outlets... But it's not taking into account that many people in the country just don't have access to that (supermarkets)... what they have is a corner shop...” (Participant 7, Civil Society Advocate or Representative).

Participants frequently considered the degree of individual agency to be a measure of the potential equity of policy outcomes. However, there was also an underlying concern that obesity prevention policies have historically favoured high-agency approaches, which may result in less equitable outcomes. Several participants expressed apprehension that these policies may disproportionately benefit those who possess the resources and ability to comply actively with the policy's desired outcome. One participant articulated this concern as follows.

“(Food policies) It's realisable influence is in my mind, will influence the people that have the means by which...they can put into practice... So, the worried well are much more likely to benefit from the food policy, because the...simplicity of it. It's simplistic, therefore it meets the needs of those that can put it into place” (Participant 9, Academic or Knowledge Broker).

The popularity of individual responsibility framing (see Section 1.5) throughout the policy process, coupled with failure to consider the structural drivers such as poverty, was associated with the long-term commitment to high agency policies within obesity prevention strategies.

“Over recent years, they've increasingly focused on individual level approaches, that's basically approaches that require the individual to actively participate in their behaviour when we know that actually the major drivers of obesity sit outside what the individual is able to influence, such as the wider socio-economic circumstances. And a lot of the more

population level obesity policies haven't been implemented, even if they have been promised.” (Participant 1, Public Sector Official).

Some participants offered a more optimistic perspective and believed that Tackling Obesity (2020) offered a clear commitment to policies that were more equitable in their outcomes [179]. Furthermore, a few participants acknowledged that the strategy recognised health inequalities resulting from obesity, but perceived acknowledgements as limited to rhetoric.

“So past strategies... much more focused on individual responsibility, where I think the most recent strategy was making an attempt to have a more equal environment, which we hope will have a good start at addressing inequalities, inequalities are complex, they're very embedded... it's not going to change immediately overnight...” (Participant 2, Academic or Knowledge Broker).

Furthermore, local governments were perceived as having the potential to implement equitable interventions that directly relate to their local constituents' experiences through tailored measures. One participant provided an example of how interventions at a local level can work for and with local communities to create direct health benefits: *“One of the interesting things that they've done was around cooking oil. So, they'd worked with all of the traders to get them to use a better-quality cooking oil and get a label... what was going on with the fried chicken places is there was actually consumer led change as well... people were coming in, particularly younger clients, more informed, saying I don't want that, so they themselves are changing” (Participant 12, Public Sector Official).*

Despite the expected impact of local government interventions, the barriers to local-level action were acknowledged. Some participants noted that higher-income areas may be best positioned to influence obesity rates and improve diet quality due to their resources and the likelihood of less severe obesity related challenges, highlighting the potential for inequitable outcomes, as wealthier local governments possess greater resources to implement effective interventions.

“What you see is the more affluent communities and cities have much more scope... to be able to act and smaller ones haven't. And that in many ways can further exacerbate inequalities. (Participant 2, Academic or Knowledge Broker).

Stakeholders' Perceptions on Tackling Obesity Inequalities with Wider Inequalities

The participants discussed the lack of collaboration between policies targeting broader inequalities and obesity prevention. As discussed, the impact of structural determinants of obesity, such as the built environment, were thought to be exacerbated by existing inequalities. The participants discussed the benefits of considering obesity prevention and health outcomes within policies addressing wider inequalities. It was believed that many key areas for reducing obesity inequalities are not limited to food policy.

“Policy is really only going to be successful if we're going to address some of these other underlying health inequalities and broader inequalities... Some of the barriers that people faced, are not actually within the realms of food policy...” (Participant 11, Public Sector Official).

The participants generally agreed that enhancing the synergy between broader policies aimed at addressing inequalities and obesity prevention could be an effective step in mitigating disparities. Approximately half of the respondents highlighted the lack of collaboration in this area. Some participants expressed concern that the oversimplification of obesity prevention in recent decades has resulted in policies that are considered in isolation from one another. They often discussed disparities between policy areas, gaps, and limitations in policy that could be remedied through greater collaboration and joined-up thinking.

“On policies that tried to address underlying determinants. So, income inequality, educational stuff, they are very much what my interpretation is... if they do exist, they exist in silo, and not necessarily with the purpose of, hey, actually, if we start focusing on income inequality, this is going to have beneficial health outcomes...I don't feel like policies like that are necessarily linked up very well.” (Participant 14, Public Sector Official).

Some participants highlighted the negative consequences of failing to integrate overlapping issues related to inequalities and obesity. These participants acknowledged that well-intentioned policies or interventions could inadvertently cause harm without considering other related outcomes that fall under the umbrella of food policy. For instance, providing people with food without considering its quality or long-term impact on individuals' food behaviours can lead to unintended negative consequences.

“I think probably overall, in the UK, there's still a bit of a disconnect between policies that are around ensuring people have enough food...and, nutritious food... we still tend to talk about those things as two different things, but actually, it should be one in the same.”
(Participant 4, Civil Society Advocate or Representative).

Participants described that food insecurity interventions are often focused on ensuring an appropriate quantity of food rather than considering the quality of food. The participants believed that the silos that exist within food policy resulted in the failure to bring together food insecurity targets related to food provision with obesity prevention goals.

“I really do think in the UK, we need to move away from food insecurity and talk about nutrition insecurity. There's a real need for that, because food insecurity is about adequacy. And nutrition insecurity is about... the level of nutrients that you're getting, and how healthy food is. And I really do think that needs to be reframed. And actually, now is the time to be doing that. Because it we've got the cost-of-living crisis.” (Participant 2, Academic or Knowledge Broker).

4.2.6 Mechanisms to Enhance Policy Impact

The final theme to emerge from the data examined participants' perspectives on the mechanisms and strategies for enhancing the effectiveness of the policy. This overarching theme is divided into four distinct sub-themes: the effective dissemination of research findings with two linked sub-themes, the incorporation of lived experience and community voices, and broad networks for policy impact, followed by the role of the food and drink

industry in enhancing policy impact, monitoring and evaluation of policy outcomes, and the value of global research sharing.

Effective Dissemination of Research

One of the most held views among the participants was the significance of effectively disseminating research findings. These participants considered dissemination as a bridge between research and policy impacts. Several stakeholders expressed their opinion that there is a greater opportunity to disseminate academic research more effectively to enhance its practical application.

“I think what happens a lot is there is academic research done, but there's no real effort to look at practical application and rollout. So that's the gap” (Participant 12, Public Sector Official).

Participants emphasised the importance of publications in academic journals while acknowledging the impact of ensuring that research findings are not limited to the academic community.

“And it's about how we communicate our evidence. And in academia, impact is becoming more important, but it's not, It's still about our big papers... and that's great. But it needs to be in digestible format” (Participant 2, Academic or Knowledge Broker).

Several participants offered additional perspectives on how evidence should be conveyed during dissemination. The terms "accessible," "digestible," and "inclusive" were among those discussed. These individuals argued that the dissemination of findings should consider dialogue without the excessive use of technical jargon to ensure that it is comprehensible to individuals who are not experts in the field. They believed that jargon-free, quick-bite formats were most effective in reaching the widest audience and capturing the attention of policymakers. Additionally, these participants emphasised the importance of contextualising the findings within the broader cultural, political, and economic landscape.

“But there needs to be a like, yes, the academic output. But that's not the real output. The real output is how you use that then to describe its relationship with current obesity policy, its potential impact on future obesity policy and how it relates also to the political value systems that are in place at the time. And without that breadth, you're not going to get any traction in what's going on” (Participant 1, Public Sector Official).

Additionally, these participants emphasised the importance of considering the broader political context in which research findings are disseminated, including the dominant ideological perspective of the government, group, or organisation when relevant. The potential impact of the findings may be enhanced by presenting research in a way that invites discussion and consideration from multiple perspectives.

“I think it's we need to make sure that when we're advocating things to policymakers, we're aware of their political ideology. And we don't want to rub up against that, but we need to make sure that our argument aligns to some extent to a way that can gently rub away at that” (Participant 2, Academic or Knowledge Broker).

The notion that public health often faces ideological barriers was linked to the recognition that health prevention and obesity prevention are frequently associated with anti-choice, pro-state intervention, and pro-nanny-state framing (See section 1.5). This framing was described to risk policy impact, as health prevention is often assumed to be at odds with certain political ideologies. To address this, some participants suggested disseminating research findings in a format that is not aligned with any particular political party. Therefore, these participants emphasised the importance of being mindful and understanding ideological considerations when disseminating research to overcome these barriers and achieve greater policy impact.

“The public health community are quite left wing and that's not necessarily a bad thing. But I think it means that it can become quite oppositional, we're not always seeing the other side of the argument very clearly. And I don't think often challenging ourselves with the opposing ideology, and I think doing so more frequently would be helpful...” (Participant 10, Academic or Knowledge Broker).

Some stakeholders discussed how wider support for policies from a broad range of stakeholders and the public was also believed to be improved by effective dissemination. Cultivating support for policies was believed to be essential to ensure effective implementation; therefore, some participants felt that this was a hugely important outcome of effective dissemination.

“(in discussion of restriction promotions of HFSS products) I very much felt I could get behind because there was good evidence there to suggest that actually, promotions were costing people money, people were ending up spending more because of promotions... the evidence showed, which was reassuring because I really didn't feel that we were going to cause unintended consequences of people ending up spending more on food, let alone junk food.” (Participant 14, Public Sector Official).

The Inclusion of the Lived Experience and Public Perceptions

The second theme explores participants' views on the inclusion of lived experience and community voices in the policy process to enhance policy impact. Participants shared their experiences of how storytelling can generate greater attention and consideration of research findings and proposed policies by forming a personalised narrative around the policy aims. The inclusion of the lived experience was described as transcending the traditional channels of discussion involved in policymaking.

“I think one of the really great things about working with young people is their storytelling, the sort of the power of lived experience... I think joining that up with rigorous, you know, the quantitative data, for example, with the lived experience... But if you bring that to life with a roundtable, for example, where you put young people and policymakers in the same room.” (Participant 4, Civil Society Advocate or Representative).

Furthermore, including the lived experience was felt to ensure that the realities of individuals' experiences are heard by stakeholders, who may lack in-depth awareness. Some participants expressed the impact of including the lived experiences of individuals who do

not reflect the norm and how the inclusion of this voice can help generate support and commitment to a policy. For example, one participant discussed their experience of incorporating a voice representing a lived experience of weight stigma, which resulted in their appreciation of the importance of tackling societal stigma through policy.

“[Organisation] had a conference recently where somebody with obesity was talking about their lived experience of how she was treated, and it was truly horrifying” (Participant 8, Academic or Knowledge Broker).

Utilising Networks for Policy Impact

Networks were also vital to policy impact according to many participants. Although there were discrepancies in the participants' perspectives on what a network consisted of, it was generally agreed that they comprised academics from diverse research fields, advocacy groups, civil servants, local and national government representatives, and members of the global public health community. The participants described the nature and importance of these networks, which included both formal and informal networks. Informal networks were primarily the focus of discussion, but this led to conversations about the challenges of gaining access to these networks and the need for approval from a gatekeeper. The participants acknowledged that interactions between networks can significantly enhance the influence of research findings; thus, the value of networks was a unanimous view among the participants.

“I think also things like trying to make informal connections with policymakers, because to me, the model I understand is that quite often, people working in civil service and policy, you'd have the sort of small network of trusted academics that they call up and say, “Oh, what's your opinion on this?”, “Who should I speak to?” (Participant 10, Academic or Knowledge Broker).

Selected participants, particularly those outside of academia, felt that utilising networks prior to the completion of research can help ensure that research is focused on upcoming strategies, consultations, or debates.

“It's important to... include relevant actors throughout your research process... and knowing what type of research is going to be necessary” (Participant 6, Civil Society Advocate or Representative).

Participants from the civil society felt that collaboration between civil society professionals and academia is often overlooked during research development. Including the expertise of civil society groups was believed to form greater links between research outcomes and the government's requirement for evidence, resulting in enhanced impact from research findings.

“I think just sharing more with the... campaigners, I think sometimes we might have, like more direct communication channels... our job description is to influence government, like we know when those opportunities are” (Participant 4, Civil Society Advocate or Representative).

Furthermore, the utilisation of networks was thought to ensure that policymakers are made aware of the evidence base when required. The participants discussed how the timeline of academia and policymaking do not necessarily match. Policymaking was perceived to be quick and often missed because of the slower pace of research development. Therefore, these participants discussed the importance of informal networks sharing emerging research findings to match the requirements of policymakers.

“...if we're building relationships with government departments and... we need to make sure that we've given them the right evidence, the right data and the right messages so that they can be sent up at the right time... They want things as thing they're emerging so that they can be sent up in response and policy briefings... when they're needed” (Participant 2, Academic or Knowledge Broker).

Furthermore, several participants acknowledged the value of establishing interdisciplinary networks that could span various research and policy sectors including climate change.

These networks, according to some participants, could facilitate future partnerships and collaboration among policy areas with shared objectives.

“I feel like some policymakers, and even some people who maybe opposed to traditional public health interventions are swayed more by a... climate-based policy, or argument. And I wonder if there's scope for us to sort of like piggyback off of climate policies... (Participant 10, Academic or Knowledge Broker).”

Perspectives on the Food and Drink Industry’s Role in Enhancing Policy Impact

As discussed, participants drew parallels between the role of the food and drink industry and other UCIs, such as tobacco and gambling. There were some opposing views on the role of the food and drink industry in the policy process. Some participants were opposed, suggesting that the industry should not be included in setting policies that have a known knock-on effect on their profits.

“So, we need to be very clear as to how do we separate how government works from industry in that sense. I don't have a problem talking to industry. I don't think they should be in the same room when we're talking about public health policy.” (Participant 8, Academic or Knowledge Broker).

The participants acknowledged the distinction between the food industry and other UCIs as food is a necessity. Establishing the role of the industry was an area of debate among the participants, as some believed that there was no simple solution to exclude them from policy development. Instead, some participants believed that including the industry and ensuring their engagement with policy was necessary to achieve the desired impact. By increasing the industry's engagement with the obesity prevention agenda, the policy impact was believed by these participants to be enhanced by applying pressure to industry from within policy development, reducing the time spent mitigating industry pushback ahead of policy implementation.

“The work that has been done over the last well, at least probably six or seven years, is getting industry involved in the conversation and putting pressure on them to sort of take responsibility for the food that they're manufacturing and selling. And I think that the groundwork there for shaping the demand from consumers, but also getting on the agenda within the food industry, is probably a very good thing.” (Participant 14, Public Sector Official).

Monitoring and Measuring Policy Outcomes

Several participants expressed concern over the inadequate monitoring and evaluation of policies. This was considered a crucial aspect of policy development to ensure sustainability and improvement of a policy, as well as to build a foundation of evidence for future policies with similar characteristics.

“And really committing to more monitoring and evaluation of those policies as well... it's something that's really been lacking in the past, if we can get the advertising restrictions in place and actually see what impact that has, and where it needs to be strengthened. I mean, that would be a huge win.” (Participant 7, Civil Society Advocate or Representative).

They pointed out that there had been a history of ineffective monitoring and evaluation in obesity prevention, which impeded the implementation of new policies and hindered the advancement of existing policies. One participant discussed the benefits of monitoring and evaluating the ban on HFSS advertisements across Transport for London and how the generation of this data can lead to advancement in policies elsewhere:

“And it's really, really important that any policies are evaluated and monitored. Because obviously, that's... a really crucial bit of evidence that we can use for policymakers going forward. So that TFL ban can be used not just for TFL success, or it can be used not just for, you know, calling for an extension on outdoor advertising, but also on all of the online advertising policy as well.” (Participant 4, Civil Society Advocate or Representative).

Selecting an appropriate indicator to establish the impact of a policy was deemed an essential component of a policy's design that is often overlooked. Some participants acknowledged the difficulty of establishing an appropriate indicator, as obesity rates would not demonstrate any short-term changes. Therefore, the participants included the need for an appropriate indicator in their discussion of the necessity of measuring policy outcomes.

“Being able to find more creative ways of interim indicators for how a policy is working and progressing... linking a policy with obesity rates, it's just never going to happen, probably not in our lifetime, sadly, but having those alternative ways of measuring progress. And again, kind of the evidence base for that, I think is really important.” (Participant 14, Public Sector Official).

Research Practice at the Global Level

Some participants discussed the importance of the global agenda for obesity prevention. The participants discussed how the UK, at one point, was considered world leading in obesity prevention. One of the major global successes at this time was the knowledge sharing that occurred between UK and other nations: *“I would argue around that time, the UK was absolutely leading the way without a shadow of a doubt internationally. Because we had a lot of people coming from all over the world coming to visit, and effectively took taking our ideas” (Participant 9, Academic or Knowledge Broker).*

As other countries continue to implement different policies, sharing findings, successes and failures was believed to be essential to speed up the impact of policies and avoid wasting resources and repeating flaws in policy design. Furthermore, the participants discussed how governments respond well to the success of policies found in other countries. The SDIL was used as an example of the global domino effect of policy implementation when the impact of a policy is effectively monitored, and the results are shared.

“I think over 50 countries that have already added things like the sugar tax the soft drink tax... that's like an increasing number we can measure that over years...” (Participant 5, Civil Society Advocate or Representative).

Forming cross-country governance for obesity prevention was suggested to assist with knowledge sharing. In addition, one participant suggested that learning from the tobacco industry suggests that regulation in developed countries risks pushing industry activity into other nations. Therefore, global knowledge sharing, and cross-country governance were viewed to protect lower income nations from industry activities before the countries implement prevention strategies of their own.

“I sometimes struggle with the idea that we might, with all these like national policies coming in, we might just be squashing the activity of these kind of unhealthy food companies to low-income countries, as has happened for things like tobacco. And that ethically, like troubles me somewhat” (Participant 10, Academic or Knowledge Broker).

4.3 Discussion

4.3.1 Summary of Research Findings

The research has demonstrated that the drivers of obesity were widely acknowledged as multifaceted in nature, with the food environment recognised as the primary driver. The focus was specifically placed on the affordability and accessibility of HFSS and UPF products, as well as the unaffordability and low availability of healthy, fresh products. Several participants from the three stakeholder groups identified in this study believed that the activity of the food and drink industry was the dominant driver because of their role in shaping the environment.

The study indicated that the UK obesity prevention policy has progressed in recent years, forming a sense of optimism for future prevention efforts. The SDIL was cited as a turning point in the implementation of preventive measures and Tackling Obesity (2020) was believed to exemplify a more profound commitment than prior strategies ^[179]. Despite the acknowledgement of progress, the study found that the pace of progress was a key concern, along with fears that policies remain narrow and surface level, with numerous policy gaps

and loopholes that enable industry manipulation and undermine the overall effectiveness of policy outcomes.

This study found that weight stigma, infant nutrition, and interventions that incentivise the consumption of nutritious foods are missed in prevention efforts. This study highlighted the necessity of adopting a system-wide approach that transcends governmental boundaries regarding governmental departments and levels of governance, such as local governments, to develop a cohesive strategy that effectively addresses the underlying structural drivers of obesity. In addition, the study identified the benefits of removing silos in food policy, for example, integrating food insecurity with obesity prevention.

Various barriers to policy progress were identified in this study, including inconsistencies in government commitment, the cycle of proposed policies that failed to reach implementation, industry activity in the policymaking process, ideological barriers, and competing political priorities. However, the study also identified important facilitators, such as the increased engagement of a broad range of stakeholders, increased government commitment, and empowerment of the local government.

The research demonstrated that the stakeholders were knowledgeable about the connection between SES and obesity rates and recognised that the drivers of obesity tend to be more severe in areas with lower socioeconomic conditions, particularly regarding the structural drivers of obesity. Governmental commitment to tackle obesity and health inequalities was believed to be limited to rhetoric. The study revealed that stakeholders expressed particular concern about the consequences of policy gaps and loopholes for lower socioeconomic groups, who are already grappling with heightened drivers of obesity.

However, the study found that the prioritisation of inequalities in obesity was currently not a feasible approach because of the difficulty of forming effective prevention action at the population level. The importance of considering individual agency and the equitable outcomes of policies has been recognised as a valuable approach for ensuring that inequalities are accounted for within the development, implementation, and evaluation of population-wide policies.

This study uncovered numerous potential strategies that could enhance the policy impact of research as identified by the stakeholders involved. These mechanisms included greater dissemination of research findings, the utilisation of both formal and informal networks, improved monitoring and evaluating of policy impact with appropriate indicators, and greater knowledge sharing and collaboration with the global public health community. The study revealed a diverse range of opinions regarding the role played by industry in the policymaking process. While certain individuals contended that industry has no or a limited role in the process, others recognise the advantages of their participation, including the capacity to develop industry responsibility, improved engagement, and foster accountability.

4.3.2 Strengths and Limitations

The research conducted online one-to-one interviews as its methodological approach. Although conventional face-to-face interviews are considered the best practice, using digital interviews facilitates broader geographic coverage among participants. Furthermore, the timing of the interviews proved advantageous, as they were conducted during the removal of Covid-19 restrictions and while the cost-of-living crisis began to worsen. Consequently, the interviews were conducted during a politically turbulent period characterised by heightened policy activity following the release of *Tackling Obesity (2020)* ^[179].

The researcher created a list of eligible participants for the sample, which was later reviewed by the research supervisors and an external expert in the field affiliated with the SPECTRUM research consortium. This strengthened the sample as it ensured the eligibility of participants and guaranteed their expertise in the topic area. Despite these efforts, it is possible that some relevant stakeholders were not included in the target population. The sample was slightly smaller than initially intended because of uneven participation rates among stakeholder groups. Despite some recruitment challenges, a sufficient level of data saturation was achieved for the main themes in the dataset.

The participants in the study comprised individuals from Wales, Scotland, and England. This provided an array of perspectives and included preventive activities within Wales and Scotland. Although the discussion predominantly focused on UK Government policy activities, it would have been beneficial to have more stakeholders from Wales and Scotland and representatives from Northern Ireland to account for the differences in attitudes among stakeholders across devolved nations. Additionally, the study design intentionally excluded certain PSH, such as representatives from the food and drink industry, who would likely have offered a different perspective beyond what was captured in the study findings.

4.3.3 Relevance to previous literature

Insights into Stakeholders' Perspectives on the Modern Drivers of Obesity and Obesity Prevention Strategies

This study contributes to the literature on the perceptions and understanding of key stakeholder groups regarding the connection between food policies for obesity prevention and obesity inequalities. Few studies have examined stakeholder attitudes and experiences with the policymaking process in this manner. Prior literature has primarily focused on specific policies or specific government strategies ^[163,387–389]. Providing qualitative data on this topic is a beneficial step towards identifying areas where inequalities can be more effectively incorporated into policy and determining how to navigate the modern policy landscape.

The study found that the participants shared similar views on the factors contributing to obesity in the UK. Their perspectives regarding drivers reflect the dominant view of the modern food environment in literature consisting of broken system due to the excessive accessibility and affordability of EDNP products, coupled with the scarcity and high cost of healthy, fresh produce ^[71,316,390]. It is noteworthy that some participants placed more emphasis on the role of industry in shaping the environment, identifying industry activity as the key driver by perceiving the environment as the direct outcome of industry activity. Previous studies have typically overlooked PSH' perspectives on the drivers of obesity. This study reveals the change in how obesity causation has been framed over the fifteen to

twenty years, moving away from individual blame and personal responsibility for causation, which was a common narrative in the 2000s [200,391].

The study found that the stakeholders agreed that policy was progressing. However, unlike studies throughout Europe from the late 2000s that found stakeholders favoured policy education and skills and disliked fiscal policies, this study suggested that the stakeholders predominantly favoured policies that address structural drivers and regulate industry activity [231,392]. The study's findings demonstrate the support and acceptance of fiscal policies as compared to past research. Consequently, this study demonstrates how the policy landscape, regarding the framing of drivers and accepted policies, has evolved over the past two decades. Previous research identified the benefits of maintaining a childhood obesity focus in order to mitigate political anxieties [163]. However, participants celebrated the adoption of a population-wide prevention approach over the childhood obesity approach.

Insights into Stakeholders' Perspectives of Challenges within the Policy Process.

The research provides a comprehensive understanding of the stakeholders' viewpoints on the obesity prevention policy process, identifying the major facilitators and barriers that impact effective policy action. The findings reflect the reality that the policy process does not occur in a vacuum and is not necessarily a neutral process. As a result, the enablers and disablers of effective prevention approaches often reflect messy interactions related to values, norms, and hierarchies, as established by Ulijaszek et al (2016) [147]. The study also found that competing political priorities, dominant ideology, the context of policy decisions, political leadership stability, and the timing of electoral cycles are influential in shaping the policy process. Clarke et al's systematic review discovered similar themes in studies of obesity prevention policies that were underpinned by political science theories, primarily from the US, but also included UK studies. [393]

This study revealed an intriguing finding regarding the factors that influence the effectiveness of prevention strategies. Prior research has frequently emphasised the importance of the strength and quantity of evidence in determining the feasibility of a

policy. However, the current study suggests that the evidence base for many policies is often sufficient, leading to their inclusion in national prevention strategies. The findings of this study are in line with those of Uljiazsek et al., who believed that evidence had less influence on the policymaking process than the pressures and interactions within policymaking that go less reported. ^[393]

Political Commitment

The study identified sustaining political commitment as the greatest disabler of effective actions. The stakeholders believed that the commitment had improved yet doubted its consistency and depth. The study found that although policy was believed to have progressed and commitment to impact strengthened, there was a unanimous agreement of the damaging effect of policy proposal and failure to implement. The cycle of proposal and failure to implement has dominated commentary on modern day prevention efforts and may account for the emphasis placed on the impacts of stable commitment to prevention efforts found in this study ^[141]. Regarding prior research, political commitment and the cycle of proposal and failure to implement have been raised in past research; for example, Theis and White's analysis of UK obesity prevention policies found that 689 policies had been proposed in the UK over 14 prevention strategies, and they established that many of these were proposed in a way that was unlikely to lead to implementation ^[141].

The recent political climate has been particularly turbulent with regard to Covid-19, the Ukrainian War, Brexit, and the cost-of-living crisis. The study found that stakeholders believed that crises such as these has created a challenging climate for obesity prevention policy regarding sustaining commitment and the difficulty of navigating pressures faced by policymakers and civil servants. Another interesting area regarding competing priorities is related to the theme of health prevention versus economic gain. This theme was not discussed within the results as it was not a particularly strong theme, but it indicates an interesting discussion: the study found that some stakeholders believed that within the policy process, the rhetoric of health or economy is often the baseline. This suggests that there is a significant framing issue whereby health is often seen to risk economic gain and thus is ignored in order to safeguard the economy. Although a considerable body of

research demonstrates how health prevention is essential for economic security, this does not seem to transcend stakeholder awareness of the considerations made in the policy process.

Political Ideology in Obesity Prevention

The study found that ideological barriers were believed to persist in the policy process. Neo-liberalism, opposition to government interventions, and individual responsibility framing were identified ^[86,147,394]. The study also established that stakeholders believed that the complete removal of ideological barriers was not required for policy action. The SDIL was used to exemplify how a policy that met ideological resistance as it is inherently unconservative still reached implementation during a Conservative government and has since been sustained. An important finding of the study related to stakeholders' fears regarding policymakers and government falls back to ideologic-based decisions when they are under pressure, confronted by competing priorities, or looking to boost their political popularity. Previous research has stressed the dominance of ideological barriers or political anxieties as key disablers of effective policy action ^[147,394]. The study found how stakeholders saw ideological decision making occurring in response to a delayed policy from Tackling Obesity (2020), demonstrating the implications of this barrier in practice ^[179].

Insights into Stakeholders' Perspectives of Consideration to Inequalities within the Policy Process.

There is limited research exploring stakeholders' attitudes towards the consideration of obesity inequalities in the policy process for obesity prevention. This study found that all participants were aware of the socioeconomic gradient in obesity rates and understood obesity drivers to be socially stratified, reflecting the dominant perspective in the existing literature ^[192,395,396].

Overall, the study established that most stakeholders believed that the tackling of inequalities was generally limited to rhetoric and had limited practical implications. This same theme was found in a UK based study exploring stakeholder perspectives on

developing and implementing England's obesity strategy, whereby stakeholders believed attempts to tackling inequalities across government were aspiration rather than reality

[163,396]

The study emphasised the need for a population-level approach to obesity prevention, while the overall policy area remains insufficient. This does not diminish the recognition of the importance of addressing obesity inequalities but rather highlights the collective agreement that population-level prevention efforts are currently insufficient. Achieving effective and comprehensive population policies remains a challenge. This perspective relates to Rose's population strategy for prevention, whereby prevention activity targets the whole population regardless of the variation in individual's risk status ^[397]. Furthermore, participants' attitudes are in line with McLaren et al. 's review of Rose's prevention strategy, in that population-level approaches have value and do not necessarily worsen inequalities when the prevention strategies are structural rather than agentic ^[398].

This concept is linked to findings regarding the importance of feasibility within stakeholders' perspectives in tackling inequalities. Participants identified structural drivers such as limited access to green spaces, poor housing quality, and low-quality employment as examples of critical factors that intensify the impact of obesity drivers in LSEA. Policies that can influence structural drivers have been found in the literature to be the most politically unpopular and, consequently, less politically feasible ^[184,358,399]. Previous research has identified that in high-income countries, policies that are likely to have the greatest impact, those that influence structural causes, often have the lowest political feasibility^[183,399]. For instance, structural mandates are generally found to have great public health impact, but most often have low political feasibility due to the political context in which ideological barriers are embedded. This tug-a-war can be seen throughout the participants perspectives. The study's findings related to the prioritisation of population-level action reflected the many barriers shaping the obesity policy process, resulting in slow and ineffective policy action.

Applying a Health Equity Lens to Obesity Prevention

Furthermore, the study found concerns surrounding the impact of policy gaps and loopholes in lower SES groups. The concept of the 'worried well' presented itself among the participants' views regarding the suspected disproportionate impact of policy on higher SES groups, who likely hold the ability to adhere to a policy's intention. These perspectives also expressed concern over the influence of a policy targeting the food environment due to the suspected failure to consider the socially stratified differences in environments that risked, resulting in the ineffectiveness of well-intentioned policies depending on the area.

Previous research has established that sustaining a population-level focus for obesity prevention is required yet improving the equitability of policy outcomes would help alleviate the impact of health inequalities. For instance, embedding the health equity lens into the monitoring and evaluation of a policy. This study found that ensuring the equitability of policy outcomes was an appropriate and realistic approach to improving the integration of inequalities in obesity prevention. For some participants, this perspective was based on the importance of considering the level of agency required for an individual to benefit from a policies outcome. Previous literature has established those agentic policies are more politically palatable; however, without policies that change or remove barriers constraining healthy choices, agentic policies are expected to be less effective among lower socioeconomic groups ^[183,400].

This finding is linked to the development of utilising an equity lens in obesity prevention, while the policy landscape remains challenging. In line with the research findings, Kumanyika (2019) proposed a framework for increasing equity impact in obesity prevention, building upon Swinburn et al analysis grid for environments linked to obesity ^[91]. Kumanyika proposed that health inequalities such as obesity cannot be alleviated without addressing underlying inequalities related to social and economic resources ^[400]. The study's research findings contribute to this area of thought within obesity prevention, suggesting that stakeholders' views support the adoption of a health equity lens throughout the policymaking process, while approaches to prioritise inequalities within the agenda remain challenging.

Insights into Stakeholders' Perceptions Towards the Direction of Future Food Policy for Obesity Prevention

This study found that stakeholders were cautiously optimistic about the future of obesity prevention. Although there was a general belief that policy has progressed, there were clear areas considered as important to future research and prevention approaches. Firstly, in line with a large body of international research, transdisciplinary, collaborative effort is required to tackle obesity due to the stakeholders' acknowledgement of the cumulative impact of policies and their ability to influence health inequalities ^[185,196]. As the stakeholders each held different expertise in the topic area, there was an array of views regarding missed opportunities in existing policies and vital areas to focus on in future policy.

Policy Evaluation at the Heart of Policy Design

Previous literature has established very poor design and execution of monitoring and evaluation in obesity prevention ^[141]. The study found that improved research on policy evaluation would have a significant impact on future policymaking. Although stakeholders rarely considered evidence as a problem area within the policy process, many acknowledged the importance of improved evaluation of policy impact to sustain and advance existing policy and contribute to evidence for new policy.

Breaking Down Policy Silos

The study found that perceptives towards missed opportunities is often linked to silos in food policy, for instance, the exclusion of weight stigma in obesity prevention. Silos were found in two areas. The first was the division of different areas of food policy such as food insecurity and obesity prevention. Silos have been established in prior research, such as the separation of food insecurity advocates and food allergy policymakers interested in school foods ^[401]. Interestingly, some of the silos identified in this study relate to the identified areas that were not considered or minorly considered by the Foresight map ^[196,402,403]. This link may indicate the long-term implications of the foresight map for policymaking since 2005. For example, the management of inequalities and stigma was excluded from the map. The

second area of silos in policy related to the opportunity to encourage collaboration between obesity prevention and other areas of policy with overlapping interventions for solutions. For example, obesity prevention policies can be combined with climate policies. This collaboration has been established in previous literature and highlights its potential to be hugely beneficial in gaining public and political attention^[404,405].

The study found that stakeholders understood these silos to be detrimental to policy efforts because of the risk of unintended consequences within food policy, wasted resources, and failure to take windows of opportunity. Furthermore, the study found that stakeholders believed many opportunities to tackle obesity, particularly regarding inequalities, lay outside the realms of food policy.

Collaborative, Joined-Up Approach in the Prevention Agenda

Furthermore, the study found that stakeholders saw the vitality of forming a cross-government, whole system approach to obesity prevention. This view was intrinsically linked to the stakeholders' emphasis on breaking down policy silos, engagement with a broad range of stakeholders throughout the policymaking process, and challenges surrounding government commitment and prioritisation of obesity prevention more generally. The requirement for multi-faceted, well-coordinated, mutually supportive policies has been in discussion in the UK for some time ^[7]. One criticism of current actions focused on the difficulty of establishing the cumulative effect of policies in the context of a turbulent policy landscape. Establishing a cross-government approach was identified to reduce the turbulence of this landscape. The stakeholders acknowledged that impactful policies for obesity prevention exist in policy areas outside of food, thus, some participants suggested adopting this approach to address obesity prevention would allow for action outside of food policy.

Role of Local Government

One clear study finding related to the stakeholders' perspectives towards the role of local governments in obesity prevention. There were clear justifications for the perceived

importance related to local governments' ability to know their community and respond to the specific needs of their constituents^[406]. The opportunity to mitigate unintended consequences and shortfalls of national policies and their position to influence inequalities that were not deemed to be feasible to target from national policy at present^[165,406,407]. Past research and interventions have often focused on the local governments' ability to influence planning; however, the study established that many stakeholders saw this as narrow minded^[408]. The stakeholders often focused on the local governments' ability to influence the structural drivers in the environment, this same view is held within literature for example, developing equity in access to green spaces across different socioeconomic areas^[406].

However, austerity policy, stretched resources, competing priorities, and a lack of personnel were identified to block action at the local level. Similar themes have been found in research addressing the management of public health in local governments^[409]. The study found that some believed in the power of local government in this space but understood that at present, it is unfeasible to burden local governments with this task without stronger commitment from the central government, improved resources, and a clear plan for action.

Furthermore, the study's findings regarding local government action linked an additional finding that indicates the importance of networks and collaboration. The stakeholders often held experience with working with local governments to develop or implement small-scale interventions, as outlined in 4.2.4. This finding suggests that experiences within local governments offer an opportunity for collaboration and direct communication with decision-makers, which may have influenced some stakeholders' views on the ability to see the practical impact of research or advocacy work.

Insights into Stakeholders' Perspectives on the Role and Power of the Food Industry in Obesity Prevention

Despite the diverse backgrounds and areas of expertise of the participants, their views on the core aspects of the policy area were frequently observed to be similar. One of the most

contested areas in the results is related to the framing of industry activity within the understanding of key drivers of obesity and the role of industry activity in the policy process.

One study finding established that some stakeholders believed that their understanding of the food environment could be reframed to explicitly focus on the role of industry activity in shaping the environment. The explicit framing of industry as the cause of the obesogenic environment has been discussed in previous research yet does not dominate understanding of the food environment.

Some stakeholders identified the importance of establishing who we are referring to when discussing the industry and highlighted the risk of referring to the food and drink industry as a homogenous group. In some cases, the food industry was perceived the same as other UCI's like tobacco, identifying the importance of the dichotomy between the aims of a policy and the aim of industry regards the profitability of HFSS and UPF products.

The theme of the power of the food and drink industry was apparent in the data, although it was not explicitly discussed in the results. Prior research has addressed how industry positions themselves within the policymaking landscape as part of the solution ^[410]. The solution framing was also identified in the study findings, regarding industry engagement with food banks. This example provided in the study indicates the complexity of industry activity, which has been well established in prior research, not only for food but also for other UCIs. Furthermore, the findings highlighted the power of industry in the policy process, as stakeholders often described the difficulty of managing the industry regarding their resources, personnel, and both formal and informal relationships with policymakers.

The study's findings demonstrated that there was not a collective agreement on the role of industry in the policy process. Industry was described as a constructive stakeholder and barrier within the policy landscape; in some cases, industry was seen as both. Therefore, there was no general agreement about the boundaries of industry engagement in the policy process; however, the findings suggest that the stakeholders agreed on their absence during the final decision making. The findings indicate that the profession and expertise of stakeholders play a vital role in forming a perspective on engaging with industry; however,

regarding future research, understanding stakeholders' ideas of when industry engagement is constructive, and damaging may have significant importance.

4.3.4 Conclusion

This research has provided an in-depth insight into PSH' perspectives on the considerations of inequalities within the food-related obesity prevention policy. The findings of this study contribute to an under-researched area within the obesity prevention literature. Overall, the PSH was cautiously optimistic regarding the future of obesity prevention policy despite acknowledging a range of barriers to effective policy implementation within the policy process regarding government commitment, industry activity, competing priorities, and ideological resistance. With regard to the consideration of inequalities within obesity prevention, the study found that the PSH believed in the importance of tackling inequalities but were reluctant about the feasibility of prioritising inequalities, while population-level obesity rates remain high, and policies remain insufficient. Further research is required to understand the position of power throughout the policy process, understand how a health equities lens could be integrated into policymaking, and explore how local governments can be better positioned and empowered to support obesity prevention and the considerations of inequalities within action.

5 Chapter 5: Investigate how the food environment is influenced by the implementation of a policy included in the obesity prevention strategy

The fifth chapter presents the final primary research study of this thesis. This study's intended aim is to understand what food and drink products consumers are exposed to within their local food environments, how a policy could influence this exposure, and whether these exposures vary according to socioeconomic level. To achieve this the study examined the change in exposure to HFSS products after the implementation of a policy in 2022, which imposed a restriction on the placement of these products in prominent store locations. This study also explored how the socioeconomic status of an area may influence the impact of this policy. This is achieved by investigating the exposures to food and drink products in stores in two districts of Nottinghamshire, one representing a higher socioeconomic area (HSEA) and the other a lower socioeconomic area (LSEA).

The introduction of the restriction on the placement of HFSS products from prime locations is one of the few policies implemented from Tackling Obesity (2020). Prime locations refer to areas of stores such as end of aisles, store entrances, checkout areas and temporary display units located in these three areas. It is well established that food-purchasing behaviour is greatly influenced by the food environment ^[411]. This study focuses on food retail stores, often referred to in the literature as consumer nutrition environments or retail food environments ^[412]. As discussed throughout this thesis, food environments are often conducive to poor quality diets because of the high accessibility and affordability of EDNP foods ^[125,411,413,414]. Food stores are part of the physical and economic environment in which consumers make food choices ^[184]. It is well known that food stores are cleverly designed to increase exposure to products to raise sales ^[233,415]. Accordingly, these environments can have influence over individuals' purchasing behaviours. Previous research has established that the prime locations of stores are most often associated with HFSS products ^[416,417]. Prime or prominent locations refer to areas of stores with the highest visibility to attract the most potential customers, these areas are most desirable for food companies to promote products and raise sales ^[418–420]. Removing products from these areas by limiting their store

presence to the inside of the aisles provides an intervention that does not influence the availability or affordability of a product but instead reduces exposure to EDNP products ^[416].

The aim of this study is to investigate how the food retail environment may be influenced by the implementation of the restriction on the placement of HFSS items in prime locations of stores in England included in the 2020 Tackling Obesity strategy ^[179].

This aim is underpinned by three objectives.

1. Examine the effects of restricting the placement of HFSS products in prime store locations by exploring changes in product exposures.
2. Assess the influence of socioeconomic level on the characteristics of food retail environments.
3. Investigate variations in the effect of a policy on different areas based on their socioeconomic levels.

5.1 Restricting Promotions of Products High in Fat, Sugar, or Salt (HFSS) by Location

Included within Tackling Obesity (2020) ^[179], the government announced its commitment to introduce a policy to restrict the placement of pre-packaged HFSS products in the prime locations of stores. The prime locations included in the policy were prominent locations such as store entrances, aisle ends, checkouts, and website homepages. This policy was not limited to food stores. It included all types of stores with HFSS items in prime locations, if the store had more than 50 employees. Initially, the policy was delayed, but it was implemented and enforced from the 1st October 2022 ^[421].

The policy was intended to target products that are most heavily promoted, large contributors to children's calorie and sugar intake, and, consequently, are of concern for childhood obesity in the UK. The FSA's nutrient profile model (NPM) was used to determine whether the prepacked product was HFSS ^[422]. During the consultation period, a list of exempt products was finalised.

This chapter frequently refers to policy adherence in the study's findings. In this context, policy adherence is defined as the observed decrease in the exposure to products that meet the policy's inclusion criteria between 2022 and 2023. However, it is important to note that this study cannot definitively conclude whether the removal of these products is attributable to the implementation of the policy.

5.2 Methodology

5.2.1 Observational Studies

Observational studies serve as valuable tools in health research, allowing for the exploration of natural behaviours and natural phenomena ^[236,262,423]. Observations are considered the gold standard when research is interested in understanding natural phenomena rather than individual accounts of said phenomena ^[262,423]. As the study aimed to explore the real world, non-participant observations were selected to gain insight into store food environments. Observational research is often used to study the mundane or unremarkable features of everyday life that may pass by everyday people without notice; therefore, the methodology provides a means to capture the natural world as it is found by the researcher rather than others' accounts of it ^[262].

This study's fundamental aim was to understand what food and drink products consumers are exposed to within their local food environments, how a policy could influence this exposure, and whether these exposures vary according to an area's socioeconomic level. The study was run in accordance with the policy's modification of the food environment, reflecting a natural experiment as environmental changes were independent of the researcher's activities through the introduction of an England-wide policy. It included no direct intervention by the researcher ^[244].

Observational methods are generally aligned with the realist perspective regarding the ontological continuum, which assumes that researchers can observe an external objective reality ^[262,424]. This study takes a realist approach by investigating the natural effects of a new policy without directly intervening in the phenomenon. The study's design followed the

quantitative aspects of an observational survey used for recording observations, reflecting a positivist theoretical framework. This framework emphasises an empirical approach, assuming that objective truths can be discovered through systematic observation ^[424,425]. Although this approach offers valuable insights into observable phenomena, it is essential to recognise its limitations, such as its focus on measurable aspects of the natural environment that are dynamic and multifaceted.

5.2.2 Study Design

This study is the first of its kind to investigate the impact of the introduction of the restriction on placement of HFSS items from prime locations in England. There are other existing studies that observe product exposure in food retail environments that supported the development of this study's methodology ^[222,223,233,413]. It contributes to the evidence demonstrating the impact of the restriction of HFSS items in the prime locations of stores. This study adopted an experimental observational survey approach to explore the nature of randomly selected stores in the LSEA and HSEA socioeconomic areas within Nottinghamshire. Observations were completed before the policy implementation from February to April 2022 and after its implementation during the same months in 2023. Accordingly, this study explores how the policy has changed exposures in these stores. Ethical permission for this study was granted by the University of Nottingham Medical School Ethics Committee, reference FMHS 249-0421.

1.1.1 Selection of Stores for Inclusion

As one of the study's aims was to explore the impact of the policy in different socioeconomic areas, supermarkets, chain convenience stores (CCS) and independent convenience stores (ICS) from a HSEA and a LSEA were selected. To explore socioeconomic differences, the highest and lowest socioeconomic areas in Nottinghamshire were identified using Office for National Statistics data ^[426]. Next, using Google Maps, supermarkets were searched, and a list of all supermarkets central to both locations was constructed. Each supermarket was then assigned a number, and a random calculator was used to select the stores. In the UK, the nine largest supermarket chains are Aldi, Asda, Coop, Lidl, M&S,

Morrisons, Sainsbury’s, Tesco, and Waitrose. Once the supermarkets were selected, CCS and ICS were searched using the addresses of supermarkets, and a list was constructed based on the proximity to the previously selected supermarkets. Six CCS and six ICS were selected in each area. The decision to sample convenience stores in this way was to generate a dataset that reflected the different types of store environments to which a local consumer would likely be exposed. The purpose of the study was not to identify which store had the healthiest food environment or the best adherence to the policy; therefore, the identity of the stores is not reported.

Before data collection, a pilot study was completed in stores that were not included in the study, which provided an opportunity to test the observational survey and assess any issues regarding access to stores. Verbal explanations of the study and verbal consent were obtained from store managers, senior staff members, and store community champions. Prior to data collection, the researcher contacted other researchers with experience working with stores and conducted extensive research to explore how similar studies had gained access in past research [222,233,417,427].

Table 1 Distribution of observations by store type, area, and time period.

Store type	Number of stores observed		Total number of observations		Months and years of observations
	LSEA	HSEA	LSEA	HSEA	
Supermarkets	3	3	18	18	2022: February, March, April 2023: February, March, April
Chain convenience stores	6	6	24	24	2022: March, April 2023: March, April
Independent convenience stores	6	6	24	24	2022: March, April 2023: March, April
Total observations complete = 132					

Table 1 presents the observations of this study. The intention of repeating the observations in supermarket stores over a three-month period was to account for seasonal changes and natural variations in the products that occur in stores. Convenience stores were expected to have less variation in exposures over the course of a month due to their size. The researcher

decided to observe a higher number of different convenience stores (n=6 per area), but less frequently (Twice per year rather than three times per year).

Determining the prime location within stores

Locations within stores were selected based on the details of the policy implemented in 2022 ^[421]. Accordingly, the prime location of stores was understood as the following:

1. End of aisles spaces.
2. Store entrances: all food and drink exposure immediately to entering stores. Most relevant to supermarkets.
3. Checkout areas, including manned and self-scanning checkout areas, and exposures within one meter of the checkouts were included.
4. Temporary display units that are positioned in one of the three locations (1-3).

5.2.3 Development of Data Collection Tool: Food Environment Observational Survey

A unique observational food environment survey was developed to collect the data for this study. The researcher explored existing methods using a similar approach in the literature on the food retail environment. An established pool of research has explored exposure within the food retail environment, many of which have focused on checkout areas ^[222,232,415]. The observational survey was designed to collect data that could potentially influence consumer behaviour, including the types of products offered, pricing, shelf space, promotions, and any additional marketing observed in prime locations. See Appendix 8.12 for this observational survey.

5.2.4 Data collection

The data collected during the observations adopted a structured and focused approach ^[423]. Data were collected using two approaches depending on the store's preference. The first option required completing the detailed observational survey and field notes in the store. The second approach used photos when consent was obtained from staff members. In these cases, it was agreed that the photographs would only be used to assist with data collection and to complement field notes. Some stores favoured photos, as this was a much

quicker method of data collection. When photos were taken, the data were input into the observational survey in Excel immediately after leaving the stores and deleted once the data were inputted. Observational field notes were taken to capture store-specific details, forming a contextual backdrop for the survey data. Each product and its location in the store were recorded. Table 2 summarises the key variables recorded through data collection.

5.2.5 Data Cleaning and Data Management

The data were subjected to several cleaning cycles and categorisation processes. First, the raw data from the observational survey was inputted into a new excel spread sheet. Each observation was coded by store type, area, and year, for example supermarket observations from the HSEA in 2022 were coded as SMHSEA22. A temporal aggregation technique was used by combining the observations of each store across monthly intervals (February, March, and April of 2022 and 2023) into cohesive datasets for the HSEA and LSEA. This aggregation process transforms the data from a monthly basis per store to a yearly basis for all the stores in both areas, by store type. This allowed for a higher-level comparison of dataset between the two areas and two years. This approach was used as it allows for a higher-level comparison between each year, store type and each socioeconomic area.

There variables included are summarised in Table two. Price and product facings, referring to the number of times each product is displayed at each prime location was recorded but was not used in analysis.

Table 2 Description of variables included in this study.

<i>Variable</i>	<i>Definitions</i>	<i>Measurable scale</i>
<i>Product name</i>	Number of each different product in a prime location, brand name (and description if necessary) recorded. Distinction between pack sizes was made. E.g., diet coke 4 pack was recorded separately from single diet coke.	Total number of different products seen on shelf.
<i>Promotion</i>	Three types of promotions were identified: Price reduction, multibuy and meal deals	Price reduction (1), Multibuy (2), meal deal (3).
<i>Store placement</i>	The exposures in prime locations were separated: entrance, end of aisles, checkout, and temporary display units	Entrance, end of aisles, checkout, and temporary display units
<i>Food and drink category</i>	40 bespoke food and drink categories were designed to summarise the types of products placed in the prime locations. The 40 categories are derived from the policy's inclusion criteria as well as by the researcher's assessment of the products.	40 food and drink categories (1-40). See Appendix 8.11 for full list.
<i>Policy inclusion status</i>	Each product coded by the policies inclusion criteria: NPS ¹ classification and list of exemptions.	Restricted (1), permitted (2).
<i>NPS (Healthier or less healthy)</i>	Each product coded by its NPS, products with a score of 4+ = less healthy (HFSS), products scoring 3 or less = healthier.	Healthier (1), Less healthy (2).
<i>NOVA Group</i>	Each product coded using the NOVA system to determine products' level of processing.	Group 1: no or minimal processing, Group 2: processed culinary ingredients, Group 3: processed, Group 4: UPF.

Abbreviations: NPS = Nutrient profile score

HFSS = high fat, salt, and sugar

Table 2 Description of variables included in this study.

Categorisation of Data

Once the data were collected, each recorded product was inputted into a master product list. Each product was categorised according to its food and drink type, nutrient profile score (NPS), HFSS criteria, policy inclusion criteria, and NOVA score. After the examination of the inclusion and exemption criteria of the policy, it was decided that applying multiple categories to understand the data set would enhance the study's findings and highlight important gaps in the policy design, as many products that can classify HFSS are permitted due to the policy's exemptions. In turn, this would reveal significant distinctions in the classification of products which was expected to demonstrate different perspectives on the impact of the policy. As some classification systems require detailed information about each product ingredient list or nutrient content, stores or food brand websites were used to obtain this information after the store observation was conducted.

Food and drink categories

Each product was assigned to a food or drink category. In total, 40 categories were established. These categories were decided upon through careful assessment of the categories within the policy's exemption criteria, as well as the categories included in previous literature. Important distinctions are made within the policy eligibility criteria that were used to develop these categories, such as chocolate as a separate category to sweets rather than using an umbrella term of confectionary items. This decision was made to ensure the study findings remained relevant to the policy and did not oversimplify the type of products placed in prime locations. Therefore, the food and drink categories were intended to provide a descriptive reflection of the dataset that was meaningful and remained relevant to the policy and existing literature. Each food group was assigned a number from 1-40. Refer to Appendix 8.11 for a list of categories.

Nutrient profile score (NPS)

The next category uses the NPM to develop each product's NPS ^[56,422,428]. The Consumer Data Research Centre (CDRC) NPM online calculator was used to calculate each product's NPS, ignoring all policy exemptions. NPS was not used in the data analysis but was required to develop the following two categories that formed a central part of the study's analysis.

Healthier versus less healthy products

Based on each product's NPS, the products were categorised as healthier (1) or less healthy (2). Products with a NPS of four or higher were categorised as 'less healthy'. Products with scores of three or less were categorised as 'healthier'^[422]. The same terminology, based on the same categorisation criteria, has been used in many similar studies from the UK and globally ^[222,223,232,415]. Additionally, as mentioned, the NPM has important policy relevance as the core tool to determine whether a product is HFSS in policy.

Policy inclusion criteria

The products were then classified according to their inclusion (1) or exclusion (2) in the policy. This category was established by referring to the products' NPS. If a product had a score of 4+, it was then checked against the policy inclusion criteria, ensuring that products that were on the key exemption list were recorded as excluded from the policy even if they had a score of 4+ ^[421].

NOVA Classification System

The final classification system applied to the data was the NOVA system. NOVA classification provides a system for categorising foods according to their level of processing. The importance of the level of processing on health is becoming increasingly important to the international public health and the food policy community, yet it is not recognised in the UK food policy. It is estimated that 60% of the general population's diet is made up of UPF this number is expected to be even higher in children's diets ^[429]. Additionally, an increasing amount of studies indicate an association between high consumption of UPF and heart, kidney and liver disease, obesity, cancer, and poorer mental health ^[430]. Developed by Monteiro et al (2019), the NOVA categories consist of four groups based on the extent and purpose of the processes they have undergone before consumption ^[54]. The intention of the NOVA was to provide a tool to discuss the commonality between EDNP foods, which are often referred to as fast foods, convenience foods, and soft or sugary drinks.

To assign each product to a NOVA group based on its ingredients, the ingredient descriptions in the table below were examined, and a group number was assigned to each

product. Table 3 presents a concise overview of the NOVA groups based on a briefing document prepared by Monteiro et al. (2019) for the Food and Agriculture Organization of the United Nations (FAO).^[53]

Table 3 Summary of NOVA groups

Summary of NOVA groups^[53]

<i>NOVA</i>	Name	Description
<i>Groups</i>		
<i>Group 1</i>	Unprocessed and minimally processed foods	Foods found very similar to their raw form, such as fruit, seeds, meats. A minimal degree of processing may occur such as the removal of inedible or unwanted parts, drying or powdering.
<i>Group 2</i>	Processed culinary ingredients	Substances obtained directly from group 1 foods or from nature by industrial processes, e.g., refining. examples include: vegetable oils, butter and lard, honey extracted etc.
<i>Group 3</i>	Processed foods	Products made by adding salt, oil, sugar or other group 2 ingredients to group 1 foods. Preservation methods are often used such as canning and bottling. Examples include canned or bottled vegetables, salted nuts cured, or smoked meats.
<i>Group 4</i>	Ultra-processed foods (UPF)	Formulations of ingredients, mostly of exclusive industrial use, made by a series of industrial processes, many requiring sophisticated equipment and technology. Processes used to make UPF include the fractioning of whole foods into substances, chemical modifications of these substances, assembly of unmodified and modified food substances using industrial techniques. The process tends to make the final product highly palatable and is often combined with sophisticated packaging. The ingredients list of these products tends to include many of following compounds: fructose corn syrup, hydrogenated or interesterified oils, and protein isolates, flavour enhancers, colours, emulsifiers, and sweeteners, thickeners, and anti-foaming, bulking, carbonating, foaming, gelling, and glazing agents, and additives that prolong product duration, protect original properties or prevent proliferation of microorganisms. Examples of these products include many carbonated soft drink, sweet or savoury packaged snacks; chocolate, ice cream, mass-produced packaged breads, biscuits, cakes, breakfast cereals, instant sauces, infant formulas and instant soups.

5.2.6 Data Analysis

Statistical analysis was conducted using the R statistical software (version 4.3.2, 2023) and the RStudio integrated development environment (Version 2023 09.1+494). The total number of products and percentages were calculated based on socioeconomic area and prime locations within the store areas. The placement of products in stores was analysed by store type: supermarket, CCS, and ICS.

The data analysis used basic descriptive statistics to offer an overarching representation of the exposure patterns comparing the difference between 2022 and 2023, between HSEA and LSEA and between store types. These differences were analysed using the categories outlined in Section 5.2.5. Key statistical measures including means, percentages, and total counts were used to explore the underlying characteristics of the products. The use of means, percentages, and total counts provided a foundational understanding of the data, contributing to an insightful interpretation of exposure changes in the data set. Product exposures to non-food and drink were recorded in the field notes, but the observational survey was not used to account for these products. Table 2 presents the variables used in the study.

The section on findings investigates how the policy has aligned with changes in the food retail environment, as well as the influence of socioeconomic status on the supposed impact of the policy. Initially, the study's findings detail the changes in exposure before and after the implementation of the policy by categorising products as either permitted or restricted. The changes in exposure by food and drink category is then outlined to provide a clear understanding of how exposures to different types of food and drink changed between 2022 and 2023. The subsequent sections outline the exposure changes by NPS and the Nova classification system. The findings then demonstrate how exposure to promotions have changed between 2022 and 2023 in relation to price promotions and multibuy promotions.

5.3 Reflections as a Researcher

The researcher attempted to account for some of the limitations of the study regarding the lack of control and temporal changes that occur within food stores through multiple

observations. For example, seasonal variations, such as exposure to Easter products, were attempted to be accounted for by multiple observations of the same stores at different times (see Table 1); however, the methodology was very time consuming. Therefore, due to the time frame and research resources, a small sample was appropriate. Furthermore, previous studies adopted a small sample size and generated insightful findings ^[223].

The researcher observed the stores in the same order in an attempt to observe them at similar times of the day, as it was expected that exposure may have some fluctuations on a day-to-day basis, as it is a rapidly changing environment. Furthermore, although stores were divided by store type, the researcher was aware that within the sample, there would be diversity in store size and format. However, as this study intends to provide a snapshot of product exposure in different environments across both areas, the diversity in store size was deemed a natural variation.

As the research method adopted a detached observer approach, meaning that the observer could not influence the observed phenomena. However, the researcher was aware that there was a lot of data to be recorded in the observational survey which increased the risk of error. The researcher used the same approach to record the data, whether it was through completion of the in-store observation or after the observations through photos.

5.4 Ethical Considerations

The study's primary focus was on the physical food environment, rather than human behaviours; accordingly, no human participants were included in this study. Consequently, ethical considerations are limited. Additionally, the study only recorded natural changes in the food environment that were beyond the control or influence of the researcher.

As discussed, the researcher identified store managers, senior store employees, and community champions during the first intended observation. The research objectives and study design were explained to these individuals, and they were asked if they required any further information or contact information before the completion of the observations. All but two stores consented verbally to participate in this study. The stores that did not consent to participate were replaced by other stores in the area. The researcher agreed

with the staff on how to access the stores during each visit. Some stores did not want to be informed of each visit, while others requested that the researcher inform them of their presence in the stores each time. Additionally, the researcher established whether stores were comfortable with the researcher taking photos of prime locations within the store, with the understanding that no customers or staff members would be photographed, and with the agreement that the photos would remain confidential, limited to research supervisors. All raw data were stored in a secure folder at the researchers' University OneDrive. Consent was refreshed at the start of 2023, when one store denied access due to its plans to close down during the research period. This store was then replaced with a different store on the same road as the original store.

As far as researchers' safety was concerned, there was minimal concern as the observations were conducted in a public setting. Most store managers and employees were pleased to support this research.

5.5 Results

In this section, comparisons are made between the exposure to products in 2022 and 2023. The baseline exposure was derived from data from 2022. Adherence is measured as the reduction in exposure to products restricted by the policy in 2023 compared to product exposure in 2022.

5.5.1 Total food and drink product exposure: supermarket, chain convenience stores, and independent convenience stores.

Section 5.5.1 provides a summary of the total food and drink exposure in each store type across the two socioeconomic areas in 2022 and 2023. Table 4 shows the total exposure by prime location area, store type, and socioeconomic area.

Supermarkets

As shown in Table 4, in supermarkets, there was a substantial reduction between 2022 and 2023 in the total number of products found in the prime locations. Many stores removed food and drink items from these areas or removed the space itself. Products were often replaced by non-food items such as medication and batteries.

Chain Convenience Stores

In CCS, there were less consistent trends in comparison to supermarkets. Between 2022 and 2023 total exposures increased in the LSEA and decreased in the HSEA. There were some notable differences between the stores in the two areas as no entrance exposures were recalled in any CCS in the HSEA. This reflects practical differences between stores.

Independent Convenience Store

Regarding exposure changes in the ICS, as shown in Table 4, the only notable difference was found in LSEA 2023, which may reflect general fluctuations in exposure as well as the closing of one store and its replacement with another. The HSEA area was found to have very little change in exposure over the year.

Table 4 Summary of total food and drink exposures in all prime locations of stores

Summary of total food and drink exposures in all prime locations of stores									
Supermarkets	End of aisles		Checkout areas		Entrance		Temporary display units		Whole store
Area	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)	(n)
SM LSEA 2022	2365	87.1%	147	5.4%	58	2.1%	146	5.25%	2716
SM LSEA 2023	1786	90.3%	122	6.2%	34	1.7%	37	1.9%	1979
SM HSEA 2022	2570	70.4%	786	21.5%	212	5.8%	81	2.2%	3649
SM HSEA 2023	1814	78.6%	298	12.9%	169	7.3%	27	1.2%	2308
CCS LSEA 2022	605	89.2%	49	7.2%	11	1.6%	13	1.9%	678
CCS LSEA 2023	585	80.9%	121	16.7%	11	1.5%	6	0.8%	723
CCS HSEA 2022	764	81.7%	156	16.7%	0	0.0%	15	1.6%	935
CCS HSEA 2023	643	82.5%	135	17.3%	0	0.0%	1	0.1%	779
ICS LSEA 2022	184	52.0%	170	48.0%	0	0.0%	0	0.0%	354
ICS LSEA 2023	340	62.0%	209	38.0%	0	0.0%	0	0.0%	549
ICS HSEA 2022	255	68.2%	117	31.3%	0	0.0%	2	0.5%	374
ICS HSEA 2023	242	65.4%	126	34.1%	0	0.0%	2	0.5%	370

Percentage of Products Found per Area

Abbreviations: SM = Supermarkets, CCS = Chain convenience stores, ICS = independent convenience stores, LSEA = lower socioeconomic area, HSEA = higher socioeconomic area.

5.5.2 Exposures in Prime Locations by Products Restricted by the Policy's Inclusion Criteria

Section 5.5.2 explores the changes in exposure to products restricted by the policy's inclusion criteria. See Section 5.1 for further information on the policy's inclusion criteria. The products included in the policy are expected to be removed from the store's prime locations. Supermarkets and CCS are required to adhere to the policy, while the ICS are not. Table 5 shows the exposure to products restricted by the policy and products permitted in prime locations of stores. Good adherence to the policy should result in a significant drop in exposure to products restricted by the policy.

Table 5 Exposure to food and drink products in all prime locations of stores by the policy's inclusion criteria

Exposure to Products Restricted or Permitted	LSEA 2022		LSEA 2023		HSEA 2022		HSEA 2023	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Supermarkets								
Restricted	991	36.5%	298	15.6%	1480	40.6%	308	13.3%
Permitted	1725	63.5%	1681	84.9%	2169	59.4%	2000	86.7%
Chain convenience stores								
Restricted	289	42.6%	114	15.8%	279	29.8%	153	19.7%
Permitted	389	57.4%	609	84.2%	656	70.2%	623	80.3%
Independent convenience stores								
Restricted	206	58.2%	363	66.1%	218	58.3%	181	48.7%
Permitted	148	41.8%	186	33.9%	156	41.7%	191	51.3%
Percentage of products permitted or restricted by area and year								
<i>Abbreviations: LSEA = lower socioeconomic area, HSEA = higher socioeconomic area.</i>								

Supermarkets

The study found that the policy was successful in reducing exposure to products restricted by the policy criteria. For example, within all supermarkets, irrespective of their area, exposure to products restricted by the policy was reduced from 39% of all exposures to 14%. As shown in Table 5, there was high adherence in both the HSEA and the LSEA to the policy, with 15% or less exposure to products restricted by the policy found after its implementation. As shown in Table 5, the total number of product exposures excluded from the policy had minimal change, accounting for the removal of products from prime locations in stores. In 2023, the LSEA was found to have marginally higher exposure to products included in the policy, suggesting poorer adherence. The policy's impact appears to be the most change in the HSEA.

When examining each specific prime location, the highest level of adherence was found at the end of aisles space, meaning that the study found the lowest exposure to restricted products at the end of aisles in comparison to the other prime locations recorded.

Adherence to the policy varied throughout store areas; for example, store entrances in the LSEA were found to have removed almost all products included in the policy; however, in the HSEA, the overall exposure to products in entrances reduced, but 40% of all product exposures in the entrance space were food and drink products restricted by the policy.

Some prime locations were uninfluenced by the policy, and exposure to products restricted by the policy remained level in supermarket checkout area in the LSEA between 2022 and 2023. After the implementation the over presence of temporary display units in prime locations decreased in both areas. Of those remaining, more than 30% of the items displayed in these units were restricted in the policy.

Chain Convenience Stores

As seen in Table 5 the findings from the CCS reflect those from the supermarkets. After the implementation of this policy, changes in the nature of prime locations in CCS were observed. In 2022, exposure to restricted products was higher in the LSEA 43% in comparison to 30% in the HSEA. After the policy's implementation the exposure to restricted products in the LSEA fell to 15% and 20% in the HSEA respectively. By 2023, a 4-percentage point difference was found between the two areas, resulting in slightly higher exposure to restricted products in the HSEA.

The HSEA area showed little exposure change to products that were permitted by the policy. Exposure to products restricted by the policy was replaced by non-food and drink items or the prime location area was removed entirely. In the LSEA, the study found a considerable increase in exposure of permitted products, suggesting that these stores replaced the restricted products with other food and drink items that were permitted by the policy; therefore, they were not required to be removed from prime locations. The policy appeared to reduce the total number of exposures to both restricted and permitted food and drink items in the HSEA but not in the LSEA.

Independent Convenience Stores

The study found a notable difference between the two areas regarding exposure to products restricted by the policy in ICS. As discussed, these stores were not required to adhere to this policy. In the LSEA and HSEA in 2022, the prime locations of stores were dominated by exposure to products restricted by the policy (See Table 5). The total number of product exposures in the LSEA was affected by a store closure. Although the HSEA and LSEA were similar in 2022, by 2023, the HSEA became more balanced with almost an even split in the exposure of products included and excluded by the policy, while exposure in the LSEA to restricted products remained high.

Table 6 Exposure to food and drink products in prime locations by category

Exposure to food and drink products in prime locations by category	LSEA 2022		LSEA 2023		HSEA 2022		HSEA 2023	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Supermarkets								
Chocolate	449	16.1%	0	0.0%	762	20.6%	48	0.1%
Biscuit and cakes	62	2.2%	5	0.2%	114	3.8%	16	0.7%
Dessert	105	3.8%	11	0.5%	156	4.2%	13	0.5%
Sweets	31	1.1%	12	0.6%	67	1.8%	2	0.1%
Sugar-free Chewing gum/mints	127	4.6%	31	1.5%	323	8.7%	70	2.9%
Alcohol	302	10.9%	342	16.6%	372	10.1%	476	19.9%
Processed meat/fish	198	7.1%	289	14.0%	126	3.4%	139	5.8%
Miscellaneous	70	2.5%	212	10.3%	273	7.4%	234	9.8%
Dairy products	161	5.8%	238	11.6%	110	3.0%	117	4.9%
SF Soft drink/Energy drink	34	1.2%	23	1.1%	46	1.2%	90	3.8%
Dried fruit	7	0.3%	8	0.4%	71	1.9%	96	4.0%
Salty Snack	118	4.2%	58	2.8%	74	2.0%	90	3.8%
Fruit and vegetables	176	6.3%	120	5.8%	105	2.8%	115	4.8%
Pizza, pie and quiche	194	7.0%	93	4.5%	144	3.9%	119	5.0%
Chain Convenience Stores								
Chocolate	97	14.0%	8	1.1%	99	10.3%	36	4.4%
Biscuit and cakes	53	7.7%	5	0.7%	39	4.1%	6	0.7%
Salty Snack	67	9.7%	32	4.3%	72	7.5%	39	4.8%
SF Soft drink/Energy drink	43	6.2%	16	2.1%	48	5.0%	25	3.1%
Breakfast cereal	41	5.9%	36	4.8%	11	1.2%	29	3.6%

Alcohol	50	7.2%	106	14.2%	161	16.8%	154	19.0%
Miscellaneous	35	5.1%	146	19.6%	70	7.3%	57	7.0%
Juices/dilute/smoothies	16	2.3%	42	5.6%	18	1.9%	20	2.5%
Snack bar	35	5.1%	26	3.5%	41	4.3%	47	5.8%
Tinned goods	36	5.2%	11	1.5%	42	4.4%	60	7.4%
Fruit and vegetables	17	2.5%	33	4.4%	45	4.7%	32	4.0%
Water	0	0.0%	56	7.5%	11	1.2%	33	4.1%
Dried fruit and nuts	20	2.9%	2	0.3%	20	2.1%	36	4.4%
Independent Convenience Stores								
Alcohol	63	16.7%	67	11.8%	31	8.1%	54	14.0%
Biscuit and cakes	9	2.4%	48	8.5%	35	9.1%	19	4.9%
Chocolate	133	35.3%	192	33.9%	64	16.7%	33	8.6%
Juices/dilute/smoothies	22	5.8%	6	1.1%	4	1.0%	2	0.5%
Salty Snack	22	5.8%	38	6.7%	50	13.0%	55	14.3%
Soft drink/Energy drink	9	2.4%	21	3.7%	23	13.0%	49	12.7%
Sweets	42	11.1%	69	12.2%	40	13.0%	35	9.1%
Fruit and vegetables	10	2.7%	0	0.0%	13	2.4%	14	3.6%

Percentage of all food categories by area and year.

Abbreviations: LSEA = lower socioeconomic area, HSEA = higher socioeconomic area.

5.5.3 Exposures in Prime Locations by Food Categories

Section 0 outlines the change in product exposure by product category. As described in Section 5.2.2, 40 categories of food and drinks were identified. As shown in Table 5, exposures changed notably between 2022 and 2023, according to food categories.

Supermarkets

As shown in Table 6, the findings suggest that the implementation of the policy in late 2022 had the largest impact on reducing exposure to chocolate, biscuit, cakes, sweets, and desserts, which were identified in both socioeconomic areas. As seen in Table 6, the data showed a notable increase in exposure to alcohol, processed meat and fish, miscellaneous items, and dairy products in both areas in 2023. There were some differences between exposures in the two areas. The HSEA recorded an increase in sugar-free soft drinks/energy

drinks; dried fruits and nuts; salty snacks; fruits and vegetables; and pizza, pie, and quiche categories, whereas many of these categories were reduced in exposure in the LSEA.

Chain Convenience Stores

Regarding food category exposure in CCS, the study found trends similar to those of exposure in supermarkets. In both areas, exposure to chocolate, biscuits and cakes, salty snacks, and sugar-free soft drinks/energy drinks reduced after the implementation of the policy. Exposure to alcohol, water, and juice increased in both areas (refer to Table 6). In the HSEA, dried fruit and nuts, tinned goods, and snack bars also increased, whereas in the LSEA, miscellaneous items, fruit, and vegetables increased, and tinned goods, snack bars, dried fruit, and nuts decreased. Therefore, the study found differentiation in the two areas category exposures.

Independent Convenience Stores

The ICS had the most limited range of products compared with the other store types. Alcohol, biscuits and cakes, chocolate, juices, salty snacks, sweets, and soft drinks occupied prime locations in both years and areas. As shown in Table 6 fluctuations in exposure were observed. For example, alcohol exposure was reduced by 5-percentage points in the LSEA and increased by 6-percentage points in the HSEA, whereas exposure to biscuits and cakes increased by 6-percentage points in the LSEA but decreased by 4-percentage points in the HSEA. Fruit and vegetable exposure was low in both areas in 2022 (3%) but slightly increased in the HSEA and completely disappeared in the LSEA by 2023.

5.5.4 Exposure to Products in Prime Location in Stores by Nutrient Profile Score (NPS)

Section 5.5.4 provides a summary of the study's findings regarding exposure to products in prime locations based on their NPS. As outlined in Section 5.2.5 each product's NPS was calculated, products with scores four and above were categorised as 'less healthy', and products with scores less than four were categorised as 'healthier'. The same approach and labels have been used in previous research ^[222,233].

Table 7 Exposure to food and drink product by Nutrient Profile Score

Nutrient Profile Score Categorisation	LSEA 2022		LSEA 2023		HSEA 2022		HSEA 2023	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Supermarket stores								
Healthier	1033	38.0%	902	45.6%	1488	40.8%	1103	47.8%
Less healthy	1381	50.9%	734	37.1%	1788	49.0%	729	31.6%
Alcohol	302	11.1%	343	17.3%	373	10.2%	476	20.6%
Chain Convenience Stores								
Healthier	276	40.7%	338	46.8%	405	43.3%	393	50.6%
Less healthy	352	51.9%	278	38.5%	369	39.5%	229	29.5%
Alcohol	50	7.4%	107	14.8%	161	17.2%	154	19.9%
Total	678		723		935		776	
Independent Convenience Stores								
Healthier	83	23%	113	20.6%	93	24.9%	103	27.7%
Less healthy	208	59%	369	67.2%	250	66.8%	215	57.8%
Alcohol	63	18%	67	12.2%	31	8.3%	54	14.5%
Total	354		549		374		372	

Percentage of products by healthier (NPS>4), less healthy (NPS=>4), and alcohol

Abbreviations: LSEA = lower socioeconomic area, HSEA = higher socioeconomic area.

Supermarkets

In line with the findings outlined in Section 5.5.2 and 0 exposure to less healthy products reduced in line with the policy's implementation. Table 7 shows the changes in the exposure between 2022 and 2023. Regarding exposure to less healthy items, this study found a reduction in both socioeconomic areas. Proportionate exposure to less healthy items was reduced by 14-percentage points and 17-percentage points in the LSEA and HSEA, respectively. Overall, exposure to healthier foods was proportionately higher in the HSEA,

49% of exposures consisting of healthier products, whereas exposure to less healthy items was proportionately higher in the LSEA, with 39% of total exposures consisting of less healthy items. In the HSEA, alcohol exposure was higher than in the LSEA, with 21% of total exposures consisting of alcohol in comparison to 17% in the LSEA.

Chain Convenience Stores

As shown in Table 7, this study found that the policy reduced exposure to less healthy products and increased exposure to healthier products and alcohol in CCS in both areas. The study found a 13-percentage point reduction in exposure to less healthy products in the LSEA and a 10-percentage point reduction in the HSEA. The findings suggest a lower reduction in exposure to less healthy products in CCS than in supermarkets. Exposure to less healthy items remained higher in the LSEA, and 39% of the exposures consisted of fewer healthy items. In comparison, 30% of exposures consisted of less healthy items in the HSEA. However, the policy brought the exposures found in each area closer.

Independent Convenience Store

In the ICS, this study found that in both socioeconomic areas, exposure was dominated by less healthy foods, as shown in Table 7. In the LSEA, 59% of all product exposures were classified as less healthy by 2022; by 2023, the exposure to less healthy items increased to 67%. In the HSEA, 67% of all product exposures were classified as less healthy; by 2023, this number was reduced to 57%. Accordingly, the study found that exposure to less healthy items in the HSEA was reduced, while the exposure in the LSEA increased. Additionally, exposure to healthier products increased slightly in the HSEA and decreased slightly in the LSEA.

5.5.5 Exposure to Products in Prime Location in Stores by NOVA Classification System

Section 5.5.5 explores how exposure to products changed with regard to the NOVA classification system before and after the implementation of the policy. As discussed in Section 5.2.2 the NOVA classification system is a broadly accepted model for classifying food and drink products based on their level of processing. The NOVA classification system offers

a notable difference in exposure compared with the NPS or policy inclusion criteria. See Table 3 Summary of NOVA groups, for comprehensive description on each NOVA group.

Table 8 Exposure to food and drink product by NOVA group

Exposure by NOVA Categorisation	LSEA 2022		LSEA 2023		HSEA 2022		HSEA 2023	
	(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
Supermarket stores								
NOVA1	395	14.5%	321	16.3%	381	10.4%	346	14.5%
NOVA2	39	1.4%	103	5.2%	172	4.7%	55	2.3%
NOVA3	440	16.2%	465	23.5%	401	11.0%	385	16.1%
UPF	1540	56.7%	746	37.8%	2321	63.6%	1046	43.8%
Alcohol	302	11.1%	340	17.2%	374	10.2%	476	19.9%
Chain Convenience Stores								
NOVA1	68	10.0%	133	18.4%	148	15.8%	129	16.6%
NOVA2	23	3.4%	44	6.4%	6	0.6%	10	1.3%
NOVA3	71	10.5%	99	13.7%	107	11.4%	124	16.0%
UPF	466	68.7%	337	46.7%	515	55.0%	359	46.3%
Alcohol	50	7.4%	107	14.8%	161	17.2%	154	19.9%
Independent Convenience Stores								
NOVA1	14	4.0%	8	1.5%	23	6.2%	23	6.2%
NOVA2	0	0.0%	2	0.4%	6	1.6%	5	1.3%
NOVA3	7	2.0%	26	4.7%	38	10.2%	32	8.6%
UPF	270	76.3%	446	81.2%	276	73.8%	258	69.4%
Alcohol	63	17.8%	67	12.2%	31	8.3%	54	14.5%
Percentage of product by Nova classification system groups								
<i>Abbreviations: LSEA = lower socioeconomic area, HSEA = higher socioeconomic area, UPF = ultra-processed food.</i>								

Supermarkets

As shown in Table 8, the policy appeared to reduce exposure to UPF in both areas. In the LSEA, a 19-percentage point reduction in exposure to UPF items between 2022 and 2023 was identified. In the HSEA, a 20-percentage point reduction was found. Exposure to UPF was 6-percentage points higher in the HSEA in comparison to the LSEA in 2023. The study also found an increase in exposure to NOVA1 (no processing) products suggesting an increase in exposure to fresh and unprocessed products like fruit and vegetables and water.

Chain Convenience Stores

Regarding UPFs, the study found an overall reduction in exposure to UPF products in CCS. As shown in Table 8, a 22-percentage point reduction in exposure to UPF was found in the LSEA, and a 9-percentage point reduction was found in the HSEA. In general, the level of UPF exposure is greater in the LSEA in 2022, 69% than in the HSEA 55%. However, after the implementation of the policy, proportionate exposure to UPF products was similar in the two areas, 47% in the LSEA and 46% in the HSEA. Furthermore, exposure to NOVA 1 increased by 8-percentage points in the LSEA and 1-percentage point in the HSEA resulting in 18% exposure to NOVA1 products in the LSEA and 17% exposure in the HSEA.

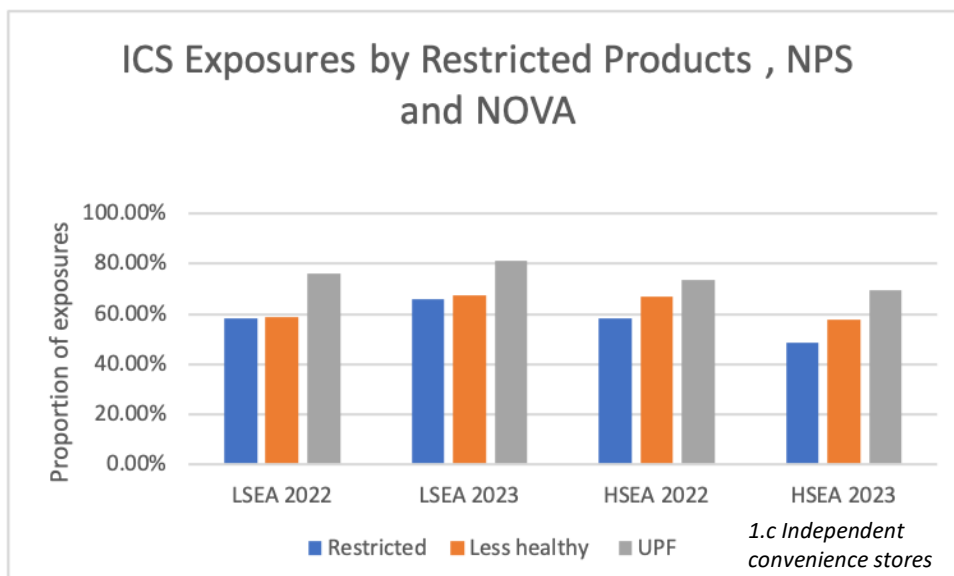
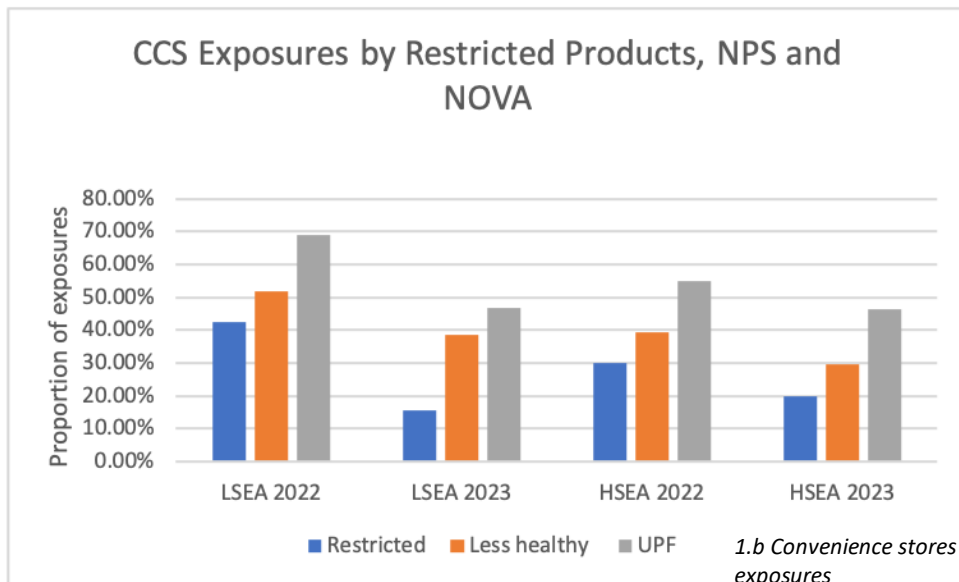
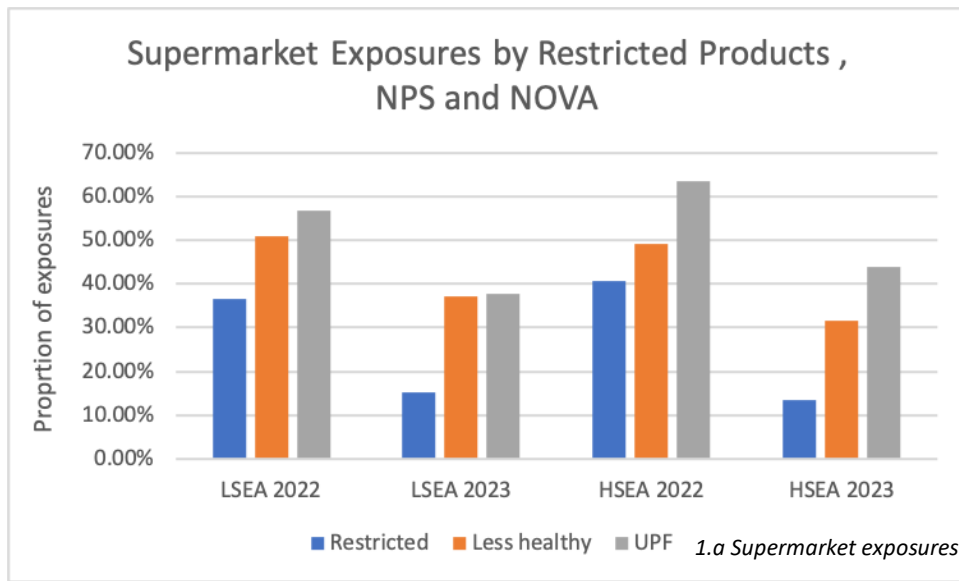
Independent Convenience Stores

The study found that in the ICS, UPF dominated exposure in both areas. As seen in Table 8, in 2022, approximately 75% of the total exposure of all products consisted of UPFs. By 2023, this shifted slightly to 81% in the LSEA and to 69% in the HSEA. When considering exposure to unhealthy commodities, the exposure to both UPF and alcohol in these stores was 93% in the LSEA and 84% in the HSEA. Furthermore, the analysis of stores by specific prime locations found that in ICS checkouts, UPF exposure was extremely high; in the LSEA in 2022 and 2023, 94% of exposures were classified as UPF. The study found exposure to be slightly lower in the checkout areas of the HSEA, with 83% of exposures classified as UPF in 2022 and 75% in 2023.

Overall Comparison of the Classification Systems

There are significant differences in the results regarding exposure when using different metrics to describe food and drink products. As clearly demonstrated in Figure 10, the policy appeared to reduce exposure to products restricted by the policy, less healthy items, and UPF. However, the graph demonstrates a significant gap between the exposures of products restricted by the policy and less healthy items and UPF exposures. This suggests that the policy may have some fundamental gaps in its design.

Figure 10 Comparison graphs of exposures by each classification systems



5.5.6 Exposure to Promotions: Price Promotion and Multi-Buy Deals

Section 5.5.6 explored the study’s findings regarding exposure to price promotions and multi-buy deals. As seen in Table 9, there were some changes in exposure between the two years. The total exposure to price promotions increased in HSEA supermarkets but reduced in the LSEA, whereas multibuy deal exposures increased in the LSEA and considerably reduced in the HSEA. As for the CCS, price promotion exposures showed minimal change, with a slight reduction in exposure in the LSEA and almost no change in the HSEA. As for the CCS, multibuy deals exposures considerably increased in the LSEA but remained the same in the HSEA. As for the ICS, price promotion notably increased in the LSEA; however, exposure to multibuy deals and both forms of promotion in the HSEA showed almost no change.

Table 9 Total exposure to price promotion and multibuy deals in prime locations of stores

Total exposure to promotions	LSEA 2022	LSEA 2023	HSEA 2022	HSEA 2023
	(n)	(n)	(n)	(n)
Supermarkets exposure to promotions				
Price reduction	836	711	634	751
Multibuy	6	75	707	339
Chain convenience store exposure to promotions				
Price reduction	248	211	192	194
Multibuy	4	44	38	36
Independent convenience stores exposure to promotions				
Price reduction	0	27	4	4
Multibuy	2	2	12	15

5.5.7 Exposure to Promotions by Food and Drink Categories

Table 10 shows the highest exposure to price promotions and multi-buy deals by food and drink categories. As some stores had very low exposure to promotions, particularly the ICS.

Table 10 Exposure to Price promotions and Multibuy deals by food and drink category in stores.

LSEA 2022			LSEA 2023			HSEA 2022			HSEA 2023		
Category	(n)	(%)	Category	(n)	(%)	Category	(n)	(%)	Category	(n)	(%)
Supermarket Price Promotion											
Alcohol	145	17.3%	Processed meat and fish	135	19.0%	Chocolate	105	16.6%	Alcohol	134	17.8%

Processed meat and fish	101	12.1 %	Alcohol	93	13.1%	Alcohol	84	13.3%	Miscellaneous	67	8.9%
Fruit and vegetables	91	10.9 %	Fruit and vegetables	70	9.9%	Miscellaneous	47	7.4%	Salty snacks	58	7.7%
Chocolate	70	8.4%	Dairy products	57	8.0%	Processed meat and fish	47	6.2%	Pizza, pie and quiche	51	6.8%
Pizza, pie and quiche	58	6.9%	Pizza, pie and quiche	50	7.0%	Biscuits	34	5.4%	Dairy products	49	6.5%
Supermarket Multibuy deals											
Chocolate	36	14.5 %	Miscellaneous	47	22.3%	Chocolate	33	17.2%	Alcohol	38	19.6%
Salty snacks	26	10.5 %	Alcohol	41	19.4%	SF soft drink/energy drinks	26	13.5%	Miscellaneous	24	12.4%
Breakfast cereal	24	9.7%	Tea and coffee	25	11.9%	Salty snacks	25	13.0%	Breakfast cereal	18	9.3%
Tea and coffee	24	9.7%	Breakfast cereal	16	7.6%	Alcohol	21	10.9%	Dried fruit	13	6.7%
Alcohol	12	4.8%	Salty snacks	14	6.6%	Biscuit and cakes	14	7.3%	Juices	12	6.2%
Chain Convenience Price Promotions											
Chocolate	36	14.5 %	Miscellaneous	47	22.3%	Chocolate	33	17.2%	Alcohol	38	19.6%
Salty snacks	26	10.5 %	Alcohol	41	19.4%	SF soft drink/energy drinks	26	13.5%	Miscellaneous	24	12.37%
Breakfast cereal	24	9.7%	Tea and coffee	25	11.9%	Salty snacks	25	13.0%	Breakfast cereal	18	9.3%
Tea and coffee	24	9.7%	Breakfast cereal	16	7.6%	Alcohol	21	10.9%	Dried fruit	13	6.7%
Alcohol	12	4.8%	Salty snacks	14	6.6%	Biscuit and cakes	14	7.3%	Juices	12	6.2%
Chain Convenience Multibuy Deals											
Alcohol	1	25.0 %	Alcohol	8	18.2%	Alcohol	14	36.8%	Alcohol	4	11.1%
Miscellaneous	2	50.0 %	Miscellaneous	12	27.3%	Dried fruit	2	5.3%	Chocolate	20	55.6%
Sweets	1	25.0 %	Dried fruit	4	9.1%	Chocolate	22	57.9%	Tinned goods	12	33.3%
			Meal kits	10	22.7%	Snack bar	1	2.6%			
			Fruit and veg	8	18.2%	Water	1	2.6%			
Independent Convenience Price Promotions											
No price promotions	n	n	Sweets	2	8.0%	Salty snacks	2	50.0%	Salty snacks	2	50.0%
n/a	n	n	Salty snacks	6	24.0%	Grains	2	50.00%	Grains	2	50.0%
n/a	n	n	Miscellaneous	2	8.0%						
n/a	n	n	Chocolate	10	40.0%						

n/a	n	n	Biscuit and cakes	5	20.0%						
Independent Convenience Multibuy Deals											
Soft drink	1	100%	Sweets	2	100%	Salty snacks	2	16.7%	Salty snacks	1	6.7%
n/a	n	n				Grains	0	0.0%	Grains	4	26.7%
n/a	n	n				Sweets	2	16.7%	Soft drinks	2	13.3%
n/a	n	n				Miscellaneous	8	66.7%	Miscellaneous	8	53.3%
Percentage of food categories by promotion type: Price promotion and multibuy deals											
<i>Abbreviations: LSEA = lower socioeconomic area, HSEA = higher socioeconomic area.</i>											

Supermarkets

Table 10 shows the top five food and drink categories by exposure to promotions and how exposure changed after policy implementation. In both areas, alcohol products dominated exposure to price promotions. The study found a differentiation between the two areas, in the LSEA the only notable change in price promotion related to chocolate due to the complete removal of chocolate in prime locations, as outlined in Section 0. In the HSEA, chocolate and biscuits comprised 22% of all promotion exposures, all of which disappeared in 2023. Exposure to promotions on fruits and vegetables in supermarkets in the LSEA was around 10% of all price promotion exposures.

The findings suggest that exposure to multibuy promotions increased in the LSEA in 2023, it decreased in the HSEA. However, overall exposure to these promotions in the prime locations was significantly higher in the HSEA, as shown in Table 10. The categories associated with multibuy promotion exposure were sugar-free soft drinks, morning goods, and processed meat and fish. Multibuy promotions were commonly used on alcohol products such as wine, spirits, and beer. The study found that, although the number of multibuy promotions increased in the LSEA, they appeared to be on products that form a meal, such as dairy products and pizza, pie and quiche rather than treats, snacks, or alcohol, with the exception of ice cream.

Chain Convenience Stores

The overall number of exposures to price promotions in prime locations remained unchanged by the policy. In both areas, exposure to promotions on chocolate was greatly reduced by 2023, whereas exposure to price promotions on alcohol increased considerably, as shown in Table 10. This study found notable differences between the two areas. As

shown in Table 10, in 2022, exposure to price promotions in the LSEA was most associated with chocolate, salty snacks, breakfast cereals, SF soft drinks/energy drinks, tea, coffee, and alcohol. By 2023, this shifted to miscellaneous items, alcohol, tea and coffee, breakfast cereals, and salty snacks. Fewer exposures to price promotions were found in the HSEA. In 2022, price promotion in the HSEA was mostly associated with chocolate, SF soft drinks/energy drinks, salty snacks, alcohol and biscuits, and cakes. In 2023, exposure to alcohol and miscellaneous products dominated, followed by breakfast cereal, dried fruit, and juices.

The study found fewer multibuy promotions than price reduction promotions in CCS. In 2022, only four exposures were found in the LSEA, which increased in 2023 in line with the HSEA. Exposure to multibuy promotions of alcohol was the most common. In 2022, exposure was only found to alcohol, miscellaneous items, and sweets in the LSEA in 2022. In 2023, dried fruits, meal kits, and fruits and vegetables were found to have multibuy promotions. In the HSEA, alcohol, chocolate, dried fruit, snack bars, water, and tinned goods were associated with the highest exposure to multibuy promotions in 2022. In 2023, the study found that exposure was limited to alcohol, chocolate, and tinned goods.

Independent Convenience Stores

As shown in Table 10, in comparison to the other store types, considerably fewer promotions were found in the prime locations in the ICS. In the LSEA in 2022, the study found no price promotions and only two exposures of multibuy promotions on food or drinks limited to sweets and soft drinks. In 2023, 27 price promotions were found, predominately on biscuits, chocolate, salty snacks, and sweets, and two multibuy promotions on sweets. In the HSEA, in 2022, only four price promotions were identified in prime locations, limited to grains and salty snacks. Twelve exposures to multibuy promotions were identified, predominantly linked to miscellaneous products, salty snacks, and sweets. A marginal change was established in 2023 as shown in Table 10.

5.5.8 Exposure to Promotions in Prime Locations: NPS

Table 11 shows the exposure to promotions by products NPS. The table shows, the policy appeared to have an overall positive impact on influencing promotions exposures to become more associated with healthier products than with less healthy products.

Table 11 Exposure to Price promotions and Multibuy deals by food and drink category in stores

Exposures to promotions by NPS		Price Reduction promotion		Multi buy promotion	
Area	NPS classification	Supermarkets			
		(n)	(%)	(n)	(%)
LSEA 2022	Healthier	358	42.8%	4	66.7%
	Less Healthy	331	39.6%	2	33.3%
LSEA 2023	Healthier	381	53.6%	55	73.3%
	Less Healthy	237	33.3%	20	26.7%
HSEA 2022	Healthier	225	35.5%	154	21.8%
	Less Healthy	324	51.1%	465	65.8%
HSEA 2023	Healthier	337	44.9%	145	42.8%
	Less Healthy	279	37.2%	82	24.2%
Chain Convenience Stores					
LSEA 2022	Healthier	97	39.1%	1	25.0%
	Less healthy	139	56.1%	2	50.0%
LSEA 2023	Healthier	86	40.8%	20	50.0%
	Less healthy	84	39.8%	12	30.0%
HSEA 2022	Healthier	77	41.0%	1	2.6%
	Less healthy	90	47.9%	23	60.5%
HSEA 2023	Healthier	80	41.0%	12	33.3%
	Less healthy	77	39.5%	20	55.6%
Independent Convenience Stores					
LSEA 2022	Healthier	0	0.0%	0	0.00%
	Less healthy	0	0.0%	2	100.0%
LSEA 2023	Healthier	6	22.2%	0	0.0%
	Less healthy	21	77.8%	2	100.0%
HSEA 2022	Healthier	2	50.0%	2	16.7%
	Less healthy	2	50.0%	10	83.3%
HSEA 2023	Healthier	2	50.0%	4	26.7%
	Less healthy	2	50.0%	11	73.3%
Percentage of promotion type by NPS classification					
<i>Abbreviations: LSEA = lower socioeconomic area, HSEA = higher socioeconomic area. NPS = nutrient profile score.</i>					

Supermarkets

Table 11 shows how the distribution of exposure to price promotions in the LSEA was similar between healthier and less healthy products by 2023, favouring the exposure of promotions to healthier items. With regard to multibuy promotions, exposure in the LSEA consistently favoured healthier items. It is worth noting that multibuy promotions were uncommon in the LSEA. In the HSEA, a higher exposure to unhealthy products than to healthier items was found. This disparity was more pronounced in multibuy promotions for healthier and less healthy products. The findings from the HSEA in 2023 indicate a significantly different food environment, where both price reductions and multibuy promotions favoured healthier items. This suggests that the policy successfully influenced the exposure to promotions in prime locations for healthier products.

Chain Convenience Stores

The research demonstrated that in CCS, price reduction promotion favoured less healthy products in 2022. By 2023, the two areas were found to have a nearly equal distribution of promotion exposure on healthier and less healthy items. However, exposure to multibuy promotions was less consistent. The study found that an increase in multibuy promotions in the LSEA favoured healthier products. In the HSEA, the total number of exposures to multibuy promotions on healthier products increased, and the proportion of exposures to promotions on less healthy items reduced; however, the overall proportion of exposures to promotions still favoured less healthy items.

Independent Convenience Stores

As discussed, few exposures to promotions were found in the ICSs. Regarding the HSEA, the study further found that exposure to price promotions in the HSEA was evenly split between healthier and less healthy items, whereas multibuy promotion exposures overwhelmingly favoured less healthy items. In the LSEA, in 2023 exposure to both price promotions and multibuy promotions were on less healthy items

5.5.9 Exposure to Promotions in Prime Locations: Ultra-Processed Foods

The final section outlines exposure to promotions regarding UPF. Table 12 shows the exposure to price promotions and multibuy deals in supermarkets and CCS. The study found

that both types of promotions were most associated with UPF compared to the other NOVA groups and alcohol.

Table 12 Exposures of promotions on Ultra-Processed Foods

Exposures of promotions on Ultra-Processed Foods	Price Reduction		Multibuy	
	(n)	(%)	(n)	(%)
Supermarkets				
LSEA 2022	379	45.3%	5	83.3%
LSEA 2023	288	40.5%	47	62.7%
HSEA 2022	409	64.5%	535	75.7%
HSEA 2023	397	52.9%	132	38.9%
Chain Convenience Stores				
LSEA 2022	194	78.2%	3	75.0%
LSEA 2023	100	47.4%	6	13.6%
HSEA 2022	143	76.1%	24	60.0%
HSEA 2023	110	56.4%	22	57.9%

Percentage of promotion type by NOVA groups
Abbreviations: LSEA = lower socioeconomic area, HSEA = higher socioeconomic area.

Supermarkets

Although the study found that exposure to price and multibuy promotions in supermarkets were frequently associated with UPFs, the findings suggest that the policy had a positive influence on exposure to promotions on UPF; for example, a 12-percentage point decrease was identified in exposure to price promotions on UPFs in the HSEA. Exposure to price promotions was higher in the HSEA, and exposure to UPFs still accounted for over 40% of these promotions. Exposure to multibuy deals on UPF products in the LSEA was proportionately higher, yet the raw total was considerably lower than in the HSEA. The proportion of exposure to multibuy promotions on UPFs decreased in the LSEA, but the total number of exposures to multibuy promotions on UPFs significantly increased. Regarding the HSEA, a significant reduction in exposure to promotions on UPFs was found for multibuy promotions. In summary, the policy brought about a decrease in promotional exposure to UPF products in general, excluding multibuy promotions in the LSEA in 2023. Despite this, UPF promotions continue to dominate prime locations.

Chain Convenience Stores

The study found that in 2022, all exposures to promotions were UPFs. As Table 12 shows, the policy appears to have influenced exposure to promotions on UPF, as the proportion of promotions was reduced across all areas and in both types of promotions considered in this study. Regarding price promotion exposures on UPF, between 2022 and 2023 a 31-percentage point reduction was found in the LSEA. In multibuy exposures, a 61-percentage point decrease was found over the year in the LSEA. In the HSEA, a 20-percentage point reduction was found in exposure to price promotions on the UPF, but only a 2-percentage point difference was identified in exposure to multibuy promotions on the UPF.

Independent Convenience Stores

As discussed, few promotions were found in the ICS. All exposures were found in the NOVA3 or UPF. In the LSEA, exposure to price promotions and multibuy deals in 2023 were all associated with UPF products. In the HSEA, all price promotions were associated with NOVA3 in 2023. The exposures to multibuy deals were split between NOVA3 (53%) and UPF (47%) in 2023.

5.6 Discussion

5.6.1 Summary of Findings

The study revealed that the policy had a significant impact on reducing consumer exposure to restricted products in supermarkets and CCS. The ICS did not exhibit the same pattern as they were not required to adhere to the policy. The study interpreted the decrease in exposure to restricted products in prime locations between 2022 and 2023 as a sign of policy adherence. Although the study found that adherence to the policy in supermarkets and CCS was high, in 2023 some products restricted by the policy were observed. The study showed that the policy's implementation reduced exposure to high sugar products such as chocolate, biscuits, cakes, and desserts.

Overall, high levels of adherence in both supermarkets and CCS were observed, in supermarkets, the policy's impact was similar in both socioeconomic areas, resulting in

aligned exposures between the two areas. In CCS, the study found that before the policy's implementation in 2022, the LSEA had higher exposure to restricted products. After the policy's implementation the study found that the HSEA had higher exposure to restricted products compared to the LSEA. There was a limited difference in the ICS, the LSEA ICS had higher exposure to restricted products, as well as to less healthy products and UPFs. The lack of change in the ICS suggests that without the policy, the levels of exposure found in 2022 in supermarkets and CCS would have remained consistent in 2023.

The categorisation of the data by the NPS and Nova classification system revealed some challenges regarding the policy's impact. Exposure to less healthy products in supermarkets was reduced in both areas, resulting in the HSEA having lower exposure to less healthy products in comparison to the LSEA. In regard to exposures to UPF, in 2023, exposure was higher in the HSEA in comparison to the LSEA. Although the policy reduced exposure to UPFs, exposure to UPFs was considerably higher than exposure to products restricted by the policy, and higher than product classifying as less healthy. Regarding CCS, exposure to healthier products increased and exposure to less healthy products decreased in both areas. The LSEA was found to have a slightly higher exposure to less healthy items after the implementation of the policy in comparison to the HSEA. In line with the findings from supermarkets, the policy was effective in reducing exposure to UPFs. The policy helped reduce the exposure to UPFs in the LSEA, resulting in similar levels of exposure between the two areas in 2023. Although the areas became more equal, exposure to UPFs remained high in all stores despite the implementation of the policy. The study found that the ICS had considerably lower exposure to healthier products in both areas in both years.

In supermarkets, the study found that promotions were often balanced and even favoured healthier products in the LSEA. In contrast, in the HSEA, price promotions dominated for less healthy items in 2022. The study found that after the policy's implementation exposures to promotions shifted to favour of healthier products. With regard to UPFs, promotion exposure to UPFs was reduced in both locations; however, promotions were still predominately found on UPFs in all stores. In CCS, the total number of promotions was not influenced by the policy. Exposure to promotions shifted to healthier items or items that form part of a meal in 2023. As for ICS, promotions were not frequently used, but of those

observed in the study, exposures were disproportionately on less healthy items and UPFs. This finding was most substantial in the LSEA.

The results of this study suggest some unintended consequences of the policy, mainly the increased exposure to alcohol products. Alcohol exposure increased in all store types and in all areas with the exception of the LSEA ICS. These findings suggest that alcohol has been used to replace products removed from prime locations. This was evident in the study's findings on exposure to promotions as alcohol promotions dominated.

5.6.2 Strengths and Limitations

The study is the first to observe the nature of the food environment pre- and post- the implementation of the policy restricting HFSS items from prime locations of stores (refer to Section 5.1 for further information regarding the policy). As the policy was implemented in late 2022, conducting observations at the start of 2022 and 2023 allowed for a direct comparison between these two years. As the food retail environment is dynamic, seasonal variations were observed, such as an increase in confectionary exposure during the Easter period. However, as the study conducted observations during the same months each year, the findings between the years remained comparable. Regarding the example of Easter, the study provides evidence demonstrating the significant impact that the policy has had on exposure to seasonal confectionary items due to the notable reduction in exposure to chocolate products between 2022 and 2023.

The strength of this study relates to the adoption of quantitative food environment observational surveys and qualitative field notes to enhance the depth of the analysis. While the study's results were primarily developed through survey data, the supplementary field notes provide contextual information, improving the quality and rigor of the study. For example, these notes helped contextualise store changes between the two years such as the removal of prime locations in 2023. This study's food environment survey draws on established methodologies from previous related research and incorporates insights from research exploring tobacco and alcohol exposure in stores ^[222,232,233,431].

An important strength of this study is the adoption of multiple classification systems to code the data. The study categorises the food and drink products by four metrics: the policy's inclusion criteria, food group categories, FSA's NPM, and Nova. The inclusion of different classification systems provided deeper insight into the data and exposed nuances within the different classification systems.

Although the study's focus is limited to exposure changes and cannot draw conclusions regarding purchasing behaviour changes, the study provides evidence on effective implementation and store adherence to the policy. Therefore, the study adds to the evidence base demonstrating the effectiveness of the policy in changing the exposure to products in stores. Furthermore, the study demonstrates the unintended consequences of the policy's implementation such as the increase exposure to alcohol. The study does not incorporate sales data, precluding claims regarding the policy impact on purchasing behaviours. However, attributing the direct effects of a policy to obesity remains challenging given the multifaceted nature of this health concern.

Observational studies, like all other methods, have inherent strengths and limitations. As previously discussed in Section 5.2.1, the strengths of this methodology include its real-world relevance and ecological validity ^[424]. The integration of qualitative field notes with a quantitative food environment survey serves to mitigate observer selection bias by offering a context for quantitative data. A limitation of this methodology is its time-consuming nature; however, the methodology also yields a substantial volume of data strengthening the robustness of the study. This methodology is also subject to environmental and temporal fluctuations that are beyond the researcher's control. The observations provide snapshots of each store at a single point in time over several months; therefore, it is likely that the temporal changes that occur throughout the month may be missed. The study attempted to mitigate this effect by observing the same stores multiple times each year, as summarised in Table 1.

In regard to sample size, a limitation of this study was that many store types that would be required to adhere to the policy, such as frozen food supermarkets, were not included in the observation sample. This limitation warrants consideration when interpreting the

broader impact of the implemented policies. Considering the limitations discussed, the study faces challenges regarding the generalisability of the results due to its focus on Nottinghamshire. This study observed the lowest and highest socioeconomic districts in the county. As a result, the sample size was modest, and despite efforts to encompass high and low socioeconomic areas, these terms may not be fully representative of districts within other UK counties. Given the resources and capacity of this research, it was unfeasible to observe stores located in different UK counties.

One notable limitation is the absence of statistical tests, which hinders rigorous assessment of the significance of the observed changes. The lack of statistical tests makes it challenging to attribute differences solely to the implemented intervention, and causal relationships cannot be established firmly. As the study was focused on drawing comparisons between areas and years in order to draw conclusions regarding real-world outcomes, therefore descriptive statistics were considered to result in more meaningful findings.

One limitation of this study was the assumption of policy adherence. As this study is a natural observation, meaning that the researcher did not influence the observed environment in any way, the results assume that changes to exposures in the environment are the result of store adherence to the policy. This study cannot guarantee that the changes in store environments are the result of the policy and may be due to other confounding variables. For example, store changes may reflect changes in retail environments resulting from the impact of the cost-of-living crisis on purchasing behaviours. However, as the study's findings reflect the expected impact of the policy, it is likely that the changes observed in the retail environments are the result of the policy's implementation

It is also important to acknowledge the limitations of each of these models when interpreting the study's results. Firstly, the FSA's NPM was used to assign each product's NPS. Each product NPS was then used to categorise the products as restricted or permitted by the policy, with consideration to the policy specific inclusion criteria, and to categorise products as either healthier ($NPS < 4$) or less healthy food ($NPS \geq 4$). Due to the relevance of the NPM in policy, it was essential to replicate the NPM and NPS to ensure the data had relevance to the UK policy landscape. Regarding the categorisation of healthier and less healthy products, the same approach has been used in existing studies engaging with the

same subject and methodology ^[223,233]. However, categorising products into two groups risks the oversimplification of food and drink items and, therefore, risks becoming reductionist. However, due to the relevance of this categorisation by previous literature the data holds value. A further limitation emerged in regard to the reliance on nutritional information from stores or brand websites for coding products using NPS and NOVA classification system introduces potential errors due to incorrect ingredient information provided by sources. Although an unavoidable limitation, it underscores the need for cautious interpretation when relying on such data sources.

Furthermore, the NOVA classification system has its own strengths and limitations that should be considered when interpreting this study's findings (refer to Table 3 for further information regarding the NOVA groups). As outlined in Section 5.2.2, the NOVA classification system was selected because it is globally applicable, widely used in the literature, and is accepted as an appropriate metric for attributing the level of processing to food and drink products. As UPF becomes increasingly important to food policy, given the rising awareness of the implications UPF pose on health, ensuring that the study could contribute to the evidence regarding the policy's impact on UPF was an important component of the study's design ^[430]. However, there are some limitations to the NOVA classification system; for example, there is some debate about the applicability of the scale due to the difficulty of assigning some products to each category which may lead to some inconsistencies. This study followed the best practices for applying NOVA food classification and ensured that the researcher was familiar with applying the NOVA classification system in practice ^[53].

5.7 Relevance to Previous Literature

Existing literature from the UK and across the world has found that products in prime locations tend to be less healthy ^[234]. The results of this study from 2022 are consistent with research conducted prior to the implementation of the policy. The existing literature has generally concentrated on checkout areas; for example, one study in 2014 found that 78% of checkout food in UK convenience supermarkets was considered less healthy, as determined by the FSA NPM ^[378]. This figure is considerably higher than the findings of this

study from CCS, although it does reflect the findings from the ICS as of 2022. The total exposure to less healthy items in all ICS checkouts was 72% and in 2023 69%. Additionally, a recent study by Ejlerskov et al. (2018) found that 49% of checkout food exposures were less healthy, this study found that when considering all supermarket checkout exposures, exposure to less healthy items was 47%, demonstrating very similar findings between the two studies ^[233].

According to prior research, modifying the retail environment to minimise exposure to HFSS items and simultaneously enhance exposure to healthier options such as fresh fruits and vegetables has demonstrated the potential to foster healthier purchasing behaviours among consumers ^[417]. The policy implemented aimed to reduce the exposure to HFSS items, rather than increase exposure to healthier products, such as fruits and vegetables. Consequently, the study revealed that while exposure to healthier products (non-HFSS) showed an increase in exposure across stores, there was a limited increase in exposure to healthier food categories, specifically fruit and vegetables. For instance, this study found that exposure to fruits and vegetables across supermarkets and CCS only marginally increased. In supermarkets, exposure to fruits and vegetables remained relatively stable in the LSEA and increased by 2% in the HSEA. Conversely, in the CCS, the study observed a 2% increase in exposure in the LSEA, and a 1% reduction in the HSEA. Accordingly, the findings from this study suggest that the policy does not notably influence exposure to fresh products in the prime locations of supermarkets and CCS.

Relevance to Food Purchasing and Dietary Behaviours

The nature of the food retail environment is influential in shaping purchasing behaviours, and consequently, dietary behaviours. Although not exclusively, a large number of purchasing decisions are made in food retail environments ^[432,433]. Product placement is one of the many well-established techniques, such as promotions and advertisements, used in these environments to increase the visibility of products and stimulate purchasing ^[419]. Product placement in prime locations has been found to have a significant impact on sales. One study found that approximately 30% of total supermarket sales come from the end of aisles alone ^[434]. Studies conducted in the UK, US, and Australia have shown that the strategic placement of products, particularly those that are less healthy and well-marketed,

in prime locations leads to an increase in pester power, impulsive buying, and the influence of promotions [233,435–437].

Sales data from a similar period in which this study was conducted found a change in purchasing behaviour aligning with exposure changes found in this study. Kantar sales data indicate that the policy may have influenced purchasing behaviours, as a 5.6% increase in the sales of healthier impulse goods was found in the first nine months after the policy's implementation, while the same data on HFSS equivalents showed no change. Overall, in the last 12 weeks of 2022, post policy implementation, a 1.9% increase in sales of healthy products and 5.1% reduction in sales of unhealthy products were recorded [438].

The transition of the food environment to represent an obesogenic environment has been widely discussed as coinciding with shifts in food norms regarding what is and is not socially desirable behaviour [439]. Eating behaviours are strongly influenced by broader social contexts and social norms, which are often shaped by others' behaviours, cultural expectations, and environmental cues [440]. It has been proposed that the food retail environment plays an important role in shaping food norms [433]. In the retail environment, people are confronted with the opportunity to purchase products that are heavily marketed in the wider food environment. Previous research has established that products in prime locations often have heightened social acceptance and desirability, especially among children, strengthening their sales [232]. Social norms are known to have a notable impact on shaping food purchasing behaviours; therefore, ensuring that store environments do not strengthen food norms that align with a diet consisting of a high consumption of EDNP foods is essential.

The Food Retail Environment and Inequalities

The design of this policy has been positively received by the public health community due to its interventionist nature [367]. The policy intends to influence the environment itself and, consequently, industry action rather than targeting individual behaviour [268,375]. Therefore, the policy does not rely on individual agency, as is common in past prevention interventions. As discussed throughout this thesis, intervention that require high levels of individual agency, such as educational information to encourage healthier choices, risks widening

existing inequalities in obesity (refer to Section 1.5.3) ^[397,398]. Accordingly, policies or interventions that target the environment rely less on an individual's ability to actively engage with the intervention, mitigating the requirement for individual agency to see an impact ^[164]. Consequently, the nature of this policy should result in equal impacts across all socioeconomic environments. The study found that the policy helped align exposures within the socioeconomic areas. The findings of this study imply that the implementation of the policy was associated with an equal influence on the removal of products restricted by the policy in prime locations.

The study's findings do not suggest that the LSEA always has higher exposure to less healthy products or products restricted by the policy in comparison to the HSEA. For example, the study found that supermarkets in the HSEA had higher levels of exposure to unhealthy products than the LSEA. However, smaller stores were observed to have a higher exposure to less healthy items in the LSEA than in the HSEA. As a result, the exposure findings did not imply that the healthfulness of exposures are dictated by the socioeconomic area of the stores. Instead, the study's results indicate the importance of store type.

Supermarkets are thought to be the most balanced and healthy food retail environments due to their range of products ^[399,400]. Smaller stores such as CCS (small supermarkets) and ICS are often assumed to have the least healthy product range ^[339,363]. Numerous studies have shown that convenience stores are more prevalent in LSEA ^[399,401,402]. The combination of lower car ownership levels in LSEA and the necessity for transportation to reach supermarkets led to the hypothesis that residents in LSEA rely more heavily on their immediate food environments than those in HSEA ^[432,441,442]. Accordingly, LSEA are more likely to rely on convenience stores (both chain and independent) regularly. In regard to this study's findings, this places the LSEA at higher exposure to less healthy items as the CCS and ICS had greater exposure to less healthy and UPF items than the HSEA. However, to explore this further, it is necessary to map the total number of supermarkets and convenience stores within each area, along with developing an understanding of how residents in each area engage with their local food environment.

Adverse Effects of the Policy

As discussed, the policy was successful in reducing exposure to products included in the policy criteria, less healthy items and UPFs. However, despite the policy's success, the study identified clear gaps in the policy outcomes. Firstly, one clear finding of this study was the notable increase in exposure to alcohol. After the implementation of the policy, exposure to alcohol in the LSEA checkout areas in supermarkets increased by 20-percentage points, whereas exposure to alcohol in supermarket entrances in the HSEA increased by 21-percentage points. Consequently, this study concludes that the policy has inadvertently increased the risk of exposure to alcohol in supermarkets and CCS by replacing food and drink products with alternative high-value products. In line with the discussion on the influence of prime locations on purchasing behaviours, an increase in alcohol exposure may increase alcohol purchasing behaviours ^[431,434,435]. This finding is further supported by the high level of exposure to promotions on alcohol in both areas and in both supermarkets and CCS. At present, in consideration of CDoH, HFSS food, gambling (such as scratch cards), and tobacco all face some placement restriction regarding their accessibility within stores; however, in England, no such restriction exists for alcohol.

Nevertheless, the findings of the study suggest that the policy has resulted in a level playing field for industry, as a similar rate of exposure reduction was observed between the areas and their respective stores. This observation contributes to the growing body of evidence indicating that effective policy implementation, devoid of reliance on industry self-regulation, fosters a level playing field, ensuring a uniform impact across industry. Furthermore, the consistency in exposure found in the ICS demonstrates that without the policy, these food environments would not have changed independently.

As outlined in Section 5.1, the policy excluded a specific list of products. The NPS was utilised to categorise products as healthier and less healthy, in line with the approaches adopted in existing studies. The study found a notable difference between exposure to products included in the policy and exposure to less healthy items, demonstrating that the policy could have further influence if the exclusion criteria were reconsidered. Furthermore, this study used the Nova classification system to account for the level of product processing, specifically to understand exposure to UPFs. The gap between exposure to products included in the policy and exposure to UPFs remained significant after the policy

implementation (see Figure 10). The disparity between the level of exposure to products restricted by the policy and UPFs raises the question of whether UPFs should be used as a measure to restrict product exposure in prime locations in stores. This becomes increasingly relevant as more evidence of the adverse effects of UPF on health grows. In conclusion, while the policy was effective in reducing exposure to less healthy foods and UPF products, consumers were still exposed to a significant amount of these products that were permitted from the policy due to the inclusion criteria and NPS, suggesting areas where the policy's design could be improved to better address these issues.

One interesting finding regarding the researcher's field notes is related to the complete removal of all types of products from some prime locations, such as the complete removal of shelf space from the end of aisles found in some supermarkets and CCS. This finding may reflect an immediate response to the policy, as the data was only collected several months after its implementation. Further research is required to explore whether this is a temporary change in store environments. Another finding that emerged from the researcher's field notes was that one supermarket had replaced shelf space at the end of the aisle with a marketing campaign for a brand. Although this was only found in one store and one prime location, it may indicate an important loophole that allows the food and drink industry to engage with new food and drink advertisement spaces.

Overall, the study found that adherence to the policy was considerable; however, exposure to the included products in the prime locations still occurred. Neither the area nor store type had less than 10% exposure to the products restricted by the policy. As the policy was relatively new, the gaps in adherence may reflect the immediate response of stores while they adjust to the policy. However, it may also suggest that, with time, stores may become more complacent, and adherence may worsen. Conversely, the findings may suggest that with time, stores adherence may improve while the stores adjust to its implementation. The policy is designed to be enforced by local authorities that face insufficient funding and competing priorities. Therefore, support for enforcement is required before the policy is properly reviewed to avoid low adherence, and the impact of the policy becoming undermined.

The study's findings from the ICS demonstrate that without an intervention such as the policy restricting the placement of products in prime locations of stores, the store environment is unlikely to change. The policy was successful in influencing all stores across both areas that were eligible for the policy, demonstrating the importance of the policy in developing a level playing field for the food and drink industry. As discussed, this study cannot determine whether changes in exposure relate to changes in purchasing behaviour. Further research is required to assess whether purchasing behaviours are aligned with exposure changes during the same timeframe.

The study found that the policy appeared to influence exposure to less healthy items but did not have a notable influence on increasing exposure to healthier food categories such as fruits and vegetables. The changes observed in this study suggest that exposure can be influenced by the removal of less healthy items, suggesting that a policy could also be used to increase exposure to fresh and healthier products. Therefore, the policy design could be reconsidered to address these issues.

Furthermore, the study found that the type of store has a significant impact on the types of exposure to ICS, with the highest exposure to less healthy and UPF products. As discussed, households from more deprived areas have been found to rely more heavily on convenience stores than households from the least deprived areas because of the accessibility to larger stores due to car ownership. To understand whether this policy has equitable impact, the nature of the food environment must be assessed to explore whether the food environments in the LSEA hold more stores that are not included in the policy and, consequently, more residents who are not engaging with stores that have removed less healthy items from prime locations.

As discussed, the different categories of policy inclusion, NPS (healthier or less healthy), and NOVA classification system demonstrate notable differences in their descriptions of the food environment. Exposure to less healthy items and UPF reduction remains considerably higher than exposure to products included in the policy's criteria. This difference indicates that despite the policy exposure to products that may pose risks to individuals' diets, they are still being exposed in prime locations, particularly regarding the exposure gap between

products included in the policy and UPF. This difference requires further consideration and contributes to research regarding the inclusion of UPF in food policy.

5.7.1 Conclusion

This study shows that the restriction of placement of HFSS products from prime location of stores aligned with positive changes in the food retail environment due to reduced exposure to less healthy, HFSS and UPF items. The study found the policy restricting HFSS items from the prime locations of stores had a considerable impact on reducing exposures in supermarkets and CCS in both socioeconomic areas. Furthermore, the study's findings suggest that without the policy, stores would be unlikely to change their environments independently, as demonstrated through the minimal change in exposures reflected in the ICS were not required to adhere to the policy. Additionally, the study found that the implementation of the policy corresponded with reduced exposure to promotions on less healthy items, namely confectionary items which may have a notable influence on individuals' purchasing habits. Although the study found that the impact of the policy on stores across both areas appeared equitable, the findings of the study suggest that the policy may be most beneficial to higher SES groups in consideration to the higher use of convenience stores excluded from the policy by lower SES households. Further research is required to understand how the policy may have affected different SES groups in the UK as this research does not explore how the policy influences purchasing behaviours, demonstrating a clear area for future research.

6 Chapter 6: Summary, Discussion, Implications for Future Research and Policy

6.1 Introduction

This chapter presents a comprehensive summary of this thesis' strengths and limitations and examines the findings in relation to the existing literature. The chapter concludes with a discussion of the key implications and considerations for future policy and research that have arisen from this body of research. Each objective was directly linked to one of the three studies included in this thesis. These three studies can be found in Chapter 3, 4, 5. This chapter considers how the three primary studies that form this thesis respond to the overarching research question that guided this study:

What is the relationship between food-related obesity prevention policies and inequalities in obesity in the UK?

This overarching aim was underpinned by three core objectives.

1. To understand UK based adults' experiences, attitudes, and future outlooks of food-related obesity prevention policy.
2. To explore how socioeconomic inequalities in obesity are considered in the UK obesity prevention policy process.
3. To investigate how the restriction on the placement of HFSS items in prime locations of stores in England may influence food retail environments in different socioeconomic areas.

6.2 Strengths and Limitations

The study produced a range of novel findings that have important relevance to both academic and policy literature; however, there are key strengths and limitations that require addressing. Chapters 3, 4, 5 provide a comprehensive description of the strengths and limitations of each of the three primary studies that form this thesis.

Regarding the three studies, the research was strengthened by the timeliness of data collection. The research was designed during Covid-19 and data collection commenced shortly after the Covid-19 measures were lifted in the UK. There was also considerable political instability at this time, with the looming cost-of-life crisis and a recently published *Tackling Obesity (2020) for England* ^[179]. As discussed throughout this thesis, Covid-19 marked a unique period of exceptional closeness between government decision-making and the day-to-day behaviours of the public. Additionally, the publication of *Tackling Obesity (2020)* and the link between Covid-19 cases severity and weight classification has led to extensive mainstream media messaging around obesity ^[179]. This context was developed as an important timeframe to explore public opinion and the policy landscape by exploring stakeholder opinions. Furthermore, the observational survey study was designed to explore the impact of a policy before and after its implementation. This offered a unique opportunity to explore how this policy may have influenced exposure to HFSS products in the prime locations of stores.

Another strength of this study links to the strengths of a mixed-method approach. As referred to by Denzin and Lincoln (1998), using multiple methods allows for an in-depth study of a phenomenon through the analysis of multiple perspectives ^[238]. This brings a new understanding to the field regarding how different groups, the general public participants (GPP), and policy stakeholders (PSH) view food policy for obesity prevention and its interactions with inequalities and provides an opportunity to explore the similarities and differences between these perspectives as well as incorporate a case study to investigate the practical implications of a policy in this area.

A notable strength of this research lies in the extensive and diverse collection of primary data that formed this thesis. The wealth of primary data collected in this research allows for a nuanced exploration and convergence of the data to answer the research question. By adopting convergence triangulation in the discussion (see 6.3), the study is strengthened by employing multiple data sources that provides a comprehensive understanding of the study research question, which enhances the robustness and depth of the study ^[245,443].

The nature of the samples in each of the three studies require consideration. The sample size for interviews with members of the public was considerable for a qualitative research study (n=31), however more women than men were included in this study due to the pool of respondents to the initial recruitment survey. As a result, it was more difficult to draw conclusions regarding male perspectives. Furthermore, the participants' screening survey failed to obtain demographic data regarding ethnicity, which may have missed an interesting component regarding participants' identities, culture and lived experiences. As discussed in section 3.2, the validity of BMI is heavily debated within literature, however, the tool provided a means to categorise participants by weight classification to explore the differences in lived experiences between participants. Therefore, the study accepts the limitations of BMI but found that the measure was beneficial to divide the sample into weight classification to account for differences in the lived experiences (See 3.2.1 for further discussion of the limitations of BMI classification). Overall, the sample was strengthened due to its considerable size, geographic variation, and variation in weight classifications.

There are two key limitations to be considered in the sample of PSH. Firstly, the sample size was small (n=14). The small sample size was due to the difficulty of recruiting PSH because of scheduling challenges and lack of response to recruitment invites. However, it is important to consider why recruitment was difficult in this sample and how this difficulty may have influenced the research findings. The stakeholders who were contacted but did not respond or did not follow through after the scheduling of an interview may have been reluctant to participate because of the predicted aims and intentions of the research. The stakeholders might have held preconceptions regarding the research questions which may have prevented them from engaging with the research if they believed they would disagree with associated views; for example, the views held by the SPECTRUM consortium, which is associated with this thesis and acknowledged in the study invite and participant information sheet (see Appendix 8.7). The sample may represent those whose beliefs align with popular perspectives and those who are comfortable sharing their views. The sample did not include the food and drink industry representatives due to the expected difficulty of recruitment as well as the perspective that the food and drink industry would not add considerable value in the consideration of inequalities within the food policy process. As the researcher, I was advised that including the industry in this study may lead to a lack of transparency in

industry representatives' responses which was then expected to reduce the overall depth of the study's findings. Therefore, it was decided that the value addedness from including industry for this study was limited.

Finally, as discussed in Section 5.2, the sample for the observational study was focused on two districts in Nottinghamshire. The two districts were carefully selected to reflect the highest and lowest socioeconomic areas in Nottinghamshire. This sample size was appropriate given the resources and time-consuming nature of the data-collection process. Despite the sampled area being limited, the total number of conducted observation was considerable (n=132) and the sample included two socioeconomic areas aligning with the study's objectives.

6.3 Discussion of Key Findings

The following section brings together the findings of the three studies that form this thesis to answer the overarching research question. This section employs a convergence model of triangulation, in accordance with Creswell and Plano Clarke (2007) ^[443]. This model involves merging the findings from the three primary studies in this thesis at the discussion stage of the research process to answer the overarching research question. In this model, the weighting of the qualitative and quantitative data is equal, allowing the research findings from each study to be compared, contrasted, and interpreted in this chapter to fulfil the thesis's overall objective. This section will draw upon framing theory and social construction target population theory. This section also demonstrates the relevance of the study's findings to the existing literature and outlines the key policy and academic implications resulting from this study.

6.3.1 Perceptions of Obesity Causation, the Nature of the Food Environment, and the Barriers to Healthy Weight

In contrast to earlier research exploring public and PSH attitudes, both qualitative studies indicated that individual blame and attribution of causation to individual characteristics were minority perspectives. Both studied samples believed that the primary cause of

obesity was the nature of the modern food environment. The GPP and PSH emphasised factors such as the accessibility and affordability of energy dense, nutrient poor (EDNP) foods, as well as the low availability and unaffordability of nutritious, fresh products. Therefore, both the GPP and the PSH perspectives agreed with the dominant perspective found in academic literature that attributes rising obesity rates to the modern food environment ^[74,90,185].

The study found that individualised framing of obesity regarding causal attitudes was the minority perspective among the GPP and was not identified among the PSH. The findings contribute to the literature that suggests public awareness of the food environment as increasing and the popularity of causal attitudes focused on individual attributes is declining ^[200,203,392]. This finding suggests that individual responsibility framing that has dominated obesity prevention discourse is being challenged by structural framings. The participants from both samples generally posited that the lack of desire or motivation was not a primary barrier to a healthy diet or weight. The findings from the two qualitative studies align with one another regarding the framing of obesity causation as related to the nature of the food environment acting in opposition to individuals' desire to maintain a healthy weight.

The shift in framing obesity causation may result from the lived experiences of the GPP. Many GPP experiences demonstrated the complexity and reinforcing nature of the barriers to a healthy diet and weight. The study found that barriers such as modern lifestyles and stress, coupled with restricted financial freedom and material conditions, exacerbated poorer food behaviours. The PSH utilised a structural framing of obesity and alluded to the food environment as part of the broken food system, which placed individuals vulnerable to the overconsumption of cheap, EDNP foods due to the availability and affordability of these products discussed.

This study provides an interesting opportunity to align an observational study of the food environment with accounts of lived experiences from the GPP. In line with previous studies, participants discussed the influence of the food retail environment on their purchasing decisions, specifically regarding prime locations ^[436]. Many participants described how temptations in stores through industry tactics led to impulse purchases and pester power.

The GPP described utilising their own tactics to resist temptations in stores, such as avoiding shopping with children. This is contextualised by the findings from the observation study, which found that, in 2022, exposure to treat products, such as chocolate, were extremely high in all prime locations of stores and in all store types. Furthermore, the data from 2022 also demonstrated how store retail environments had high exposure to treat products on promotion, intensifying the attractiveness of these products due to product placement and promotion. The accounts of the GPP regarding the influence of the store environment on impulse purchasing behaviours support the existing literature and provides insight to suggest that the removal of HFSS products from prime locations, as observed in study three with regards to the evident change in exposures to restricted products between 2022 and 2023, would have a notable influence on purchasing behaviours [233,431,434].

Structural framing of obesity causation was observed in both samples' perspectives, evidenced by the emphasis on economic hardship, financial insecurity, and restricted material conditions as exacerbating barriers to healthy diet and weight. The exacerbated barriers were thought to result in greater reliance on EDNP food because of its convenience, capacity to be stored and prepared, and most significantly, its cost-effectiveness. As discussed, limited research has been conducted on exploring UK general public and PSH perspectives on the impact of financial hardship and poverty on obesity causation and the barriers and facilitators to healthy weight. However, the findings support the existing literature that has explored low-income households' attitudes and experiences, especially regarding the importance of pragmatic factors and material conditions [205,301].

In summary, the study's findings regarding the GPP and the PSH perceptive on obesity causation, the nature of the food environment, and barriers to healthy weight indicate an alignment and notable shift in perspectives compared to previous research. The change in perspective could be attributed to the normalisation of obesity in society, particularly in the case of childhood obesity, the reframing of obesity causation related to the food environment and structural drivers, and the extensive media coverage and political activity in obesity over the past few decades. The findings indicate that a constructive climate for policy action may exist due to the acknowledgment of the structural drivers found within the food environment. These findings contribute to the existing literature by providing

qualitative data exploring the perspectives of the PSH and contemporary literature on the attitudes and experiences of the GPP in a post-covid context.

6.3.2 Perspectives on the Role of the Food and Drink Industry: Shaping the Food Environment, Bearing Responsibility for Prevention, and as a Stakeholder in the Policymaking Process

Although exploring perspectives regarding the role of the food and drink industry in obesity prevention policy was not an intended objective of this research, the findings regarding the position of the industry within the policy landscape were interesting. A clear distinction emerged between the GPP and the PSH regarding the role of the food and drink industry. Firstly, the PSH saw the industry as a dynamic and active player in obesity causation. A subgroup of PSH blamed the industry for the formation of a food environment that encouraged the overconsumption of UPF and EDNP diets. The GPP discussed their awareness of industry activity in the formation of the food environment, but strictly regarding the physical retail environment and marketing practices. However, unlike the PSH, the GPP did not frame the food and drink industry as the cause of the nature of the food environment but rather understood these activities as the expected nature of any industry.

The study's findings indicate the influence of the food and drinks industry on shaping the food retail environment. In line with the descriptions from the GPP, the findings from study three demonstrate how in 2022, consumers were exposed to high quantities of less healthy and UPF items, consisting of high exposure to chocolate, cakes and biscuits products in all store types. The study also found that these exposures were coupled with both price promotions and multibuy deals, demonstrating that consumers were frequently exposed to two well-known marketing techniques. In consideration of the GPP perspectives and the findings from the observation study, the food retail environment, prior to the policy's implementation, swayed towards EDNP products. There is limited research exploring the mechanisms and interactions between food retail companies and food brands. Therefore, how and why certain products and brands gain access to prime locations of stores is largely unknown.

The Food and Drink Industry and the Emergence of the Digital Food Environment (DFE)

The DFE has received considerable attention in the literature in recent years [298,329,444]. This study suggests that the DFE has become essential to the lived experience of the public as well as to the concerns of many PSH. The findings of this study and existing literature suggest that the DFE has created an extension of the food environment, with 24-hour exposure that extends into individuals' homes, consisting of purchasing opportunities, marketing, and promotion cues [330,333,388]. Many GPP, particularly the younger participants, described how online delivery platforms (ODP) had become a normalised part of their dietary behaviours. Unlike previous literature, this study did not conclude that takeaways were perceived as a treat but rather as a normal part of the participants' week [321,335]. Many PSH feared the impact of these platforms on shaping dietary norms and food cultures, as it was believed that much of the food available on these platforms are EDNP fast food. The impact of ODP on obesity requires further research, however it is expected to result in increased calorie consumption due to the increased convenience and accessibility to calorie-dense, fast food [445,446]. Additionally, some PSHs indicated that the DFE, particularly with regard to ODP, requires greater attention to avoid these platforms falling through the gaps in existing policies as well as to build appropriate regulations for platforms.

Participant Views Towards the Responsibility of the Food Industry Within Obesity Prevention and the Presence of Industry in the Policymaking Process

A clear distinction between the PSH and GPP perspectives relates to the responsibility of the food and drink industry. The GPP held more fatalistic beliefs about industry behaviour. The GPP infrequently described the food and drink industry as responsible for obesity prevention. The importance of a free market and the feasibility of the industry's uptake of responsibility dominated the justifications for the lack of industry responsibility. The GPP often held the perspective that industry activity does not influence their behaviour, particularly in regard to the influence of industry's advertisements. Yet the GPP did acknowledge the impact of other marketing practices such as promotions and product placement. The PSH were more critical of industry and saw the importance of industry responsibility within the policy process, whereas GPP generally did not adopt the same perspective. This may expose a disconnect between GPP awareness of industry's power and influence on their lived experience in the modern food environment.

Prior research indicates that the industry's adoption of individual responsibility framing, which likely influences public perspectives, cultivates a strong association between the requirement for individual willpower to maintain a healthier diet ^[447]. Although the GPP did not adhere to pre-existing causal arguments focused on individual behaviour, most described how responsibility ultimately lay with the individual, irrespective of their views on inequalities in obesity rates and the unequal opportunity to sustain a healthy weight in the UK. This finding suggests a further disconnect between the GPP framing of the food environment as the cause of obesity and the role of the food industry in forming the environment, as described by many PSH.

Most PSH were sceptical of industry involvement in past policy action, in part due to the limited impact of industry self-regulation. Some PSH who were more optimistic about industry willingness to change behaviours in line with public health goals discussed the importance of ensuring that policy guaranteed a level playing field. The study three demonstrates the impact of a policy as long as it is clearly designed and enforced. The results from study three demonstrate that irrespective of the store chain, exposure differences between 2022 and 2023 were similar across the different store chains included in the study. Therefore, the findings of this study suggest that the removal of HFSS in prime locations may result in impact equal across different store chains, forming a level playing field. Similarly, the increase in exposure to alcohol was also found throughout the different store chains demonstrating how another UCI, the alcohol industry, are utilising the implementation of this policy to support their sales.

As discussed, the PSH and GPP framed the food and drink industry in different ways. The PSH often framed the industry as an unhealthy commodity industry (UCI), considering the failure to effectively regulate the food and drink industry resulting in huge economic, social, and individual costs through rising obesity levels among other health conditions. This perspective has not been reported in previous literature that has explored stakeholder perspectives in the UK. However, a common perspective within literature related to the failure to regulate industry's activity and the overreliance on industry self-regulation ^[57,410,448]. Accordingly, many PSH alluded to the importance of industry's responsibility

regarding their role in sustaining individual responsibility framing and the power held by industry in the policymaking process. The GPP infrequently described the impact of the food and drink industry in shaping the policy process. The PSH extensively discussed the influence and power of the food industry within the policy landscape with regard to industry lobbying, resulting in delayed, watered down, and abandoned interventions ^[449].

6.3.3 Views on Socioeconomic Inequalities within Obesity; Exacerbated Barriers to Healthy Weight and Consideration of Inequalities in Prevention Action

The study's findings indicate that inequalities in obesity rates as well as the impact of inequalities on obesity drivers were well known among the PSH and GPP. The quality of the food environment and barriers to healthy weight were believed to be socially stratified by all participants. This finding contradicts a similar study from Australia that found GPP perspectives to be uninfluenced by their understanding of inequalities on regarding causation and barriers to healthy weight ^[450]. Furthermore, the PSH alluded to the suspected likelihood of the differential impact of obesity prevention based on an individual's SES. Some GPP expressed how their SES resulted in policies becoming disconnected to their lived experience due to the intended impact of a policy being perceived as out of reach. The following section outlines the projects' main findings regarding the role of socioeconomic inequalities in obesity regarding barriers to healthy weight, the nature of the food environment, lived experiences of poverty and low income in relation to policy, and the understanding of inequalities in obesity through policy action.

Views Towards the Socioeconomic Status as a Barrier to Healthy Diets and Weight

A novel finding of this study was the high awareness of the impact of inequalities on obesity in the UK. Both the GPP and PSH unanimously believed that the opportunity to sustain a healthy diet and, accordingly, a healthy weight was unequal in the UK. Some GPP described the ability to sustain a healthy diet as a luxury, suggesting that Crawford's (1984) statement 'choosing health is an unaffordable luxury' remains relevant to this thesis' findings ^{[30(p.[451(p. 69)]]}.

Both the GPP and the PSH acknowledged the perceived relationship between lower SES and poorer quality food environments, particularly in urban settings. Previous studies that have explored food environments have found that the overall quality of an environment is socially stratified ^[414,441]. The PSH acknowledged how the social stratification of the quality of a food environment was not limited to the accessibility and affordability of EDNP foods, but also to the walkability and environmental quality of an area. Accordingly, both samples generally believed that lower SES groups were confronted with greater barriers to healthy diet and weight due to their environments.

The influence of SES on the food environment was observed in study three. Overall, the study found that, in 2023, exposure to less healthy products (classified by the FSA NPM) was higher in all store types in the LSEA than in the HSEA. As discussed, the ICS and CCS showed the largest differences based upon the level of deprivation of each area. This finding is particularly important because of the lack of accessibility to supermarkets in more deprived areas in the UK, resulting in greater reliance on smaller stores such as CCS and ICS ^[452]. In the CCS in 2022, exposure to chocolate, sweets, salty snacks, cakes, and biscuits was higher in the LSEA than in the HSEA. Additionally, exposure to fruits and vegetables was higher in the HSEA among these stores. The implementation of the policy led to the exposure of these products by category becoming aligned in both areas by 2023; however, exposure to less healthy products in the LSEA remained 12.4-percentage points higher than that in the HSEA. The study's findings from 2023 showed that exposure to chocolate, biscuits, cakes, and sweets was higher in the LSEA than in the HSEA, resulting in a 9.4-percentage point difference between the LSEA and HSEA. Accordingly, an important finding from the observations suggests that exposure to food retail environments results in the LSEA confronting less healthy items in prime locations more frequently than in food retail environments in the HSEA. It is important to note that this study was conducted solely in Nottinghamshire, the extent of generalisability and representativeness to broader populations may be limited.

Higher SES was believed to equate to fewer barriers and more facilitators to healthy weight, such as the type and stability of employment, material conditions, and financial freedom. The widespread awareness of the influence of SES on obesity may result from the increase

in inequalities in the UK and widespread media coverage regarding FSM and the increased use of food banks. For example, a recent survey of 3,000 UK adults found that two-thirds of people thought social inequality was increasing, and one-in-five people had recently used a food bank, were actively planning to or were considering it ^[453]. Therefore, widespread awareness of the impact of SES on dietary behaviours and the ability to sustain a healthy weight may reflect the societal circumstances of rising inequalities and the imminent cost-of-living crisis at the time of the interviews. Consequently, SES was described as a currency to remove barriers to healthy diet and weight. Limited qualitative research from the UK has explored public attitudes towards the importance of SES in shaping one's ability to sustain a healthy weight or has limited its focus to individuals from lower SES groups ^[229]. This study concludes that the impact of inequality on obesity is widely recognised among different SES groups which may have important implications for public acceptance of new policies.

6.3.4 Views Towards Government Action to Tackle Inequalities in Obesity Rates in the UK

Overall, the study found limited perspectives to suggest that the government's action to tackle inequalities generally and specifically in obesity was considered sufficient.

Participants from both samples described prevention actions to tackle inequalities as tokenistic, limited to messaging, or failing to acknowledge inequalities. The study found that although important, many PSH believed that focusing on inequalities in obesity rates was unfeasible, while population rates remain high, policies remain insufficient, and the policy process continues to be complex. However, the GPP generally believed that the poor commitment to tackling inequalities in obesity was because the government did not care about inequalities or about lower SES groups in the UK. The research found that the continuation of health messaging and guidance that adopts individual responsibility framing, the sense of disconnection between the lived experience and intentions of policies, and high-profile examples of poor government handling of issues related to inequalities formed this perspective. ^[438]

Furthermore, an important study finding related to the belief that policy felt disconnected from the lived experiences of GPP, specifically when confronted by poverty, financial hardship, or lower SES. The sense of disconnection was also exacerbated in participants with

higher weight classifications. Among this subgroup, the participants recalled feeling as though the policy was out of reach to be impactful to their lived experience. Reports of disconnection or divergence between policy and lived experiences were also found in previous literature from the mid 2000s ^[229]. Consequently, participants reported a sense of frustration regarding their inability to benefit from policies such as calorie labelling due to other barriers, like the affordability of healthy foods having a significantly greater impact than the lack of knowledge or understanding of healthy diets. This finding likely reflects decades of policy that has overly focused on individualised, agentic policies, such as information provision, which are well established to exacerbate inequalities (refer to Section 1.5.3 and 4.3.1) ^[14,454].

As discussed in Section 1.5.3 relying on informing policies and high agency policies more generally are embedded through past prevention strategies and reflects neoliberal discourse that positions the public as responsible choice makers. Under this discourse, the public are assumed to require information and knowledge to act in terms of the interest of their health, the state, and the NHS irrespective of any other influences shaping behaviour ^[455].

The findings of this study indicate that ensuring that the lived experience is well understood and considered throughout policy development is essential. This study adds to the literature that suggests that the proposed obesity policy within recent prevention strategies draws on assumptions about what drives behaviours in the LSEA that are deeply rooted in middle-class norms of dietary behaviour ^[450]. The findings from Study 1 and 3 demonstrate how policies can appear equitable in their outcomes but come with assumptions regarding consumer behaviours that may reflect middle- and high-socioeconomic household norms. Accordingly, after the implementation of the policy restricting exposure to HFSS items in the prime locations of stores, the outcome of the policy appeared to reshape the food retail environments in HSEA and LSEA to reflect similar food environments within supermarkets and CCS. This finding suggests a positive impact on the whole population, irrespective of SES, as exposure to HFSS items in stores is associated with purchasing and consumption behaviours ^[234,417,431].

The removal of exposure throughout all areas suggests that the outcome of this policy would be more equitable than a policy that requires an individual agency to reach the policy's desired impact. However, as suspected by PSH and as discussed in previous research, lower-income groups tend to have the lowest levels of access to supermarkets and larger food stores ^[441,456]. A recent study found that in similar English counties to Nottinghamshire, access to supermarkets was low. 45% of neighbourhoods in the Northeast lacked easy access to supermarkets and had poor availability for online deliveries and low levels of car ownership, as well as a higher need for family food support, such as FSM and take up of healthy start vouchers ^[452]. Accordingly, poor accessibility to large stores in the LSEA may force individuals to rely on the ICS. The observation study found that ICS had the highest exposure to less healthy and UPF products in prime locations and showed that the ICS in LSEA was more exposed to these products than the HSEA. As larger stores are only required to adhere to the policy, this may result in individuals from HSEA reaping the benefits of policy implementation due to higher access to the stores included. This may suggest that assumptions in the policy development process are based on middle-class norms, potentially overlooking the experiences of lower socioeconomic groups.

6.3.5 Views Towards Existing Action for Obesity Prevention: Governmental Commitment, Barriers to Effective Prevention Action and Mistrust in Government

This section explores how the PSH and GPP perspectives regarding government action for obesity prevention converge and relate to existing literature. Firstly, there was a clear distinction between the PSH and the GPP perspectives towards the progress in obesity prevention in the UK. The findings from the PSH interviews suggested that policy action was progressing slowly, with a degree of optimism regarding the trajectory of recent action. The GPP were far more critical about existing action, suggesting that the policies they were aware of would have minimal, if any, influence on their lives. Comparing the perspectives between the PSH and GPP may simply reflect differences in the position of participants and the knowledge and understanding of the policies. The PSH are expected to have considerable understanding of policies, resulting in the perceptions that small wins throughout the policy process is a sign of success due to the requirement for a cumulative effect of multiple policies. However, the GPP may perceive population-level policies in

isolation and struggle to connect with the policy's primary aim. Additionally, many of the policies in discussion do not result in instant changes, therefore resulting in the perception that policies have limited impact. Furthermore, the mistrust in government and divergence between the lived experience and policy fuelled the participants' reluctance to describe the policy action as improving or beneficial (See section 6.3.4).

In line with existing research, the research demonstrated that the GPP favoured policies framed as protecting children, such as marketing restrictions. The study also found the GPP support policies that adjusted the default environment. The study did not find a major difference between the participants' sociodemographic profiles and their support for policies. Policies that were perceived to limit or restrict freedom or influence price received more complex responses.

The findings of this study support previous literature demonstrating that the public is more supportive of policies on place and promotion than of those involving an increase in food prices ^[213]. One major justification for the lack of support for policy was that policies were deemed to have a limited impact on participants' day-to-day lives. The participants were generally supportive of the policy restricting the placement of HFSS items from prime locations of stores, as they referenced their understanding of how this results in additional purchasing and impulse buying. The results from the observations demonstrate that without the implementation of the policy, consumers would likely continue to be exposed to higher volumes of less healthy items, namely, confectionary and treat products in prime locations. The GPP easily comprehended the impact of removing these items from prime locations, had a degree of awareness of the evidence base for this policy, and believed that the policy did not restrict participants' freedom to purchase the items. The findings demonstrated that although the policy was supported, its overall impact was still significantly doubted.

In line with the existing literature, the GPP discussed the requirements for education and information provision style policies ^[450,457]. However, contradicting literature ^[450,457], when asked about traffic light food labels and calorie information on menus, the participants were often indifferent and doubted its impact. The PSH were more likely to discuss an array of different policies; of these, the SDIL was celebrated most frequently. There was a notable distinction

between the two samples: the GPP perspectives were complex, many felt indifferent towards SDIL and questioned its impact. Some believed it punished the masses for the actions of a few, and others wanted it expanded to a further range of products so long as it was complemented by appropriate subsidies on healthy foods. Whereas the PSH celebrated it as not only an ideological win but also regarding the success in reformulation and the removal of sugar from many children and adults' diets.

The GPP perspectives regarding policy were deeply linked to their scepticism towards the Conservative government at the time of the interviews (late 2022) that is referred to in this thesis as government mistrust. The government handling of Covid-19 appeared to be central to the development of mistrust. Previous literature has explored how Covid-19 was damaging to public trust in governments across European countries, including the UK, particularly among younger populations ^[458,459]. Furthermore, the findings regarding government mistrust align with the results of a Kings College London survey from 2022, in which only 23% of the public were found to have confidence in the government ^[460]. This research adds to the literature by providing qualitative insights that indicate that GPP perceived the government as neglectful and unconcerned about acting in the best interest of the public. These beliefs fuelled the GPP reluctance to support prevention action and described policies were tokenistic, weak, or poorly intentioned.

The PSH were not found to feel mistrust, but doubted the government's commitment to obesity prevention, tackling inequalities, and believed that ideology often overpowered evidence. The study's findings were aligned regarding the GPP and PSH perspectives towards existing action lacking depth, maintaining a narrow focus, and failing to shift the structural drivers. Furthermore, the PSH and GPP perspectives showed similarities in that the government's lack of commitment to obesity prevention policy is related to the fear of losing political popularity. Additionally, the PSH discussed the neoliberal essence of government action whereby health prevention within the policy process, is often framed as at a cost to the economy rather than as containing economic benefits.

Individual Responsibility Framing and the Perceived Disconnect Between the Lived Experience and Policy

Both the PSH and GPP felt that government messaging is often individualised. Considering the findings from both qualitative studies, the GPP's perspectives linked to the belief that policies were disconnected from their lived experience may be fuelled by the continuation of individual responsibility framing in government messaging and media narratives (See Section 1.5 and 6.3.4). An analysis of media coverage of obesity found that it overly focused on individual personal choices related to diet and exercise ^[355]. Many GPP described obesity as requiring political prioritisation due to the burden on the NHS and the rise of childhood obesity. This framing is clearly communicated in *Tackling Obesity 2020*, where government messaging implies that people with obesity rely heavily on the NHS, resulting in its overburdening ^[179]. Previous research has discussed how this encourages individual responsibility by failing to acknowledge other factors which are likely to contribute to the overburdened NHS, namely poor and ineffective health policy, budget cuts, and widespread underfunding ^[455]. An example of this messaging is as follows: *"Going into this winter, you can play your part to protect the NHS and save lives"* ^[179]. Messaging such as this has demonstrated neoliberal discourse where the public appears to be assumed to take responsibility for not only their health but also the health care system during a global pandemic ^[455]. Furthermore, government messaging has maintained an individual responsibility narrative through decades of strategy publications that came before it (refer to Section 1.4) ^[141,147].

This study indicates that the continuation of individual responsibility framing by the government may have a considerable impact on GPP scepticism towards government action. Furthermore, although the PSH most often believed that policies themselves were moving away from individual responsibility framing, many PSH believed that ideology, namely neoliberalism, plays a crucial role in slowing down the pace of the policy process, restricting the implementation of specific policies, watering down original policy designs, and specifically restricting government action to tackle health inequalities, especially when the government faces competing priorities. Accordingly, in line with the literature, the PSH discussed how governments failing to implement policies included in strategies show them to ignore the evidence they previously put forward to justify the policy's proposal ^[449].

In addition, a clear distinction emerged between perspectives regarding the government's prioritisation of obesity prevention over other political priorities. Most GPP believed that obesity prevention should be prioritised by the government, yet there was a large proportion of participants who believed that competing priorities, Brexit, Covid-19, and the Russian-Ukrainian war should be the government's focus, causing these participants to excuse slow progress in prevention and turn to ideas around individual responsibility. The PSH often viewed competing priorities as a justification used by the government to avoid policy action, prolong policy implementation, or weaken policies. For instance, some PSH cited the cost-of-living crisis as the reason for delaying restrictions on volume-based multi-buy promotions. Competing political priorities were perceived as a justification for inaction, as well as a barrier within the policy process due to factors such as staff turnover, changes in funding, and the challenge of maintaining political attention. One of the key findings of this study pertained to stakeholders' anxieties about the government resorting to ideologically driven decisions when faced with pressure, competing priorities, or a desire to enhance their political appeal.

6.3.6 Views Towards the Future of Obesity Prevention`

The final section of this chapter's discussion relates to the thesis' findings on the future of obesity prevention. One of the key problems identified from this research regarding studies two and three is related to the importance of evaluating and monitoring policies. The evaluation and monitoring plans for policies have been criticised by previous literature and provided as examples to suggest the lack of government's commitment to policy over the past three decades ^[141]. Some PSH discussed their reluctancies about the impact of the restriction on HFSS items in prime locations of stores. This was due to the complexity of the inclusion criteria and reliance on local governments to monitor adherence and penalise stores for non-compliance. As found in study three, adherence to the policy was not 100%, although there was notable change in exposures after implementation (refer to Section 5.5.2). It is important to note that the observations were conducted shortly after the policy's implementation, therefore the study's results regarding adherence may not current adherence by stores. Adherence may be higher in the study due to the immediate response from stores to obey the policy's criteria, however, adherence may also improve with time as

stores may have been still in an adjustment period. Furthermore, the observational study also suggests how well-intentioned policy may have gaps that limit the policy's real-world impact (See section 6.3.4).

Additionally, in consideration to silos within the CDoH, the findings from study three demonstrate how the CDoH would benefit from a more collaborative approach as exposure to alcohol increased in stores as a result of the restriction on HFSS items in prime locations in the food retail environment. For example, the study found that alcohol exposure notably increased in checkout areas. Although the outcome of purchasing and consumption behaviours cannot be determined by the findings from study three, previous literature and the GPP accounts on the influence of the food retail environment, suggest that it is likely that exposure to alcohol in prime locations will result in further alcohol purchasing ^[431]. The placement of HFSS in prime locations also raised important considerations regarding how policies interact with lived experiences. Many HFSS products excluded from the policy were exposed to these areas, demonstrating the policy's design limitations.

Furthermore, the policy does not recognise the level of processing in its inclusion criteria resulting from the lack of acknowledgment of the Nova classification system by policy makers, resulting in significantly higher exposure to UPFs in comparison to products included within the policy, limiting its overall impact on public diets ^[461,462]. UPF has become an increasingly important consideration regarding UK diets and food policy. Recent studies have estimated that British school lunches contain almost 80% UPFs, highest among children from low-income households ^[463,464]. Furthermore, the general population diet is estimated to be 60% UPF ^[429]. Accordingly, the high exposure to UPF despite the policy's implementation suggests an important consideration for review.

Gaps, limitations, and loopholes have a huge impact on policy, not only in terms of their direct impact but also in terms of sustainability and public support. However, as discussed by the PSH, implementing policies is a fundamental challenge, and editing and advancing policies are believed to be easier once they are implemented. With this in mind, it is essential that the development of a policy is well-designed by considering the barriers to healthy weight that disproportionately impact lower SES, in order to achieve the end result.

6.3.7 Applying a Target Population Theory Lens

Target population theory provides a valuable lens for understanding the divergent perspectives between the GPP and PSH. As outlined in Section 1.5, the theory suggests populations are socially constructed and labelled as advantaged, contenders, dependents and deviance. This theory suggests that social groups are constructed and categorised within policy narratives based on their perceived deservingness and political power, which in turn shapes how policies are designed, targeted, and implemented ^[207].

In regard to the four socially constructed populations, lower SES groups and children are likely perceived as dependent populations—those deemed deserving of support but with limited political power. Similarly, higher SES groups are likely perceived as advantaged populations, characterised by high political power and deservingness. The food and drink industry, however, may be framed as a contender population, a group with significant political influence but deemed undeserving of leniency in obesity prevention policy. Meanwhile, those living with obesity may be categorised as a deviant population, viewed as having low political power and being undeserving of support. The consideration of these populations provides an approach to consider how the power dynamics between the influential groups, such as the food industry and higher SES groups, and the more marginalised populations, those living with overweight and lower SES groups. The theory provides a lens to understand how these power dynamics have important implications for policy outcomes.

The results from this research suggest that the participants do not always perceive themselves within these socially constructed populations. Most GPP aligned with this perspective, with a small sub-group adhering to the label that people living with overweight as being less deserving of support, blaming individual behaviour as the result of their weight. Individuals living with excess weight described their experiences as aligning with those of a deviant group, feeling stigmatised, unfairly treated, and frequently overlooked in both the obesity prevention discourse and access to weight management services. Furthermore, the PSH did not label individuals living with overweight as undeserving, in fact many PSH

discussed the importance of acknowledging weight stigma, problems in weight management services and the stigmatic attitudes rooted in individual responsibility framing.

Both the PSH and GPP described lower SES groups as categorising as dependent rather than deviant. Many of the participants who discussed economic challenges and financial hardship indicated that they perceived themselves as being viewed as undeserving and powerless. This perspective was rooted in feeling of disconnect between policy aims and their lived experiences. As discussed, the PSH recognised the importance of addressing inequalities in obesity and acknowledged the need to challenge structural drivers. However, they believed that focusing on lower SES groups was unfeasible given the policy context. This perspective may reflect the lack of power and influence held by this group in the policy space, making it difficult to prioritise their needs within the existing framework.

The results of this study show that the GPP align with this social construction of higher SES groups as the advantaged population. The GPP described how a healthy lifestyle was a luxury, and how higher SES relieved the influence of the drivers of obesity that exacerbate inequalities. Furthermore, higher SES groups have greater agency to act in line with the desired outcomes of policies, such as traffic light system labelling. The additional power held by these groups enhances the impact of policy that was deemed as disconnected from the lived experiences of the lower SES groups. However, even among the GPP who would likely classify within the advantaged population many still believed policy was weak, tokenistic and did not go far enough. This may reflect the power held by the contender population, the food and drink industry.

The long history of industry self-regulation and industry power within the obesity prevention policy process described by the PSH suggest that their position as the contender population is appropriate. Although there was some deliberation regarding the role of the food and drink industry, the PSH were largely concerned with the influence industry has on shaping the policy landscape through policy delays, watering down of policies and their ability to exploit loopholes in policy.

In regard to the implications of utilising target population theory, reframing individuals living with obesity and lower SES groups as dependents may shift the policy focus towards addressing the structural barriers that contribute to inequalities in obesity. Sustaining the socially constructed target populations outlined in Section 1.5 is likely to reinforce narratives of individual responsibility. Furthermore, it highlights the need for policymakers to engage more deeply with the lived experiences of these populations in order to design interventions that are more equitable and empowering.

6.4 Original Contributions of Study: Policy and Academic Considerations and Implications

This section outlines the original policy and academic contributions that have emerged from this research. The section first considers the study's insights into policy implications regarding improving the consideration of inequalities within the policymaking process. The section then outlines the broader policy implications of food-related obesity prevention policies, considering the results of the study. The section then outlines the important areas for future policy and research regarding the findings from engaging with PSH and GPP, as well as conducting an observational study of the food environment. Policy recommendations are provided throughout this section, a full list of recommendations can be found in Appendix 8.13.

6.4.1 Policy Contributions and Implications

This study revealed the popular belief that the food environment, characterised by the accessibility and affordability of EDNP products, was key to obesity causation. In contrast, causal attitudes regarding individual behaviour were the minority perspective among the GPP and were not found among the PSH. Despite this finding, individual responsibility framing regarding prevention actions remained strong among the GPP perspectives. In addition, the PSH described the barrier of individual responsibility framing within the policy landscape, particularly regarding governmental commitment to tackling inequalities and the implementation of policies that influence the structural drivers of obesity. The continuation of individual responsibility framing is embedded within the neoliberal discourse that has

been well-documented throughout government action in this policy area. The continuation of individual responsibility framing within obesity prevention reflects the oversimplification of the drivers of obesity and suggests that policies that continue to inform and nudge the public will remain. Neoliberal policies ignore the fact that life circumstances have a huge influence on one's ability to sustain a healthy weight, rather than a lack of awareness or motivation. Furthermore, in line with previous research, the continuation of individual responsibility framing in policy disproportionately impacts lower SES in the UK ^[455].

One vital finding regarding policy implications is the importance of bridging policy silos. The study's findings suggest that policy silos have a determinantal impact on health inequalities. The study found that the policy silos between food insecurity interventions and obesity prevention action were well known by the PSH and experienced by some GPP. According to some PSH, food insecurity interventions were believed to focus on the quantity of food rather than quality. The GPP who had used food banks or were familiar with food banks acknowledged how food provided was often EDNP or UPF, despite the banks being described as a lifeline. A complex discussion arose regarding the failure to integrate food insecurity interventions related to food provision with obesity prevention goals, highlighting a key policy silo. The failure to integrate these policy areas risks challenges for lower SES groups in maintaining a healthy weight when food poverty support is required.

This study found negative repercussions of policy silos across the three studies included in this thesis. Policy silos were found in this study regarding the commercial determinants of health (CDoH), demonstrating how the lack of consideration for other UCIs meant that the removal of HFSS items in stores, as found by study three, resulted in increased exposure to alcohol products. Maintaining policy silos within the CDoH has negative repercussions on the public, as the policy may cause further damage to public health by increasing exposure to alcohol products and increasing purchasing ^[431]. Furthermore, removing these silos was expected to have important benefits for policy action, help mitigate adverse impacts on inequalities, and create windows of opportunity for future policy development.

One approach to bridging silos is to develop a joined-up, long-term approach that reflects the aims of health in all policies. Previous research has discussed the necessity of this

approach to account for the multifactorial nature of obesity drivers that transcend beyond the realms of food policy and influence structural drivers. However, a joined-up, long-term approach requires considerable political buy-in and has been proposed and failed in past strategies, (refer to Section 1.4). Consistent with the findings of this study, maintaining government commitment is a significant challenge. The study found that health prevention is often perceived in conflict with economic interest. More research is required to consider how political buy-in for a joint-up approach can be developed.

Furthermore, as discussed in Sections 6.3.4 and 6.3.5, there was a strong belief among the GPP that policy does not account for their lived experience. This belief was most significant among participants with lower SES and higher weight classifications. This led to the conclusion that obesity prevention policies are often disconnected from lived experiences. The study's findings suggest that assumptions regarding the 'norm' may be more reflective of middle-class environments and lived experiences, causing policies to fail to reflect the lived experiences of those communities that do not reflect the assumed norm. Policy in this area has been consistently criticised for falling short and failing to consider inequalities and the lived experiences of the individual ^[175,178]. One approach discussed by the PSH as a mechanism for policy impact was the inclusion of the lived experience voice throughout the policymaking process through advocacy work and patient and public involvement (PPI) groups. Including the public voice in the policy process has been found to improve public support and the sustainability of policies ^[302]. This study indicates the benefit of including community voices that represent different social groups and different lived experiences in the policy process.

As discussed in Section 4.2.5, the PSH generally believed that targeting inequalities within obesity prevention was essential, yet unfeasible, as population-level policies remain uninfluential on obesity rates. However, this study suggests that the policy process would benefit from incorporating a healthy equity lens throughout policy development. This is also related to questioning the level of individual agency required to have an impact on all socioeconomic groups in the UK. This approach may help ensure that obesity inequalities are not worsened by policy outcomes that are limited by their impact on lower SES groups.

Furthermore, the placement of local governments has received significant attention from the PSH perspective. As discussed in Section 4.2.6, local government was believed to be well positioned to develop and implement meaningful interventions that respond directly to community needs and, consequently, may result in actions that can be directly felt by the individual. Empowering local governments through resource provision, strengthened leadership, extended power, and personnel may unlock a hugely impactful area of governance for obesity prevention. This could have significant benefits in tackling inequalities and mitigating barriers regarding inconsistent national government commitment. The findings of this study suggest that fostering collaborative strategies between national and local authorities offers a beneficial outcome for prevention efforts that can aid important distinctions between different areas' lived experiences that cannot be achieved at the national level.

Policy Implications

A full list of policy recommendations derived from this research can be found in Appendix 8.13. Firstly, food policy is likely to benefit from an improved understanding of the unreported interactions and mechanisms between actors and policymakers within the policy process. These interactions and mechanisms likely have important implications for policy outcomes that could help improve the efficiency of the policy process and identify where considerations of inequalities could be strengthened. This study established that activities at this level often shape whether a policy is implemented, watered down, or delayed. As the study's findings demonstrate, one of the largest challenges within food policy is related to the cycle of policies being proposed in national strategies and never reaching implementation. Mapping where power is held and harnessed within the policy process could have a significant benefit in overcoming existing obstacles in the obesity prevention policy landscape.

As discussed, mistrust in the government resulted in significant dislike and mistrust in policy action, irrespective of the type of policy. Developing public trust in the government is essential for the foreseeable future. One approach to achieve this is to build democratic empowerment within communities, which would assist in the lived experience becoming

more central to the policy process, but likely requires local government action to bridge the divide between communities and the national government. Building democratic mistrust and strengthening community voices will benefit the inclusion of inequalities in obesity prevention by ensuring the lived experience and needs of different socioeconomic groups are acknowledged. Some of the policy recommendations derived from the study's findings include:

- Foster community engagement and involvement throughout the policymaking process to ensure that the community voice is reflected in policy actions to align with the lived experiences and rebuild the belief that food policy is for public benefit.
- Ensure that the lived experiences of individuals from higher weight classifications are understood throughout the policy process.

Furthermore, the study found that the policy process may benefit from greater awareness and consideration of collaboration between policy stakeholders, including advocacy groups, academics, civil servants, and government officials. The findings of the study demonstrated the importance of networks, namely informal networks, exploring how these networks are built, strengthened, and how incorporating junior representatives of stakeholder groups could strengthen the policy process. This is particularly the case with regard to challenging the food and drink industries throughout the consultation period for policies.

Acknowledging the importance of formal and informal networks and how they are built and accessed could help enhance research impact. Additionally, utilising networks allows for the inclusions of stakeholders with expertise in obesity inequalities in the policy process when discussions are focused on population level action to help overcome assumptions regarding the 'norm'.

The study found that the policy process would benefit from improved dissemination of the evidence base and the intentions of policy within mainstream media to cultivate greater public support for policies. This includes engaging with media across the political spectrum to capture a larger audience. It is well established that public support drives policy implementation and sustains policies post-implementation, and it was found that the GPP was more likely to support a policy when they were confident in its intentions and

understood the evidence. Therefore, the improved dissemination of policies may strengthen public support.

- Promote greater dissemination of research findings both formally and informally. Foster collaboration with the global public health community to share knowledge and best practices.
- Enhance networks within the policymaking process to promote collaboration and information sharing among stakeholders.

With regard to the policies included in food-related obesity prevention policy, the study's findings indicate the necessity of improved monitoring and evaluation of policies, including how different social groups respond to the policy's outcomes to assess the equitability of a policy. The findings suggest that monitoring and evaluation are essential for sustaining and strengthening policies, particularly in consideration of policies that are watered down before implementation.

- Develop thorough and routine monitoring and evaluation of the implemented policies to assess their impact on different sociodemographic groups and to ensure that the policy outcomes are as intended.

Many opportunities for further policy development were established in this study. The PSH stressed the importance of the cumulative impact of policies, including policy areas that are currently absent from the prevention strategies. The findings suggest that prevention strategies should not solely focus on proposed but unimplemented policies. Instead, they should continue to consider these while also exploring a broader range of prevention measures, as these may have a greater impact. The implementation of multiple policies could help reshape public perspectives that doubt the commitment and will of government to act in the interest of public good. Some of the key proposed policies that emerged from the data included:

- Extend the SDIL to other food types in combination with appropriate food subsidies for healthier food items, to counteract the barrier of affordability of food to form healthier food purchasing behaviours.
- Extend reformulation efforts to improve the nutritional quality of products and improve the nutritional benefits of processed foods.
- Extend the 9pm watershed restriction of HFSS marketing on TV to reflect the behaviour of the average child in the UK. And ensure that policy is effectively extended across all platforms and across social media.
- Implement protocols to support convenience stores, particularly in deprived urban environments, to support the sales of fresh fruits and vegetables.
- Introduce formal policies that propose appropriate prevention policies to address stigmatic attitudes in society, media, and healthcare.
- Bridge the silo between obesity prevention and infant nutrition to ensure that the relationship between infant nutrition practices and childhood obesity is not overlooked.
- Invest in comprehensive educational programs in schools and communities aimed at improving nutritional literacy through practical skills, targeting young people and lower socioeconomic status groups.
- Develop new regulations to safeguard social media users and develop a system to verify the trustworthiness of nutritional information sources in order to combat dietary misinformation and the association of healthy diets with diet culture.
- Extend the policy to encourage stores to place healthier products in prime locations in supermarkets to increase the desirability of products and encourage purchasing.
- Further extend the policy to include alcohol products due to increased exposure to these products is associated with the outcomes of the policy's implementation.
- Review the inclusion criteria of the policy to consider the HFSS items that have been permitted by the policy and consider the inclusion of UPF items based on the NOVA scale.

Lastly, the study found that prevention efforts provide a joined-up, long-term strategy that places the lived experience at the core of policy design in order to ensure equitability of

policy outcomes. The policy process requires further understanding in order to map power and understand the role of the food industry. This study supports the idea of forming a food and health policy unit within the government to bring together silos, encourage greater commitment and prioritisation, push through strategies, and develop clear action to consider obesity inequalities into population level action ^[465]. Empowerment of local authorities may help ensure inequalities are considered, while population-level action remains a priority for policymakers and may help maintain national government commitment through action at the local level. Effective monitoring and evaluation of policies is necessary, along with the addition of a metric to evaluate the impact of a policy on different social groups. Disseminating policies to the public may help encourage support and demand for action by ensuring that the evidence base is attainable for members of the public. Finally, ensuring that stakeholders are collaborating and utilising networks to strengthen research impact and challenge the power of the industry throughout the policymaking process. This study developed several recommendations to improve the consideration of inequalities in the policymaking process.

- Integrate food insecurity with obesity prevention efforts to ensure food insecurity transcends beyond providing adequate calories and protects health through the provision of diets that match governmental dietary guidance.
- Incorporate a health equity lens into the policymaking process to actively consider the impact of policies on different social groups
- Develop a policy tool to question assumptions related to individual agency and consider how policies may inadvertently reinforce biases or assumptions about "normal" behaviours and environments.
- Ensure income support programs to address financial barriers to maintaining a healthy weight, such as subsidies for healthy food or employment support.
- Prioritise building an evidence base that demonstrates the effectiveness of policies among different social groups.
- Empower local governments through the provision of resources, power, and support to utilise their position to influence their populations through tailored policies to address the unique challenges faced by different social groups.

- Develop national and local level food strategies to ensure prevention action is developing towards a shared goal.

6.4.2 Academic Contribution and Implications

To the best of the researcher's knowledge, this research is the first to compare the attitudes, experiences, and future outlooks of GPP with those of PSH in a post-covid context. Furthermore, this research is also believed to be the first of its kind to contextualise these attitudes and experiences with an observational case study of the food environment to investigate the impact of a food-related obesity prevention policy.

To the researcher's knowledge, this thesis offers the first qualitative studies of public attitudes toward obesity prevention policies since the publication of Tackling Obesity (2020) and Covid-19. Although Covid-19 was not the focus of this research, data collection began towards the end of the pandemic and holds important relevance to obesity prevention in a post-covid era. Covid-19 is generally believed to have had a substantial impact on the public's awareness of health risks, public health, food behaviours, and food norms, as well as perspectives towards government action. Therefore, this study provides critical insights into public attitudes towards food-related obesity prevention policies. This study adds to the existing literature that explores public attitudes towards inequalities in obesity among different SES groups. Furthermore, this study is one of the first to address the impact of government mistrust on public support for obesity prevention policies.

The study also offers novel findings regarding PSH' attitudes and experiences in the food-related obesity prevention policy process, which have been under-researched in the existing literature despite playing an influential role in shaping the complex policy landscape. Furthermore, this research offers a unique take on PSH perspectives due to the context of the interviews, in that the 2020 Tackling Obesity strategy had recently been published, the PSH were confronted with the impact of Covid-19, the cost-of-living crisis, Brexit, and COP26, all of which have important implications for public health ^[179]. The study offers an interesting opportunity to converge the findings from qualitative interviews with both GPP and PSH that to the researcher's awareness has not been found in the previous literature.

The final study of this thesis is believed to be the first to investigate the impact of the recent restriction on HFSS food and drink products in prime locations of larger stores in the UK. As this study consists of observations before and after the implementation of the policy, it offers a unique insight into the impact of this policy across different store types in Nottinghamshire. The study also explores how this policy influenced different socioeconomic areas, as well as the inclusion of stores that were not eligible for the policy which consequently acted as a control group to demonstrate how stores would likely remain unchanged without legislation.

6.4.3 Future Research Recommendations

Based on the study's findings, several areas require further research. Further research is required to explore public attitudes and their relationships with the food and drink industry. The study found a negligible critique of industry activity among the GPP despite describing how industry activities within the food environment encouraged excessive consumption of EDNP and UPF products. Understanding how the public perceives and understands the industry is heavily linked to their perspectives on policy and responsibility in food policy ^[455]. Strengthening public understanding of the CDoH may help challenge ideas around individual responsibility by shedding light on the complex power dynamics that occur in shaping individual freedom of choice in an obesogenic environment. Exploring how the public understand the CDoH through a framing theory lens may resulting in important outcomes for understanding how to reframe the CDoH and UCI as heavily influential in shaping the drivers of obesity. Furthermore, breaking down individual responsibility framing by exploring the CDoH within the public will likely have a positive impact on reshaping stigmatic attitudes regarding weight.

The findings of this study suggest that further research is required to understand how the public forms nutritional literacy in modern society. Online dietary information, as well as diet culture and food norms, were themes discussed throughout this thesis. Social media was found to be highly influential among the GPP and resulted in challenges around the trustworthiness of content, body image issues, and a lack of confidence in knowledge

regarding how to sustain a healthy weight due to the sheer volume of information that is often described as difficult to understand and contradictory. Academic research exploring how social media users engage with diet-related health content would benefit this area by understanding how social media and online platforms could be regulated to protect the public from misinformation^[337,339].

Further research is required to explore how policies can be designed to effectively influence societal weight stigma. The study found that stigma had a significant impact on individuals lived experiences, yet it remains absent from prevention action. As discussed in Section 6.4.1, in order to implement effective policy, further research is required to understand how to maximise a policy's impact in order to protect individuals from the well-established harmful ramifications of societal weight stigma^[276,381].

Rebuilding trust in the government requires an improved understanding of the public perspective regarding government action, experts, and public health. As discussed extensively, one of the largest findings of this study was the extensive mistrust of the government. Rebuilding this trust and understanding how it links to public health and the concept of an expert is essential, particularly in a society with growing challenges around fake news, and misinformation.

Additionally, further research is required to understand how the restriction of HFSS products from the prime locations of stores impacts purchasing behaviours and consumer experiences. As discussed, the exposure to products clearly reduced after the policy implementation, but the research cannot draw conclusions about whether the removal of products translates to changes in purchasing behaviours. Furthermore, although the GPP were positive towards this policy, exploring their perspectives on the policy since its implementation would add to the discussion regarding public attitudes towards policy and cultivating support for further prevention action.

6.5 Conclusion

Overall, this research underscores the urgent need for action. In summary, this research highlights the complexity of experiences and attitudes within the GPP and PSH regarding obesity prevention policies in the UK. Contrary to prior assumptions, both groups share aligned perspectives, emphasising the role of the modern food environment in driving obesity rather than solely attributing it to individual behaviour. The findings underscore the pervasive nature of obesity inequalities and the unequal opportunity to sustain a healthy weight in the UK. While the GPP expressed mistrust and doubt over government willingness to act in line with public interest, the PSH maintains a more optimistic outlook, advocating for cumulative policy effects despite identified barriers such as ideological resistance and competing priorities. Both groups acknowledge the need to address obesity inequalities, proposing tactics such as integrating lived experiences into policymaking and applying a health equity lens.

Observations of the food environment suggest the potential for equitable policy implementation, dependent upon considerations of socioeconomic context. Moving forward, enhancing networks within policymaking, amplifying community voices, and adopting a whole-systems approach to policy development are deemed essential for advancing obesity prevention efforts with a focus on equity. The full list of recommendations that emerged from the research findings of this thesis can be found in Appendix 8.1.

Overall, this thesis demonstrates that the relationship between food-related obesity prevention policies and inequalities in obesity is highly complex. The findings of this study demonstrate the necessity of moving inequalities into the centre of policymaking, even when it is unfeasible to prioritise tackling inequalities. This research demonstrates the detrimental impact of the insufficiency of existing policies and the failure of policies in influencing the general public's ability to sustain a healthy diet and weight in the modern food environment. Continuing the present course of policymaking and implementation risks further isolating lower SES from the impact of policy and consequently placing them at further risk of obesity and poor health. However, building an evidence base that demonstrates the effectiveness of policies among different social groups, ensuring that the lived experience is nested in policy development, and challenging assumptions regarding the 'normal' environment and food behaviours can support greater consideration of

inequalities in future action. This research demonstrates the necessity of integrating a health equities lens into obesity prevention action to challenge assumptions regarding the 'normal', ensure that action does not continue to widen health inequalities and ensures policy is effective and meaningful for everyone.

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8 Appendices

8.1 Appendix 1 – Theis and White’s (2021) Summary of Policy Type Code ^[141]

Code	Description	Examples
1. Institutional	Any policy relating to institutional change in national or local government or any other sector, body, or organization. Includes a policy to introduce a new or update an existing strategy.	A change in or a new ministerial position, government body, organization, or strategy (eg, in a specific policy area).
2. Evaluate	A policy focused solely on an evaluation carried out by government, an independent body, or another nongovernment sector or organization. Includes the evaluation of a policy program or other initiative.	Evaluation of a particular policy, a government review.
3. Monitor	A policy relating to the monitoring and/or surveillance of an identified issue, for example, population obesity levels. Includes any policy that seeks to continue and/or expand an existing monitoring/surveillance program.	National Health Survey for England, National Child Measurement Programme, Central Health Monitoring Unit.
4. Research	Any policy focused on the facilitation, funding, or initiation of research on an identified issue by government or any other sector, body, or organization. Includes any policy to produce a one-off piece of research on an issue.	NIHR Obesity Policy Research Unit, launch of a national prevention research initiative.

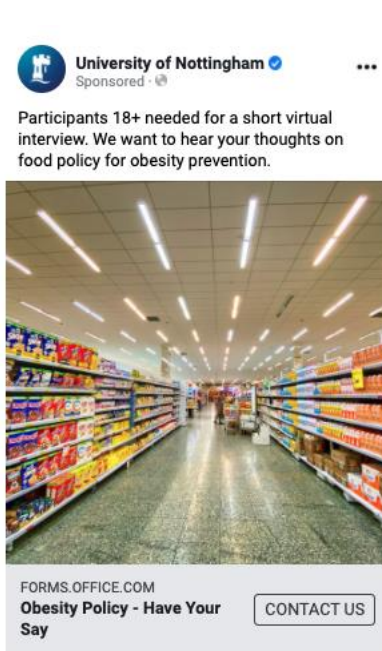
Code	Description	Examples
5. Guidance or standards	Any policy relating to the development, implementation, or updating of guidance or standards by and/or for government or any other sector, body, or organization. Standards are sometimes referred to as “codes” or “codes of conduct.”	NICE guidance, school food standards, government buying standards.
6. Professional development	Any policy relating to the development or training of relevant professionals.	Health professionals, NCMP training, resource packs for teachers, training for planners on the health implication of local plans.
7. Eliminate choice	A policy that seeks to regulate in such a way as to entirely eliminate a choice.	Ban a particular food or drink; ban trans fats.
8. Restrict choice	A policy that regulate to restrict options available to people (including to certain demographics).	Ban the sale of energy drinks to children; ban vending machines in schools; ban advertising of junk food to children on TV.
9. Fiscal disincentive	Any policy that uses a fiscal disincentive to achieve change or reduce noncompliance.	Soft Drinks industry Levy.
10. Fiscal incentive	Any policy that uses a fiscal incentive to achieve change or increase compliance.	Tax break on bicycle purchases for employees, tax cut for the production or sales of healthy products.
11. Non-fiscal disincentive	Any policy that uses a non-fiscal disincentive to achieve change or reduce noncompliance.	Traffic congestion charge. ⁷³
12. Non-fiscal incentive	Any policy that uses a non-fiscal incentive such as a reward or award to achieve change or increase compliance.	Healthy Eating Award, Healthy Workplace Award.

Code	Description	Examples
13. Change default	Any policy that seeks to change the default of a product by making it healthier or when options are still offered, the default option is the healthier of them.	Calorie and sugar reduction program.
14. Enable	Any policy that enables individuals to change their diet and/or physical activity behavior. Differs from non-fiscal incentive policies in that the offering is passive.	Weight loss classes, free fruit and vegetables, Our Family Health digital support, Cooking for Kids.
15. Inform	Any policy that seeks to provide people with information, including through a health promotion campaign.	Menu labeling, food labeling, health leaflet, 5 A DAY.

8.2 Appendix 2 – Facebook Recruitment Advertisement and Engagement

<input checked="" type="checkbox"/>	Off/On	Ad name	Results	Reach	Impressions	Cost per result
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	 Obesity survey - FB - 159828 - £170 - Traffic	987 Link Clicks	36,977	58,041	£0.17 Per link click
		England	856	31,375	50,351	£0.17
		Wales	41	1,686	2,437	£0.18
		Scotland	68	3,005	4,025	£0.18
		Northern Ireland	22	911	1,228	£0.15
		> Results from 1 ad	987 Link Clicks	36,977 People	58,041 Total	£0.17 Per link click

Figure 11 Breakdown of recruitment campaign exposures



University of Nottingham Sponsored

Participants 18+ needed for a short virtual interview. We want to hear your thoughts on food policy for obesity prevention.

FORMS.OFFICE.COM
Obesity Policy - Have Your Say
CONTACT US

Figure 12 Advertisement for General Public Recruitment

8.3 Appendix 3 – Ethical Approval Certificate



**Faculty of Medicine & Health Sciences
Research Ethics Committee**

Faculty Hub
Room E41, E Floor, Medical School
Queen's Medical Centre Campus
Nottingham University Hospitals
Nottingham, NG7 2UH
Email: FMHS-ResearchEthics@nottingham.ac.uk

17 June 2021

Olivia Brown
PhD Student
Epidemiology and Public Health
School of Medicine
Clinical Sciences Building
City Hospital Campus
Nottingham University Hospitals
Hucknall Road, Nottingham
NG51PB

Dear Ms Brown

Ethics Reference No: FMHS 249-0421 – please always quote	
Study Title: A Study of the Relationship between UK Food policy for Obesity Prevention and Socioeconomic Disparities in Obesity.	
Chief Investigator/Supervisor: Dr Tessa Langlely, Associate Professor, Epidemiology & Public Health (EPH), School of Medicine	
Lead Investigators/student: Olivia Brown, PhD, EPH, School of Medicine	
Other Key investigators: Rachael Murray, Professor in Health Policy, Ilze Bogdanovica, Principal Research Fellow, Manpreet Bains, Associate Professor, EPH, School of Medicine.	
Proposed Start Date: 01/02/2021	Proposed End Date: 31/10/2023

Thank you for submitting the above application which was considered at the meeting on 21/05/2021 and the following documents were received:

- FMHS REC Application form and supporting documents version 1.0: 21.04.2021

These have been reviewed and are satisfactory and the project has been given a favourable ethics opinion.

A favourable ethics opinion has been given on the understanding that:

1. The protocol agreed is followed and the Committee is informed of any changes using a notice of amendment form (please request a form).
2. The Chair is informed of any serious or unexpected event.
3. An End of Project Progress Report is completed and returned when the study has finished (Please request a form).

Yours sincerely



Dr John Williams, Associate Professor in Anaesthesia and Pain Medicine
Chair, Faculty of Medicine & Health Sciences Research Ethics Committee

8.4 Appendix 4 – General Public Interview Guide

Interview Guides – The General Public

Introduction:

Hello, I'm Olivia Brown, I'm a PhD candidate at the University of Nottingham in the Division of Epidemiology and Public Health. Thank you for agreeing to talk to me today. To reiterate, all responses from this interview will be anonymised and all personal identifiers will be removed. The interview will be audio recorded. Your participation in the interview is completely voluntary and you are free to withdraw at any time, without giving any reason. If you need to stop the interview for any reason, please inform me and I will stop the audio recording. The data from the interview will be analysed and the study findings will be published in an academic journal. If you wish to have your data removed from the study at a later date, please inform me, you have until publication to do this.

Before starting the interview, please could you verbally confirm your consent for participating in this study?

The data collected in these interviews is for my PhD. My PhD is interested in the approaches used by the UK government to influence how people buy and consume foods in attempt to prevent weight gain. And how these approaches may differ in effectiveness between wealthier and less wealthy groups. The data collected from this interview will be used to inform my study. The research outcomes of my study can be made available to you if requested. In this interview, I will use the term excess weight to talk about people who classify as overweight or obese. If a question is unclear, please let me know.

Background

1. To start, which health problems do you think are caused by excess weight?
2. Do you think the number of people with excess weight in the UK is a problem? Why?
3. Who do you think is most likely to be living with excess weight in the UK?
Prompt: which groups might be more at risk
E.g., men or women? adults or children? most deprived or least deprived?

Experiences

4. How would you describe a healthy diet?
Prompt: What would a healthy diet include?
Do you think your diet is similar to what you have described?
5. Where do you normally do your food shopping?
Prompts: Do you shop in supermarkets, online or in convenience stores?
Do you use a variety of different stores to do your food shopping?

- Why do you rely on (answer)?
6. What kind of things do you consider when food shopping?
 Prompt: Do you consider flavour, value for money, convenience etc?
 If lots of responses are given: What do you prioritise?
 7. How does the price of food in your local area influence what food you buy and where you buy it?
 Prompt: Do you find it expensive to buy healthier foods?
 Can you give an example of when the price has influenced what foods you buy?
 8. When food shopping, do you think the food shop influences what products you actually buy?
 Prompt: for example, do you think stores influence you to impulse buy or buy different types of food than planned?
 Can you give an example of when this happened?
 Online: When online shopping, do you think the website suggests items that you wouldn't ordinarily buy?
 9. Do you think that your local area impacts your ability to eat healthily?
 Prompt: what's available in your area that might lead to a healthy or less healthy diet?
 Does your environment inspire unhealthy or healthy diets?
 10. Do you think your local area makes it difficult or easy to sustain a healthy weight?
 Prompt: For example, do your local amenities provide you with unhealthy options? Is it convenient to buy healthy products? Can you walk places? Is there a variety of products to choose from?
 11. In the UK, do you think everyone has equal opportunity to buy healthy foods and sustain a healthy diet?
 Prompt: Why do you think this?
 12. Who do you think is most at risk of not being able to buy healthy foods and sustain a healthy diet?

Experiences with Food Industry

13. Food marketing is heavily used by companies, it includes things like TV, online or social media adverts, high-street billboards, eye-catching branding in-stores, the use of celebrity endorsements, branded events such as Coca-Cola at the Football World Cup, etc.
 Can you describe the kinds of food and drink products you most frequently see marketed and where?
14. Can you tell me whether you think this kind of food marketing influences the foods you end up buying?
15. Food promotions include things like price percentage reductions, buy one get one free deals and meal deals etc. When buying food, how do promotions of this sort influence what you buy?

Prompt: Do they lead to healthier or less healthy food purchases?

16. Would you like to see a change in the food you see on promotion and marketed in your local area? why?

Prompt: What types of products would you like to see instead? Why wouldn't you want to see change?

Attitudes

17. Can you name things that you think might lead people to gain weight?

18. Higher rates of people with excess weight are found in more deprived areas of the UK, can you describe why you think this might be happening?

19. Do you think it's the government's responsibility to help people sustain a healthy weight throughout their lives?

Prompt: if not the government, who holds responsibility?

20. Can you explain whether you think it is or isn't a priority for UK government to ensure that everyone in the UK has an equal opportunity to sustain a healthy weight throughout their lives?

21. I'm going to read you three examples of existing UK food policies; I'd like to know how you think these policies might influence people's diets and abilities to sustain healthy weights...

a. Front of package traffic-light food labelling - showing fat, salt and sugar quantities in foods

b. The sugar tax on soft drinks e.g., Sprite & Pepsi

c. TV marketing restrictions on children's TV

Prompt: Who do you think they would influence?

Would they influence you or people close to you?

Why wouldn't/would they be influential?

Covid-19 Attitudes & Experiences

22. Since the start of the pandemic, do you think your diet has become more or less healthy? In what way?

23. Have you experienced any changes in your ability to buy healthy food during the pandemic?

24. Do you think Covid-19 has influenced your awareness about the health risks caused by excess weight?

25. Do you think Covid-19 has changed the way you think about the importance of ensuring everyone in the UK can sustain a healthy weight?

Future Outlooks

26. What would the government need to do to help you improve your ability to sustain a healthy weight?

Prompt if policies relating to physical activity are focused on: what would you like to see the government do to improve your ability to sustain a healthy diet?

27. I'm going to read you four policies that are included in the 2020 Obesity strategy –

Please could you give your view on the following policies and whether you think they would influence your food choices?

- a. Restrictions on unhealthy food adverts on TV and online before 9pm
- b. Restrictions on the promotion of unhealthy products in food stores and online, for example, promotion strategies like buy one get one free, percentage reductions.
- c. Restrictions on the placement of unhealthy products in prime locations in stores such as checkout areas, end of aisles and store entrances, limited to supermarket stores.
- d. Calorie labelling on food menus in large restaurants, cafes and takeaways and calorie labelling on alcohol products.

Part 1. Do you think they would influence your behaviour?

Part 2. Do you think they will help people sustain healthier weights?

28. Do you think there's anything else the government should do to help people sustain a healthy weight?

29. How do you believe we could strengthen the impact of research on policy?

Conclusion

30. Any additional thoughts or comments to add to the discussion

Thank you.

8.5 Appendix 5 – Stakeholder Interview Guide

Interview guide for Policy Stakeholder Interviews

Introduction:

Hello, I'm Olivia Brown, I'm a PhD candidate at the University of Nottingham in the Division of Epidemiology and Public Health. Thank you for agreeing to talk to me today. To reiterate, all responses from this interview will be anonymised and all personal identifiers will be removed. The interview will be audio recorded. Your participation in the interview is completely voluntary and you are free to withdraw at any time, without giving any reason. If you need to stop the interview for any reason, please inform me and I will stop the audio recording. The data from the interview will be analysed and the study findings will be published in an academic journal. If you wish to have your data removed from the study at a later date, please inform me, you have until the completion of data collection to do this. Before starting the interview, please could you verbally confirm your consent for participating in this study?

The data collected in these interviews is for my PhD which is looking into the relationship between food-related obesity prevention policy and socioeconomic disparities in obesity rates. The data collected from this interview will be used to inform my study. The research outcomes of my study can be made available to you if requested.

In this interview, I will be asking about the food environment, for this study I refer to the food environment as what consumers encounter within and around retail food outlets, for example, features like access to fresh products, affordability of products, food promotions and so forth. Food policy will refer to any policy that intends to influence the way people purchase and consume foods. Obesity will be referred to as individuals who are already living with obesity or are overweight so are at high risk of becoming obese.

Background

1. In what way does your role relate to food policy or broader obesity policy?

Understanding

2. Can you describe what groups in society are most at risk of being overweight or obese and why?

Prompt: Could you summarise your understanding of sociodemographic patterns of overweight and obesity in the UK?

3. Do you think socioeconomic disparities are adequately addressed in food policy and/or wider obesity prevention policy?

Prompt: why? Why not?

Do you think they are considered in food policy and/or wider obesity prevention policy?

Assumptions in the Policy process

4. (Specific knowledge) Do you think there is a difference in the effectiveness of national food policies in low-income areas compared to high-income areas?

OR

(Broader knowledge) Do you think national food policies are equally effective across different social groups in the UK?

Prompt: What groups might benefit the most/least? And why?

5. What do you think the key barriers restricting an individual's ability to make healthy food choices are?

Prompt: what constrains an individual's ability to maintain healthy diets?

6. Do you think the existing UK policy adequately influences these barriers?

Prompt: do you think policy reduced the barriers or constraints?

7. In your opinion, does the existing food policy address barriers that specifically impact low-income groups?

Prompts: are the factors constraining low-income groups' ability to make healthy choices considered in policy?

8. Can you summarise some of the key properties of the physical food environment that can influence an individual's ability to make healthy food choices?

Prompt: For example, access, income level of an area, convenience etc.

9. (Participants who have substantial experience in food policy) Have you found that the differences in physical food environments across the UK relating to income-level, are considered in the design and implementation food policy?

Role of ideologies in the policy process

10. What role do you think political ideologies play in food policy decision making?

Prompt: Political ideologies refers to the shared ideas and ideals that are found within an institution, political party or social movement

Are you aware of political ideologies influencing food policy decision making?

11. Can you describe an example of a food policy whose proposed implementation was met with ideological resistance? (The policy can either be one that was implemented or just proposed)

12. Do you think the impact of political ideologies on food policies has negatively impacted certain socioeconomic groups?

Food insecurity and obesity

13. Why do you think those most at risk of food insecurity in the UK are also more likely to be living with obesity?

14. How do you think food policy for obesity prevention could be integrated with food insecurity prevention?

Prompt: do you think this would be positive/negative?

Policy Gaps and Future outlooks

15. Can you outline what you think the strengths and weaknesses are of the 2020 Obesity Strategy announced in July?

Prompt: is there anything missing? Are there any positive/negative aspects?

16. I'm going to read you four policies that are included in the 2020 Obesity strategy –

Please could you share your views on the following policies and whether you think they account for the drivers facing low socioeconomic groups in anyway?

- a. Restrictions on unhealthy food adverts on TV and online before 9pm
- b. Restrictions on the promotion of unhealthy products in food stores and online, for example, promotion strategies like buy one get one free, percentage reductions.
- c. Restrictions on the placement of unhealthy products in prime locations in stores such as checkout areas, end of aisles and store entrances, limited to supermarket stores.
- d. Calorie labelling on food menus in large restaurants, cafes and takeaways and calorie labelling on alcohol products.

Prompt: Do you think the proposed policies in this strategy sufficiently account for the drivers confronting lower socioeconomic groups?

Prompt: Why do you think this?

Prompt: Is there anything you'd like to add regarding the 2020 strategy?

17. Do you think Covid-19 will have any long-term influence on the demand for future food policy for obesity prevention?

Prompt: do you think it will have any influence on the demand for policies targeting inequalities in obesity.

18. In what way do you think Covid-19 has influenced political will to reduce obesity on a whole?

Prompt: Do you think it has influenced political will to reduce inequalities in obesity?

Do you think the increase political will be sustained?

Conclusion

19. Any additional thoughts/comments to add to the discussion

Thank you.

8.6 Appendix 6 – General Public Information Sheet

Information Page for Interview

Study Title: Understanding the Relationship between UK food policy and socioeconomic disparities in obesity.

Research Team: Olivia Brown, Dr Tessa Langley, Dr Rachael Murray, Dr Ilze Bogdanovica and Dr Manpreet Bains

Faculty of Medicine & Health Sciences Research Ethics Ref: FMHS 123-2003

This study is looking into UK policies that aim to influence the way people buy and eat foods to reduce obesity rates. Specifically, the study is interested in how these policies may influence people from different social standings across the UK differently. Previous studies from countries similar to the UK, like the US, Canada and Australia have found that poorer areas are more likely to have higher levels of obesity compared to richer areas due to the nature of the areas e.g., the number of fast-food outlets and access to fruit and vegetables. Studies have also found that the policies that are being implemented to reduce obesity aren't as effective in poorer areas. Meaning those who live in poorer areas are more at risk to be living with obesity and may be less likely to benefit from the effect of new policies. Understanding the experiences, attitudes and future outlooks of people around the UK to food and their ability to sustain a healthy weight is crucial for effective policy development in the UK. Thank you for your interest in taking part in this study. To become a participant, you must be over 18 years old. Please read through this information before agreeing to participate. You can ask any questions before deciding by contacting the researchers (details below). Taking part is entirely voluntary.

What will I be asked to do?

No background knowledge is required to participate in the interviews. We would like you to answer all interview questions as honestly and completely as possible. If questions come up that you do not wish to answer, please say so. You do not have to respond to questions, and you can withdraw from the interview at any point during the interview for any reason. If you change your mind about participating at a later date, your data can be removed at any point until publication

You will be asked to provide basic demographic information regarding age, gender, self-assessed weight status, contact details and socio-demographic questions including employment status, housing status and years in education.

Once you have read the information sheet, answered the demographic questions and completed a consent form you will be contacted to organise an interview, either over the phone or over Microsoft teams video call (dependent on your preference).

What are the disadvantages of taking part?

The interviews will take approximately 30 minutes to carry out. The interview may contain questions that you do not feel comfortable answering. You can request to skip those questions, and you can pause and end the interview at any point.

What are the advantages of taking part?

Your contribution together with others will help the researchers to understand more about what individuals' attitudes and experiences of diet and their local area are, and, how future outlooks related to diet and the healthiness of individuals areas differ.

Who will know I have taken part in the study?

No one will know you have taken part in this study because any personally identifiable data e.g., sociodemographic data like age and gender will be completely anonymized. Any personal accounts given in the interviews will also be anonymized ensuring your privacy. All data used in analysis and in text will be completely anonymized.

What will happen to your data?

After the completion of the interviews, the master recording will be uploaded into a password protected database with a code number. Your data (research data) will be stored in a password-protected folder sitting on a restricted access server at the University under the terms of its data protection policy. Data is kept for a minimum of 7 years. The data collected in these interviews is for a PhD research project and the audio recordings will be transcribed verbatim. The anonymised data will be used in publications, presentations and will be used in the PhD thesis. A small research team will have access to the data. The overall anonymised data from this study may be shared for use in future research and teaching (with research ethics approval).

Contact details will be stored to carry out the interviews and provide the participants with research outcomes upon request. For further information about how the university processes personal data please see: <https://www.nottingham.ac.uk/utilities/privacy.aspx/>

Who will have access to your data?

The University of Nottingham is the data controller (legally responsible for data security) and the main researcher and the Supervisors of this study (named above) are the data custodians (manages access to the data) and as such will determine how your data is used in the study. Your research and personal data will be used for the purposes of the research only. Research is a task that we perform in the public interest.

Responsible members of the University of Nottingham may be given access to data for monitoring and/or audit of the study to ensure it is being carried out correctly.

If you have any questions or concerns about this project, please contact:

Olivia Brown E-mail olivia.brown@nottingham.ac.uk)

or if you have any concerns about any aspect of this study please contact the Research Leader: Tessa Langley Email tessa.langley@nottingham.ac.uk).

If you remain unhappy and wish to complain formally, you should then contact the FMHS Research Ethics Committee Administrator E-mail: FMHS-ResearchEthics@nottingham.ac.uk

I have read and understood the above information and consent form, I confirm that I am 18 years old or older and by clicking, I indicate my willingness to voluntarily take part in the study.

Consent form (on a separate page)

Thank you for participating!

8.7 Appendix 7 – Stakeholder Information Sheet

Information Page for Interview

Study Title: Understanding the Relationship between UK food policy and socioeconomic inequalities in obesity.

Research Team: Olivia Brown, Dr Tessa Langley, Dr Rachael Murray, Dr Ilze Bogdanovica and Dr Manpreet Bains

Faculty of Medicine & Health Sciences Research Ethics Ref: FMHS 123-2003

This study is investigating how food-related obesity policy influences socioeconomic disparities in obesity in the UK. It is well-documented that socioeconomic status is a determinant of obesity. Previous studies in Australia, Canada, the US and the UK have suggested that national-level food policies appear less effective in lower socioeconomic areas than in higher socioeconomic areas. The study aims to understand the relationship between food-related obesity policy and socioeconomic disparities by focusing on how disparities are managed and understood in the policy process and what the future direction of managing disparities through national-level policy might be.

Thank you for your interest. You are invited to take part because you are +18 years old and have a role in food policy or wider obesity prevention policy. Please read through this information before agreeing to participate. You can ask any questions before deciding by contacting the researchers (details below). Taking part is entirely voluntary.

What will I be asked to do?

You will be asked to provide some basic demographic information regarding job role and years working in food policy or broader obesity prevention policy. A minimum of two years' experience of UK food policy and/or wider obesity policy is required for these interviews.

Once you have read the information sheet, answered the demographic questions and completed a consent form you will be contacted to organise an interview, either on Microsoft teams video call or over the phone (dependent on your preference).

We would like you to answer all interview questions as honestly and completely as possible. If questions come up that you do not wish to answer, please say so. You can withdraw from the interview at any point during the interview for any reason.

What are the disadvantages of taking part?

The interviews will take approximately 30-50 minutes. It is unlikely that questions will cause distress however if this situation arises, please inform the interviewee and the interview will

be stopped. You can skip any questions you do not wish to answer and the interview can be paused at any time by asking the interviewer.

What are the advantages of taking part?

Your contribution together with others will help the researchers to understand more about the policy process and how socioeconomic disparities are understood and addressed in the policy process. The findings from this research will be published and intend to inform future policy

Who will know I have taken part in the study?

No one will know you have taken part in this study because any data that is personally identifiable e.g., sociodemographic data/job title will be completely anonymized. Any personal accounts given in the interviews will also be anonymized ensuring your privacy. All usage of data derived from interviews will be completely anonymized in analysis and in-text.

What will happen to your data?

After the completion of the interview, the master recording will be uploaded into a password protected database with a code number. Your data (research data) will be stored in a password-protected folder sitting on a restricted access server at the University under the terms of its data protection policy. Data is kept for a minimum of 7 years. The data collected in these interviews is for a PhD research project, and the audio recordings will be transcribed verbatim. The anonymised analysed data could be used in publications, presentations and the PhD thesis. A small research team will have access to the data. The overall anonymised data from this study may be shared for use in future research and teaching (with research ethics approval).

Contact details will be stored to carry out the interviews and provide the participants with research outcomes if requested. For further information about how the university processes personal data please see: <https://www.nottingham.ac.uk/utilities/privacy.aspx/>

Who will have access to your data?

The University of Nottingham is the data controller (legally responsible for data security) and the main researcher and the Supervisors of this study (named above) is the data custodian (manages access to the data) and as such will determine how your data is used in the study. Your research and personal data will be used for the research only. Research is a task that we perform in the public interest.

Responsible members of the University of Nottingham may be given access to data for monitoring and/or audit of the study to ensure it is being carried out correctly.

If you have any questions or concerns about this project, please contact:

Olivia Brown E-mail olivia.brown@nottingham.ac.uk

or if you have any concerns about any aspect of this study please contact the Research Leader: Tessa Langley Email tessa.langley@nottingham.ac.uk).

If you remain unhappy and wish to complain formally, you should then contact the FMHS Research Ethics Committee Administrator E-mail: FMHS-ResearchEthics@nottingham.ac.uk

I have read and understood the above information and consent form, I confirm that I am 18 years old or older, I indicate my willingness to voluntarily take part in the study.

Thank you for participating!

8.8 Appendix 8 – Participant Consent form for General Public and Stakeholder Participants



Faculty of Medicine & Health Sciences
School of Medicine
Academic Unit 3 population and Lifespan Sciences
The University of Nottingham
Clinical Sciences Building
Nottingham City Hospital Campus
Hucknall Road

Participants Consent Form Final version 1.0: 22/02/2021

Title of Study: Understanding the Relationship between UK food policy and socioeconomic disparities in obesity.

REC ref: FMHS-249-0421

Name of Researchers: Olivia Brown (PhD Student),
Supervisors: Dr Tessa Langley, Dr Rachael Murray, Dr Ilze Bogdanovica and Dr Manpreet Bains.

Name of Participant:

Please initial box

1. I confirm that I have read and understand the information sheet version number 1 dated: 22/04/2021 for the above study which is attached and have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason and without disadvantage.
3. I understand that relevant sections of my data collected in the study may be looked at by the research group and by other responsible individuals for monitoring and audit purposes. I give permission for these individuals to have access to these records and to collect, store, analyse and publish information obtained from my participation in this study. I understand that my personal details will be kept confidential.
4. I understand that the interview will be audio recorded using a digital device and that anonymous direct quotes from the interview may be used in the study reports.
5. I understand that information about me recorded during the study will be made anonymous before it is stored. It will be uploaded into a secure database on a computer kept in a secure place. Data will be kept for 7 years after the study has ended and then deleted.
6. **Optional:** I agree that my anonymous research data will be stored and used to support other research in the future, and shared with other researchers including those working outside the University.
7. I understand that what I say during the interview will be kept confidential unless I reveal something of concern that may put myself or someone else at any risk. It will then be necessary to report this to the appropriate persons.
8. I understand that the information discussed in the interview may be sensitive and is confidential. I agree to respect other participant's privacy and will not disclose what others have said in the Focus group.
9. I agree to take part in the above study.

Name of Participant Date Signature

Name of Person taking consent Date Signature

2 copies: 1 for participant, 1 for the project notes.

A Study of UK Food Policy and Health Inequalities: Online consent form, Version no 1.0, Date: 22/04/2021

8.9 Appendix 9 – Stakeholder Invite

Email invite for interviews with policy stakeholders

Dear ****,

My name is Olivia Brown, I am a PhD student at the University of Nottingham funded by the [SPECTRUM Consortium](#). I'm writing to invite you to participate in a research study.

I am studying the relationship between food-related obesity prevention policy and socioeconomic inequalities in obesity in the UK. I am looking for participants with two or more years of experience in food policy or wider obesity policy. The study aims to understand the different attitudes and perceptions held by policy stakeholders on past, existing, and future food policy for obesity prevention.

Participants will be asked to complete one interview via Microsoft Teams video call, audio call or over the phone. The interview is estimated to take between 30-60 minutes. All data will be anonymised, and all personal identifiers removed.

If you are interested in taking part, please respond to this email. You will then receive a link to a participant information sheet and participant consent form.

Alternatively, if you have a contact who may be willing to take part in the study, please let me know or forward this invitation to them.

If you have any questions, please let me know.

Many thanks,

Olivia Brown
PhD Student
University of Nottingham
School of Medicine
Population and Lifespan Science

8.10 Appendix 10 – Store Information Sheet



Study Title: Understanding the Relationship between UK food policy and socioeconomic Inequalities in obesity.

Research Team: Olivia Brown, Dr Tessa Langely, Dr Rachael Murray, Dr Ilze Bogdanovica and Dr Manpreet Bains

Faculty of Medicine & Health Sciences Research Ethics Ref: FMHS 123-2003

This study is looking into UK policies that aim to influence the way people buy and eat foods to reduce obesity rates. Specifically, the study is interested in how these policies may influence people from different settings across the UK differently. Previous studies from the UK and countries like the US, Canada and Australia have found that poorer areas are more likely to have higher levels of obesity compared to richer areas. There are several reasons for this, one of the most prominent reasons is the differences in the nature of rich and poor areas e.g., the number of fast-food outlets and access to fruit and vegetables. The nature of an individual's surrounding environment impacts individuals' diets and longer-term, their ability to sustain a healthy weight. Studies have also found that the policies that are being implemented to reduce obesity aren't as effective in poorer areas. Understanding these differences is vital to ensure that policies attempting to improve an individual's ability to sustain a healthy weight are effective for all.

This study aims to understand how the food stores utilise the promotional areas in stores e.g., end of aisles, checkouts and store entrances. The observations will look at the types of products, how many of each product (product facings), in-store marketing, the presence and types of promotions and the presence of nutritional labelling on products. The stores will be completely anonymised.

Please read through this information before agreeing to participate. You can ask any questions before deciding by contacting the researchers (details below). Taking part is entirely voluntary.

What will it involve for your store?

If you agree to participate in this research, a member of the research team will make field notes about areas of the stores such as the end of aisles, checkouts and entrance areas. With your approval the research team member will take pictures. The pictures will reduce the amount of time required to complete the observation but will not be used in any publications.

Confidentiality of your data?

All data will be treated as confidential. Any data collected from your store will be removed of all identifiable factors. The data will have no negative impact on you or your store's reputation. If you permit the taking of photos, no customers or staff members will be in photos.

What will happen to the data?

If you agree to participate, the data collected from your store will be stored in a password-protected folder sitting on a restricted access server at the University under the terms of its data protection policy. Data is kept for a minimum of 7 years. The anonymised data will be analysed and used in publications, presentations and will be used in the PhD Thesis. A small research team will have access to the raw data. The overall anonymised data from this study may be shared for use in future research and teaching (with research ethics approval).

8.11 Appendix 11 – Food and Drinks Category Classifications

Established Food and Drink Category Classifications	
1. AF/Low alcohol	2. Grains
3. Alcohol	4. Juices/dillute/smoothies
5. Flavoured yoghurts	6. Meal kit
7. Milk drink	8. Dairy alternatives
9. Meat/fish	10. Meat alternative
11. Processed meat/fish	12. Pizza, pie and quiche
13. Dessert	14. Potato based product
15. Breakfast cereal	16. Ready meal
17. Biscuit and cakes	18. Salty Snack
19. Bread	20. SF Chewing gum/mints
21. Fresh baked goods	22. SF Soft drink/Energy drink
23. Morning goods	24. SF Sweets
25. Dried fruit and nuts	26. Snack bar
27. Chocolate	28. Soft drink/Energy drink
29. Miscellaneous	30. Sweets
31. Convenience food	32. Tea and coffee
33. Ice cream	34. Eggs
35. Chocolate	36. Frozen Veg
37. Tinned goods	38. Dairy products
39. Fruit and vegetables	40. Water

8.12 Appendix 12 – Store Survey

Observational Survey

Name of shop:

Address:

Postcode:

Employee Spoken to:

Date of visit:

Supermarkets

Entrance (immediate products at entrance, before first aisle - Likely to be in the form of display islands)

1. Total No. of food/soft drink products in immediate entrance area
2. Type of product e.g., cake, confectionary, soft drink, sugar free soft drink etc
3. No. of product facings per product (How many of the same product are front of shelf)
4. No. of products with front of package traffic light labelling
5. Size of packaging? E.g., multi-pack, single packs
6. Promotion type on product
7. HFSS/Non-HFSS - checked with UK nutrient profiling model
8. Any additional advertising surrounding.
Entrance
9. What brands are most visually prominent...?
10. Comments...

End of Aisle

1. No. Food (& soft drink) aisles/no. total
2. Approximate length of end of aisle
3. Total number of products at end of aisle
4. Type of product e.g., cake, confectionary, soft drink, sugar free soft drink etc
11. No. of product facings per product (how many of the same product are front of shelf)
5. No. of products with front of pack labelling
6. Size of packaging? E.g., multi-pack, single packs
7. Promotion type - Description
8. No. of HFSS/Non-HFSS - checked with nutrient profiling
9. Additional brand marketing – Description
10. What brands are most visually prominent...?
11. Comments ...

Checkouts – Arms reach of checkout/Queuing area

1. Total no. of checkouts
2. Total no. of checkouts with food or drink within reach
3. Type of checkout (self-service, scan and shop, traditional checkout)

4. Checkout areas – small medium large
5. Type of products
6. No. of product facings per product (how many of the same product are front of shelf)
7. Size of packaging? E.g., multi-pack, single packs
8. No. of products with front of pack labelling
9. Promotion type – Description
10. HFSS/Non-HFSS - checked with nutrient profiling
11. Additional marketing – Description
12. What other products are at checkouts?
13. What brands are most visually prominent...?
14. Comments ...

Convenience stores

Name of shop:

Address:

Postcode:

Employee Spoken to:

Data of visit:

Entrance (immediate products in entrance area before first aisle - Likely to be in the form of islands)

1. Total No. of food/soft drink products in immediate entrance area
2. What other items?
3. Type of product e.g., cake, confectionary, soft drinks etc
4. No. of product facings per product (how many of the same product are front of shelf)
5. Size of packaging? E.g., multi-pack, single packs
6. No. of products with front of pack labelling
7. Promotion type on product
8. HFSS/Non-HFSS - checked with nutrient profiling
9. Any additional Brand marketing?
10. What brands are most visually prominent...?
11. Additional comments...

End of Aisle

1. No. Food (& soft drink) aisles/no. total
2. Approximate length of end of aisle
3. Total number of products at end of aisle
4. Type of product
5. No. of product facings per product (how many of the same product are front of shelf)
6. Size of packaging? E.g., multi-pack, single packs
7. No. of products with front of pack labelling
8. Promotion type - Description
9. No. of HFSS/Non-HFSS - checked with nutrient profiling

10. Additional brand marketing – Description
11. What brands are most visually prominent...?
12. Comments ...

Checkouts – Arms reach of checkout/Queuing area

1. No. checkouts (likely only one in independents, several in chain)
2. Type of checkout (self-service, scan and shop, traditional checkout)
3. Checkout areas – small medium large (demonstrate difference between chain and independents)
4. Type of product
5. No. of product facings per product (how many of the same product are front of shelf)
6. Size of packaging? E.g., multi-pack, single packs
7. No. of products with front of pack labelling
8. Promotion type – Description
9. HFSS/Non-HFSS - checked with nutrient profiling
10. Additional marketing – Description
11. What other products are at checkouts?
12. What brands are most visually prominent...?
13. Comments ...

HFSS/Non-HFSS will be determined using UK Nutrient Profile Model developed by the Food Standards Agency (FSA) in 2004-2005.

Product Facings: Facings also refer to the amount of shelf space a particular product is given. A lot of facing generally increases sales of a particular product

8.13 Appendix 13 - Policy Recommendations

Recommendations regarding the policy process

1. Foster community engagement and involvement throughout the policymaking process to ensure that the community voice is reflected in policy actions to align with the lived experiences and rebuild the belief that food policy is for public benefit.
2. Ensure that the lived experiences of individuals from higher weight classifications are understood throughout the policy process.
3. Promote greater dissemination of research findings both formally and informally. Foster collaboration with the global public health community to share knowledge and best practices.
4. Enhance networks within the policymaking process to promote collaboration and information sharing among stakeholders
5. Develop thorough and routine monitoring and evaluation of the implemented policies to assess their impact on different social groups and to ensure that the policy outcomes are as intended.

Recommendations to Amend Policy Gaps

1. Extend the SDIL to other food types in combination with appropriate food subsidies for healthier food items, to counteract the barrier of affordability of food to form healthier food purchasing behaviours.
2. Extend reformulation efforts to improve the nutritional quality of products and improve the nutritional benefits of processed foods.
3. Extend the 9pm watershed restriction of HFSS marketing on TV to reflect the behaviour of the average child in the UK. And ensure that policy is effectively extended across all platforms and across social media.
4. Extend the policy to encourage stores to place healthier products in prime locations in supermarkets to increase the desirability of products and encourage purchasing.

- a. Further extend the policy to include alcohol products due to increased exposure to these products is associated with the outcomes of the policy's implementation.
 - b. Review the inclusion criteria of the policy to consider the HFSS items that have been permitted by the policy and consider the inclusion of UPF items based on the NOVA scale.
5. Implement protocols to support convenience stores, particularly in deprived urban environments, to support the sales of fresh fruit and vegetables.
6. Introduce formal policies that propose appropriate prevention policies to address stigmatic attitudes in society, media, and healthcare.
7. Bridge the silo between obesity prevention and infant nutrition to ensure that the relationship between infant nutrition practices and childhood obesity is not overlooked.
8. Invest in comprehensive educational programs in schools and communities aimed at improving nutritional literacy through practical skills, targeting young people and lower socioeconomic status groups.
9. Develop new regulations to safeguard social media users and develop a system to verify the trustworthiness of nutritional information sources in order to combat dietary misinformation and the association of healthy diets with diet culture.

Strengthen the Consideration to Socioeconomic Inequalities in the Policy Process

1. Integrate food insecurity with obesity prevention efforts to ensure food insecurity transcends beyond providing adequate calories and protects health through the provision of diets that match governmental dietary guidance.
2. Incorporate a health equity lens into the policymaking process to actively consider the impact of policies on different social groups
3. Develop a policy tool to question assumptions related to individual agency and consider how policies may inadvertently reinforce biases or assumptions about "normal" behaviours and environments.

4. Ensure income support programs to address financial barriers to maintaining a healthy weight, such as subsidies for healthy food or employment support, is aligned with the lived experience of lower socioeconomic households.
5. Prioritise building an evidence base that demonstrates the effectiveness of policies among different social groups.
6. Empower local governments through the provision of resources, power, and support to utilise their position to influence their populations through tailored policies to address the unique challenges faced by different social groups.
7. Develop national and local level food strategies to ensure prevention action is developing towards a shared goal.