Could a parent funded, primary school based, child growth programme be sustainable in England?

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Could a parent funded, primary school based, child growth programme be sustainable in England?

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LIST OF ABBREVIATIONS

BMI	Body Mass Index
CHAMP	Children's Health and Monitoring Programme
FSM	Free School Meal
GP	General Practitioner
HCP	Healthy Child Programme
NCMP	National Child Measurement Programme
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
PCHR	Personal Child Health Record
RCPCH	Royal College of Paediatrics and Child Health
SEN	Special educational needs
WHO	World Health Organisation
Parents	Parents/carers/guardians

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ABSTRACT

Introduction

A child's growth pattern is a fundamental indicator of physical health and emotional wellbeing and yet, despite professional recommendations, there is currently no system in England that routinely monitors children's growth from birth through to adolescence. Parents are unable to recognise growth concerns in their own children and the increasing rate of childhood obesity in England has shifted the norm so that visual comparison between children is ever less valid. The societal stigma that surrounds overweight in childhood has created a reluctance to raise visible growth concerns with parents.

Aim

To measure the acceptability and feasibility of a parent funded, primary school based, child growth programme in England and to assess whether such a programme could have long term sustainability.

Method

A mixed methods approach was adopted incorporating an electronic questionnaire completed by parents (study 1. n=110) whose children were linked with primary schools (n=62) with both higher free school meal (FSM) eligibility (n=22) and lower FSM eligibility (n=40). Furthermore, semi-structured interviews were conducted with primary school leadership of varying degrees of seniority (study 2. n=6). Both studies took place in Greater Manchester.

Results

The findings from study 1. showed that that child growth monitoring in Early Years is perceived positively by parents. However, this positivity diminishes as children progress beyond primary school age, and as parents have experience of the National Child Measurement Programme (NCMP). Study 1. also showed that parents consider primary schools to be an appropriate setting for child measurement and that they appreciate the benefits of annual growth monitoring. The findings show the need for clear communication surrounding the relevance of growth information and the importance of acceptable feedback methods. Study 1. also found that parents value child measurement and growth feedback and are open to the idea of paying an affordable fee, with the preferred amount being £5.00 per year, irrespective of relative deprivation level.

The findings from study 2. showed that school leadership also consider primary schools to be appropriate settings in which to measure children. The study found that school leaders place importance on communicating the benefits of child growth information effectively and on ensuring that feedback is presented in such a way as not to cause a negative response. Whilst school leaders are amenable to facilitating a parent funded programme, they expressed reservations regarding levels of parent engagement and regarding fee collection.

Conclusion

This research offers a new perspective on monitoring child growth trajectories. It shows that parents place a personal financial value on receiving growth information

and that a sustainable parent funded, primary school-based child growth programme is feasible. The research also highlights the crucial role political support plays in programme sustainability, alongside parent and school leadership support and engagement.

Recommendations for practice include exploring and testing models to further ascertain concept feasibility. Recommendations for research include using the existing primary school based NCMP to test and evaluate novel parent feedback methods, including the integration of explanatory visual diagrams that offer a reduced reliance on language and that foster positive parental response.

1 CHAPTER ONE

INTRODUCTION

1.1 Overview

In England, there is no single system of recording individual children's growth routinely over time, and yet a child's growth pattern is a fundamental indicator of health and wellbeing (Royal College of Paediatrics and Child Health (RCPCH), 2019). Fluctuations in a child's growth pattern can indicate underlying physical illness or psychological distress (Smith, 2007; RCPCH, 2019; NHS Hampshire Child and Adolescent Mental Health Service, 2021).

The importance of monitoring child growth is not restricted to identifying illness or distress at the point it has occurred. Child growth programmes help to identify and stratify the future risk of weight related illness (Nihiser et al., 2007), enable risk management and support financial planning within the health system (Nihiser et al., 2007). Weight related illness reportedly cost the National Health Service (NHS) £6.1bn in 2014/15 with the economic costs estimated at £27 billion for the same period (Public Health England, 2017). Additionally, weight related illness results in a financial impact being felt across the wider health system including general practice (Walker et al., 2007) and public health budgets within local authorities (House of Commons, 2015).

Child growth monitoring is important at a population level in order to monitor the nation's health and to design government response (Department of Health, 2008). It is important to monitor at an individual level because parents have significant

influence on their children's health (Gray et al., 2018). Essentially a two-step process, child growth monitoring consists of performing weight and height measurements, followed by data analysis (in the case of population level monitoring) or individual parent feedback. Both elements have complex implications in terms of resourcing, interpretation and state verses individual responsibility. Historically, school aged children were measured for population statistical purposes and in order to create child growth reference charts (Cole et al., 1995). However, in more recent years, some parents have received feedback on their child's growth measurements as part of the National Child Measurement Programme (NCMP) (Department of Health and Social Care, 2022).

Population data confirms that children in England have increasingly high Body Mass Index (BMI) values, that childhood obesity levels continue to rise and that the norm has shifted (NHS Digital, 2021). It is crucial to feedback results to parents because they are unable to recognise important changes to their children's growth (Falconer et al., 2014) and are not able to make accurate assessments when comparing their children's growth to that of others.

Parents have significant influence on their children's health and yet behaviour change theory confirms that awareness is key to being motivated to change family lifestyle habits (Prochaska and DiClemente, 1983). Effective feedback is commonplace in multiple settings including education, business and healthcare (Ivers et al., 2014), but there is a heightened sensitivity and feeling of parental judgement that surrounds child growth feedback (Dam et al., 2019). Feedback that

causes offence rather than motivates behaviour change is counterproductive and, in any event, difficult to deliver (Walker et al., 2007) while feedback that motivates action and encourages parents to seek professional support presents capacity challenges to the NHS and to the wider health service (Department of Health, 2008).

Through statutory programmes, parents in England are able to monitor their children's growth from birth to 2 years supported by health visitors as part of the Healthy Child Programme (HCP) (Public Health England, 2021) and through the primary school based NCMP (Public Health England, 2020) at 4-5 years and at 10-11 years. Annual child growth monitoring from birth to adolescence, noted on one single record, is recommended by the RCPCH (RCPCH, 2017).

A pioneering annual child growth monitoring programme, Children's Health and Monitoring Programme (CHAMP), was awarded public funding to offer growth feedback to all parents of primary aged children in Manchester from 2012 to 2018 (Dam et al., 2019). Despite positive outcomes in terms of child growth trajectories, and national acknowledgement, the programme was not sustainable beyond the initial funded period due to lack of on-going public funded resource (Dam et al., 2019).

1.2 Research aim

Given the importance of growth monitoring during childhood, the aim of this research is to measure the acceptability and feasibility of a parent funded, primary

school based, child growth programme, in order to assess whether such a programme could have long term sustainability in England.

1.3 Research objectives

1. To assess parents' perception of visual growth graph information in relation to standard Early Year's growth graphs used in England.
2. To assess whether parents consider primary schools to be appropriate environments in which to measure children's growth.
3. To assess the acceptability of parents choosing to pay an affordable fee in exchange for child measurement and parent feedback information.
4. To discover parents' perception of an affordable fee for a child growth programme.
5. To collect views of school leadership regarding the feasibility of a parent funded, primary school-based child growth programme.
6. To determine whether a parent funded, primary school based, child growth programme could be sustainable over the long term.

1.4 Current child growth monitoring programmes in England

Child growth is measured by health professionals in units of kilogrammes (kg; weight), centimetres (cm; height) and kilogrammes per metre^2 (kg/m^2; BMI). Additional measurements, such as head circumference and ulna length, may be taken in clinical settings (Smith, 2007) and in order to monitor specific growth rates of children (Whitfield, 2017). Measurements are plotted on age and gender specific

charts and compared to population standards so that growth related issues can be identified (RCPCH, no date).

Children are routinely weighed and measured at birth and at two weeks of age, with measurements plotted onto paper-based, parent held growth charts within the Personal Child Health Record (PCHR) and as part of the HCP (Department of Health, 2009; NHS, 2020). The NHS website advice is clear that weight gain is an indication that babies are healthy and that they are well nourished (NHS, 2020). Parents can further request for their child to be measured by a health visitor up until the age of 2 years, at which point the child's body mass index (BMI) may be calculated and plotted onto a BMI chart (NHS, 2020).

Children are next routinely measured, their BMI calculated and plotted, at age 4-5 years and again at age 10-11 years as part of the NCMP. Introduced in 2006, the NCMP is a primary school based opt-out programme, which means that parental consent is assumed unless parents stipulate otherwise. The NCMP participation rate is consistently high and was recorded at 95% in 2018/19 (NHS Digital, 2019). In 2008 the NCMP recommended that local authorities offer individual child growth feedback to parents (Public Health England, 2020). Parents are unlikely to correctly identify overweight in their own children (Doolen et al., 2009) and therefore NCMP feedback is considered to be important in order that parents can seek further information regarding weight related concerns (Falconer et al., 2014).

1.5 Annual growth measurements and parent feedback: expert recommendations

Within the State of Child Health report of 2017, the RCPCH recommended that the HCP and the NCMP should be expanded to include multiple measurements from birth to adolescence (RCPCH, 2017). In 2019 the RCPCH reiterated that routine serial measurements taken annually were useful in monitoring a child's growth pattern, and that all measurements should be combined onto one electronic PCHR to ensure that a coherent record is available to relevant health professionals (RCPCH, 2019). This would enable health professionals primarily, but parents also, to see a retrospective pattern of growth, to assess a child's current growth status and to predict future health and wellbeing implications.

1.6 Children's Health and Monitoring Programme (CHAMP)

CHAMP was an NHS led, Manchester based, large-scale initiative that linked annual measurements taken during the primary school day with web-based parental feedback (Dam et al., 2019). The premise of CHAMP was to ascertain the impact on children's growth trajectories of on-line parental feedback over time. The study showed that parents were receptive to annual child measurement and web-based growth feedback. Importantly it showed that having an awareness of how their children were growing appeared to have a positive impact on healthy growth trajectories (Dam et al., 2019), which suggests that parents are able to reduce future weight related health risk. Despite the reported impact, CHAMP was discontinued after six years due to a lack of recurrent public funding.

1.7 Sustainable child growth programme

Given the significance of child growth information, and the empowerment to parents that it offers, it is vital to consider how a system can be developed and moreover sustained over the long term. In the absence of a centrally funded annual child growth programme, dedicated to providing parents with annual child growth information in England, this research sets out to explore an alternative funding model and will specifically ask parents if they would be willing to fund such a programme. The research will assess the likelihood of parents choosing to pay a fee in exchange for child measurement and parent feedback information, something which to the author's knowledge has never before been asked of parents. It will also discover parent perceptions of an affordable annual fee and subsequently the financial value placed by parents on this information. Given that such a programme would take place in primary schools, the current study will ask school leadership their views regarding feasibility and whether, as gate-keepers, they would be amenable to facilitating a child growth programme.

2 CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

This chapter will explore literature and current views that surround the research objectives. It will begin by considering the HCP (Public Health England, 2021) and parents' perceptions of the child growth feedback that health visitors impart to them. It will then explore the introduction of the primary school based NCMP (Public Health England, 2020) as a childhood obesity surveillance mechanism, its subsequent evolution and its alignment with successive government's childhood obesity targets.

This chapter will consider the rationale behind using BMI to measure child growth and parents' views of BMI as an appropriate measure, specifically given the NCMP's evolution from a surveillance exercise to a parent feedback programme. With regards to the setting of the NCMP, this chapter will look at measuring children during the primary school day and consider the impact on parents, on children and on school leadership.

There is a societal stigma that is associated with child growth, and weight in particular (O'Donnell et al., 2017), and this chapter will consider the sensitivity that surrounds both the measurement process and parent feedback information. This chapter will look how child growth information is imparted to parents and how it is received. CHAMP will then be described as a precedent to a parent funded annual child growth monitoring concept.

Furthermore, the chapter will consider the impact of national government policy and the cost implications of a long-term child growth programme to the public funded health system. It will examine the propensity of parents for paying for health appointments and education services, given the setting of the NCMP, over and above those services which are provided for by central funding. The purpose of this exploration is to garner a view on the likelihood of parents finding a parent funded child growth programme acceptable.

Finally, this chapter will explore and outline the strengths and weaknesses of sustainability theory in the context of public health programmes in the UK. The theory will be considered in the context of the programme, CHAMP in order to understand how this particular programme approach could be adapted to become a long-term sustainable funded model.

2.2 Parents' perception of Early Years growth monitoring

Childhood obesity prevention strategies highlight the benefits of engaging with families pre-birth in order to provide education and information on appropriate feeding practices (Public Health England, 2021). Growth patterns recorded early in childhood, specifically before the age of 6 years, can help to predict future weight related health risk (Robinson et al., 2019).

The HCP allows for regular growth monitoring of infants from birth to around 2 years of age (dependent on local commissioning arrangements) by health visiting teams. A leaflet from Hertfordshire NHS Trust, scheduling growth measurements,

recommends that infants are weighed 12 times between birth and 2.5 years of age, with four of the measurements listed as ‘self-weigh' (Hertfordshire Community NHS Trust, no date). The leaflet includes an image of a detailed growth graph, an explanation as to how to interpret growth results and how to self-record measurements in the Personal Child Health Record (Hertfordshire Community NHS Trust, no date) although it is not clear from the leaflet the rationale behind parent led measuring and recording child growth as opposed to health visitor appointments.

Research has shown that parents are familiar with the use of growth graphs in order to monitor infants’ growth (Sullivan et al., 2011). However, a review by Mansoor and Hale (2021) found that despite this familiarity, the charts’ meaning was not fully understood by parents (Mansoor and Hale, 2021). Parents were found to prefer their children to follow centiles than not, with higher centiles more favoured than lower centiles, and to consider heavier infants healthier than lighter infants (Laraway et al., 2010; Sullivan et al., 2011). Mansoor and Hale (2021) found that, although parents valued growth graph information, they interpreted it in the context of a wider picture, including physical activity and ethnicity (Mansoor and Hale, 2021).

2.3 Introduction of the NCMP

The NCMP was introduced as a statutory surveillance programme to establish the extent of childhood obesity in England. The Government mandated local authorities to facilitate the measurement of all Reception (aged 4-5 years) and Year 6 (aged 10-

11 years) children in state funded primary schools in England. The NCMP data at aged 10-11 years of age forms the outcome measure of childhood obesity reduction targets, originally set out in two government policy documents; 'Choosing Health: Making healthy choices easier' (Department of Health, 2004) and 'Healthy Weight, Healthy Lives: A cross government strategy for England' (Department of Health, 2008).

The NCMP participation rate increased from 80% in 2006/2007 to 95% in 2018/19 (NHS Digital, 2019). The programme has continued every year since, with all eligible children being measured and their BMI value subsequently plotted onto an age and gender appropriate growth chart. The exception was 2020/21 when the NCMP was suspended due to the Covid 19 pandemic The NCMP stratifies and classifies growth status as 'underweight', 'healthy weight', 'overweight' or 'very overweight' with population-level results published by the Government annually.

The NCMP consistently reports that the percentage of children at age 10-11 years whose BMI plots in the high-risk categories is increasing. In 2006/07 the percentage of children classified as above the healthy BMI range was 31.6% (Department of Health, 2008) and by 2020/21 it had risen to 40.9% (NHS Digital, 2021).

Successive governments have set ambitious targets to reduce childhood obesity. In 2008, the Government set a target to reduce the level of childhood obesity by 2020 to that recorded in 2000 (Department of Health, 2008). By 2011 this target had been revised to a downward trend in childhood obesity (Department of Health,

2011). Neither of these targets were met, with levels of childhood obesity continuing to rise. Most recently, the Government declared a new national target; childhood obesity levels to be halved by 2030 (HM Government, 2018). Although not expressly stated, it can be assumed that the target relates to 2017/18 NCMP results (National Audit Office, 2020). This latest target would see obesity rates reduce to less than those recorded in 2000 (National Audit Office, 2020).

2.4 Relevance of Body Mass Index (BMI) in the context of child growth

BMI is a ratio of weight to height and is calculated by dividing weight in kilogrammes by height in metres. The target BMI for UK adults, over the age of 18 years and irrespective of gender, is between 18.5kg/m2 and 24.9 kg/m2 (NHS, 2019). Adults with a BMI consistently within the target, or 'healthy', range have a relatively low risk of weight related health conditions occurring. Children's BMI is calculated in the same way however the results must be interpreted using age and gender specific BMI charts (RCPCH, no date). A child's target BMI will typically be at its lowest around the age of 5 years and will gradually increase to adult BMI parameters over time (Appendix 12.).

A BMI that plots above the target range in childhood is likely to lead to a BMI above 25 kg/m2 in adulthood (Simmonds et al., 2016) which in turn is associated with an elevated risk of developing cardiovascular disease, type 2 diabetes and cancer (Guh et al.; 2009, Khanna et al. 2022). The longer a person has a high BMI (above target range) the greater the number of healthy years likely to be lost due to diabetes and cardiovascular disease (Grover et al., 2014). A review by Khanna et al. (2022)

reveals positive correlations between high childhood BMI and poor mental health, in extreme cases leading to suicidal behaviour. Sub-optimal health and wellbeing amongst children and adults places a significant emotional and financial burden on individuals, families and on communities (Guh et al., 2009).

2.5 Evolution of the NCMP: parent feedback

The NCMP has evolved over time from a surveillance programme to one which informs parents of their children's results. In 2008 the government recommended, although did not mandate, that local authorities offer individual child growth feedback to parents (Public Health England, 2020). Local authorities who elect to offer parents feedback do so in written letter form, stating the child's weight, height and growth classification (Department of Health and Social Care, 2022). Parents are unlikely to correctly identify overweight in their own children (Doolen et al., 2009) and so NCMP feedback is considered to be important in order that parents are better able to recognise overweight in their children and subsequently seek advice and support (Falconer et al., 2014). However, an Expert Advisory Group expressed caution in feeding back results to children and parents, given that there was a lack of effective interventions available thereafter (Department of Health, no date) and deduced that the potential harm caused by a weight related conversation could outweigh any benefit gained given the lack of interventions, a stance that has been repeated relatively recently (Department of Health, no date; Public Health England, 2021).

This research sought to ask parents their perception of primary schools as an appropriate setting in which to measure children. However, it is likely that many parents will be familiar, or may have experienced the NCMP and therefore align their answer with their view of this longstanding programme. Therefore, the research will also compare and contrast parents' experiences of the NCMP with their view on primary school as an appropriate measuring environment, in order to understand the underlying impact of the NCMP on the acceptability of a parent funded programme.

2.6 Expert concerns around the NCMP measuring procedure

The standard procedure for measuring children in schools was set out by an Expert Advisory Group on behalf of the Department of Health (Department of Health, no date) based on research findings (Muttock and Butcher, 2005). The NCMP ensures that children are measured by trained personnel who record weight silently using a display unit separate to stand-on scales, and who measure height using portable height measures (Department of Health, 2007). No conversations regarding weight measurements or classifications are held between children and measuring personnel (Department of Health, 2007). No written records or results are given to children in order to minimise the risk of result comparison and subsequent bullying (Department of Health, 2007).

Concerns around stigmatisation and bullying caused by measuring children were raised by an Expert Advisory Committee prior to the commencement of the programme (Department of Health, no date). The concerns were subsequently

allayed by research commissioned by the Children's Commissioners Office to explore the views of children on being measured in primary school (Muttock and Butcher, 2005). However, the Department of Health reported that Year 6 children with obesity were less likely to be measured than children in other growth classifications (Department of Health, 2009) and that a less than 100% participation rate of the programme would to lead to a statistical underestimation of obesity prevalence (Department of Health, 2009). This strongly suggests that there is a reluctance of children with high weight to present themselves, or to be presented by their parents, to be measured. The most recent NCMP operational guidance advises that children have the option of refusing to be measured on the measurement day and that parents may withdraw their children from the programme if they so wish (Public Health England, 2021).

2.7 Appropriateness of measuring in the school setting

Despite expert concerns around stigmatisation and bullying caused by measuring children (Department of Health, no date), the high participation rate of the NCMP (NHS Digital, 2019) suggests that parents, children and primary school leadership are comfortable with the concept of measuring children during the school day.

There are clear benefits to measuring children in school. Children can be measured relatively quickly and without the need for them and their parents to attend an appointment off-site. Parents tend to seek advice from school nurses regarding their child's growth (Viner et al., 2020, House of Commons, 2015) and school nurses

are likely to have access to a child's NCMP data which could be helpful if a growth-related concern is raised by a parent (Public Health England, 2021).

As well as school nurses, parents tend also to seek advice from their General Practitioner (GP) (House of Commons, 2015). However, O'Donnell et al. (2017) found that GPs considered obesity to be best managed in schools rather than in primary care settings. In any event, GPs would be unlikely to have access to NCMP data (University of Birmingham, 2020) and so would need to measure children in clinic. This can present as challenging for GPs (University of Birmingham, 2020) not least because healthcare professionals find discussion around childhood obesity sensitive and ineffective (Walker et al., 2007).

Despite offering the professional view that childhood obesity is best managed in schools, Walker et al. (2007) found that primary care health professionals considered obesity to be a personal or family responsibility. Given that healthcare professionals have expressed a need for training around the interpretation of BMI charts (University of Birmingham, 2020), it is likely that parents would also lack knowledge and confidence in child growth assessment. Tracking a child's growth at home requires confidence and measuring equipment which many parents lack (Trace, 2021). In order to be interpreted correctly, weight and height measurements must be converted into units of BMI and then plotted onto an age and gender appropriate chart. If a child is weighed and measured at home, a parent may anxiously anticipate a weight related conversation with their child which they would likely consider inappropriate (Dam et al., 2019).

The primary school based NCMP provides child measurement in a setting that is convenient for parents because it is a process that does not require a parent to be present (Public Health England, 2020). The programme offers confidential parent feedback thereby offering an opportunity for parents to consider seeking any advice and support that they may deem necessary (Public Health England, 2020). Importantly, there is a clear division between the measurement process and the feedback element of the programme in terms of timing, environment and those present. Children are measured by healthcare professionals with instructions not to engage into conversation regarding the results or to allow children to overhear each other's weight measurements (Public Health England, 2020). Child growth feedback is delivered confidentially to parents who subsequently have the opportunity to consider the results and their implications without involving their children (Public Health England, 2020).

Whilst the NCMP is a statutory requirement of local authorities, and while the majority of schools now routinely take part in the NCMP, it is not obligatory that individual school leadership allow their school to participate in the programme. To the author's knowledge there is limited research asking school leaders for their views of child growth measurement in the school setting however it is reported that school leadership were reticent about the introduction of the NCMP owing to concerns around the impact on learning time and the confidentiality of child measurements (Statham et al., 2011). Statham et al. (2011) also reported that personal meetings between school leaders and public health leaders are important in securing programme support.

2.8 Weight stigmatisation

There is a deep and widespread stigma attached to weight, both in adulthood and in childhood (Puhl and Heuer, 2010; Tomiyama et al., 2018). Weight stigma places people with obesity at a disadvantage within society, above and beyond the physical health risks to which they are more susceptible (Tomiyama et al., 2018). Weight stigma further increases health risk by discouraging physical activity, negatively affecting emotional wellbeing and by a pervasive discrimination within the nation's health system (Tomiyama et al., 2018).

The introduction of NCMP feedback in 2008 recognised the stigma attached to weight and rather than recommend universal parent feedback, parents who specifically requested their child's results were sent their child's weight and height measurements, with no explanation or weight category stipulated (Department of Health, 2007). However, this basic information presented a risk of parents using the measurements to calculate BMI and to incorrectly interpret it against adult BMI parameters. Guidance subsequently changed to recommend that all parents be offered a 'weight status' based on their children's measurements; underweight, healthy weight, overweight or very overweight (Department of Health, 2011). The terminology was strong and referred to a child's result as 'very overweight', 'clinically obese' and at risk of long-term illness including 'some kinds of cancer' Department of Health, 2011:64). Two years later, the terminology was less forceful and referred to 'overweight' (formerly 'very overweight') and children being at risk of 'ill-health' (Public Health England, 2013:57).

Although studies have shown that parents find NCMP feedback useful (Falconer et al., 2014), parents have also reported to feel strong negative emotions as a result of receiving NCMP feedback (Falconer et al., 2014; Dam et al., 2019). A review by Ames et al. (2020) also found that parents experienced negative reactions when receiving feedback and that additional literature sent to support and advise may be disregarded or actively disposed of (Ames et al., 2020). The stigma attached to weight impacts healthcare workers who lack confidence in their knowledge of child growth and find conversations with parents around weight uncomfortable and difficult to initiate (Bradbury et al., 2018; Thorstensson et al., 2018).

Parents regard privacy and confidentiality as being very important throughout the measurement and feedback process so as to avoid stigmatisation (Ames et al., 2020). Parents prefer child growth feedback to be sent by post rather than by 'satchel' post which risks being opened, read or thrown away by children (Ames et al., 2020). The NCMP operational guidance (2021) acknowledges the sensitivity around the topic of weight and, while parental feedback is explicitly recommended, the guidance discourages weight related discussion between healthcare providers and parents, and between parents and children, for fear of causing emotional distress (Public Health England, 2021).

2.9 Description of CHAMP

Dam et al. (2019) describe a time limited funded programme whereby school nurses measured all year groups of primary school children annually and CHAMP subsequently offered individualised feedback to parents via a web-based portal.

The CHAMP programme operated under NCMP operational guidelines and was undertaken by NHS personnel (Dam et al., 2019). The study found that the growth patterns of children whose parents registered with the on-line feedback portal were more likely to follow a healthy trajectory, and less likely to progress into the NCMP 'overweight' classification, than those of children whose parents were not registered.

It is not clear from the research the nature of the visual feedback to parents; however, given that it followed the NCMP guidance, it is likely that it consisted of BMI graphs including centiles, similar to the UK90 graphs used in clinical settings, because the same LMS growth data set from which the UK90 graphs originate is referenced as part of the study (Dam et al., 2019).

The CHAMP programme was an initiative that positively impacted child growth trajectories and aimed to prevent weight related illness in a geographical area with a large and diverse population, high levels of deprivation and a particularly high rate of childhood obesity (GMCA, 2018).

In 2019/20 the NCMP childhood obesity level, including severe obesity, was recorded as 21.0% for England and as 22.8% for the North West of England (Office for Health Improvement and Disparities, 2022). The level of childhood obesity, including severe obesity, in England increased further to 25.5% and in the North West of England it increased to 25.8%, according to NCMP data for 2020/21 (NHS Digital, 2021). This represented the highest one-year rise in childhood obesity since

the NCMP began in 2006/07. However, it should be noted that the NCMP measuring process for 2020/21 was severely disrupted due to the Covid-19 pandemic and a reduced number of children were measured (NHS Digital, 2021).

2.10 National policy and cost implications of NCMP parent feedback

The importance of child growth assessment by means of the NCMP has been recognised by consecutive UK governments and, as a statutory requirement, public funding is made available to undertake the measurement process. In contrast, NCMP parent feedback is not centrally mandated (Public Health England, 2021), with local authorities assuming commissioning responsibility for their local approach (Statham et al., 2011). Therefore, depending on the stance of their local authority, some parents will receive information on their child's growth and development following the NCMP, whilst others will not.

Whilst providing parents with feedback presents a financial pressure to local authorities, the perceived financial impact on the health system is arguably greater. There is a long-held view that routine parent feedback has significant cost implications for health services in England, and has the potential to highlight service provision inadequacy. A memorandum presented to the Government in 2008 evidenced an assumption that weight management services would be overwhelmed by parents seeking support if they were to be informed that their children were overweight (Department of Health, 2008). In 2015 the House of Commons Health Committee heard evidence from a range of experts regarding childhood obesity and who expressed a similar concern. While the Committee

heard support for the NCMP measurement and feedback, as well as for expanding the programme to younger and older cohorts of children, the lack of in-person weight management service provision available to those identified as being 'overweight' or 'very overweight' was described as 'the elephant in the room' (House of Commons, 2015:42).

The scale of childhood obesity in England is such that meeting the potential demand for weight management services would create significant financial pressures within and across the health system. GPs are a first-line source of support and treatment for children with weight related illness (Turner et al., 2012) and local authorities have responsibility for commissioning services for families of children identified through the NCMP as requiring weight related support. The NHS have a specific responsibility for providing services for children whose level of weight-related health risk (overweight and underweight) requires specialist and clinical support (NHS England, no date). All providers of child growth-related services are therefore susceptible to increased service demand as a result of an annual child growth monitoring programme. The latest NCMP operational guidance discourages programme providers from having any contact with parents in order to discuss individual children's results in the absence of available follow-up services (Public Health England, 2021).

NCMP feedback is commonly offered in letter form. Written feedback is relatively cost-effective and can incorporate support and advice relating to a child's results (House of Commons, 2015) thereby reducing the health system impact of parents

seeking in-person support. However, concern has been expressed that written feedback appeals only to motivated parents and could therefore serve to increase health inequalities (House of Commons, 2015). By not offering parent feedback, the health system is deemed to be protected and health inequalities not adversely affected.

2.11 Increased parent spending in healthcare and in the education setting

A parent funded child growth programme is a novel concept spanning both healthcare and education given the school setting. There are longstanding screening programmes in England which are carried out during the school day; children who attend state funded primary schools are eligible to receive vision screening at age 4-5 years (Public Health England, 2019) and some children are eligible for hearing screening at the same age (NHS, 2021). Although not technically a screening programme, the current growth programme for primary aged children in England, the NCMP, is also essentially 'free'. Commissioned by local authorities, the NHS commonly delivers the NCMP and is strongly associated with it. However, children who attend independent schools are not eligible for routine health screening, or the NCMP, and parents must proactively source NHS or private alternatives.

Private health insurance is a growing sector in England with younger adults more likely to opt for private healthcare than older generations, who tend to have a stronger affiliation with the public funded NHS (Propper et al., 2001). Privately funded healthcare appointments are appealing due to the choice of specialists,

flexibility of appointment times and amenable facilities (Rodriguez and Stoyanova, 2004). The increased use of privately funded healthcare correlates with longer waiting times for NHS treatment and the wider availability of private services (Biro and Hellowell, 2016).

In the education setting there has been an increase in parent funded activities including after-school clubs (King, 2021) and private tutoring (Bray, 2006). Supplementing state funded learning with private funding is a convenient and relatively low-cost way for parents to ensure that children reach their potential within the education system (Ireson, 2004). This increased engagement has been driven by a number of factors including a competitive environment amongst parents and by the social normalisation of private tutoring (Bray, 2006).

This research will assess the likelihood of parents choosing to pay an affordable fee in exchange for child measurement and parent feedback information and will seek to discover what parents' perception of an affordable fee for an annual child growth programme might be. Whilst a parent funded annual child growth programme would mitigate the financial pressure of additional child measurement and parent feedback on the public purse, it is not clear the extent to which it would alleviate the previously highlighted demand risks to the health system. There is uncertainty whether these perceived risks would translate into active political opposition to a parent funded child growth programme and therefore impact on programme delivery and sustainability.

2.12 Defining programme sustainability

Shediac and Bone (1998) report that valuable resource is routinely directed towards community-based health initiatives which are subsequently not sustained beyond their initial funding phase. If a programme is sustainable, it is commonly thought to be able to continue beyond initial, time limited, funding. However, in the context of health initiatives, there is ambiguity associated with the term sustainability and this affects the definition of a sustainable programme.

A review by Scheirer (2005) looked at multiple time-limited health initiatives ranging from 18 months to 8 years and considered the complexity in determining sustainability beyond the initial period. The author referenced degrees of, rather than absolute, sustainability (Scheirer, 2005) suggesting that a programme's continuing format could differ to its original. Scheirer and Dearing added further complexity by considering the impact of potential external factors on programme conditions (Scheirer and Dearing, 2011). The authors reviewed interpretations of programme sustainability across a variety of health fields and sought to develop a standard framework that could be used to assess the likelihood of programme sustainability (Scheirer and Dearing, 2011).

Shediac and Bone (1998) also acknowledge the lack of clarity and devised a conceptual approach as a means of testing programme sustainability. According to the authors, a programme is sustainable if it satisfies the following conditions: it continues to be effective and is able to monitor its efficacy, it can be integrated into

an organisation's day to day business with no extra financial pressure and it can utilise non-paid lay persons to support the programme (Shediac and Bone, 1998). Walugembe et al. (2019) considered the impacts of not sustaining health initiatives over the long-term and identified four key reasons why practitioners should seek sustainability. Firstly, the value of positive 'behaviour change' programmes increases the longer the programme runs and the longer behaviour change is maintained. Secondly, emerging health outcomes may not become apparent during a short-term programme. Thirdly Walugembe et al. (2019) highlight lost financial investment and human expertise when a successful programme is not sustained beyond an initial funded period. Finally, programme stakeholders may perceive their commitment to be disregarded when it ends prematurely and this could jeopardise participants' involvement in future programmes.

Despite the adverse impacts of programmes not continuing beyond an initial funded period, sustainability should not be considered an inherent objective (Swerrissen and Crisp, 2004). Examples of application forms from both public and private organisations suggest that funders do not necessarily request or prioritise programme sustainability (Tesco Community Grants, no date; NHSX, 2021; Public Health England, 2021; The Joseph Rowntree Charitable Trust, 2022). A programme evaluation may offer inconclusive evidence or even show that sustainability is neither viable nor warranted; Swerrissen and Crisp (2004) describe sustainability as a 'familiar catch-cry' that is poorly defined and therefore misunderstood. The authors suggest that critical reflection may be overshadowed by unfounded

enthusiasm leading to misjudged decisions, and that health outcomes may carry on irrespective of a programme continuing (Swerrissen and Crisp, 2004).

In 2013, Schell et al. presented a conceptual a framework to support public health programmes plan for sustainability over time. The authors scored nine core elements that contributed to sustainable public health programmes. Political support was found to be the most important factor followed by organisational capacity and funding stability. Political support was deemed important not least because of the funding that it could access; organisational capacity referred to adequate resources to carry out the programme. Therefore, the three highest scored elements suggest that funding is fundamental to programme sustainability. The other six elements were, in order of importance, partnerships, programme evaluation, communications, programme adaptation, strategic planning and public health impacts (Figure 2.1).

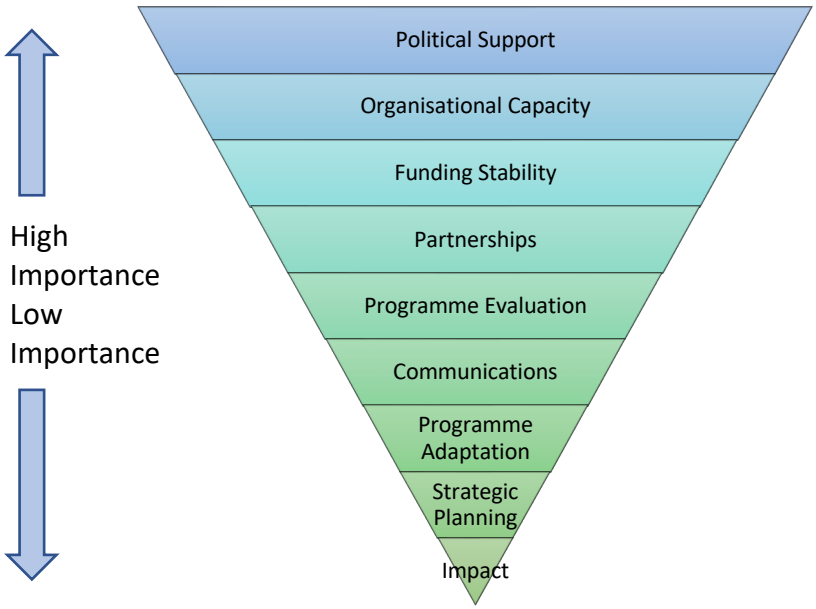


Figure 2.1 The core elements of programme sustainability (adapted from Schell et al., 2013)

2.13 Political support: sustainability core element

Political support for a programme that served to inform parents of their children's measurements was high around the time of CHAMP (Dam et al. 2019). In the years preceding the programme, between 2004 and 2011, there was a number of government documents and policies supporting childhood obesity reduction in England (Theis and White, 2021) as illustrated in Table 2.1.

However, changes in government led to a change in direction with the focus and responsibility for childhood obesity shifting from individual growth feedback (under the NHS) to population-based strategies (under local authorities).

In 2013 responsibility for obesity prevention transferred from the NHS to local authorities (Department of Health, 2011). Two years later, in 2015, a House of Commons committee heard a repeat of previous objections (Department of Health, no date) with witnesses cautioning against written feedback in relation to increased inequalities, increased demand for insufficient and ineffective weight management services (House of Commons, 2015). The panel concluded that the measuring element of the NCMP was important in terms of data information and should be expanded (House of Commons, 2015) but omitted to reference the parental feedback element of the programme (Table 2.1).

Table 2.1 Government policies in England supporting childhood obesity reduction 2004-2020

Government	Year	Policy Document	NCMP Commentary
Labour (1997-2010)	2004	'Choosing Health: Making healthy choices easier'	**Introduction** of NCMP measurement
	2004	Health Committee: 'Obesity: Third report of session 2003-04'	**Recommendation** of annual NCMP measurement **Recommendation** of annual NCMP feedback
	2006	NCMP measurement (2006-present)	
	2008	'Healthy Weight, Healthy Lives: A cross government strategy for England'	**Introduction** of NCMP feedback
	2008	NCMP feedback (2008-present)	
Conservative -Liberal Coalition (2010-2015)	2011	'Healthy weight, healthy lives: a cross government strategy for England'	**Promotion** of NCMP measurement and NCMP feedback
	2013	CHAMP (2013-2018)	
Conservative (2015-present)	2015	Health Committee: 'Childhood obesity-brave and bold action'	**Recommendation** of extended NCMP measurement **Caution** against NCMP feedback
	2016	'Childhood Obesity: A Plan for Action'	**No mention** of NCMP measurement or NCMP feedback
	2018	Health and Social Care Committee: 'Oral evidence: childhood obesity'	**Recommendation** of extended NCMP measurement **No mention** of NCMP feedback
	2018	'Childhood Obesity: A Plan for Action Chapter 2'	**Continuation** of NCMP measurement and NCMP feedback
	2020	'Tackling obesity: empowering adults and children to live healthier lives'	**No mention** of NCMP measurement or NCMP feedback

Political support for individual parent feedback was waning by 2016 when a Conservative government policy document was published entitled 'Childhood obesity: a plan for action' (HM Government, 2016). The policy prioritised an environmental approach to obesity reduction and included industry led food and drink reformulation, food packaging/labelling review, promotion of increased physical activity in schools and a centrally operated fiscal measure commonly known as the 'sugar tax'. The NCMP was not mentioned within the document.
In 2018, the Government published 'Childhood Obesity: A Plan for Action Chapter 2' and confirmed that childhood obesity reduction policy had shifted from empowering individuals with tailored information to affecting population change using environmental and legislative levers (HM Government, 2018). Although the Government had previously recommended the wider uptake of CHAMP (Department of Health and Social Care, 2019:12), the programme had ended a year prior to the recommendation due to lack of resource (Dam et al., 2019). In 2020 the Government published an obesity reduction policy paper and focused on food industry related legislation again with no mention of the NCMP (Department of Health and Social Care, 2020).

2.14 Organisational capacity and sustainability

Organisational capacity is often referred to in the context of health promotion whereby lay persons, or community members, are trained to impart knowledge to others and commonly refers to programmes in under developed countries where resource is particularly scarce (Gruen et al., 2008; Yarber et al., 2015).

Dam et al. report that the child growth programme was developed in 2012 by two large organisations; Manchester University NHS Foundation Trust (the Trust) and the University of Manchester. Although the roles of both organisations in the early development of the programme are unclear, the timing of the research suggests that there had been organisational capacity within the Trust to undertake this preliminary work. This is reinforced by a senior executive of the Trust addressing the Health and Social Care Committee (House of Commons Health and Social Care Committee, 2018:6). In this instance, it seems that organisational priorities had shifted in order to increase programme capacity, rather than incorporating lay persons or community members.

The CHAMP programme was described as 'cost neutral' (House of Commons Health and Social Care Committee, 2018:5) with initial set up costs resulting in CHAMP's ongoing costs being no more than the NCMP. Initial financial investment can support organisational capacity and ongoing cost reduction (PwC, 2016). However, in this case 'cost neutral' related to the measurement part of the programme and not to the parent feedback. Sustainability of CHAMP required ongoing resource and therefore was not cost neutral.

2.15 Funding and programme stability

NHS England spent an estimated £6.1billion in 2014/15 (HM Government, 2016) to treat ill-health relating to obesity. In April 2013 the responsibility to drive obesity prevention work transferred from the NHS to local authorities (HM Government, 2010, Department of Health Obesity Team, 2012).

Despite the shift in responsibility, the NHS funded CHAMP through Health Education England, a Department of Health sponsored organisation (Health Education England, 2012) from 2015 until 2018. This funding was significant given the economic downturn of 2008 which saw government health spending between 2009 and 2020 at the lowest ever recorded growth rate, and resulted in NHS Trusts experiencing heavy financial pressures (Institute of Fiscal Studies, 2021).

Despite CHAMP's close link with the NCMP the programme was not adopted by the commissioning local authority. Dam et al. (2019) had interviewed public health professionals within the local authority as part of the study and subsequently reported unanimous backing for the surveillance element of the programme, and a lack of support for the parental feedback element of CHAMP. An emergent theme that has been repeated since the introduction of NCMP feedback in 2008.

2.16 Impact of partnership working

Schell et al. identified the importance of partnerships as one of nine key components within a conceptual framework to aid programme sustainability (Schell et al., 2013). Mayan and Daum (2016) reported that cooperative partnerships between multiple invested stakeholders formed the basis of community health projects. Dam et al. (2019) describe the CHAMP programme as being a collaboration between two partners and one that included key stakeholders, school leadership, parents and children.

Improved health and equality within communities is one of multiple advantages of bringing together a diverse group of partners (Estacio et al., 2017). Unlike formal contractual agreements, effective partnerships are built on mutual respect, trust and understanding, different views and opinions (Mayan and Daum, 2016; Estacio et al., 2017). Within local settings, programme teams often bring together people who have prior knowledge of each other, and this familiarity can be advantageous in the team building process; creating a level of commitment to each other and to the programme (Estacio et al., 2017). However, partnerships have the potential to become unwieldy and a significant resource burden (Lasker et al., 2001).

Local public health teams are often considered the most appropriate leaders for public health programmes (Estacio et al., 2017; Littlecott et al.,2017). Local authorities hold financial accountability for public health programmes and have access to local communities through a network of local government departments, therefore giving programmes the popular hallmarks of a whole systems approach (Bagnall et al., 2019). A whole systems approach is often referred to in the context of a multi-agency response to complex health challenges and one which works on the basis that all stakeholders integrate their actions, whilst simultaneously considering the impact of their decisions on the reduction of health inequalities (Stansfield et al., 2020).

2.17 Importance of programme evaluation

Programme evaluations serve to improve the quantity and quality of public health programmes (Public Health England, 2018) and yet not all programmes warrant an

evaluation. An evaluability assessment should consider both the purpose and the practicalities of undertaking an evaluation, it should establish to what extent an evaluation is feasible and how much resource allocation is warranted (Davies, 2013). Evaluation costs are programme specific and are subject to multiple variables therefore resource will likely determine the extent and quality of an evaluation (Ogilvie et al., 2011).

Evaluability assessment is explored by Ogilvie et al. (2011) who set out five areas of investigation. The timing of an evaluation is important; will any results be reflective of the intervention if undertaken in the short term and will interest be lost if undertaken in the long term. Secondly, the impact on policy of an evaluation, and whether this is even an objective of the evaluation (Ogilvie et al., 2011). Next, the relevance, accessibility and alignment of an evaluation with appropriate decision-makers followed by the size of the intervention impact on a large number of people and what an evaluation would add to scientific evidence base (Ogilvie et al., 2011). Finally, the authors note the importance of realistic timescales and sufficient evaluation budgets (Ogilvie et al., 2011).

Within the topic area of weight management programmes, Mears et al. (2019) found that commissioned programmes were rarely evaluated. According to Dam et al. (2019) CHAMP fulfilled criteria as set out by Ogilvie et al. (2011). The early findings of the CHAMP evaluation were presented to the Government thereby demonstrating an interest in influencing policy making. At its inception, CHAMP had aligned with the national policy of the time (Department of Health, 2011). CHAMP

reported on a very high number of children demonstrating a small change in their growth trajectory therefore having the potential for a large overall impact (Dam et al., 2019). In terms of adding to current knowledge, Dam et al. (2019) report that a literature search was undertaken and that no comparable programmes were found with this indicating that a programme evaluation had the potential to increase both knowledge and understanding in this field.

2.18 Programme communication

Defining programme communication as 'the strategic dissemination of program outcomes and activities with stakeholders, decision-makers, and the public' (Schell et al., 2013:7), Schell et al. found that communication was ranked sixth out of nine core elements for programme sustainability.

According to Kreuter and Bernhardt (2009) both the communication and implementation of research is failing due to the volume of research publications and a lack of organised systems. Estabrooks et al. (2018) also discuss the disconnect between public health research findings and implementation into practice. This suggests that despite efforts to communicate findings, programme outcomes are liable to get lost in the sheer volume of studies. The Cochrane reviews are deemed credible sources of information serving to communicate research findings to health professionals and policy makers with the Cochrane reports considered early examples of synthesis of research, bringing together swathes of publications and establishing best practice (Estabrooks et al., 2018).

2.19 Programme adaptation

Programme adaptability is a core element of sustainability according to Schell et al. (2013). Sustaining programme outcomes takes precedence over sustaining programme delivery format with programmes that adapt having more likelihood of discovering solutions to complex challenges than those bound by rigid programme plans and target outcomes (Andrews et al., 2016). Agile programme plans can consist of multiple paths which all lead to the same programme outcome (Bandali et al., 2022) and is integral to sustaining and scaling up successful programmes within complex health systems (Paina and Peters, 2012).

Dam et al. (2019) report that CHAMP broadly operated under NCMP guidelines and that the programme was adapted to enable more children to be measured and to provide parental feedback electronically. The authors offer no evidence of programme adaptability beyond this and there is no suggestion of programme scale-up.

2.20 Strategic planning

In the UK, public sector organisations are often transparent with their strategic plans at national level and at local level. The NHS produces medium-term strategic plans such as the 'Five Year Forward View' (Department of Health, 2014) and more recently 'Next Steps on the NHS Five Year Forward View' (Department of Health, 2017). Both of which are high level plans, outlining organisational priorities, financial arrangements, key deliverables and timescales with no implementation or operational detail offered. At a regional level, and with similar timescales, Greater

Manchester Combined Authority (GMCA) and the Association of Greater Manchester Authorities (AGMA) published a regional strategic plan in 2013, 'Stronger Together' (GMCA and AGMA, 2013), followed by 'Our People, Our Place' (GMCA, 2018) five years later.

Strategic planning is the organising of activities and investments with the goal of achieving medium-term, three-to-five-year, outcomes (Terwindt and Rajan, 2016). Schell et al. (2013) place strategic planning at the very heart of the other core elements, and yet eighth out of the nine important core elements when considered independently.

2.21 Public health programme impacts

On the face of it, positive outcomes are at the core of public health programmes (Porter, 2010) however a programme that delivers positive health outcomes will always be considered against cost and time, in a bid for optimal programme value for money. Schell et al. (2013) discovered that impact ranks ninth out of nine elements linked with programme sustainability.

Dam et al. (2019) reported positive outcomes for the CHAMP programme but it is difficult to compare the extent of its success with other programmes because the results were reported differently to other interventions (Mears et al., 2019) and because comparable programmes seemed not to exist (Dam et al., 2019).
The different formats used to report programme outcomes is a barrier to identifying the most impactful interventions, especially in the field of public health,

where programme impacts are inextricably linked to multiple external factors (Porter, 2010; Mears et al., 2019). Positive health outcomes are best assessed over the long term in order to understand how benefit is sustained over time (Porter, 2010) and yet the longer the timespan the more vulnerable the programme.

3 CHAPTER THREE

RESEARCH DESIGN

3.1 Overview

This chapter outlines and justifies the study design used in order to achieve the study aim and objectives. It begins with ethical considerations, followed by data management procedures and goes on to explore the geographical location of the study. The research methods used, study sample sizes and the participant recruitment strategy are identified with rationale regarding the questionnaire and semi-structured interview considered and discussed.

The ethical approval for the research was obtained from Manchester Metropolitan University's online ethics application system Ethos (reference number 39844). Participant information was imparted, and consent obtained, prior to any data collection.

3.2 Mixed methods approach

The current study employed a mixed methods approach. Mixed methods research has increased in recent years and this has generated literature articulating its characteristics and exploring its benefits (Creswell et al., 2011). Unlike traditional research, which is based around statistical analysis employed to prove or disprove a hypothesis, mixed methods research is used to explore and understand beliefs at individual, group and population level (Tashakkori et al., 2013).

A mixed methods approach is considered appropriate for investigating multi-factorial and complex health questions (Fetters et al., 2013) and combines quantitative research with qualitative research methods with each type of research confirming and enhancing the findings of the other (Brannen, 2005; Creswell et al., 2011). It is usual in mixed methods research for quantitative research to address a concept whilst qualitative research addresses a process (Tashakkori et al., 2013). This is reflected in this current study with a questionnaire used to gauge parents' acceptability of a new concept and qualitative research, in this case semi-structured interviews, carried out to explore school leaderships' view regarding the feasibility of the process (Braun and Clark, 2006).

Quantitative research can be used first in order to establish broad knowledge of a topic, which can then be honed by the use of in-depth qualitative interviews either with a sub-set of the same population or with a different study population (Guest and Fleming, 2015). Conversely qualitative research can be undertaken first in order to establish core beliefs amongst a relatively small group, the extent of which can then be tested amongst a larger population using quantitative research (Guest and Fleming, 2015). The parent funded approach to child growth monitoring as described in this study would rely on parents finding the approach acceptable (quantitative) as well as school leadership confirming feasibility (qualitative).

The research order is classed as sequential, parallel and/or complex (Waszack and Sines, 2003) however in practice, quantitative and qualitative components may be carried out one after another (sequentially), at the same time (in parallel) or taking

a more fluid approach which can lead to exploration of results as they arise (Waszack and Sines, 2003). Within the current study, the quantitative study (1.) was undertaken ahead of the qualitative study (2.), although the two streams of research were not interdependent and therefore could have been carried out in parallel or sequentially without one affecting the validity of the other.

3.3 Sample size

Defining an absolute sample size is not possible given the heterogeneity of research projects, however assuming optimal study design and implementation, the greater the sample size the greater the probability that research results will reflect the larger population at the time of research (Cottrell and McKenzie, 2011). Lanscar and Louviere (2008:670) observe that 'one rarely requires more than 20 respondents per [discrete-choice questionnaire] version to estimate reliable models or information' whilst also acknowledging that the larger the sample the more detailed the potential analysis. A study by de Bekker-Grob et al. (2015) considered sample sizes used by researchers in healthcare based discrete-choice experiments, and importantly the rationale that guided research sample sizes, and found that almost three quarters of eligible research projects did not report clearly on the rationale for sample size. The authors acknowledge that a practical gauge is to simply maximise the sample size according to the study budget and resources available (Bekker-Grob et al., 2015).

Table 3.1 Summary table of research studies 1. & 2.

Study	Aims	Sampling Frame	Participants	Method	Outcomes
Study 1. Greater Manchester Parents	To assess parent acceptability of the proposed programme	Parents were introduced to the questionnaire via WhatsApp and Facebook connections	Purposive sampling. Parents of children aged 0-16 years N=110	110 Electronic questionnaires	Assessment of; 1. perception of early years growth information 2. appropriateness of a school-based programme 3. likelihood of a parent funded programme 4. perception of an affordable fee
Study 2. Greater Manchester Senior school leadership	To collect the views of school leadership on programme feasibility	School leadership were introduced using professional networks	Purposive sampling. Senior school leadership N=6	6 Semi-structured interviews	Collect views regarding acceptability and feasibility of a parent funded, primary school-based programme.

The sample sizes for this study were ultimately led by the practicalities of the project in terms of time, cost and specificity of the target audience although publications with a similar topic were also considered. A systematic review by Ames et al. (2020), regarding communication of children's weight status with parents, highlighted reported sample sizes of 45 survey participants (Gillison et al., 2013), 18 focus group participants (Gainsbury and Dowling, 2018) and 16 semi-structured interview participants (Nnyanzi et al., 2016). The qualitative aspect of the CHAMP study, on which this research hopes to build, comprised a relatively high figure of 29 semi-structured interviews (Dam et al.,2019). The view of Sandelowski (1995) was that the sample size required for qualitative research interviews should be manageable within research constraints and yet sufficient to offer new learning and understanding of a topic.

The original target number of parent survey responses for study 1. was 50, however this was increased by the supervisory academic team to 250 in order to strengthen the study findings and to enable the researcher to divide the respondents into sub-cohorts whilst still maintaining strength of analysis. The researcher had a target of 6 semi-structured interviews (Guest et al., 2006) for study 2. which was deemed sufficient by the supervisory team to garner a view on the feasibility of a parent funded, primary school based, child growth programme.

3.4 Participant recruitment

Purposive and snowball sampling was used to recruit participants for study 1. and 2. A concern of snowball sampling is that participants, by introducing additional participants to the researcher or else distributing research questions amongst themselves, form a like-minded sample of the population, reduce the diversity of the study population and consequently impact on the research validity (Kirchherr and Charles, 2018). However, purposeful sampling,

of which snowball sampling is a variation, (Suri, 2011) also ensures that researchers use limited resource to best effect in ascertaining views and beliefs from expert participants. In contrast, traditional sampling methods rely on the construction of a sampling frame containing all eligible participants, followed by the selection of participants from the frame at random (Desroches et al., 2015). Given the breadth of the potential population for this study, constructing a sample frame was not feasible and therefore engaging with professional contacts in order to connect with initial participants was a legitimate starting point to recruitment (Desroches et al., 2015).

An electronic hyperlink to the research questionnaire was sent directly to professional and social acquaintances, who subsequently distributed it via school parent groups and via local community WhatsApp and Facebook groups. Encouraging the questionnaire (study 1) to be freely distributed by the researcher's professional and extended social network, rather than restricting circulation to a smaller group of acquaintances, increases the breadth of participation and avoids a narrow categorisation of participants and is generally a useful approach (Browne, 2005; Kirchherr and Charles, 2018).

Recruitment for semi-structured interviews (study 2.) through known contacts was found to be more successful in terms of securing interviews than emailing school leaders directly. This is again an example of snowball sampling, used when experienced and knowledgeable subjects are required to participate in in-depth interviews on complex topics (Cottrell and McKenzie, 2011). The researcher's professional network and acquaintances introduced the researcher to 6 primary school senior leaders who were each willing to take part in a semi-structured interview.

3.5 Participant eligibility

The inclusion criteria for the questionnaire (study 1.) stipulated that those completing the questionnaire must be over the age of 18 years of age at the point of completion and that they must have parental responsibility for children aged between 0 and 16 years of age. The broad age range of the children offered the potential for data to show whether parents of older children view the questions differently than those of younger children. In the event that parents listed children both younger and older than 16 years, the children over 16 years were omitted from the data analysis. The study requested that parents had at least one child who would attend, were attending or had attended a primary school in Greater Manchester. Where parents listed more than one primary school, perhaps due to children attending different schools, then only the first listed primary school was included in the data analysis. The study also required participants to have a good command of the English language in order to fully understand participant requirements and to complete the questionnaire with informed consent.

With regards to interview participants (study 2.) the inclusion criteria stipulated that the interviewees held senior leadership roles within a Greater Manchester primary school and that they considered themselves to have decision making influence within their school.

3.6 Questionnaire design

Study 1. consisted of an on-line questionnaire as opposed to a paper printed version. The use of on-line surveys has increased in recent years and offers a cost-efficient method of survey distribution (Buchanan and Hvizdak, 2009). On-line questionnaires are convenient for

respondents to complete and submit, the results are automatically collated and the researcher is able to compile results in real time (Buchanan and Hvizdak, 2009).

Online questionnaires used as part of university-based research must meet security standards with examples being: Qualtrics, JISC, Survey Monkey and Microsoft Forms. The forms have different functionalities in terms of question construction and form appearance, both of which are important for participant engagement (McColl et al., 2001). The method of questionnaire distribution also varies between software providers and is commonly via email (Cottrell and McKenzie, 2011).

However, WhatsApp is now the most used messaging service in the UK with 75% of on-line adults reporting to use it followed by Facebook Messenger with 58% (Ofcom, 2021). A scoping review of the use of WhatsApp messenger for health-related research, published in 2021 (Manji et al., 2021) highlighted an increased use of WhatsApp due to three main reasons: its extensive reach across populations, low associated cost and speed of circulation and result feedback.

This current study notes that WhatsApp does not have universal coverage and that a population's use of the service may be restricted by a lack of data, electricity and access to a WhatsApp compatible smartphone. However, these barriers do not apply to the vast majority of homes in the UK; a UK report revealed that in 2020, 94% of homes had internet access with 85% of internet users choosing to do so using a smartphone rather than any other device (Ofcom, 2021).

Ultimately, the study questionnaire was built as a Microsoft Form which has the functionality to be distributed electronically including via WhatsApp and Facebook messenger. The questionnaire was distributed using a hyperlink that led the participant directly to the survey. Using this method rather than distributing via email ensured that responses were anonymous, which in turn may encourage participants to answer questions freely (McColl et al. (2001; Fowler and Cosenza, 2008).

The questionnaire (appendix 1.) was designed to take less than 5 minutes to complete. Participant consent questions were completed electronically prior to the completion of the study questionnaire (study 1.) and the Participation Information Sheet (appendix 2.) was embedded into the questionnaire as an electronic link.

The questionnaire consisted of four 'required' consent questions and fifteen non-obligatory study questions. The question types were mixed, consisting of multiple choice and free text questions in order to gather rich data, maintain participant attention and appeal to different response preferences (Gehlbach and Artino, 2018). The questions were specifically designed to lead participants through the questionnaire beginning with less contentious topics and ending with slightly more sensitive questions (Gehlbach and Artino, 2018). The researcher took into account the cognitive process when completing a questionnaire ensuring that questions were neither ambiguous nor multidimensional (Krosnick and Presser, 2010). This led to a survey which contained a higher number of simple questions which was preferable to fewer, yet more complex questions (Fowler and Cosenza, 2008).

Having asked the participants to consent to taking part in the study, and to confirm objective information such as number and ages of children, the questionnaire asked participants to offer a view on early years growth information. This was to remind participants of the measuring process and the format of growth graphs that are used in England as part of the HCP (Department of Health, 2009; NHS, 2020). The questionnaire asked participants to describe their feelings towards the growth measurement in early childhood using pre-populated adjectives, also inviting free text.

The questionnaire then asked participants if they had experience of the NCMP (at age 4 and 11 years) with the focus on the professional attributes of those measuring children, and on primary schools as a programme setting. Although these latter two elements of the programme have previously been considered and deemed important by an Expert Advisory Committee (Department of Health, no date) the views of parents remain unclear.

The questionnaire then introduced the concept of an annual child measurement and parental feedback programme as recommended by the RCPCH (2019) asking whether this would be helpful and including a free text option in order to elaborate on their response.

The questionnaire continued by gauging parents' reaction to a parent funded service before moving on to asking participants what they would consider to be an affordable fee for such a service. Finally, the questionnaire asked participants how likely they would be to support a parent funded, primary school based, annual child measurement and growth feedback programme, with a final option of free text.

3.7 Questionnaire data analysis

The electronic questionnaire was live for a four-week period in March and April 2022 and received 115 responses in total, with results coming to a natural halt and no new response themes emerging. Quantitative data from each of the survey questions (study 1.) was analysed and comparisons were draw between respondents who answered specific questions differently to others. The data analysis of study 1. also included qualitative thematic analysis, where respondents had completed free text questions and offered personal narrative. Through thematic analysis, the personal narratives were grouped into categories and the themes illustrated using examples of anonymous text verbatim. The qualitative data analysis was also illustrated using descriptive statistics (Cottrell and McKenzie, 2011).

3.8 Free School Meal (FSM) eligibility

The primary schools named by respondents were identified as having higher or lower than national average FSM and a number of subsequent question responses were analysed with this information taken into consideration.

FSM eligibility is a broad proxy of social need which has been used in England to distinguish between deprivation levels of schools for over two decades (Gorard, 2012). The purpose of this data capture by the Government is to inform national policy and to calculate levels of supplementary funding awarded to schools based on the additional needs of a school's population, ultimately to support high educational attainment (Gorard, 2012). The FSM eligibility data equates to the proportion of children who access FSM in a primary school, which itself relies on proof of receipt of specific means tested state funded benefits (Taylor, 2018). This means that an accurate representation of a school's FSM eligibility relies on

parents including their children in the FSM programme by disclosing their financial situation to their children's school which itself may be a barrier. There are fewer children receiving FSM than are entitled to them (Storey and Chamberlin, 2001). Families who, despite receiving state funded benefits, do not wish their children to be offered school meals are not required to disclose their personal financial situation. Research has shown that FSM compares well with measures such as social class, household income and levels of parental education when attempting to predict the future attainment levels of pupils (Gorard, 2012). These two measures are considered slightly more accurate measures of future pupil attainment than FSM, however the benefit is considered disproportionate to the reliability and capture of what is considered to be highly sensitive information (Gorard, 2012).

In order to establish any statistical significance between responses based on FSM, a statistical software package, SPSS (Statistical Package for the Social Sciences) version 27 (IBM Corporation, 2020) was used. The statistical test used for this purpose was the Mann-Whitney U test, given that the data was non-parametric, and the test significance level was p=0.050. The data analysis was illustrated using descriptive statistical charts (Cottrell and McKenzie, 2011), specifically a combination of bar charts, column charts and pie charts.

3.9 Semi-structured interviews design

The research interviews (study 2.) were semi-structured and followed a series of open-ended questions, allowing the interviewees to freely express their thoughts and perceptions whilst being guided through the topic by the researcher (Adams, 2015; Jamshed, 2014). The topic of child growth, extreme weight gain and weight loss in particular, can be met with sensitivity and therefore the interview was approached with due care and consideration (Corbin and

Morse, 2003). The Participant Information Sheet (appendix 2.) and Consent Form (appendix 3.) were completed over email. The semi-structured interviews were organised over either email or WhatsApp and at a time convenient to the participants.

The semi-structured interview (appendix 4.) began with introductions, confirmation of the study purpose, time allocated to the interview, consent to audio record and transcribe the conversation, and acknowledgment of participant confidentiality. The researcher set out the context of the study outlining the overarching research question while honing in on the school feasibility aspect of the question. The school leaders were asked to consider current services and programmes within the school setting which were paid for by parents, and in particular, the decision making around those services and how payment was facilitated. The interviewer then moved to the feasibility of offering an in-school annual growth graph service, in terms of lesson impact and administration. The participants were offered contact details of the researcher in order to accommodate further comments or research related queries. The voice recordings were conducted by telephone, audio recorded by the researcher and transcribed verbatim.

3.10 Semi-structured interview data analysis

The researcher undertook manual content analysis on the interview recordings, as opposed to using a computer software analysis package, in order to identify emerging themes (Cottrell and McKenzie, 2011). Each participant was assigned a code to distinguish them from the other participants. The transcripts were read through twice at which point phrases within the transcripts were highlighted and then grouped according to theme (Johnson and Kittleson, 2000). The phrases from each participant were manually transposed onto a separate file and

colour coded to signify different themes that were raised. Although the responses were anonymised, the colour coding enabled the researcher to link all of the responses from each participant and to consider cross over of themes between them. The responses were grouped into emergent themes by the researcher and then re-read to ensure accuracy (Braun and Clark, 2006). The qualitative data analysis was further illustrated using examples of anonymous text verbatim along with descriptive statistics (Cottrell and McKenzie, 2011), specifically bar charts.

3.11 Pilot testing

The electronic questionnaire (study 1.) was piloted by community healthcare professionals, by lay people with no knowledge of the subject matter and by software design experts. The number of people asked to pilot the questionnaire reflected the high number of people that would be asked to complete it. Those piloting the questionnaire (n=10) had a variety of professional skills as well as differing ages of family members and this diversity contributed to the rich feedback. The pilot testing confirmed the functionality of the questionnaire along with the estimated time that it would take to complete the form. Question phraseology was altered following feedback to encourage participants to engage with the questionnaire and to complete optimal questions. Increased opportunities for free text were included to offer participants an opportunity to elaborate or justify their responses. Those who had pilot tested the questionnaire were asked to then circulate it as part of the study.

Given that the researcher had a limited number of eligible school leaders who had agreed to be interviewed (study 2.), a pilot interview was carried out with an available school leader within a Greater Manchester high school (and therefore did not meet study criteria) so as to

preserve the eligible participants for the study. The purpose of the pilot interview in this study was to test broad interview questions rather than to practice a script. The pilot interviewee had experience of primary school leadership and was able to confirm the appropriateness of questions as well as the general feasibility of the interviews. Malmqvist et al. (2019) discussed the value of conducting pilot testing as part of qualitative research highlighting that interviews are unlikely to be replicated during a study and therefore acknowledge that ideas and questions are likely to alter as a study evolves.

Pilot testing for funded research may be used to demonstrate feasibility and to justify research protocols while larger projects may find pilot testing to be valuable training opportunities for the research team (In, 2017). Overall, pilot testing is considered an important aspect of quantitative and qualitative research; researchers are able to test the feasibility of various elements of research projects such as the inclusion and exclusion criteria, the participant recruitment process and the functionality of survey tools (Connelly, 2008).

4 CHAPTER FOUR

RESEARCH RESULTS

4.1 Overview

This chapter describes the questionnaire results; quantitative and qualitative data collected for study 1. and also describes the thematic analysis of responses captured through semi-structured interviews (study 2.).

4.2 Questionnaire responses (study 1.)

Responses were collected over a four-week period during March and April 2022. In total, 115 responses were collected; 2 responses were omitted due to the participant not reporting to have children under the age of 16 years of age, 2 responses cited primary schools outside of the Greater Manchester area and 1 response gave no primary school details. The final number of responses eligible for inclusion in the study was 110.

The survey responses represented 9 out of the 10 Greater Manchester boroughs and included; Rochdale, Trafford, Tameside, Bolton, Bury, Stockport, Manchester, Salford and Oldham. The only borough for which no responses were received was Wigan. The 110 survey respondents listed 62 primary schools. Where respondents listed more than one primary school, perhaps due to children changing schools or siblings attending different primary schools, only the first listed primary school was used as part of the research. Of the 62 primary schools, 58 were maintained schools and 4 were independent fee-paying schools. No responses were received by parents whose children had links with special educational needs (SEN) schools. The primary schools were categorised according to FSM eligibility; 40 of the 62 primary schools had a less than average percentage of pupils eligible to receive free school

meals while 22 had a greater than average percentage. The average percentage of pupils who were eligible to receive free school meals in England in 2021 was 23.5% (HM Government, no date) (Table 4.1).

Table 4.1 The geographical distribution of primary schools reported by respondents and associated FSM eligibility

Geographical area	**No. of respondents**	**No. of schools**	**Maintained school**	**Independent school**	**Above average FSM eligibility**	**Below average FSM eligibility**
Bolton	2	2	1	1	0	2
Bury	24	11	11	0	8	3
Manchester	26	12	13	0	4	8
Oldham	11	5	5	0	3	2
Rochdale	2	2	2	0	0	2
Salford	16	10	8	2	4	6
Stockport	5	3	3	0	0	3
Tameside	2	2	2	0	0	2
Trafford	22	15	14	1	3	12
Wigan	0	N/A	N/A	N/A	N/A	N/A
Total	110	62	58	4	22	40

The number of child dependents reported by the survey respondents ranged between 1 and 4 children. The majority of respondents reported to having 1 child (n=48), followed by 2 children (n=45), 3 children (n=16) and then 4 children (n=1). Whilst not all of the children listed were under the age of 16 years, (there were respondents who reported having children over the age of 16 years (n=4)), each respondent had at least one child under 16 years of age. For the purposes of data analysis, the ages of the respondents' children were classified as nursery aged (0-4 years), primary school aged (5-11 years) and high school aged (12-16 years). A minority of respondents (n=18) reported nursery aged children, followed by primary school aged children (n=82) and then high school age children (n=54).

4.3 Perception of early years growth monitoring

There were 6 adjectives available to respondents to describe their feelings towards early years growth monitoring by health visitors which is routinely recorded on growth charts within the PCHR. The adjectives available to respondents were; useful, interesting, reassuring, concerning, alarming and unimportant and respondents were invited to select all of the adjectives that they felt were applicable to them.

There were 173 adjectives selected by the respondents; useful, interesting and reassuring were selected frequently (n=53, n=55 and n=49 respectively). The other three adjectives, concerning, alarming and unimportant were selected less frequently (n=8, n=2 and n=6 respectively) (Figure 4.1).

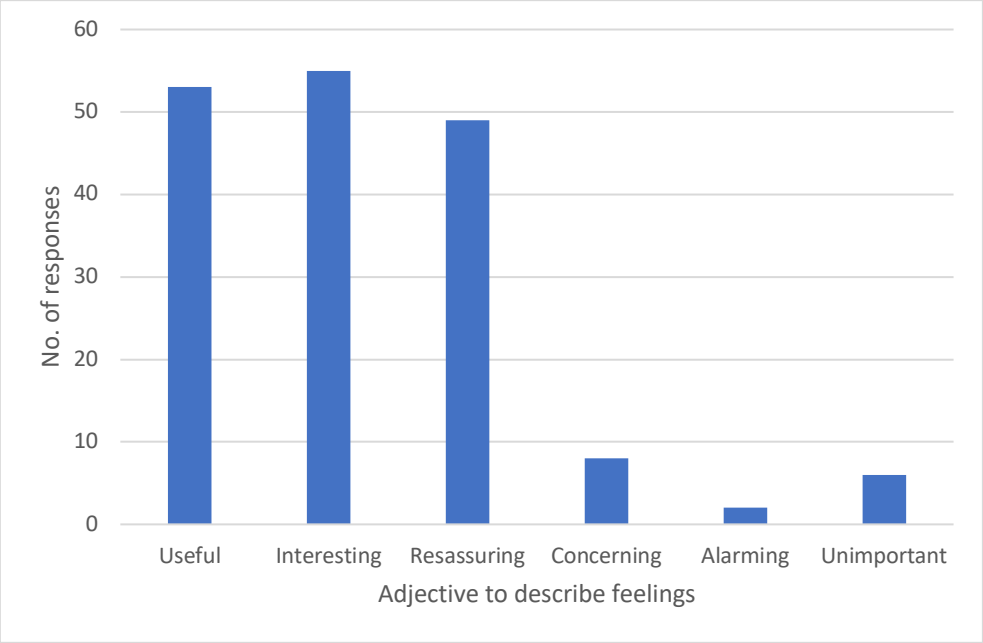


Figure 4.1 Qu. 8 Children's weight and length measurements are plotted on graphs by Health Visitors to ensure that they are growing well (usually in the Red Book). Did you feel that this information was...? (Please select any that apply)

Respondents were then invited to comment on the adjectives that they had chosen and, of the respondents, 24.5% (n=27) added free text comments. The majority of the respondents' comments related to a previous answer of useful, interesting, reassuring, or a combination of the three (n=23). Of these comments, 47.8% (n=11) highlighted that they had used the growth information at the time of each measurement.

'*I was reassured my boys were growing as expected*'

'*Was useful as mine struggled to feed enough at the beginning*'

'*When I stopped have my child weighed I forgot all about the red book!*'.

The proportion of respondents who suggested that the growth charts could be used retrospectively to evidence a child's growth pattern was 21.7% (n=5) .

'*Still refer to the red book graphs sometimes'*

'It was good to have the info to hand to check if needed and to compare.'

'*My child has [Turner's Syndrome] which affects her growth and requires hormone treatment so the graph is key to plot her growth*'.

A small number of respondents who had described their feelings towards growth information as useful or interesting, went on to question the relevance of growth chart data (n=2).

'*Unsure as to whether the graphs were updated recently as population physical changes have meant that the statistics measured are no longer the same as decades ago*.'

'*Confusing - average line as compared to what end when?*'

These previous comments were very similar to respondents (n=2) who used alarming, concerning and unimportant in the previous question to describe their feelings (interesting/concerning and alarming/unimportant/concerning).

'*I feel the graph is a basic measure based on weeks and weight, similar to BMI, no other factors are taken into consideration*.'

'*Red graph scales are out of date and do not account for babies born at a heavy weight and also the variances in difference ethnicities*'

Finally, a small number of respondents (n=2) acknowledged that the information could be a cause of upset (interesting/concerning and alarming/concerning).

> '*Could be quite anxiety provoking if your child does not follow 'the norm' but [it] was good to see growth expectations in graph form*'
>
> '*As a first time parent I stressed so much each time my baby was weighed and measured in case my baby wasn't growing as expected*.'

4.4 Experience of the National Child Measurement Programme (NCMP)

Of the survey participants, 4.5% (n=5) of all respondents had no children above the age of 4 years and therefore would have been less likely to have had experience of the NCMP; of these respondents there was a report of their child not having been measured due to disruption caused by the Covid-19 pandemic (n=1) while the remaining (n=4) understandably reported no experience of the NCMP. The respondents who named independently funded primary schools (n=4) also reported to having no experience of the programme. All other respondents (n=102) reported children of an eligible age and who attended a state-maintained school.

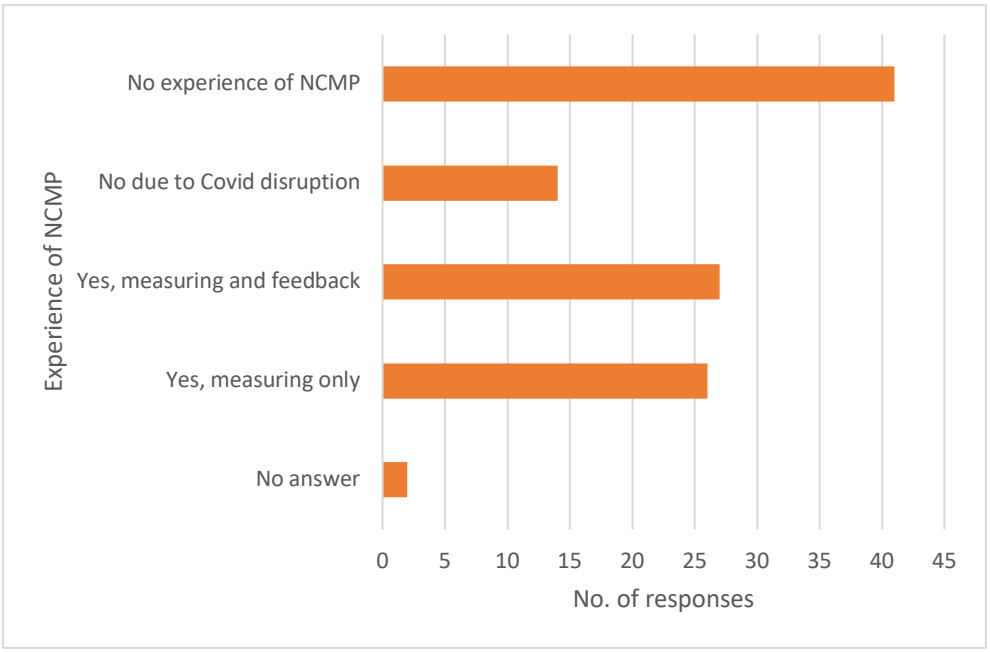


Figure 4.2 Qu. 10 The National Child Measurement Programme (NCMP) measures children's growth in Reception and Year 6 of primary school, and sometimes sends feedback to parents. The Covid pandemic has disrupted this programme. Have you had any experience of the NCMP?

There were 7.8% of respondents (n=8) who were likely not to have had any experience of the NCMP however there were 40.2% respondents (n=41) who claimed to have had no experience of the NCMP whatsoever (Figure 4.2). Given that participation rate of the NCMP was last recorded at 95% (NHS Digital, 2019), it is highly likely that participants who claimed to have had no experience of the NCMP would have received information sheets regarding the programme (Public Health England, 2020), and that their children would have been measured. The apparent lack of NCMP awareness amongst 40.2% of participants also suggests that parent feedback has not been received. A further 25.5% of the NCMP eligible participants stated that they only had experience of NCMP measuring (n=26), thereby

reinforcing that not all local authorities in Greater Manchester offer universal NCMP parent feedback.

4.5 Measuring children in the primary school setting

The subsequent question (Qu. 11) linked experience of the NCMP to measuring children in primary schools and invited participants to report reservations regarding measuring in the school environment.

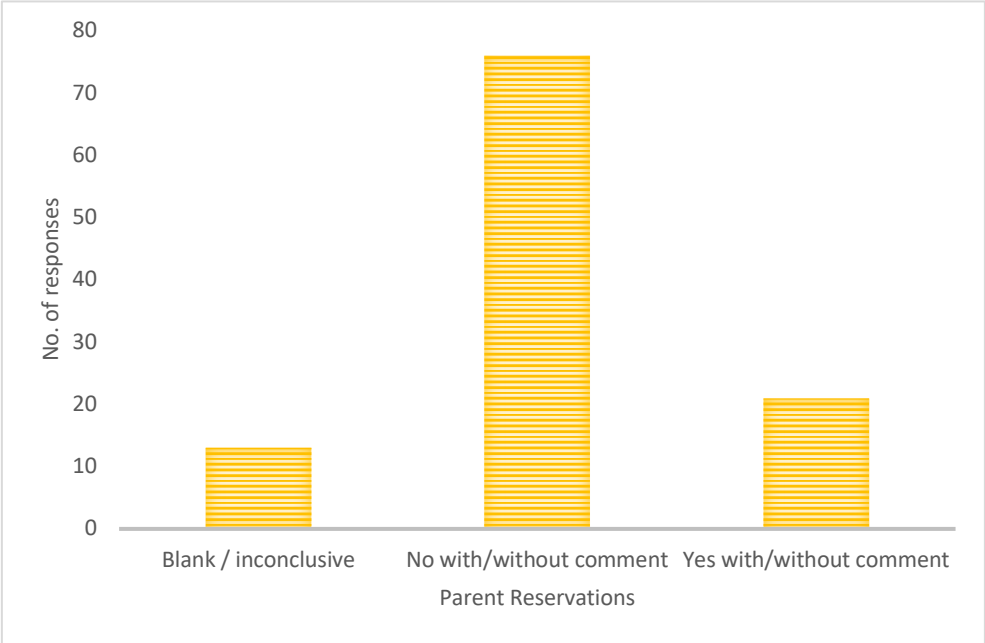


Figure 4.3 Qu.11 The NCMP measurement of children takes place in primary schools. This means that parents can receive growth feedback and that children are unaware of their results. Do you have any reservations regarding measuring children in primary schools?

The vast majority of respondents (69.1%; n=76) reported no reservations regarding measuring in school, 11.8% respondents (n=13) offered no answer and 19.1% respondents (n=21) reported to having reservations (Figure 4.3). Respondents who reported to have reservations

were much more likely to add comments to support their view (90.5%; n=19). Of these respondents, 21.1% (n=4) referred to the primary school as tangible environments when expressing reservations; highlighting lack of privacy and height comparisons amongst peers. However, the majority of reservations were centred around the broader issues of measuring children and the emotional impact that this may cause. The comments highlighted body image, insecurity, obsession and embarrassment (experience of the NCMP in brackets).

'*Yes, if done in the wrong way it promotes body image too strongly*' (NCMP measuring only)

'*I have reservations about weighing children when they are young from a psychological aspect for them*.' (NCMP measuring only)

'*By y6 children are very aware and would want to know results but also may be more conscious*' (No NCMP experience)

'I work in a primary school and it can cause discussion between older pupils predominantly about body image which can sometimes become negative and cause upset.' (No experience of NCMP)

However, of those who did not have any reservations regarding measuring children in the primary school environment, there were 14.5% of respondents (n=11) who added comments reiterating their support for this concept.

'*No, it's a good thing*.'

'*No if kids are overweight school nurse should be able to advise*'

A smaller number of respondents (n=5) questioned the accuracy or relevance of NCMP feedback (experience of the NCMP in brackets).

> '*Feedback should be constructive. Reference to BMI is not always useful/ productive*.' (NCMP measuring only)
>
> *'I have known many parents who have received feedback and each one was understandably upset - however each child had very different reasons for being the shape and size they were and only a small percent was due to over eating/unhealthy eating.'* (NCMP measuring only)
>
> '*Yes as I was told that my son could end up obese and he was a perfectly growing child*' (NCMP measuring and feedback)
>
> *'Yes. My sons graph was plotted wrongly (I am a scientist) meaning he came back as overweight for his height - anyone simply observing him by eye could see there was nothing overweight about him. I wrote to complain and point out their error and their reply was I had it wrong, even though I used their data'* (NCMP measuring and feedback)

4.6 Association between measuring reservations and experience of the NCMP

Of the respondents who expressed reservations regarding the primary school setting (n=20), denoted as Yes in Figure 4.4, 25% (n=5) had no previous NCMP experience, while a large combined majority (75%; n=15) had previous experience of the NCMP, either measuring or measuring/feedback.

Of the respondents who expressed no reservations regarding measuring child's growth in the primary school setting (n=76), denoted as No in Figure 4.4, 53.9% (n=41) had no NCMP experience, while 43.4% (n=33) had experience of the NCMP, either measuring or measuring/feedback (Figure 4.4).

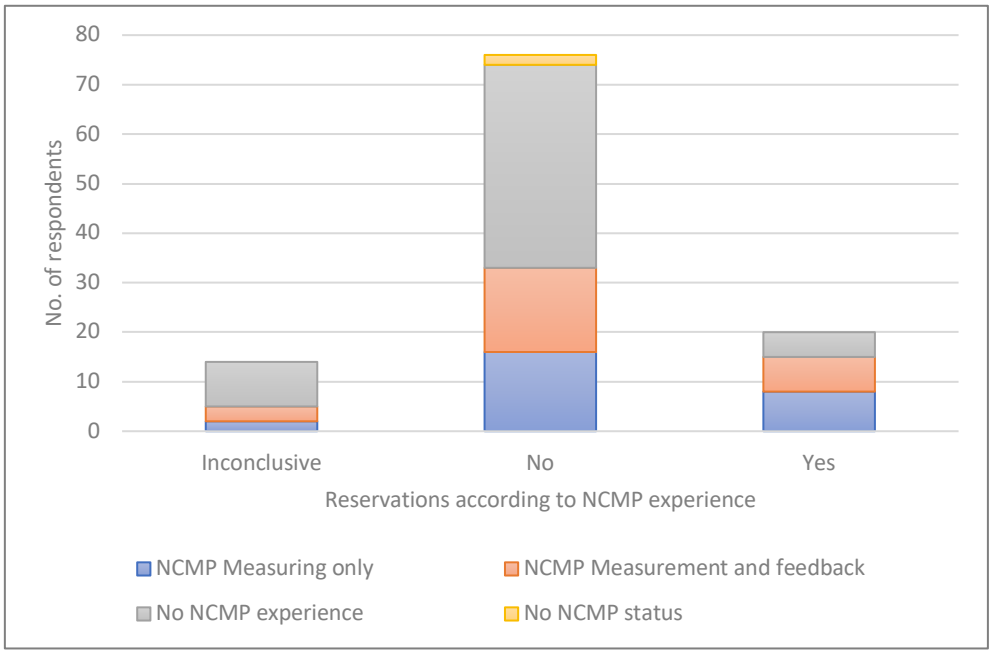


Figure 4.4 Respondents' reservations regarding measuring child growth in school according to NCMP experience

4.7 Importance of appropriately qualified and experienced staff

The questionnaire surveyed respondents on the importance of those measuring children's weight and height being appropriately qualified in healthcare (Qu. 12) and experienced in child measurement and parent feedback (Qu.13). Despite respondents' reservations that were expressed in the previous question, 99.1% answered Qu. 12 (n=109) and all respondents answered Qu. 13 (n=110). The majority of respondents scored both qualities 4 (very important) with an overall average score for each quality calculated at over 3.5 out of a possible 4 (Figure 4.5).

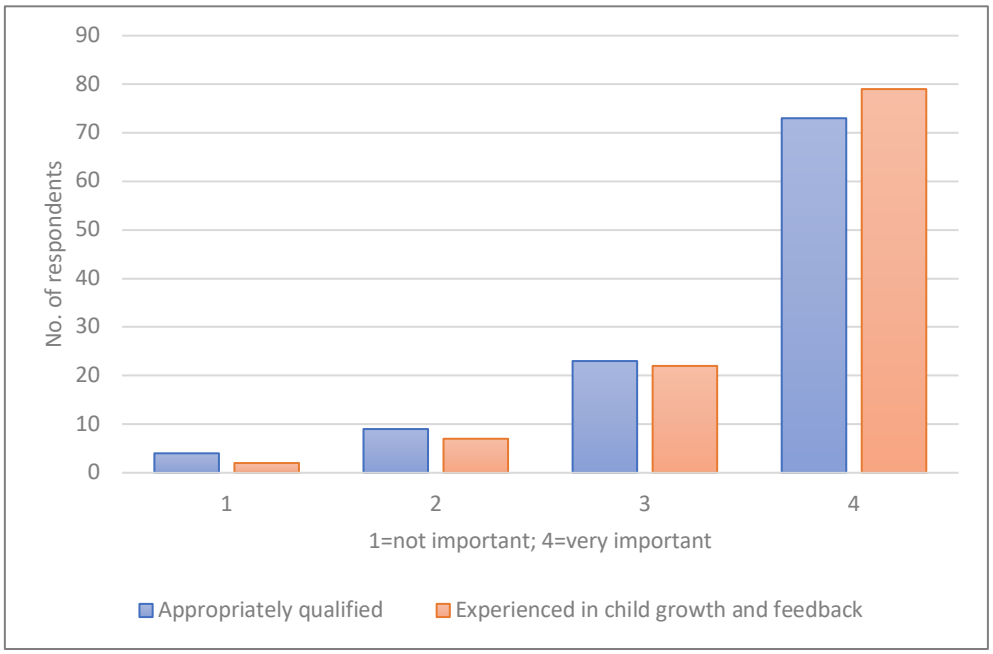


Figure 4.5 The importance to respondents of appropriately qualified and experienced child measuring and parental feedback staff where 1=not important and 4=very important

4.8 Annual child measurement and parental feedback programme

Having first asked respondents to consider growth monitoring in the Early Years, and then as part of the NCMP for Reception and Year 6 age children, the survey went on to ask respondents to state whether they would find annual monitoring and parent feedback throughout primary school helpful (Qu. 14). All respondents answered this question with 65% (n=72) saying that they would find it helpful and 35% (n=38) saying that they would not (Figure 4.6) which broadly correlated with the respondents who had reported to having no reservations regarding measuring children in the school environment.

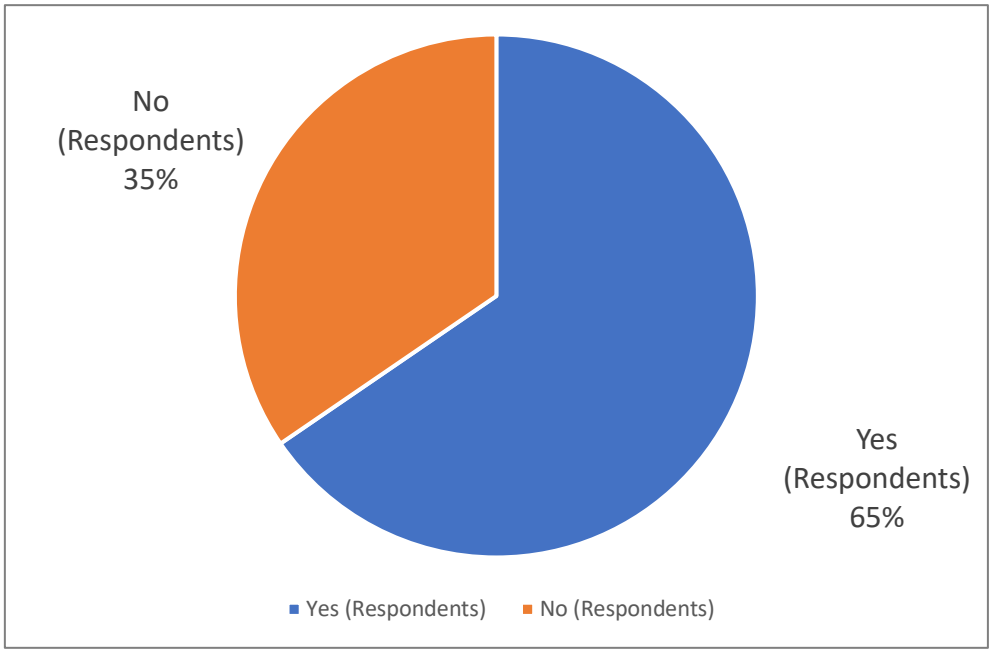


Figure 4.6 Qu. 14 In England there is no healthcare system that gives parents confidential growth information every year between Reception and Year 6. Is this something that you would find helpful?

The proportion of respondents who reported that they would find annual child growth monitoring helpful (65%; n=72) reported to having a total of 116 children; the average number of children per. respondent was 1.61 and the average age was 9 years (110.48 months). The 35% of respondents (n=38) who stated that that they would not find annual child growth monitoring helpful reported to having a total of 70 children; the average number of children per. respondent was slightly higher at 1.84 and the average age was also higher at 10 years (118.08 months). The distribution of both sets of children can be seen in Figure 4.7. While the majority of the children reported by all respondents were aged between 5 years and 11 years of age, the age of the children reported by those respondents who considered that annual child growth monitoring would be helpful, tended to be younger than children reported by respondents who claimed that such a system would not be helpful.

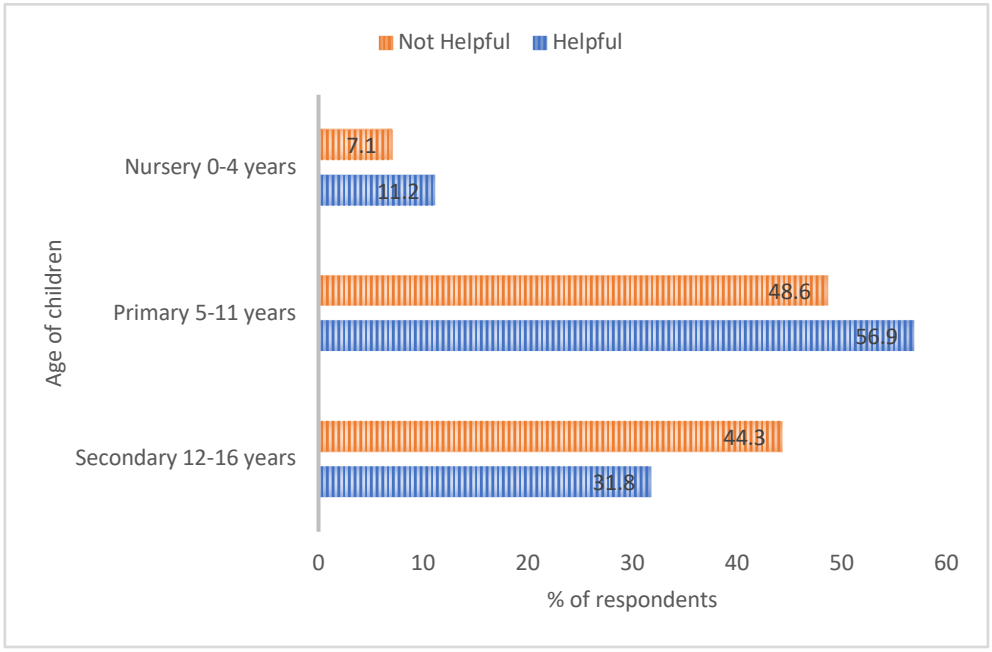


Figure 4.7 The distribution by age of children reported by all respondents who stated that annual child growth monitoring would be a) not helpful and b) helpful.

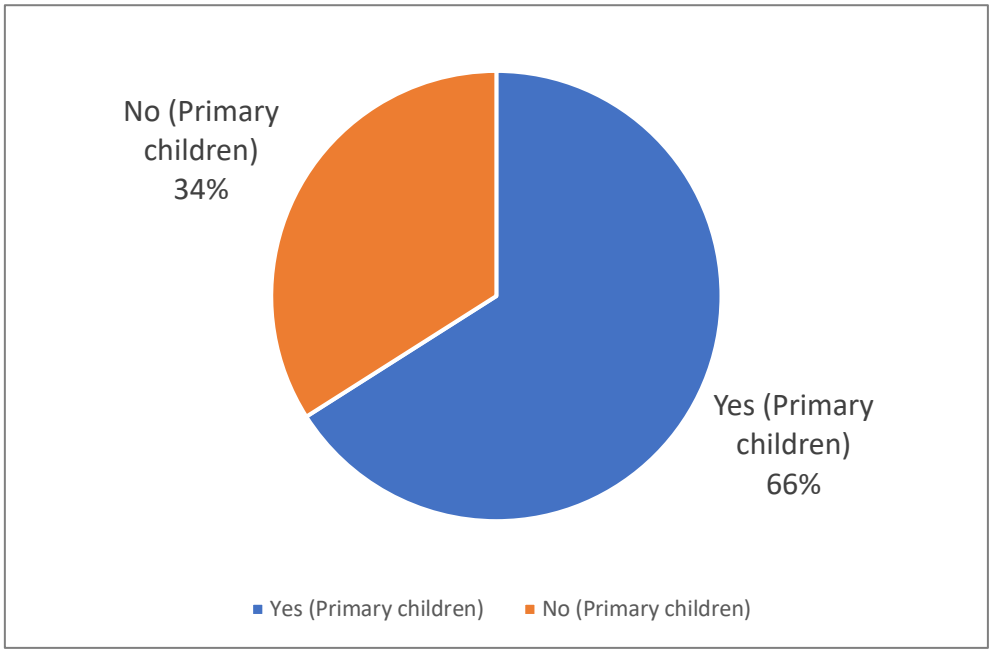


Figure 4.8 The percentage of children aged between 5 years and 11 years of age as reported by respondents who would find annual child growth monitoring a) not helpful and b) helpful

Given that the proposed system of annual child growth monitoring would take place in the primary school setting, and would be based on cost per. child, it was important to establish the percentage of primary aged children who would potentially be opted into any such programme by respondents. The data showed an alignment with the overall answer to Qu. 14; 66% of primary school aged children may be opted into such a programme while 34% of primary school aged children may not (Figure 4.8). Further data analysis and breakdown of Qu.14 can be found at appendix 5.

The respondents were invited to elaborate on their answer to Qu. 14. A very high percentage of respondents chose to add comments to support their view with 84.2% of the *Not Helpful* respondents and 84.7% of the *Helpful* respondents adding a comment. Figure 4.9 broadly illustrates the four reasons why parents feel that they would not find this information helpful.

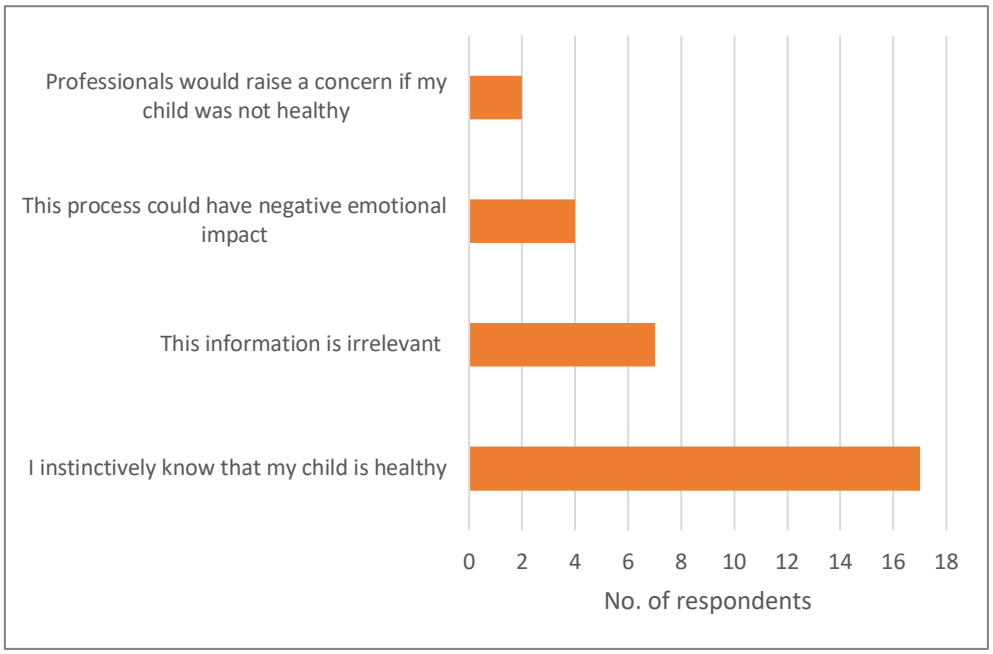


Figure 4.9 Thematic analysis of comments submitted by respondents who stated that they would not find annual child growth information helpful

The most common narrative offered was that respondents felt they instinctively knew whether or not their child was healthy; this was illustrated by comments such as;

'*I think it is fairly obvious from looking at your child/ comparing to others whether they are above/ below average height/ weight.*'

'*As a parent I know if my child is doing ok*.'.

The second most common reason was a sense of irrelevance and that growth information is meaningless.

'*Its an unnecessary measurement*'

'*Children grow differently I don't think it usually matters*'.

The third theme that emerged was around negative emotional impact with respondents using adjectives such as anger, upset and shaming.

'*I was angered by the whole thing. My daughters has come back recently and hers is ok, healthy weight but I remember how badly my son felt*'.

The final theme expressed by respondents was the belief that 'professionals' would monitor a child's growth if there was a health issue.

'*Because each child grows at their own rate if a parent had a concern it would be raised through a professional already'*

'*It's a bell curve so some children will be small and some will be tall. It's useful tool for professionals involved in the welfare of children.*'

Further data analysis and breakdown can be found at appendix 6.

The comments offered by respondents who would find child growth information helpful could also be categorised into four main themes (Figure 4.10).

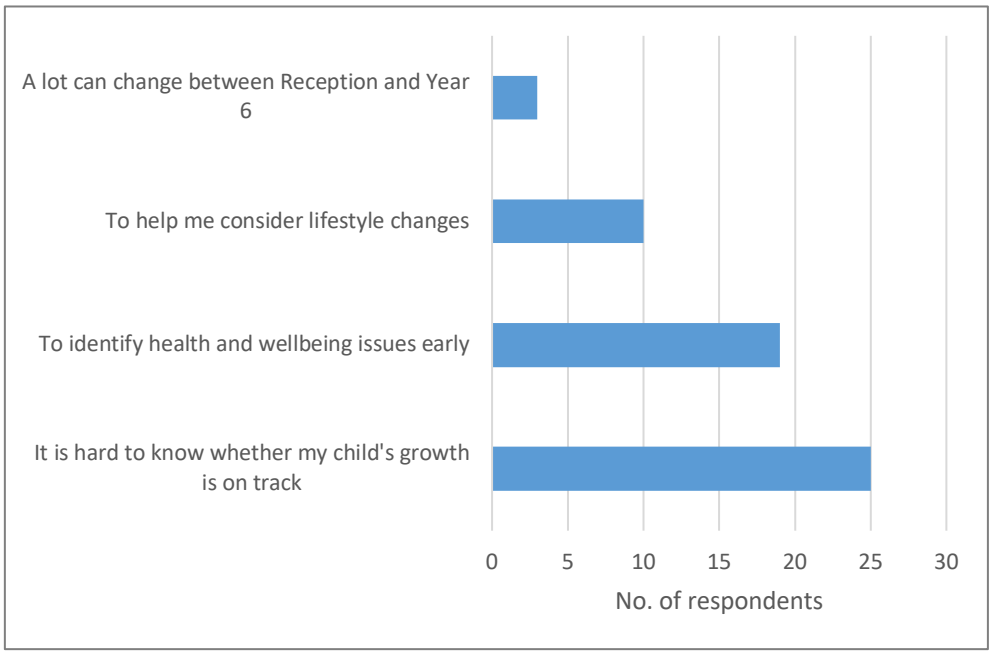


Figure 4.10 Thematic analysis of comments submitted by respondents who stated that they would find annual child growth information helpful

The main reason given by respondents was an acknowledgement of the difficulty knowing that a child's growth is on track, with comments such as;

'*To ensure that my children are growing healthily*'

'*Because it helps keeping track of the child's growth*'

'*To know my children are growing the way they should*'

The second most common theme highlighted the contribution of growth information on the early identification of health and wellbeing issues.

'*To know sooner rather [than] later if there is an issue with the health of the child*'

'*With such a long time between the readings this would support parents to ensure their child is healthy and / or deal with any issues earlier*'

'*The length of time between reception and year 6 is vast. It would be useful if the measurements were conducted annually in order to highlight any potential growth or associated health issues promptly*'

The third theme that emerged was the positive influence that growth information may have on lifestyle decisions.

'*To see if any changes need to be made*'

'*Childhood obesity is increasing, parents should be armed with information to help support their lifestyles and influence their children's.*'

'*It is always useful to keep track of this and to be able to respond accordingly to issues although I could do this at home not everyone will have the facilities to do this*'

The fourth and final theme to be identified was a recognition that a child's growth and development is particularly significant between Reception and Year 6 and therefore objective growth measurement throughout that period would be helpful.

'*The time difference for things to change from Rec to Y6 is vast*'

'*7 years is a long time to not know. A lot can change in seven years...*'

Further data analysis and breakdown can be found at appendix 7.

4.9 Introduction of a parent funded child growth service

The survey respondents were then introduced to the concept of paying an 'affordable' fee for a child growth tracking service (Qu. 16). This followed on from references to the NCMP that is universally available to parents at no cost at point of access, commissioned by local authorities and often provided by NHS staff. Overall, this question scored 2.23 out of 4 suggesting that respondents were more likely to access a child growth tracking service, for which a fee was payable, than not.

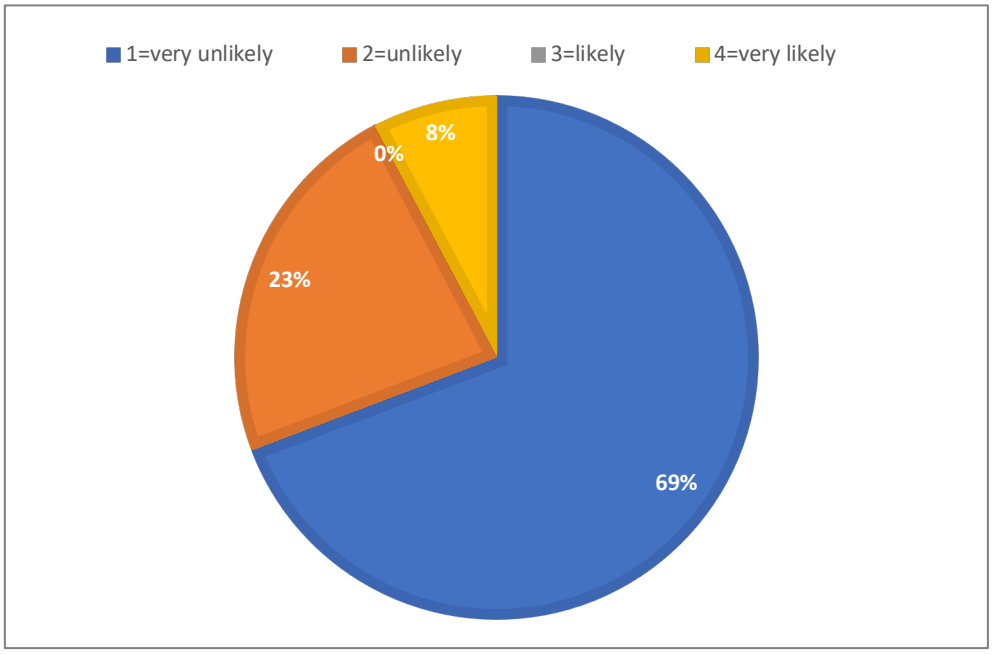


Figure 4.11 The likelihood of respondents, who had previously stated that they would not find such a service helpful, accessing such a service (1=very unlikely, 4=very likely)

A large proportion of respondents (69%; n=26) who had previously stated that they would not find child growth feedback throughout primary school helpful, stated that they would be very unlikely to access such a service if a fee was payable. However, 31.6% (n=12) did not rule out accessing such a service including 8% respondents (n=3) who stated that they would be very

likely to access such a service. Of these, 66.7% (n=2) reported to having children of secondary school age and 33.3% (n=1) qualified their previous answer noting that their child was currently monitored by a clinician and therefore such a service would not be required by them (Figure 4.11).

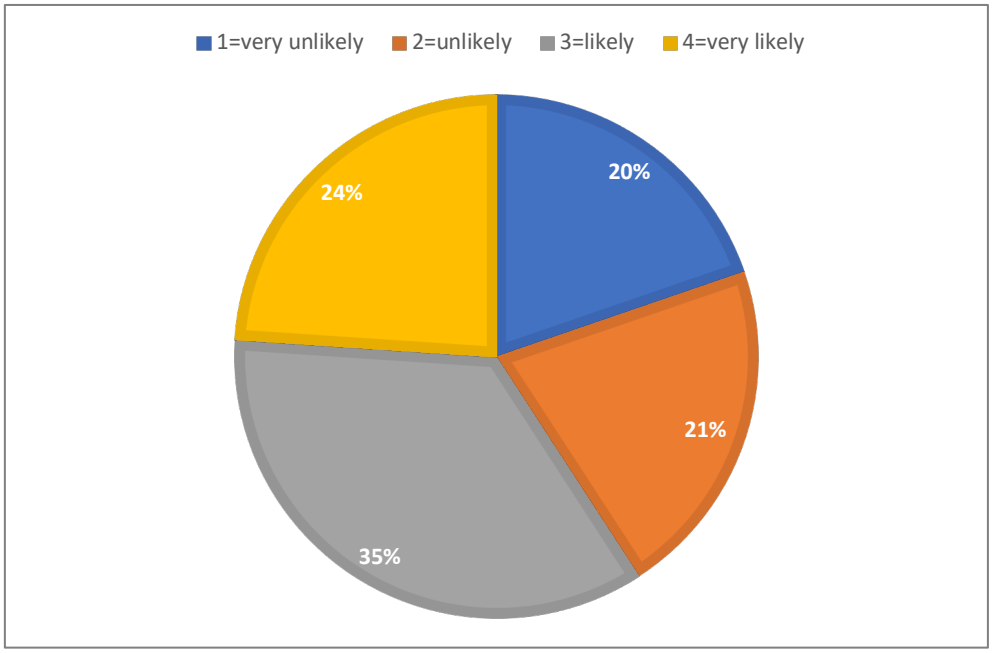


Figure 4.12 The likelihood of respondents, who had previously stated that they would find such a service helpful, accessing such a service

Of the respondents who felt that annual child growth information would be helpful, a majority of 59.2% (n=42) stated that they would be either likely or very likely to access a paid-for service. However, 21.1% (n=15) stated that they would be unlikely, and 19.7% (n=14) said that they would be very unlikely, to access a service if there was a fee attached. Notably, of the 'very unlikely' respondents, 14.3% (n=2) went on to state that £5.00 would be an affordable fee to charge whilst the remaining 85.7% (n=12) respondents stated Not Applicable (Figure 4.12).

4.10 Acceptability of a parent funded child growth service according to FSM

Of those respondents who reported that they would be very unlikely to access a funded child growth monitoring service, despite previously describing it as helpful (n=14), 64.3% of respondents (n=9) cited a primary school with lower-than-average FSM whereas 35.7% (n=5) cited a primary school with higher-than-average FSM eligibility.

Statistical analysis was undertaken using the Mann-Whitney U test at a significance value of p=0.05 to test Qu.16 and the null hypothesis: that there was no difference in the likelihood of respondents accessing a fee-based service based on FSM levels. The outcome of the test is not statistically significant as the p-value is greater than 0.05 (p=0.83). Therefore, there is no difference in the likelihood of respondents accessing a fee-based service based on FSM levels and the null hypothesis is confirmed (appendix 10.).

4.11 Perception of an 'affordable' fee

In order to understand what might constitute an affordable fee, respondents were asked for their perception in this regard (Qu. 17). There were 61.8% (n=68) respondents who expressed an amount; 48.5% (n=33) chose £5.00 followed by 20.6% (n=14) who chose the More than £5.00 option. There were 37.3% (n=41) respondents who chose the Not Applicable option (Figure 4.13).

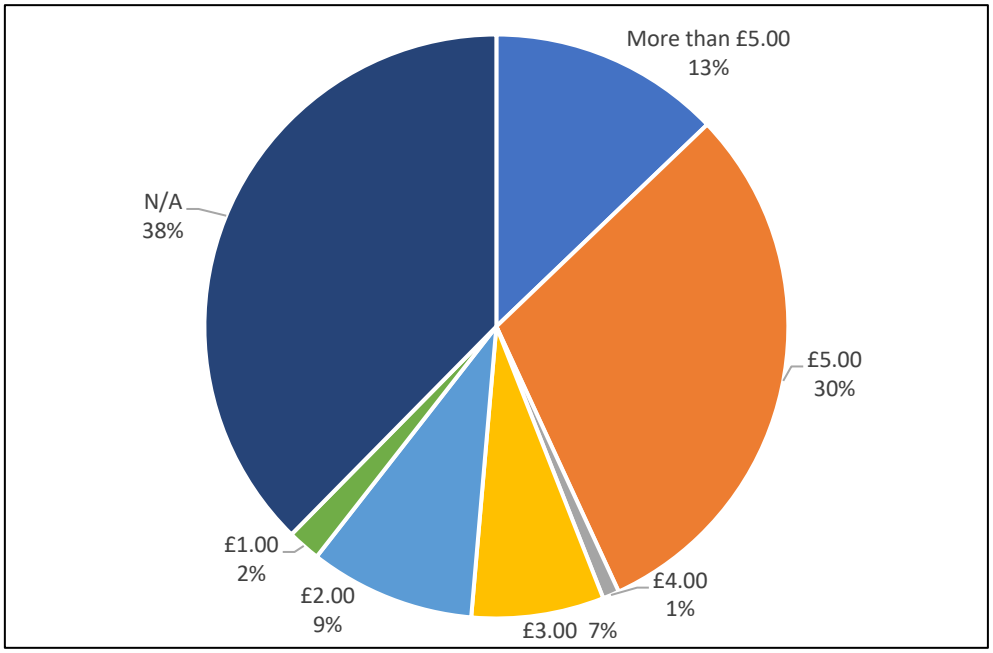


Figure 4.13 Qu.17 What would you consider to be an affordable annual fee per. child?

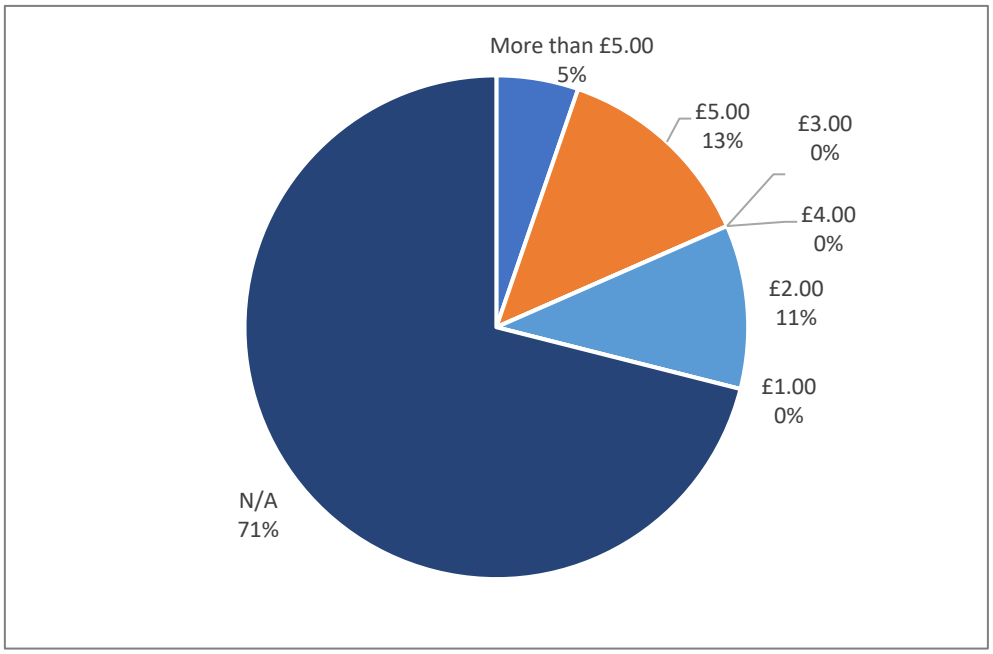


Figure 4.14 Perception of an affordable fee by respondents who were very unlikely to access a fee-based service (n=20)

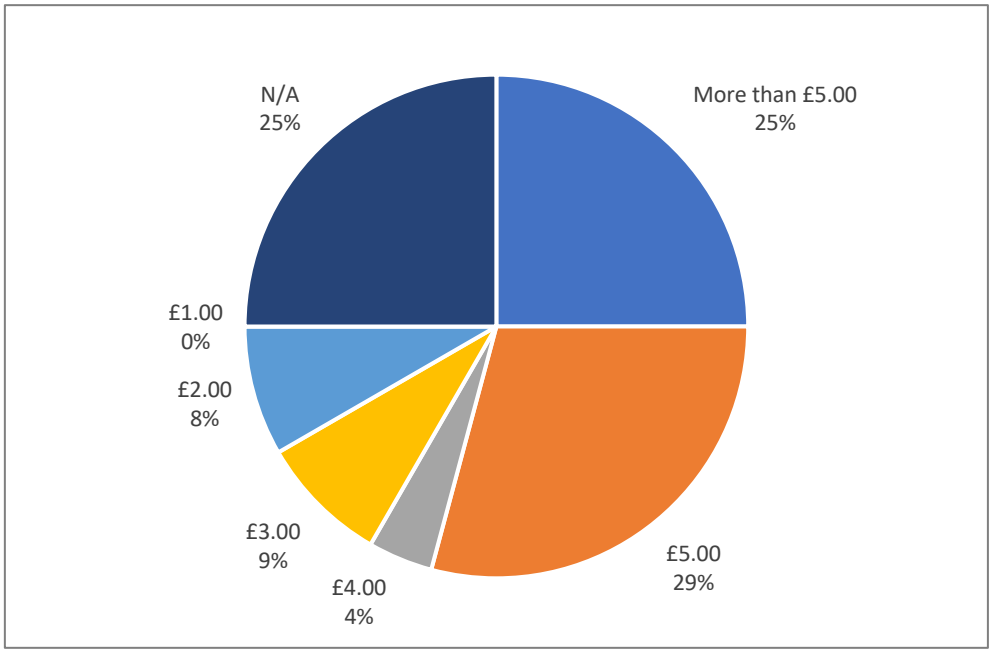


Figure 4.15 Perception of an affordable fee by respondents who were unlikely to access a fee-based service (n=25)

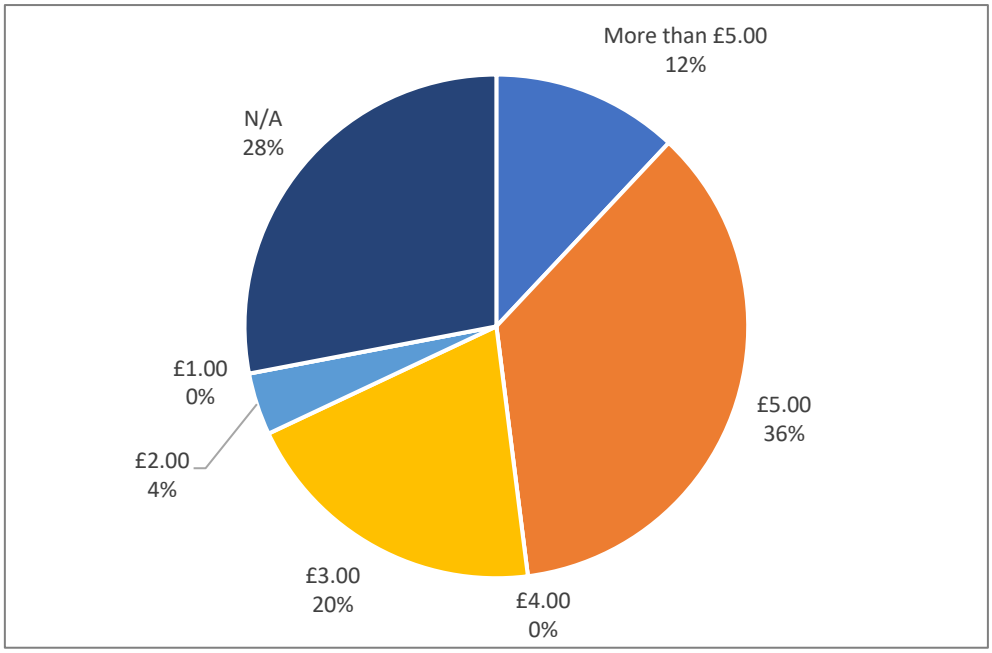


Figure 4.16 Perception of an affordable fee by respondents who were likely to access a fee-based service (n=24)

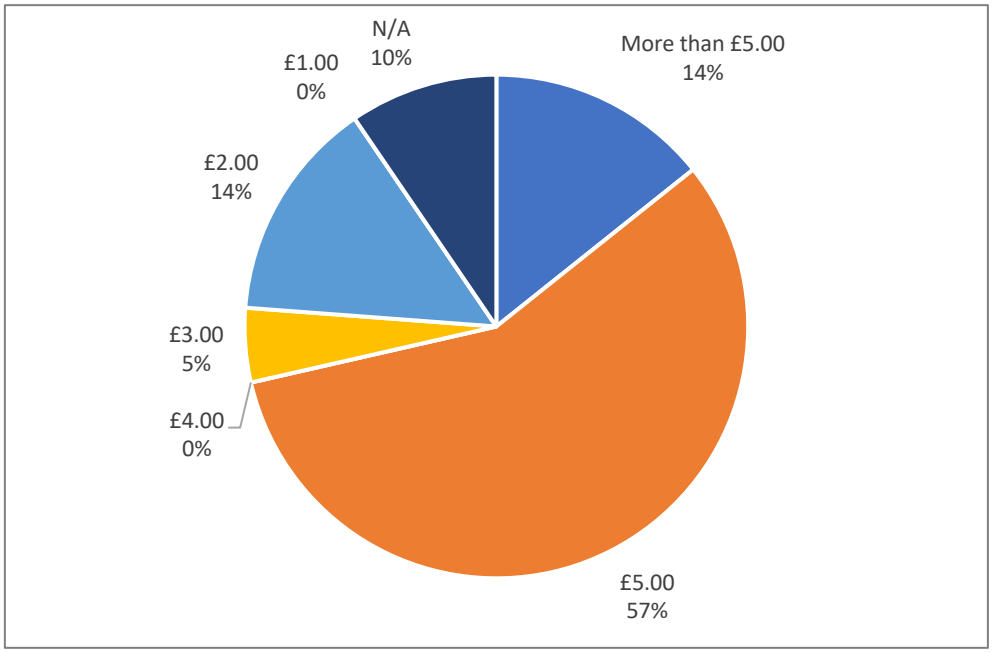


Figure 4.17 Perception of an affordable fee by respondents who were very likely to access a fee-based service (n=40)

Of the respondents who had stated that they were 'very unlikely' to access a fee-based service, 71% (n=27) of respondents selected Not Applicable while 18% (n=7) reported that £5.00 or More than £5.00 would be an affordable fee (Figure 4.14).

Of the respondents who had reported that they would be 'unlikely' to access a child growth service if there was a fee attached, 25% (n=6) chose to answer Not Applicable, while 54% (n=13) stated that £5.00 or More than £5.00 would be an affordable fee (Figure 4.15).

Of the respondents who had stated that they were 'likely' to access a fee-based service, 28% (n=7) of respondents selected Not Applicable and 48% (n=12) reported that £5.00 or More than £5.00 would be an affordable fee (Figure 4.16).

Of the respondents who claimed that they would be 'very likely' to access a fee-based service, 10% (n=2) reported Not Applicable. The largest proportion stated that £5.00 was an affordable fee (57%; n=12) with a further 14% (n=3) stating More than £5.00. (Figure 4.17).

4.12 Impact of FSM eligibility on perceived affordability

The majority of questionnaire respondents cited primary schools that have a percentage of pupils eligible for FSM lower than the national average (n=73) while the remaining respondents (n=37) cited primary schools that have a higher percentage of pupils eligible for FSM. Of the respondents who named primary schools with lower than the average FSM eligibility, 64% (n=30) deemed £5.00 or More than £5.00 to be an affordable fee (Figure 4.18). Of the respondents who named primary schools with higher than the average FSM eligibility, 81% (n=17) deemed £5.00 or More than £5.00 to be an affordable fee (Figure 4.19).

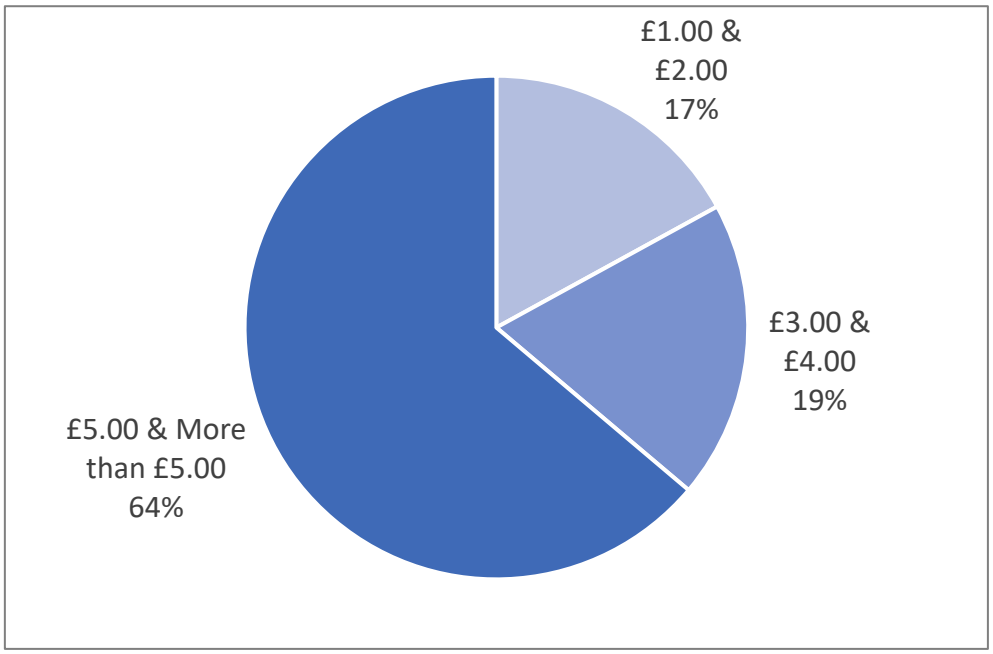


Figure 4.18 Perception of an affordable fee by respondents who named a primary school with lower that national average % FSM eligibility

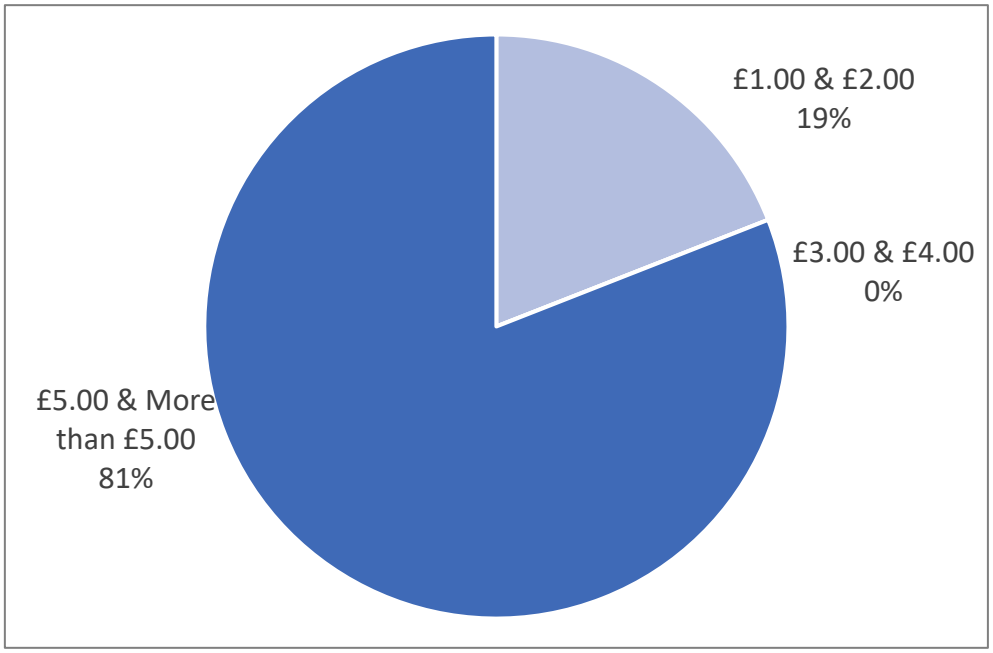


Figure 4.19 Perception of an affordable fee by respondents who named a primary school with higher than national average % FSM eligibility

4.13 Overall acceptability of a parent funded child growth service

The penultimate question (Qu. 18) brought four concepts together and asked parents to consider the acceptability of a parent funded, primary school based, annual child measurement and growth feedback service. Respondents were invited to state that they would be Not at all likely (0) through to Extremely likely (10) to accept a parent funded child growth measurement service.

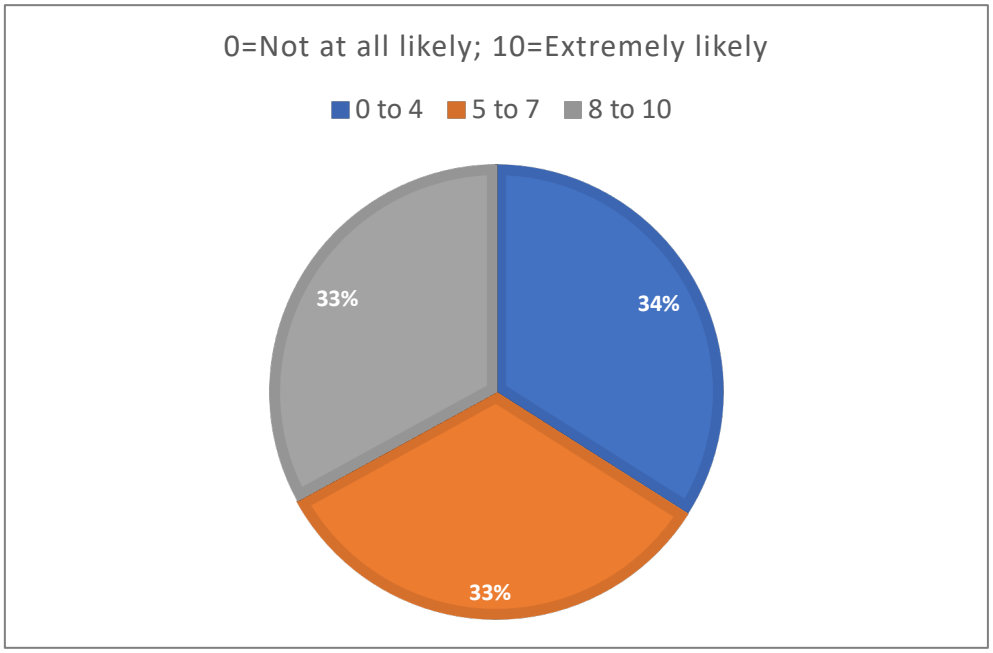


Figure 4.20 Qu. 18 Finally, how likely would you be to support a parent funded, primary school based, annual child measurement and growth feedback programme?

All respondents (n=110) answered this question with 33% (n=36) stating that they would be very likely to access a fee-based child growth service, 33% (n=36) stated that they would be likely to access such a service and 34% (n=38) stated that that they would be less likely (n=38) to access such a service (Figure 4.20).

Further data analysis and breakdown of Qu. 18 can be found at appendix 8.

4.14 Impact of FSM eligibility on overall acceptability of a parent funded, primary school-based child growth programme

The percentage of all respondents who chose answers 8 to 10 (inclusive) was 32.7% (n=36) while the percentage of respondents who chose the mid-point of the scale 5 to 7 (inclusive) was also 32.7% (n=36). The percentage of respondents who chose answers 0 to 4 (inclusive)

was 34.5% (n=38). Figure 4.21 compares these overall results with respondents who have cited primary schools with lower and higher than average FSM eligibility.

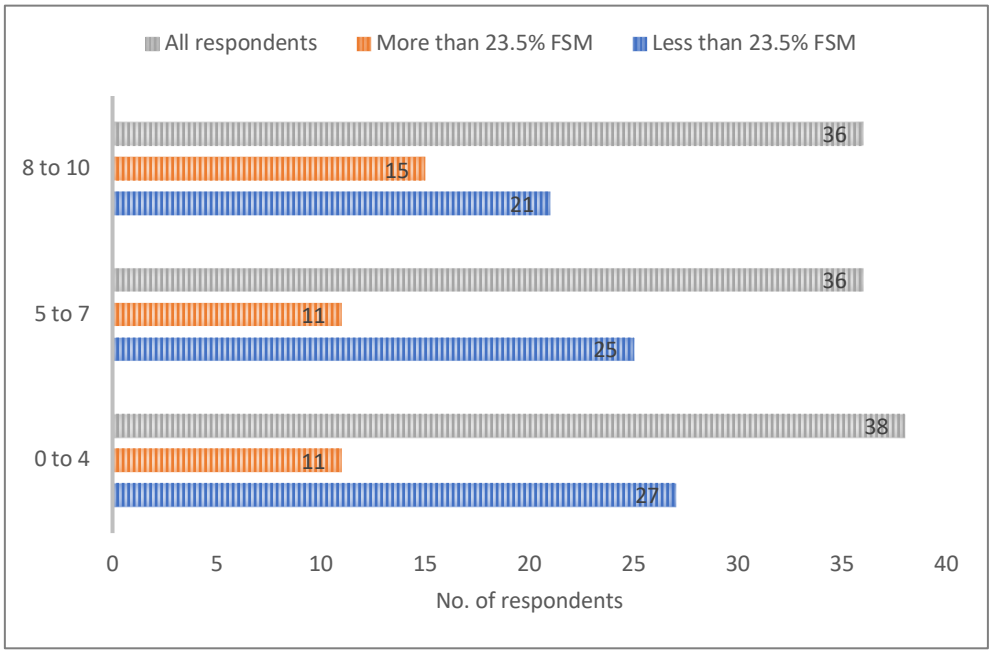


Figure 4.21 Acceptability of a parent funded child growth service by respondents according to % FSM eligibility (0 is Not at all likely; 10 is Extremely likely)

The majority of respondents (n=73) named primary schools with FSM eligibility lower than the national average in England. Of these, the percentage of respondents who chose answers 0 to 4 (inclusive) was 37% (n=27) while the percentage of respondents who chose answers 8 to 10 (inclusive) was 28.8% (n=21). The percentage of respondents who chose the mid-point of the scale 5 to 7, was 34.2% (n=25) (Figure 4.21).

Of the respondents who named primary schools with FSM eligibility higher than the national average in England (n=37); the percentage of respondents who chose answers 0 to 4 (inclusive) was 29.7% (n=11) while the percentage of respondents who chose answers at the

other end of the scale 8 to 10 (inclusive) was 40.5% (n=15). The percentage of respondents who chose the mid-point of the scale, 5 to 7 was 29.7% (n=11) (Figure 4.21).

Further data analysis and breakdown can be found at appendix 9.

Statistical analysis was undertaken using the Mann-Whitney U test at a significance value of p=0.05 to test Qu. 18 and the null hypothesis: that there was no difference in the likelihood of respondents accessing a fee-based service based on FSM levels. The outcome of the test is not statistically significant as the p-value is greater than 0.05 (p=0.36). Therefore, there is no difference in the likelihood of respondents accessing a fee-based service based on FSM levels and the null hypothesis is confirmed (appendix 10.).

4.15 Final comments offered by respondents on completion of the survey

Of a total of 110 survey respondents, 16.4% (n=18) offered final comments on completion of the survey. The highest number of comments (n=7) were from respondents who had claimed that they were Not at all likely (0 on the scale 0-10) to support a parent funded child growth service for the previous question. The next highest number of comments was from respondents who had chosen 6 for the previous question scale (n=5) and were therefore more likely than not to support such a service. The remaining respondents who offered final comments (n=6) had scored the previous question 1, 2, 3, 5, 8 and 8 (Table 4.2).

Table 4.2 Summary table of questionnaire respondents who offered final comments

Respondent	**Score for Qu. 18** **0-Not at all likely to 10-Extremely likely**	**Thematic analysis**
R1	0	I am concerned about the emotional impact of weighing children
R2 R3	3 0	My children are of an age where such a service is not relevant to me
R4 R5 R6	8 6 8	A child growth system would be reassuring and support positive change
R7 R8 R9 R10 R11 R12	2 6 6 0 0 6	I feel that such a service should probably be state funded
R13 R14 R15 R16 R17 R18	0 0 1 5 0 6	I don't see how tracking child growth is necessary unless there is a concern

The respondents' comments were grouped into five main themes as illustrated below in Figure 4.22.

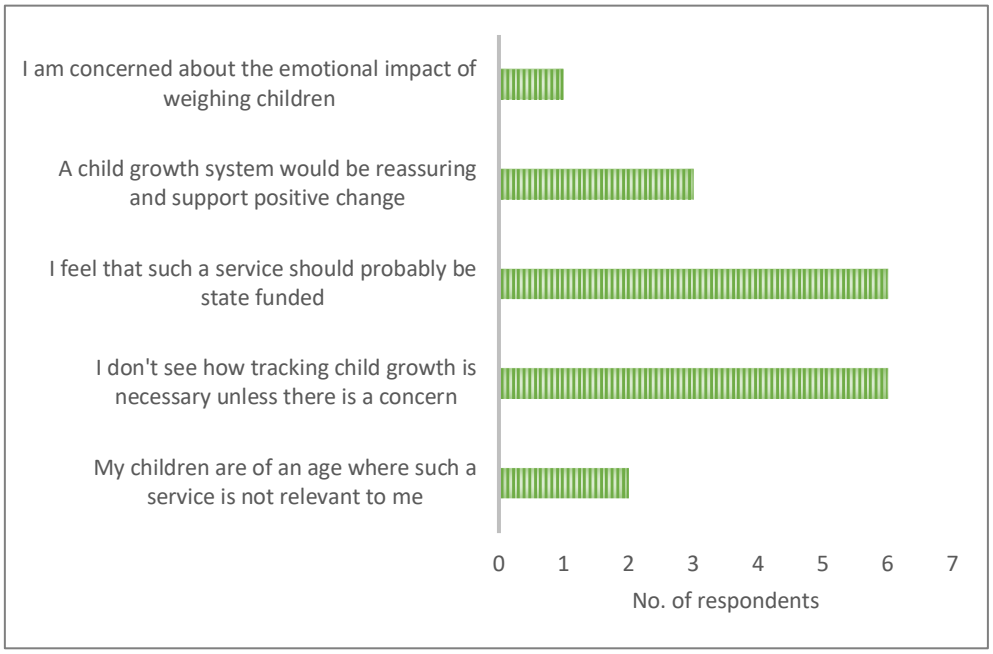


Figure 4.22 Thematic analysis of final comments submitted by respondents

There were 6 respondents who suggested that child growth tracking was irrelevant unless a concern had been identified.

> '*Unless there's obvious concern I don't see the need*' R14
>
> *'I wouldn't be interested as I don't think it would apply to my family however I can see it being useful to others'* R15

Of these 6 respondents, there were 33.3% (n=2) who acknowledged that receiving more information about the benefits of child growth tracking might make such a programme more appealing to them.

'*I would pay only if the feedback given was comprehensive and explain my children growth compared to national average'* R18

'Perhaps it is because I am not aware of the positives. However, I think my responses do indicate that, if this were to proceed, it would be helpful to understand the benefits of the programme.' R17

There were also 6 respondents whose comments raised the issue of funding; 50% (n=3) had answered the previous question with very low scores and were definitive in their responses.

'*We have an NHS which we pay for through our taxes. This service should also be part of that'.* R11

'Funding should be through NHS though, it is an important screening to prevent health problems that cost NHS significantly, they should therefore invest in this preventative measure' R8

'This should be a part of the national NHS service as it involves children, dictates the health of the society of tomorrow, the nation's future' R12

The other 50% (n=3) of respondents had all answered the previous question with relatively high scores and were less definitive in their statements.

'*Should be free really and done every year if you wish to access service or school nurse when doing immunisations'*. R9

'I support monitoring & early [intervention]. I would expect this could be done through school nurse provision. Their services may have been cut? Currently families are living

in challenging financial circumstances, in some cases unable to pay for healthy food. I assume these are the very people who need most help. These families may be excluded from [such] a scheme due to lack of funds' R10

'I would be concerned with a parent funded service in deprived areas and those children/families who would require health promotion would not be able to access support' R7

There were 3 respondents who commented on the potential reassurance and motivation that such a service could offer, with 66.7% (n=2) respondents referring specifically to 'fussy eating' in children.

'If the programme was run annually, parents would have an opportunity to make changes based on the feedback they receive. Six years is a long time between measurements. The process would also become normal for children as more of a routine measure' R4

'I think a lot of parents would find something reassuring especially if your child is a fussy eater and you are worried what it's doing' R5

'I think more services like this should be supported in schools. My youngest child is a very fussy eater and I would appreciate any support' R6

There were 2 respondents who had low scored the previous question and who offered comments by way of justification.

'*My answers to the last 3 questions are quite negative about the idea as I have no primary school age children, but I think it's a great idea as it may help show undiagnosed disorders at any earlier age'* R3

'I would have liked to answer more concisely however both my children are in high school and so this would not apply to them' R2

There was 1 respondent who highlighted a concern around weighing children and the potential emotional impact of this practice, stating,

'*I understand the importance of promoting healthy eating to children but I don't like the idea of my children being weighed regularly. I would hate for them to become conscious or paranoid about their weight'.* R1

4.16 Semi-structured interviews (study 2.)

Study 2. consisted of 6 semi-structured interviews which were all carried out with senior school leaders. The participants held similar professional positions, that is they were current employees of state maintained primary schools located within the Greater Manchester region. All participants perceived themselves to work in geographical areas of relative deprivation. None of the participants worked in a special educational need (SEN) setting and none of them worked in an independent funded primary school.

The participants who were interviewed differed in seniority; one primary school teacher(P1), one primary school teacher with SEN responsibilities (P2), two primary school Headteachers

(P3 and P4) and two Executive Headteachers (P5 and P6) each responsible for three primary schools (Table 4.3).

Table 4.3 Summary table of participants for study 2.

Participant Role within Primary Schools	**Assigned Participant Code**	**Gender**
Primary School Teacher	P1	Female
Primary School Teacher & SEN	P2	Female
Primary School Headteachers	P3 & P4	Female & Male
Executive Headteachers	P5 & P6	Female & Female

There were five significant themes that were identified throughout the interviews with two or more of the six participants contributing to each theme. A sixth sub-theme was raised by one of the participants (Table 4.4).

Table 4.4 Summary table of emergent themes for study 2.

Theme	Sub-theme A	Sub-theme B
1. The primary school environment	Impact on learning in terms of time taken to measure children	Holistic view of children's health and wellbeing
2. Parental engagement and responsibility	Parental engagement in terms of extra-curricular payment/consent forms/parents' evenings	Parental responsibility for children's welfare
3. Articulating the benefits of growth graphs	Parental understanding the benefits of growth graph	
4. Topic sensitivity and language diversity	Parental sensitivity around feedback terminology	The benefits and inclusivity of visual feedback
5. Post feedback support	Concern regarding childhood obesity	Parental aftercare and support
	Contemporary data capture	Graphs updated to reflect diverse population

4.17 Theme 1. The primary school environment

There was clear support for facilitating a child growth programme in primary schools with participants expressing that, while such a programme would take children away from their studies, the impact would be *'minimal'* P6 and therefore hosting such a programme would be

'perfectly acceptable' P1. There was strong agreement for measuring children in the primary school environment as opposed to at home or at a GP surgery.

> *'I agree with the concerns of measuring children at home or in a doctor's. I think your home's supposed to be a safe space. If a child is conscious around the height and the weight, I wouldn't want my child being weighed at home. I don't know why. I just don't want any negative connotations kind of thing…Some children get nervous going to the doctor's as well, don't they? I think it makes it seem a bigger deal. If they see the rest of the class is having it done, it takes two seconds, they're not going to think about it again for the rest of the day. Whereas I just think it's more formal in the home setting or in a doctor's.'* P1

The participants showed particular interest in child growth as part of a fundamental measure of health and wellbeing. It was recognised that primary schools face intense pressures and increasing challenges, not least due to the impacts of the Covid 19 pandemic, and yet despite this there was a high value placed on holistic support for the young students.

> *'… you know education is only one element of what we do, isn't it? There's other aspects of what we do in school that we have to consider as well in terms of their health and other things as well, which is, I think some schools are better at doing than others but that's why [a child growth programme] would be interesting, I think.'* P4

> *'If I was aware that this kind of information is a possible predictor or a measure of something like you mentioned, bereavement, early trauma, or anything like that. It's*

really interesting, isn't it? It gives a physical piece of information to go alongside a more of a cognitive one if you see what I mean.' P6

One participant suggested that the opinions of school leadership can vary and be polarised within this topic area.

'My head teacher is very open and will do what he thinks is best for the children. Some head teachers are quite black and white the kind of thing like, no, we don't need it because we work in such a deprived school. My school do have a lot of pastoral care. My head teacher is very caring about the bigger picture, not just academically.' P1

However, whilst the majority of participants saw the positives to this, there was one participant who reported on the negative aspects of measuring in school. This participant quickly and repeatedly closed down the suggestion of such a programme. Their concern was not related to facilitating health related functions within the school environment, but was around the potential financial responsibility of such a programme. This participant reported that the school's education budget was vulnerable to costs that could be considered borderline education related and that stretching it further with, what was perceived to be, a health-related programme was not feasible. They were reticent to ask parents for payment for any school related items, often referring to payment requests as voluntary donations, for fear of excluding children on the basis of wealth.

'To be honest, it wouldn't be something that I would want to start because then it would be, "Right. Some of the children want to be weighed. Who will pay for this? Who will pay for that?" It's just taking away from our core [purpose] of education.' P3

'It's all about healthy eating, healthy choices, healthy relationships. That's where we do it but that's part of our curriculum as opposed to parents buying something.' P3

The same participant shared an opinion on child development from a holistic perspective, suggesting that primary schools had too great a responsibility and that they were perceived by the system as a *'catch-all'* due the amount of time that a child spends in school, *'Everything gets pushed onto us'* P3.

4.18 Theme 2. Parental engagement and responsibility

One participant noted that, despite time spent persistently chasing payments for school meals and childcare, such fees often went unpaid and had to be supplemented using the education budget. This particular participant made no contribution to any of the subsequent themes that emerged from the semi-structured interviews.

The concern regarding unpaid school lunch fees was shared. However, the suggestion was made that low levels of parental engagement did not always relate to chargeable items, with some parents showing a lack of engagement around education related activities such as parents' evenings. Similar low engagement levels were experienced regarding non-chargeable health offers such as flu vaccinations (nasal application) where parents are required to explicitly consent to a vaccination being administered to their child by a health professional in the school setting.

'The first letter goes out and you probably get 35% of parents sign up for an appointment. Then letter two goes out and you probably get about 55%. Then the teachers stand at the door when they're releasing the [child and approaches] parents to get that number up, we get it up to 95%.' P5

One participant assimilated lack of engagement with a lack of appropriate parental responsibility or else a system of joint responsibility between parents and their children describing *'child-centred parenting'* P5. A similar view was offered by a second participant who noted in some instances a lack of parental responsibility and role modelling.

'*we have had children walk through the door at 10 to 9:00 with a bottle of Lucozade. They've not had any breakfast. They've got a bottle of Lucozade.*' P2

4.19 Theme 3. Articulating the benefits of growth graphs

There were four participants who addressed the benefits of serial growth data. Of the four, two participants remarked on the benefits without seeking further clarity from the researcher with one stating *'It's here are the facts. What do you want to do about it for the best interest of your child?'* P1 and the second participant noting that the awareness of an issue would be likely to motivate some parents to make lifestyle changes sufficient to improve a child's growth trajectory. A third participant made it equally clear that they could not see the benefits of such a programme and asked the researcher directly what the benefits of such a programme would be.

'Why would anyone pay for that when they could just do it on their bathroom scales and go online?' P5. Adding *'If you thought your child was putting weight on as a responsible parent, you'd think you might have been to the GP anyway, wouldn't you or losing weight?'* P5.

The same participant went on to conclude that such a programme would in fact be valuable if it encouraged any level of parental engagement and if it consequently contributed to positive change for even a small number of children.

'[If] you captured a few children where otherwise their health concerns may have gone unnoticed, then I suppose it's a good thing, isn't it? P5

The fourth participant demonstrated that they personally understood the benefits but suggested that parents might not automatically do so; helping parents to understand the reasoning behind such a programme would be crucial to its uptake and success.

'Sometimes if they think it's going to really benefit the child, and they can see that benefit, and then parents do ask for support, not just around this with other things, and if they can see the benefit of it, they are very enthusiastic and supportive.' P2

4.20 Theme 4. Topic sensitivity and language diversity

None of the participants expressed any sensitivity around measuring children's growth, however three did raise the issue of topic sensitivity when feeding back results to parents.

There was a concern that they could be called upon to defuse situations involving parents who were displaying negative emotions due to growth feedback relating to their child.

> *'What I'm a bit concerned about is the number of parents whose children were overweight who then complain when they got that data before saying that, "My child's not overweight."'* P5

Parent sensitivity to growth feedback was raised repeatedly by a second participant who was concerned about how feedback could make parents feel and, by way of example, they referred to a situation in school where a parent had been sensitive to feedback relating to the contents of their child's lunch box.

> *'it's how you explain it to parents isn't it, in a sensitive way,'* Adding *'It's about being sensitive, and getting parents onside, and getting their understanding. Then once you've got that, they will generally roll with you.'* P2

The third participant who commented on parent sensitivity in relation to growth feedback focused on the language and terminology that is often used by the NCMP to describe children's growth. They felt that the terms such as overweight and obese, have stigma attached to them and can elicit negative thoughts and feelings. They also acknowledged that the modern population in the UK consists of multiple languages and that translation might unwittingly cause cultural offense to parents. By offering a growth graph to illustrate a child's growth pattern, and by limiting language to minimal yet carefully chosen terms, any negative impact of feedback might be decreased.

'I think that's what the graph would get rid of. You don't need to use those words. You can just say this trajectory is not carried on, it's shot up. It doesn't have to be overweight, obese, any of those.' P1

And *'I think a visual aid would be able to help. We've a lot of parents who don't speak English as a first language. If it's visual, it's just much clearer for everybody to see and understand, isn't it?'* P1

4.21 Theme 5. Post feedback support

Of the five participants who were receptive to a primary school-based child growth programme, two commented on the benefits of having post-feedback support incorporated into any such programme and made available to parents. The first participant suggested that the offer of post feedback support, coupled with the use of sensitive terminology, would further encourage parents to participate in the programme. Interestingly, they foresaw a situation whereby a parent would be informed that their child was overweight as opposed to underweight.

'It's that idea of explaining to them that their child's BMI is a bit higher than it should be but we want to support with that, and this is how we're going to do it.' P2

The second school leader considered post feedback support less of a selling point and more of a moral obligation, implying that once a health risk is identified then the identifier is dutybound to share such information with a health or social care professional.

'I think that it would be only responsible of a programme that's going to weigh children to actually be following up where there's issues or concerns.' And *'Otherwise, it doesn't feel very responsible that somebody is measuring a child as morbidly obese, and actually then nothing happened.'* P5

This participant offered a theoretical situation involving the identification of an overweight rather than an underweight child with the school leader's primary concern being the health risks to the child as opposed to the emotional fragility of the parents upon receiving child growth feedback.

4.22 Theme 6. Contemporary data

One participant felt strongly that measuring children's growth could drive knowledge forwards and contribute to a greater understanding of child growth within contemporary populations, that is, that reflect ethnic and cultural diversity. Their view was that working to update the current data equated to advocating for minority groups of people and promoted inclusion.

'We want those children to be represented in society. That's another reason a school should want to join in because if they say, no, you never know any better, do you…?' P1

5 CHAPTER FIVE

DISCUSSION

5.1 Overview

A child's growth pattern is a fundamental indicator of physical health and emotional wellbeing and yet there is no system in England whereby individual children's growth is measured regularly and routinely. This study set out to explore whether a parent funded child growth programme, undertaken within a primary school setting, could be financially sustainable over time.

This research aimed to assess parents' perceptions around current growth monitoring programmes and around receiving more frequent, annual child growth feedback. Assuming that any such programme would take place in the primary school setting, such as the NCMP, the research aimed to assess whether parents and school leaders considered primary schools to be appropriate environments in which to measure child growth.

If primary schools were to be programme hosts, then sustainability would require programme adoption and support by school leadership. Therefore, this research collected views of school leadership regarding concept acceptability and feasibility. To the author's knowledge no research has previously been conducted asking whether primary school leadership would be willing to facilitate a parent funded, annual child growth and parental feedback programme.

The premise of an annual child growth programme is to monitor growth trajectories over time, from birth through to adolescence in order to identify and investigate pattern changes (RCPCH, 2017). Therefore, long-term programme sustainability is a fundamental tenet and

should be a primary consideration of any health-related programme (Scheirer, 2005). In the absence of a centrally funded annual child growth monitoring programme, this research explored the quantifiable value that parents might personally place on child growth information. This research considered programme sustainability theory in the context of an evidence-based child growth programme, CHAMP (Dam et al., 2019), in order to understand whether the programme's end was singularly due to a lack of resource or whether it was compounded by other factors.

5.2 Parents' perception of early years growth monitoring

The participants of this study showed a high level of engagement when asked to describe how they felt about growth measurements plotted in the parent held PCHR by health visitors. All of the participants chose at least one of the six adjectives, with several participants choosing more than one. The findings showed that parents are overwhelmingly positive about their experience of child growth feedback.

In this study, parents expressed relief that their children were growing well and maintaining optimal weight gain. The comments reflected the overarching purpose of monitoring infant growth as part of the HCP, that is to ensure that weight and length are increasing as expected throughout the early period of rapid growth (Public Health England, 2021). Although none of the participants used the terms overweight, obese or obesity, they used the term 'weight' in the context of early years, a term which was used less frequently in the context of older children. This choice of terminology corresponds to previous findings by Puhl et al. (2011) indicating that parents of children of all ages prefer to use 'weight', 'unhealthy weight' and 'weight problem' when referring to excess weight in children, as opposed to terms such as

'fat' and 'obese'. More recent research discovered that young people themselves preferred to use 'weight problem', 'BMI' and 'plus size' to describe excess weight (Puhl and Himmelstein, 2018) which is of particular relevance given that the participants of the current study will be moving into parent age and therefore the target audience of early years child growth programmes.

Research has previously shown that parents view certain Early Years growth patterns more favourably than others, with higher tracking trajectories considered healthier (Laraway et al., 2010; Sullivan et al., 2011). Literature studying the overall perception of the Early Year's measurement programme in England is difficult to identify, however it is possible that participants' views were influenced by their children's growth patterns. That is to say, if parents were pleased with their children's growth progression, then their perception of the HCP may reflect this.

Through free text narrative, participants reported what could be described as a sense of judgement and a pressure for their child's growth to be perceived as normal. A sense of judgement has also been reported in literature studying parents of primary aged children with regards to NCMP feedback (Gainsbury and Dowling, 2018). This current study also revealed evidence of parents questioning the validity of charts used to assess growth which reflected findings from Gillison et al. (2013) and in particular, the publication date of the growth graphs. Participants also questioned whether BMI was a reliable measure of growth in children and whether the interpretation of growth patterns took ethnicity into account. There is research evidencing that UK90 data overestimates the weight related health risk of children from Black backgrounds and underestimates that of children from South Asian backgrounds

(Firman et al., 2020). This suggests a sense of insightful questioning amongst a cohort of parents regarding the basis of the child growth information provided in the Early Years. However, the most recent review of guidelines published by the National Institute for Health and Care Excellence (NICE) confirms that, whilst BMI does not specifically assess harmful central adiposity as the more sensitive waist measurement might, the use of BMI continues to be the recommended method of assessing weight related health risk in children (NICE, 2022).

5.3 Diminishing level of parental engagement with child growth

This study revealed a very high level of engagement with Early Years child growth monitoring. Having an infant's growth monitored is an active process which requires parents to have the time, motivation and organisational skills to take their children to be measured by a health visitor. Growth progress is received directly and plotted on a detailed standard growth chart (appendix 11.) in the parent held PCHR. High level parental engagement has been found to be an important element of long-term childhood weight control (van der Kruk et al., 2013).

The current study suggested a much lower level of active parental engagement with the NCMP, which in contrast, is a relatively passive process. A large proportion of participants were unaware of their children's growth measurements and an even larger proportion were unaware that their children had been measured despite national levels of NCMP measurement being in the region of 95% (NHS Digital, 2019) and universal parent feedback recommended (Public Health England, 2020). Although written information is offered before and after measurement, because the NCMP operates on an opt-out basis, no parent action is required. Local authorities may or may not commission NCMP providers to offer parent

feedback, which takes the form of a written letter with no contextual diagrams supporting the information (appendix 13.).

This apparent lack of awareness is an important observation as it raises the question of parental engagement and responsibility with regards to child growth monitoring during the primary school years. During a child's early development (0-2 years) the onus is on parents to ensure that children are measured by a health visitor, usually at a health centre or similar venue, and to have a discussion regarding the results. The NCMP promotes a passive approach whereby no action is required by parents. Active consent is not required in order for children to be measured; measurement occurs during the school day and parents do not necessarily receive feedback. This could be construed by parents, and by the wider system, as a transfer of responsibility for child growth monitoring from parents to the state. Certainly, there was an indication from the study that parents were reliant on alerts from health professionals to inform them if there were concerns. Potential confusion and assumption around where responsibility lies, for something as fundamental as child growth monitoring, is significant and could present a risk to child health.

Low levels of parental engagement and responsibility was a theme raised by school leaders who noted that fees for school meals and childcare could be difficult to recoup, and that non-fee-based activities such as parent evening appointments were also difficult to organise. Obtaining explicit consent for school-based health appointments, such as nasal flu vaccinations, was cited as being particularly challenging. School leaders facilitating programmes designed to promote positive lifestyle change to families recognise a lack of parental engagement as a challenge (Warren et al., 2009; Fenton et al., 2017). However, low

parental engagement is evidently not a barrier to NCMP participation possibly due in part to the lack of involvement required of parents. The views of school leaders in this study certainly suggested that any health programme that relied on active engagement with parents would prove challenging.

5.4 Primary schools as an appropriate measuring environment

In recent years, school settings have been considered key environments in which to measure and address rising levels of childhood obesity. Notwithstanding the NCMP, schools have featured in government policy documents with regards to increased physical activity and improved school meals (Department of Health and Social Care, 2017). The current findings indicated that parents with no experience of the NCMP were less likely to express reservations regarding measuring children in the school setting than those who had experience of the NCMP. This is important because, unlike the Early Years findings where growth feedback was associated with reassurance and usefulness, it indicates that a negative association had formed between the NCMP and growth monitoring. It could be concluded that a school based, annual child growth monitoring programme would be best introduced to parents of pre-school children (Rudolf, 2009) and who had yet to have experience of the NCMP.

However, rather than limiting their reservations to measuring children in the school environment as the question had specified, narrative from parent participants indicated their reservations related to the NCMP more broadly. There was a blurring of child measurement and result feedback, with the additional claim that children had been emotionally impacted by programme feedback viewed inadvertently.

The study included a view of a parent who stated that they were commenting in a professional capacity, thereby blurring the parent and professional boundaries. Conversely, this study highlighted the complexity of obtaining views from education professionals who were also parents. In a professional capacity, one school leader felt that the school environment was appropriate in terms of practicality and as a parent noted that the school environment was psychologically preferable to home or to a GP clinic. This study offers a valuable insight into the intertwinement of growth measurement and result feedback and the complex interplay between professionals as parents and vice versa.

Ultimately, there was a sense from school leaders that any potential benefit to children's health and wellbeing must outweigh class disruption and impact on learning time and therefore a potential programme should be evidence based and compelling thus reflecting findings by Clarke et al. (2015) that school leaders, especially in areas of particular deprivation, feel a moral obligation to support holistic health and wellbeing (Clarke et al., 2015). Overall, school leadership felt that primary schools were an appropriate environment in which to measure children given that children could be measured quickly, routinely and with no opportunity for discussion. This study adds to literature recognising that schools are important settings for health interventions (Booth et al., 2021) and that school leadership support is fundamental to programme initiation.

5.5 Parents' perception of an annual child growth programme

With the introduction of an annual child growth monitoring programme, parents of nursery aged children were most likely to consider such a programme to be helpful, followed by parents of primary aged children and then by parents of secondary school aged children.

Given that parents of younger children perceived early years growth monitoring to be a positive experience, it is unsurprising that this cohort are most supportive of an annual child growth programme and it reflects evidence that intervention is most effective during a child's early years (Rudolf, 2009; Blake-Lamb et al., 2016; Ming Wen et al., 2017).

An annual child growth monitoring programme would rely on the active support of parents of primary aged children and while the majority of parents felt that such a programme would be helpful, the proportion was significantly less that the high participation rate for the NCMP (NHS Digital, 2019). This creates a sense that a sub-section of parents would be reluctant to commit to an annual growth programme, and yet do not actively withdraw their children from the NCMP. This again raises the question of parental engagement, a key theme identified in this study through interviews with school leaders and acknowledged by Berger-Jenkins, et al. (2017) who found that low level parent involvement could be improved by removing cultural and stigmatising barriers, and by communicating information through children.

However, rather than ambivalence, this potentially passive approach could reflect an uncertainty amongst parents and school leaders regarding the benefits of growth feedback. This study revealed that some parents and school leaders felt that the benefits of growth monitoring were not clear and therefore the study highlighted the importance of clear communication in this regard.

Irrespective of child age, this research showed that there is a belief held by some that children's health is instinctively apparent to parents, that annual growth information would

be irrelevant and that feedback could cause negative emotional impact for no apparent benefit. There was a confidence that health professionals would alert parents of health concerns therefore reinforcing the notion of a transfer of responsibility for child growth away from the parent. Conversely, parents presented counter rationale for supporting annual growth monitoring. Parents recognised the difficulty in assessing a child's growth pattern by sight, they identified that growth information served as an early alert to health concerns and they noted that data could inform lifestyle changes. Pointedly, there was acknowledgement that the 6-year gap between the two NCMP measurements served to create an incomplete picture of a child's growth. This dichotomy of views was discovered by Kovacs et al. (2018) when exploring on-line discussion regarding the NCMP, with the similarities between the two findings striking. The authors examined on-line conversation threads regarding the NCMP between 2011 and 2017 and found three main themes; the accuracy of NCMP feedback and the associated response from health professionals, the relevance of data collection and the uncertainty around having weight related discussions with children (Kovacs et al., 2018) with each theme having both an argument and a counter argument.

This study shows that there is a high-level support for, and sophisticated understanding of, child growth data amongst parents. However, there is also proportion of parents who demonstrate insufficient awareness of predictive child growth trajectories and the value that they offer parents as early indicators of physical illness and emotional upset.

Finally, the support of such a programme may be underestimated; respondents may have considered such a programme to be not helpful to them personally purely because their children were not of primary school age i.e., younger or older, and therefore this might

illustrate a misinterpreted, and therefore suboptimal, question rather than opposition to the concept.

5.6 Narrative around child growth

National reference to the NCMP is almost always in the context of childhood obesity reporting, and there is a longstanding association between measuring children as part of this programme and childhood obesity levels in England. The current study showed that parents were cautious with the language and terminology that they used, despite the questionnaire referencing the NCMP directly. Parents rarely used the term overweight, and even less frequently, the term obese. When these terms were used, parents inferred that they were terms used by others, such as health professionals, rather than themselves. Puhl et al. (2011) found that parents reacted differently to specific weight related terminology and identified phrases which were deemed acceptable (Puhl et al., 2011). During the course of this study, parents referred to children being above or below average weight or height, of a particular shape or size and small verses tall. There were examples where parents had used the term healthy weight and then avoided using terms outside of this category, referring to health concerns or issues. The study also showed evidence of parents using the terms; growth, keeping track of growth and children growing as they should. There was little reference by parents to BMI and to the centiles within growth graphs that are used to assess children's growth category.

The semi-structured interviews with school leaders revealed a pragmatic approach to measuring children in the school setting with none of the participants suggesting that measuring weight or height would cause distress or upset. However, there was recognition

that feedback that included terms such as overweight, obese and morbidly obese could be considered offensive, and that efforts should be made to tailor language or else limit language and offer feedback using a visual depicture. In this study school leaders avoided using terms associated with weight, height or growth and instead referred to 'those words' or plainly 'it'.

Raising the issue of weight is considered sensitive by health professionals (Walker et al., 2007; Bradbury et al., 2018; Thorstensson et al., 2018) and raising the issue of a child's weight is arguably more so. This study revealed a tension with school leaders between a holistic approach to child health and wellbeing, and an apprehension around appropriate terminology when addressing child growth. There has been national investment aimed at encouraging and de-sensitising conversations around weight (Public Health England, 2017) recognising that discussion on this topic can be uncomfortable. It is clear from historical literature that language used to categorise weight alters as terms become stigmatised. This suggests that professional training and weight related resources should perhaps focus on visual representations that incorporate limited language in order to avoid misunderstandings, and that content should adapt to reflect ever changing language landscapes (Puhl et al., 2011; Puhl and Himmelstein, 2018).

5.7 Child growth variability

Participants expressed a belief that every child's growth pattern was unique therefore suggesting that using growth graphs to monitor growth could be irrelevant. Children's weight and height does and should increase through childhood. The rate of increase over time is neither uniform nor linear and Robinson et al. (2019) highlight four distinct child growth

patterns with varying future health risk linked to high or low BMI. The growth patterns that were identified, rather than tracking along the centile lines plotted within the UK90 growth charts, routinely crossed them (Robinson et al., 2019). Owing to the nature of child growth patterns, serial child measurements taken before the age of 6 years best identity high risk growth trajectories (Robinson et al., 2019).

Attempts to constrain a child's growth trajectory to centile lines within a growth graph, rather than allow the natural growth process to emerge, albeit within a target range, would likely be unsuccessful and unnecessary (appendix 12.). A child's growth pattern is inherent and is also affected by adverse life experiences (Isohookana et al.,2016; Schroeder et al., 2021). In identifying the complexity of child growth patterns, the participants of this study showed sophisticated insight.

5.8 Limitations of the NCMP

Child growth variability highlights a significant limitation of the NCMP. The NCMP provides surveillance data at two points, only one of which is earlier than 6 years of age, and therefore it does not offer parents sufficient child growth information to help parents to predict future growth trajectories or to prevent long-term health conditions (Robinson et al., 2019).

There is a minority of children whose growth trajectories are decreasing through primary school and a larger proportion whose growth trajectories are increasing, putting them at high risk of illness in later life (Guh et al., 2009; Khanna et al. 2022). National data indicates that children's growth patterns alter between healthy weight and overweight classifications significantly between Reception and Year 6 (NHS Digital, 2020). This means that many

children whose parents who are informed that their growth is within an optimal growth range at 4-5 years, move into a higher risk zone throughout primary school years and without their parents realising. Only because of NCMP feedback at Year 6 would parents become aware of the change in growth status and associated increased risk. However, there is heightened sensitivity around growth as children get older (Viner et al., 2020) and a reluctance to broach or address weight related concerns for fear of initiating disordered eating patterns (Berge et al., 2014). This reluctance to address overweight in childhood is likely to lead to overweight in adulthood which is associated with multiple weight related illnesses and shortened healthy lifespan (Grover et al., 2015).

The NCMP includes children who attend state maintained primary schools and excludes children who attend independent schools and special educational needs settings (Department of Health and Social Care, 2022). Other than the NCMP, there is no means by which parents can receive routine growth feedback, and therefore changes in children's growth trajectories are likely to go undetected by parents (Rietmeijer-Mentink et al., 2013). This is significant because an awareness of health risk encourages health information gathering and is associated with positive behaviour change (Prochaska and DiClemente, 1983).

5.9 Complexity of growth charts used in England

Participants of this study questioned the relevance of growth graphs in terms of the publication date of the current charts and the demographic data used to create them. Views were raised regarding how accurately current populations are reflected in terms of improved nutrition, increasing physical size and ethnic diversity.

There is a complexity surrounding growth graphs used nationally and internationally. There are two BMI growth charts used in England according to the age of the target population. Both of the charts comprise data point curves; the international World Health Organisation (WHO) growth standard data (De Onis et al.,2004) is used for those aged 2-4 years and UK90 data (Cole et al.,1995) for children aged 4-18 years.

The NCMP therefore uses the UK90 growth data (4-18 years) which originates from approximately 30,500 child measurements from birth to 18 years of age (Cole et al., 1995). The data points are translated into growth curves and then divided into ranges denoting growth classifications. When the NCMP was introduced in 2006, the growth classification thresholds were lowered to accommodate population-based assessment and so as not to underestimate levels of overweight amongst children in England (Department of Health, 2009). The NCMP continues to use the lower 85th and 95th centiles to report population national trends of 'overweight' and 'very overweight' categories respectively (Department of Health, 2008). However individual clinical assessments of BMI, and therefore parent feedback letters, use the higher thresholds of the 91st centile for 'overweight' and the 98th centile for 'very overweight' categories (NICE, 2022).

With regards to BMI values that plot below the 2nd centile, this simply denotes 'underweight' for NCMP reporting purposes, for individual clinical assessments (RCPCH, no date) and also for parental feedback (Table 5.1).

Table 5.1 NCMP weight classifications and thresholds from 2006-2022

NCMP Classifications *From 2007/8 (NCMP, 2008) ** From 2017/18 (NCMP, 2018)					
	Underweight	Healthy Weight	Overweight	Obese	Obese (Severely Obese **)
Population Reporting Centile	N/A <2nd *	<85th >2nd<85th *	>85th	>95th	>99.6th
	Underweight	Healthy Weight	Overweight	Very Overweight	Very Overweight
Parent Feedback Centile	<2nd	>2nd<91st	>91st	>98th	>99.6th

Both the WHO growth standard data and the UK90 growth data are expressed in BMI values. Scepticism was voiced by parents in the current study regarding the validity of BMI calculations in children, although the national NCMP guidance remains unswerving that BMI, as a measure of body composition, is preferable to other more intrusive anthropometric measures such as waist circumference and upper arm circumference (Office for Health Improvement and Disparities, 2022).

5.10 Limitations of current growth charts

The age and diversity of the UK90 data set, and to a lesser extent the WHO growth standard data, suggests that the growth graphs currently used in England are decreasing in relevance

as time goes on. A review by Haas and Campirano (2006) revealed that child growth patterns differed according to ethnicity, primarily around the age of puberty, and that they were hereditary to a large extent. Within ethnic populations, the study also found that socio-economic status also accounted for significant differences in growth patterns (Haas and Campirano, 2006). Different countries use different data charts to assess children's growth (Butte et al., 2007) and in 2007 an expert panel concluded that, whilst international standards for child growth would be preferable to country specific growth charts, data should be drawn from a sufficient sample of healthy children of different ethnic origins in order to ensure accurate representation (Butte et al., 2007).

The current findings revealed a distrust of growth feedback and a view that visual appraisal was a more accurate assessment of growth than standard graphs. Changes in children's growth, coupled with out-dated and differing data sets, compound the difficulty that parents have predicting their children's BMI classification (Doolen et al., 2009). Children with obesity tend to be taller than peers with 'healthy' weight through primary school (Stovitz, et al., 2011) and whilst parents find it difficult to recognise a high BMI in their children (Doolen et al., 2009), parents associate tall stature with good physical and emotional health (Murano et al., 2020). There is also a positive correlation between children's stature and good socio-economic conditions in the western world, with children in developed countries being generationally taller than their predecessors (Prebeg, 1998).

However, to suggest that the validity of growth graphs is compromised because of changes in the physicality of modern-day children is to misunderstand a primary purpose of growth monitoring. The growth graph data illustrates the parameters between which children grow

from infancy to adulthood, at which point weight related risk is assessed, with the optimal BMI range being between 18.5 and 24.9 kg/m2 (NHS, 2019). Although populations may be increasing in size and stature, current research is clear that a BMI value within these parameters throughout childhood limits the health risk of weight related illness in adulthood (Grover et al., 2014). The ultimate purpose of growth monitoring was queried by participants of the current research and therefore it would seem that this important benefit of child growth tracking is not fully understood or sufficiently communicated to parents and school leaders.

5.11 Value placed on child growth information by parents

The current findings suggested that parents have positive perceptions of child growth measurement and feedback during their children's' early infancy. The findings also suggest that as their children move through school, and parents have experience of the NCMP, perceptions become less positive. It was at the point of the questionnaire where support seemed to be waning, that parents were asked if they would access child growth monitoring and feedback if it were an 'affordable' fee-based service.

The initial response from participants suggested that, on the whole, they were cautiously open to such a service. The study found that most respondents who felt that they would find an annual growth monitoring service helpful, were still accepting of such a service if an affordable fee was attached. There was a proportion of respondents who reported that the introduction of a fee would render them unlikely to participate but then offered a view on an affordable fee when the pre-populated amounts were revealed and so it is possible that respondents had erred on the side of caution prior to the fee options being disclosed.

Unsurprisingly, the majority of respondents who had stated that they would not find an annual child growth programme helpful, did not change their views on the introduction of an unspecified fee.

5.12 Value based fee according to Free School Meal (FSM) eligibility

The broad deprivation marker of FSM eligibility used in this study seemed to have no impact on the willingness to access a fee-based service and had no impact on the level of fee considered to be affordable. School leaders, by their own admission employed in schools with high levels of deprivation, did not baulk at the concept of a fee-based child growth programme. However, they did question whether parents would engage with a fee payable programme in light of their professional experience of collecting school related fees from parents.

In spite of the longstanding NCMP which is offered free of charge, and in spite of criticism of NCMP feedback methods and content terminology (Gainsbury and Dowling, 2018), this study showed that parents in Greater Manchester are open to paying an annual fee for a child growth feedback service irrespective of FSM eligibility. These findings have further significance given that children who live in Greater Manchester have worse than average overall health outcomes when compared with public health measures for England (GMCA, 2018), including the level of childhood obesity.

5.13 Programme vulnerability to political support

The most important element of a public health programme in terms of sustainability is political support, primarily because of the funding and resource that it can provide (Schell et

al., 2013). Without reliance on politically governed funding, a parent funded child growth programme could be financially sustainable, however political support could still prove an overarching factor.

The NCMP was introduced under a Labour government in 2006 keen to measure the level of childhood obesity in England and, in doing so, to set national targets for childhood obesity reduction. The same government encouraged parental feedback two years later, recognising that raising awareness could empower parents and result in positive lifestyle change. Therefore, child growth monitoring and parent feedback that occurred every year would appear to be positive progression, however by introducing a parent fee, the programme becomes less ideologically aligned with that which was originally introduced by the government of the day.

There is nothing within most recent childhood obesity policy documents that undermines or contradicts a parent funded, primary school based, annual child growth programme as described in this study, nevertheless there is nothing to suggest that it would be an initiative championed by government either. Wider political consequences of an annual monitoring and feedback programme have been raised repeatedly since the inception of the NCMP; increased demand for health services with insufficient capacity and skill base (Walker et al., 2007; House of Commons, 2015), ineffective weight management programmes (Mears et al., 2019), increase of the health inequalities gap (House of Commons, 2015) and disquiet amongst parents following child growth feedback (Ames et al., 2020).

A political reaction to such a programme would be difficult to predict. Neither the NCMP measurement nor parental feedback was mentioned in the three most recent childhood obesity reduction policy papers (HM Government, 2016; HM Government, 2018; Department of Health and Social Care, 2020). The Government target remains to halve the rate of childhood obesity 2030 (HM Government, 2018) and, despite lack of reference in recent policy papers, it can be assumed that the NCMP remains the tool used to assess progress towards that target.

5.14 Sustainability of a child growth programme

Public health programmes are rarely sustainable over the long-term (Schell et al., 2013). The concept of programme sustainability is highly complex and is non-definitive (Scheirer and Dearing, 2011) and there are degrees of sustainability based on retaining certain programme features whilst relinquishing others (Scheirer, 2005). Accepting that programme sustainability requires a continuation beyond initial time limited funding, then the most important programme characteristic is political support. Public, and therefore political, support wavers when faced with obesity prevention policies (Fatemi et al., 2021) with which the NCMP, and therefore any potential national child growth monitoring programme, is associated.

This current study suggested that a parent funded, primary school based, child growth programme may be feasible. The study showed that parents in Greater Manchester would be open to considering paying an 'affordable' fee in exchange for child growth feedback, something that no other published study has previously explored. Although an important finding, it is not sufficient to conclude that such a programme would be sustainable over the long term.

Stakeholders of such a programme would include parents and their children, school leaders, programme leaders and local/national political and healthcare leadership, all of whom would require their personal and professional priorities to be continually satisfied. According to a conceptual framework devised by Schell et al. (2013), co-operative partnership working is an important element of sustainability within public health programmes. High quality programme evaluation and communication are also key and would likely be important in a child growth programme in terms of engagement with school leaders and securing programme agreement (Schell et al., 2013).

The current findings showed that school leaders were sceptical that parents would engage in sufficient numbers to enable such a programme to be sustainable and it certainly was the researcher's experience that engaging with parents on this topic presented challenges, however engaging with school leadership in order to secure relatively brief semi-structured interviews was also challenging. This latter experience bears relevance given that school leaders are gate-keepers to such a programme and therefore sustainability could be impacted by insufficient school leaders agreeing to facilitate such a programme. Whilst the semi-structured interviews within the study illustrated school leader acceptability for such a programme, the difficulty experienced by the researcher to secure interviews suggests that accessing sufficient schools for such a programme could potentially prove to be a barrier to sustainability.

5.15 Research limitations and strengths

The aim of this research was to determine whether a parent funded, primary school based, child growth programme in England could have long-term sustainability. Whilst the study

results showed that the concept was feasible, the results should be taken in context of the research and with strengths and limitations acknowledged.

The sample size of the questionnaire did not meet the study target of 250, with 110 eligible participants completing the form, however the completion of the on-line questionnaire came to a natural halt, and data saturation was met, with no new themes emerging. The number of responses did offer meaningful answers to the questions posed; however in-depth data analysis was limited by the sizes of sub-groups of participants. Analysis of questionnaire responses revealed unexpected interpretation and ambiguity that had not been flagged during the pilot testing phase.

The method of questionnaire distribution via WhatsApp and Facebook worked well insomuch that responses were shared by the researcher's network efficiently and at no extra cost to them or to the recipient, assuming no supplemental data charges. The responses were received anonymously and therefore may have had a greater probability of being honest than if identifiable response methods had been used.

The number of semi-structured interviews with school leadership as part of the qualitative study was equal to that of the original target. The participants all worked within state maintained primary schools whereas the initial hope had been to secure interviews with a broader range of primary schools including independent schools and SEN primary schools. Independent schools and SEN schools are not included in the NCMP and therefore may have offered a different perspective on the interview questions.

The use of FSM eligibility as a marker of deprivation levels is a rudimentary measure and therefore any findings that distinguish between higher and lower than average FSM eligibility should be approached with caution. That said, FSM eligibility is used by the Government to calculate supplemental budget awards and therefore does have a level of legitimacy and accuracy. Although the FSM eligibility was not requested as part of the qualitative study, school leaders who participated in the study all considered themselves to represent families with a relatively high level of deprivation. Value would have added to the study had the perspectives of school leaders who considered themselves to represent less deprived factions of society been included.

The participants of both the quantitative and the qualitative studies were linked to primary schools within Greater Manchester, with 9 out of 10 boroughs represented within the quantitative study. By broadening the geographical area of the study to a county, as opposed to a city, the opportunity to obtain parent responses from a variety of schools and socio-economic areas was increased. Greater Manchester has a population of 2.85m which is approximately 5% of England's population (GMCA, 2021) and, although the sample sizes are justifiable in terms of similar research studies, it is accepted that the number of participants within this current study form a very small percentage of the target area population and therefore findings should be approached with this in mind.

6.0 CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Overview

This research sought to understand how parents in England could be supported to monitor their children's growth throughout primary school, in order to early identify emotional distress and physical health risk. There is currently no system in England that routinely measures children from birth through to adolescence and feeds back this information to parents, despite professional recommendations to this effect. Parents find it almost impossible to recognise growth concerns in their own children. The increasing rate of childhood obesity in England has compounded this inability, because it has shifted the norm, which means that growth assessment by visual comparison between children is ever less valid. The stigma and sensitivity that surrounds overweight in childhood discourages conversation and encourages rebuttal, and therefore there is a reluctance to raise growth concerns with parents. A child's growth pattern is a fundamental indicator of physical health and emotional wellbeing and to deny parents such an early indicator is to deny the opportunity to make positive lifestyle changes, seek professional support and avert serious health issues.

6.2 Research findings

This study concluded that a parent funded, primary school based, child growth programme was feasible and could be sustainable in England. This study explored key determinants of programme sustainability, discovering that political support was the overarching factor, primarily owing to funding to which it could provide access. In contrast, programme impact was the factor of least importance. This study looked at government policy post millennium

regarding child growth, noting that childhood obesity featured predominantly, with the introduction of the NCMP. Whilst political support for parent feedback of child growth information was strong in the first decade post 2000, it waned significantly thereafter in line with the emergence and subsequent end of CHAMP.

An innovative programme, CHAMP ran from 2012 to 2018 and sought to offer parents annual child growth information via a web-based portal. The Manchester based programme worked alongside NHS school nurses who measured all years of primary school aged children (Dam et al., 2019). The programme reportedly had a positive impact on children's growth trajectories and yet was not sustainable beyond its initial public funded period.

The current study introduced an original concept; a parent funded primary school-based child growth programme. Through a questionnaire circulated via social media, the study sought to establish the acceptability of such a concept from a parent's perspective, along with study feasibility through semi-structured interviews with school leadership. The research showed that parents were open to the idea of paying an affordable fee for annual growth information regarding their children, irrespective of relative deprivation as measured by a broad deprivation marker (FSM). Parents expressed support, and counter arguments, for the proposal in line with previous literature that explored child growth feedback (Gainsbury and Dowling, 2018; Kovacs et al., 2018), however their broad acceptance of a parent funded programme was a novel finding. School leadership expressed concern for parents' lack of awareness of concerning child growth patterns and were amenable to facilitating a programme that promised to be of benefit. However, they held reservations regarding emotional responses to parent feedback information, programme engagement and fee collection.

Therefore, the current research builds on the study by Dam et al. (2019) which reported that offering parents annual child growth information via a web-based portal was well received by parents, was feasible to school leadership and had a positive impact on child growth patterns. This study aimed to address the short-term nature of the programme and to propose an alternative funding model. It has added to current literature by determining that a parent funded, primary school-based child growth programme could be attainable and sustainable.

6.3 Recommendations (Practice and research)

There are four broad recommendations from this study relating to; parent feedback, school leadership support, political cooperation and financial resilience.

Literature has paid little attention to the format of parent feedback despite the stigma associated with overweight being widely acknowledged (Puhl and Heuer, 2010). Terminology as part of the NCMP parent feedback has been altered over the years but continues to cause offense with a proportion of parents (Gainsbury and Dowling, 2018). More research is required regarding the format of parent feedback in order to increase support and encourage active engagement, with particular consideration given to terminology, language, visual diagrams, social media, video and audio messaging.

School leadership are the gate-keepers to school-based health programmes and as such their support is crucial to any long-standing child growth programme. This study has reinforced the understanding that school leaders have a deep sense of responsibility towards the holistic health and wellbeing of their pupils; research is required to understand how a child growth monitoring programme could be considered within this context. Whilst they are staunch

advocates for their communities, school leaders acknowledge low levels of parental engagement and further research is required to explore the extent to which this would impact on a child growth programme. Research should also be undertaken to understand the influence of school governors and local authority leadership on establishing school leaders as programme pioneers.

Political cooperation at both a local and national level should be garnered, irrespective of funding reliance, in order to strengthen programme support and longevity. Research should explore the impacts of parental feedback on the wider health system in order to establish the validity of the long-held view that universal feedback would lead to increased service demand. Research should further explore the impact of parent feedback on child growth trajectories over time in order to assess the long-term financial benefit to the NHS and wider health system.

Finally, financial proposals should be developed in order to assess initial set up costs relating to a parent funded programme and ongoing operational expenditure of such a programme in order to determine overall, long term sustainability.

This research has offered a novel perspective on child growth monitoring and has asked parents the value that they place on receiving this information and has asked school leaders whether the concept is feasible. Responses from participants are aligned with previous literature and this serves to validate the current study. The overall findings are positive and are worthy of further exploration and investigation in order to prevent and reduce the society wide impact of long-term weight related illness.

REFERENCES

Adams, W.C. (2015) 'Conducting semi-structured interviews.' Newcomer, K.E., Hatry, H.P. and Wholey, J.S. (ed/s.) *Handbook of practical program evaluation.* 4th ed., California: Jossey-Bass.

Ames, H., Mosdol, N., Blaasvaer, H., Berg, R.C. and Langoien, L.J. (2020) 'Communication of children's weight status: what is effective and what are the children's and parents' experiences and preferences? A mixed methods systematic review.' *BMC Public Health*, 20(574). [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/32345274/

Andrews, M., Pritchett, L. and Woolcock, M. (2016) *Doing iterative and adaptive work.* Center for International Development Working Paper 313. Harvard University: Cambridge. [Online] [Accessed 26th September 2022] https://dash.harvard.edu/bitstream/handle/1/37366345/313_spanish.pdf?sequence=2&isAllowed=y

Bagnall, A., Radley, D., Jones, R., Gately, P., Nobles, J., Van Dijk, M., Blackshaw, J., Montel, S. et al. (2019) 'Whole systems approaches to obesity and other complex public health challenges: a systematic review.' *BMC Public Health*, 19(8). [Online] [Accessed 7th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6318991/

Bandali, S., Style, S., Thiam, L., Omar, O. A., Sabino, A. and Hukin, E. (2022) 'Pathways of change for achieving sustainability results: a tool to facilitate adaptive programming.' *Global Public Health*, 17(3), pp.457-468. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/33406002/

Blake-Lamb, T., Locks, L.M., Perkins, M.E., Woo Baidal, J.A., Cheng, E.R. and Taveras, E.M. (2016) 'Interventions for childhood obesity in the first 1000 days.' *American Journal of Preventative Medicine*, 50(6), pp.780-789. [Online] [Accessed 20th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5207495/

Brannen, J. (2005) 'Mixing methods: the entry of qualitative and quantitative approaches into the research process.' *International Journal of Social Research Methodology*, 8(3), pp.173-184. [Online] [Accessed 26th September 2022] https://www.tandfonline.com/doi/full/10.1080/13645570500154642

Berge, J.M., MacLehose, R., Loth, K.A., Eisenberg, M., Bucchianeri, M.M. and Neumark-Sztainer, D. (2014) 'Parent conversations about healthful eating and weight: associations with adolescent disordered eating behaviors.' *Journal of the American Medical Association*, 167(8), pp.746-753. [Online] [Accessed 20th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3737359/

Berger-Jenkins, E., Jarpe-Ratner, E., Giorgio, M., Squillaro, A., McCord, M. and Meyer, D. (2017) 'Engaging caregivers in school-based obesity prevention initiatives in a predominantly Latino immigrant community: a qualitative analysis.' *Journal of Nutrition Education and*

Behavior, 49(1) pp.53-59. [Online] [Accessed 28th September 2022] https://pubmed.ncbi.nlm.nih.gov/27692629/

Biro, A. and Hellowell, M. (2016) 'Public-private sector interactions and the demand for supplementary health insurance in the United Kingdom.' *Health Policy*, 120(7), pp.840-847. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/27234967/

Booth, E., Halliday, V. and Cooper, R.J. (2021) 'Headteachers' and chairs of governors' perspectives on adolescent obesity and its prevention in English secondary school settings.' *Journal of Public Health*, 43(3) pp. e213-e223. [Online] [Accessed 26th September 2022] https://click.endnote.com/viewer?doi=10.1093%2Fpubmed%2Ffdz151&token=WzM1Mjc0NjUsIjEwLjEwOTMvcHVibWVkL2ZkejE1MSJd.e49Zry2wv9w7ba96ioUBFk1Sukk

Bradbury, D., Chisholm, A., Watson, P.M, Bundy, C., Bradbury, N. and Birtwistle, S. (2018) 'Barriers and facilitators to health care professionals discussing child weight with parents: a meta-synthesis of qualitative studies.' *British Journal of Health Psychology*, 23(3), pp.701-722. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/29700900/

Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology.' *Qualitative Research in Psychology*, 3(2), pp.77-101. [Online] [Accessed 26th September 2022] https://jnoll.nfshost.com/7COM1085-spring-21/readings/Braun_2006_Using.pdf

Bray, M. (2006) 'Private supplementary tutoring: comparative perspectives on patterns and implications.' Compare, 36(4), pp.515-530. [Online] [Accessed 16th September 2022] DOI: 10.1080/03057920601024974

Browne, K. (2005) 'Snowball sampling: using social networks to research non-heterosexual women.' *International Journal of Social Research Methodology,* 8(1), pp. 47-60. [Online] [Accessed 26th September 2022] https://www.tandfonline.com/doi/abs/10.1080/1364557032000081663

Buchanan, E.A. and Hvizdak, E.E. (2009) 'Online survey tools: ethical and methodological concerns of human research ethics committees.' *Journal of Empirical Research on Human Research Ethics*, 4(2), pp.37-48. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/19480590/

Butte, N.F, Garza, C. and de Onis, M. (2007) 'Evaluation of the feasibility of international growth standards for school-aged children and adolescents.' *The Journal of Nutrition*, 137, pp.153-157. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/17182818/

Clarke, J.L., Pallan, M.J., Lancashire, E.R. and Adab, P. (2015) 'Obesity prevention in English primary schools: headteacher perspectives.' Health Promotion International, 32(3) pp.490-499. [Online] [Accessed 28th September 2022] https://academic.oup.com/heapro/article/32/3/490/2950990

Cole, T.J., Freeman, J.V. and Preece, M.A. (1995) 'Body mass index reference curves for the UK, 1990.' *Archives of Disease in Childhood*, 73(1), pp.25–29. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/7639544/

Connelly, L.M. (2008) 'Pilot Studies.' Medsurg Nursing, 17 (6), pp.411-412. [Online] [Accessed 2nd June 2022] https://www.proquest.com/openview/553d762f3224a627486acfbf1a7320e0/1?pq-origsite=gscholar&cbl=30764

Corbin, J. and Morse, J.M. (2003) 'The unstructured interactive interview: issues of reciprocity and risks when dealing with sensitive topics.' *Qualitative Inquiry*, 9(3), pp. 335-354. [Online] [Accessed 26th September 2022] https://journals.sagepub.com/doi/10.1177/1077800403009003001

Cottrell, R.R. and McKenzie, J.F. (2011) *Health promotion and education research methods: using the five chapter thesis/dissertation model*. 2nd ed., United States: Jones and Barlett Publishers.

Creswell, J. W., Klassen, A. C., Plano Clark, V. L. and Clegg Smith, K. (2011) *'Best practices for mixed methods research in the health services.'* Office of Behavioural and Social Sciences Research [Online] [Accessed 31st March 2022] https://obssr.od.nih.gov/sites/obssr/files/Best_Practices_for_Mixed_Methods_Research.pdf

Dam, R., Robinson, H.A., Vince-Cain, S., Heaton, G., Greenstein, A., Sperrin, M. and Hassan, L. (2019) 'Engaging parents using web-based feedback on child growth to reduce childhood obesity: a mixed methods study.' *BMC Public Health*, 19:300. [Online] [Accessed 26th September 2022] https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-6618-3

Davies, R. (2013) '*Planning Evaluability Assessments: a synthesis of the literature with recommendations.'* Department for International Development Working Paper no. 40 [Online] [Accessed 27th January 2022] https://www.researchgate.net/publication/333893771_PLANNING_EVALUABILITY_ASSESSMENTS_A_SYNTHESIS_OF_THE_LITERATURE_WITH_RECOMMENDATIONS_Report_of_a_study_commissioned_by_the_Department_for_International_Development_Planning_Evaluability_Assessments_A_

De Bekker-Grob, E.W., Donkers, B., Jonker, M.F. and Stolk, E.A. (2015) 'Sample size requirements for discrete-choice experiments in healthcare: a practical guide.' *The Patient-Patient-Centred Outcomes Research,* 8 pp.373-384. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/25726010/

De Onis, M., Garza, C., Victora, C.G., Onyango, A.W., Frongillo, E.A. and Martines, J. (2004) 'The WHO multicentre growth reference study: planning, study design, and methodology.' *Food and Nutrition Bulletin*, volume 25 (1), S1. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/15069916/

Department of Health. (no date) *Measuring childhood obesity; guidance to Primary Care Trusts*. London. [Online] [Accessed 11th February 2022] https://dera.ioe.ac.uk/5832/1/dh_4126406.pdf

Department of Health. (2004) *Choosing health: making healthy choices easier.* Cm 6374, London: HMSO. [Online] [Accessed on 1st December 2021] https://webarchive.nationalarchives.gov.uk/ukgwa/+/dh.gov.uk/en/publicationsandstatistics/publications/publicationspolicyandguidance/dh_4094550

Department of Health. (2007) *The National Child Measurement Programme. Guidance for PCTs: 2007-08 school year.* London: Department of Health [Online] [Accessed on 1st December 2021] https://dera.ioe.ac.uk/6713/6/A9R817D.pdf

Department of Health. (2008) *Explanatory memorandum to the National Child Measurement Programme regulations 2008*. No. 3080. [Online] [Accessed on 1st December 2021] https://www.legislation.gov.uk/uksi/2008/3080/pdfs/uksiem_20083080_en.pdf

Department of Health. (2008) *Healthy weight, healthy lives: a cross government strategy for England.* London: Department of Health [Online] [Accessed on 1st December 2021] https://webarchive.nationalarchives.gov.uk/ukgwa/20100407220245/http:/www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_084024.pdf

Department of Health. (2008) *National Child Measurement Programme:2006/07 school year, headline results.* London: Department of Health. [Online] [Accessed on 15th December 2021] https://digital.nhs.uk/data-and-information/publications/statistical/national-child-measurement-programme/2006-07-school-year

Department of Health. (2008) *National Child Measurement Programme:2007/08 school year, headline results.* London: Department of Health. [Online] [Accessed on 10th February 2022] https://dera.ioe.ac.uk/8981/1/NCMP%202007-08%20Report.pdf

Department of Health. (2009) *National Child Measurement Programme:2008/09 school year.* London: Department of Health. [Online] [Accessed on 10th February 2022] http://data.parliament.uk/DepositedPapers/Files/DEP2010-0516/DEP2010-0516.pdf

Department of Health. (2009) *Healthy Child Programme - Pregnancy and the first five years of life*. London: Department of Health. [Online] [Accessed on 10th February 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/167998/Health_Child_Programme.pdf

Department of Health. (2011) *Healthy lives, healthy people: a call to action on obesity in England*. London: Department of Health. [Online] [Accessed on 24th January 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/213720/dh_130487.pdf

Department of Health. (2011) *National Child Measurement Programme: operational guidance for the 2011/12 school year*. [Online] [Accessed 15th September 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/147182/dh_131475.pdf.pdf

Department of Health. (2014) *Five year forward view*. London: Department of Health [Online] [Accessed on 6th February 2022] https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf

Department of Health. (2017) *Next steps on the NHS five year forward view*. London: Department of Health [Online] [Accessed on 6th February 2022] https://www.england.nhs.uk/wp-content/uploads/2017/03/NEXT-STEPS-ON-THE-NHS-FIVE-YEAR-FORWARD-VIEW.pdf

Department of Health and Social Care. (2017) *Childhood obesity: a plan for action.* [Online] [Accessed 28th September 2022] https://www.gov.uk/government/publications/childhood-obesity-a-plan-for-action/childhood-obesity-a-plan-for-action

Department of Health and Social Care. (2019) *Government response to the House of Commons Health and Social Care Select Committee report on childhood obesity: time for action, eight report of session 2017-2019*. London: HMSO [Online] [Accessed 24th January 2022] https://www.parliament.uk/globalassets/documents/commons-committees/Health/Correspondence/2017-19/Childhood-obesity-Government-Response-to-eighth-report-17-19.pdf

Department of Health and Social Care. (2020) *Tackling obesity: empowering adults and children to live healthier lives.* [Online] [Accessed 16th January 2022] https://www.gov.uk/government/publications/tackling-obesity-government-strategy/tackling-obesity-empowering-adults-and-children-to-live-healthier-lives

Department of Health and Social Care. (2022) '*National child measurement programme: operational guidance 2022*.'. [Online] [Accessed 7th September 2022] https://www.gov.uk/government/publications/national-child-measurement-programme-operational-guidance/national-child-measurement-programme-operational-guidance-2022

Department of Health Obesity Team. (2012) *National Child Measurement Programme: operational guidance for the 2012/13 school year*. [Online] [Accessed 24th January 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/146720/dh_133677.pdf.pdf

DesRoches, C.M., Barrett, K.A., Harvey, B.E., Kogan, R., Reschovsky, J.D., Landon, B.E., Casalino, L.P., Shortell, S.M. and Rich, E.C. (2015) 'The results are only as good as the sample: assessing three national physician sampling frames.' *Journal of General Internal Medicine*, 30(supplement 3), pp.595-601. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/26105676/

Doolen, J., Alpert, P.T. and Miller, S.K. (2009) 'Parental disconnect between perceived and actual weight status of children: a metasynthesis of the current research.' *Journal of the American Academy of Nurse Practitioners*, 21(3) pp.160-166. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/19302692/

Estabrooks, P.A., Brownson, R.C. and Pronk, N.P. (2018) 'Dissemination and implementation science for public health professionals: an overview and call to action.' *Preventing Chronic Disease*, 15, E162. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/30576272/

Estacio, E. V., Oliver, M., Downing, B., Kurth, J. and Protheroe, J. (2017) 'Effective partnership in community-based health promotion: lessons from the Health Literacy Partnership.' *International Journal of Environmental Research and Public Health*, 14, 1550. [Online] [Accessed 26th September 2022] DOI: 10.3390/ijerph14121550

Falconer, C.L., Park, M.H., Croker, H., Skow, A., Black, J., Saxena, S., Kessel, A.S., Karlsen, S. et al. (2014) 'The benefits and harms of providing parents with weight feedback as part of the national child measurement programme: a prospective cohort study.' *BMC Public Health*, 14, 549. [Online] [Accessed 26th September 2022] DOI: 10.1186/1471-2458-14-549

Fatemi, M., Murray, R. and Langley, T. (2021) 'Public acceptance of obesity prevention policies in the UK.' *Journal of Cancer Policy*, 27:100256. [Online] [Accessed 28th September 2022] https://pubmed.ncbi.nlm.nih.gov/35559933/

Fenton, P., Ocasio-Stoutenburg, L. and Harry, B. (2017) 'The power of parent engagement: sociocultural considerations in the quest for equity.' *Theory Into Practice*, 56(3), pp.214-225. [Online] [Accessed 16th September 2022] DOI: 10.1080/00405841.2017.1355686.

Fetters, M.D., Curry, L.A. and Creswell, J.W. (2013) 'Achieving integration in mixed methods designs - principles and practices.' *Health Services Research*, 48(6) pp.2134–56. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/24279835/

Firman, N., Boomla, K., Hudda, M.T., Robson, J., Whincup, P. and Dezateux, C. (2020) 'Is child weight status correctly reported to parents? Cross-sectional analysis of National Child Measurement Programme data using ethnic-specific BMI adjustments.' *Journal of Public Health*, 42(4), pp. e541-e550. [Online] [Accessed 27th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7685848/

Fowler Jr., F. J. and Cosenza, C. (2008) 'Design and evaluation of survey questions.' *In* Bickman, L. and Rog, D. J. (eds.) *The sage handbook of applied social research methods.* Unknown: SAGE Publications, pp.375-409.

Freeman, J.V., Cole, T.J., Chinn, S., Jones, P.R.M., White, E.M. and Preece, M.A. (1995) 'Cross sectional stature and weight reference curves for the UK, 1990.' *Archives of Disease in Childhood*, 73 pp.17-24. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/7639543/

Gainsbury, A. and Dowling, S. (2018) 'A little bit offended and slightly patronised': parents' experiences of National Child Measurement Programme feedback.' *Public Health Nutrition*, 21(15) pp. 2884-2892. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/29914583/

Gehlburg, H. and Artino, A.R. (2017) 'The survey checklist (manifesto).' *Academic Medicine*, 93 (3) pp. 360-365. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/29210756/

Gillison, F., Beck, F. and Lewitt, J. (2013) 'Exploring the basis for parents' negative reactions to being informed that their child is overweight.' *Public Health Nutrition*, 17(5) pp. 987-997. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/24060095/

Gorard, S. (2012) 'Who is eligible for free school meals? Characterising free school meals as a measure of disadvantage in England.' *British Educational Research Journal*, 38(6) pp.1003-1017. [Online] [Accessed 26th September 2022] https://www.tandfonline.com/doi/abs/10.1080/01411926.2011.608118

Gray, L.A., Hernandez Alava, M., Kelly, M.P. and Campbell, M.J. (2018) 'Family Lifestyle dynamics and childhood obesity: evidence from the millennium cohort study.' *BMC Public Health*, 18:500. [Online] [Accessed 26th September 2022] https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-018-5398-5

Greater Manchester Combined Authority and Association of Greater Manchester Authorities. (2013) *Stronger together: Greater Manchester strategy 2013*. [Online] [Accessed on 6th February 2022] https://www.greatermanchester-ca.gov.uk/media/1683/gm_strategy_stronger_together.pdf

Greater Manchester Combined Authority. (2018) *Greater Manchester children and young people – health and wellbeing framework*. [Online] [Accessed 30th May 2022] https://www.gmhsc.org.uk/wp-content/uploads/2018/10/Greater-Manchester-Childrens-and-Young-People-Health-and-Wellbeing-Framework-2018-2022-Final-Print.pdf

Greater Manchester Combined Authority. (2018) *Our people, our place*. [Online] [Accessed on 6th February 2022] https://www.greatermanchester-ca.gov.uk/what-we-do/greater-manchester-strategy/

Greater Manchester Combined Authority. (2021) *Census 2021: first results*. [Online] [Accessed 20th September 2022] https://www.greatermanchester-ca.gov.uk/what-we-do/research/research-demographics/census-2021-first-results/

Grover, S., Rempel, P., Joseph, L., Dawes, M., Lau, D., Lowensteyn, I. and Kaouache, M. (2014) 'The lifetime burden of obesity: estimating the healthy years lost from diabetes and cardiovascular disease.' *Canadian Journal of Diabetes*, 38(5) pp. S20-S24. [Online] [Accessed 26th September 2022] https://www.canadianjournalofdiabetes.com/article/S1499-2671(14)00344-X/fulltext

Grover, S., Kaouache, M., Rempel, P., Joseph, L., Dawes, M., Lau, D.C.W. and Lowensteyn, I. (2015) 'Years of life lost and healthy life-years lost from diabetes and cardiovascular disease in overweight and obese people: a modelling study.' *Lancet Diabetes Endocrinology*, 3(2) pp.114-122. [Online] [Accessed 28th September 2022] https://pubmed.ncbi.nlm.nih.gov/25483220/

Gruen, R.L., Elliott, J.H., Nolan, M.L., Lawton, P.D., Parkhill, A., McLaren, C.J. and Lavis, J.N. (2008) 'Sustainability science: an integrated approach for health-programme planning.' *Lancet*, 372 pp.1579-1589. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/18984192/

Guest, G., Bunce, A. and Johnson, L. (2006) 'How many interviews are enough?: an experiment with data saturation and variability.' *Field Methods*, 18(1) pp.59-82. [Online] [Accessed 26th September 2022] https://journals.sagepub.com/doi/abs/10.1177/1525822X05279903?journalCode=fmxd

Guest, G. and Fleming, P. (2015) 'Mixed methods research' *In* Guest, G. and Namey, E. (eds.) *Public health research methods*. Unknown: SAGE Publications, pp. 581-610. [Online] [Accessed 26th September 2022] https://journals.sagepub.com/doi/abs/10.1177/1525822X05279903?journalCode=fmxd

Guh, D.P., Zhang, W., Banback, N., Amarsi, Z., Birmingham, C.L. and Anis, A.H. (2009) 'The incidence of co-morbidities related to obesity and overweight: a systematic review and meta-analysis.' *BMC Public Health*, 9(88). [Online] [Accessed 26th September 2022] https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-9-88

Haas, J.D. and Campirano, F. (2006) 'Interpopulation variation in height among children 7 to 18 years of age.' *Food and Nutrition Bulletin*, 27(4), pp. S212-S223. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/17361658/

Health Education England. (2012) *World class education and training, for world class healthcare: introducing Health Education England*. Gateway reference 17574. [Online] [Accessed 24th January 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/212797/Introducing-Health-Education-England-accessible-version.pdf

Hertfordshire NHS Foundation Trust. (no date) *Self-weighing. A guide to self-weighing your baby/infant*. [Online] [Accessed 14th September 2022] https://www.hct.nhs.uk/media/3980/doc-6-self-weigh-leaflet-v2.pdf

HM Government. (No date) *Find and compare schools in England*. [Online] [Accessed 8th April 2022] https://www.gov.uk/school-performance-tables?_ga=2.129903116.168620919.1649409479-1899271526.1638190745

HM Government. (2010) *Healthy lives, healthy people: our strategy for public health in England*. London: HMSO [Online] [Accessed on 24th January 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/216096/dh_127424.pdf

HM Government. (2016) *Childhood obesity: a plan for action*. HM Government, 10800. [Online] [Accessed 24th January 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/546588/Childhood_obesity_2016__2__acc.pdf

HM Government. (2018) *Childhood obesity: a plan for action, chapter 2*. HM Government, 10800. [Online] [Accessed 12th February 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718903/childhood-obesity-a-plan-for-action-chapter-2.pdf

House of Commons Health Committee. (2004) *Obesity. Third report of session 2003-04.* HC 23-1, London: HMSO. [Online] [Accessed 1st October 2022] https://publications.parliament.uk/pa/cm200304/cmselect/cmhealth/23/2302.htm

House of Commons Health Committee. (2015) *Childhood obesity-brave and bold action*. HC 465, London: HMSO. [Online] [Accessed 18th January 2022] https://publications.parliament.uk/pa/cm201516/cmselect/cmhealth/465/465.pdf

House of Commons Health and Social Care Committee. (2018) *Oral evidence: childhood obesity*. HC 882. [Online] [Accessed 10th January 2022] http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/health-and-social-care-committee/childhood-obesity/oral/82415.pdf

IBM Corporation. (2020) *IBM SPSS Statistics for Windows*. Version 27.0. [Software] Armonk, New York: IBM Corporation. [Accessed 10th August 2022]

In, J. (2017) 'Introduction of a pilot study.' *Korean Journal of Anesthesiology,* 70 (6), pp.601-605. [Online] [Accessed 2nd June 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5716817/

Institute of Fiscal Studies. (2021) *NHS funding boost should be enough to meet pressures over the next two years, but not in the medium term*. [Online] [Accessed 24th January 2022] https://ifs.org.uk/publications/15607

Ireson, J. (2004) 'Private tutoring: how prevalent and effective is it?' *London Review of Education*, 2(2). [Online] [Accessed 26th September 2022] https://www.researchgate.net/publication/44836264_Private_tutoring_How_prevalent_and_effective_is_it#:~:text=The%20results%20of%20the%20study,the%20situation%20may%20be%20different.

Isohookana, R., Marttunen, M., Hakko, H., Riipinen, P. and Riala, K. (2016) 'The impact of adverse childhood experiences on obesity and unhealthy weight control behaviors among adolescents.' *Comprehensive Psychiatry*, 71, pp.17-24. [Online] [Accessed 20th September 2022] https://helda.helsinki.fi/bitstream/handle/10138/228690/The_impact_of_adverse_childhood_experiences.pdf?sequence=1

Ivers, N.M., Sales, A., Colquhoun, H., Michie, S., Foy, R., Francis, J.J. and Grimshaw, J.M. (2014) 'No more 'business as usual' with audit and feedback interventions: towards an agenda for a reinvigorated intervention.' *Implementation Science*, 9 (14). [Online] [Accessed 13th September 2022] https://link.springer.com/article/10.1186/1748-5908-9-14

Jamshed, S. (2014) 'Qualitative research method-interviewing and observation.' *Journal of Basic and Clinical Pharmacy*, 5 (4) pp.87-88. [Online] [Accessed on 26th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4194943/

Jeffery, A.N., and Voss, L.D. (2007) 'Weighing in at school? The value of routine school based measurements in the fight against obesity.' *Practical Diabetes International*, 24(7) pp.335–336. [Online] [Accessed on 26th September 2022] https://onlinelibrary.wiley.com/doi/10.1002/pdi.1135

Johnson, P.H. and Kittleson, M.J. (2000) 'A content analysis of health education teaching strategy/idea articles: 1970-1998.' *Journal of Health Education*, 31(5) pp.292-298. [Online] [Accessed on 26th September 2022] https://www.tandfonline.com/doi/abs/10.1080/10556699.2000.10604706

Khanna, D., Peltzer, C., Kahar, P. and Parmar, M. S. (2022) 'Body mass index (BMI0: a screening tool analysis.' *Cureus*, 14(2), e22119. [Online] [Accessed on 12th February 2022] https://assets.cureus.com/uploads/review_article/pdf/84377/20220211-14018-1l8dgpk.pdf

King, P. (2021) 'How have after-school clubs adapted in the United Kingdom post-March lockdown?' *Journal of Childhood, Education & Society*, 2(2), pp.106-116. [Online] [Accessed on 26th September 2022] https://www.j-ces.com/index.php/jces/article/view/100

Kirchherr, J. and Charles, K. (2018) 'Enhancing the sample diversity of snowball samples: recommendations from a research project on anti-dam movements in Southeast Asia.' *PLoS ONE*, 13(8), e0201710. [Online] [Accessed on 26th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6104950/

Kovacs, B.E., Gillison, F.B. and Barnett, J.C. (2018) 'Is children's weight a public health or a family issue? A qualitative analysis of online discussion about National Child Measurement Programme feedback in England.' *BMC Public Health*, 18:1295. [Online] [Accessed 18th September 2022] https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-018-6214-y

Kreuter, M.W. and Bernhardt, J.M. (2009) 'Reframing the dissemination challenge: a marketing and distribution perspective.' *American Journal of Public Health*, 99(12) pp.2123-2127. [Online] [Accessed on 26th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2775768/

Krosnick, J.A. and Presser, S. (2010) 'Question and questionnaire design' *In* Marsden, P.V. and Wright, J.D. (ed.) *Handbook of survey research.* 2nd ed., Emerald Group Publishing ltd., pp. 263-313.

Lanscar, E. and Louviere, J. (2008) 'Conducting discrete choice experiments to inform healthcare decision making: A user's guide.' *Pharmacoeconomics*, 26(8) pp.661-677. [Online] [Accessed on 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/18620460/

Laraway, K.A., Birch, L.L., Shaffer, M.L. and Paul, I.M. (2010) 'Parent perception of healthy infant and toddler growth.' *Clinical Pediatrics*, 49 (4) pp.343-349. [Online] [Accessed on 26th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3623679/

Lasker, R. D., Weiss, E. S. and Miller, R. (2001) 'Partnership synergy: a practical framework for studying and strengthening the collaborative advantage.' *The Milbank Quarterly*, 79(2) pp. 179-205. [Online] [Accessed on 26th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2751192/pdf/milq_203.pdf

Littlecott, H. J., Fox, K. R., Stathi, A. and Thompson, J. L. (2017) 'Perceptions of success of a local UK public health collaborative.' *Health Promotion International*, 32 pp.102-112. [Online] [Accessed on 26th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5444252/

Malmqvist, J., Hellberg, K., Mollas, G., Rose, R. and Shevlin, M. (2019) 'Conducting the pilot study: a neglected part of the research process? Methodological findings supporting the importance of piloting in qualitative research studies.' *International Journal of Qualitative Methods*, 18, pp. 1-11. [Online] [Accessed on 26th September 2022] https://journals.sagepub.com/doi/full/10.1177/1609406919878341

Manji, K., Hanefeld, J., Vearey, J., Walls, H. and de Gruchy, T. (2021) 'Using WhatsApp messenger for health systems research: a scoping review of available literature.' *Health Policy and Planning*, 36, pp. 774-789. [Online] [Accessed on 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/33860314/

Mansoor, Y. and Hale, I. (2021) 'Parent perceptions of routine growth monitoring: a scoping review.' *Paediatrics and Child Health*, 26(3) pp.154-158. [Online] [Accessed on 26th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8077212/

Mayan, M. J. and Daum, C. H. (2016) 'Worth the risk? Muddled relationships in community-based participatory research.' *Qualitative Health Research*, 26(1) pp.69-76. [Online] [Accessed on 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/26612889/

Mears, R., Jago, R., Sharp, D., Patel, A., Kipping, R. and Shield, J.P.H. (2019) 'Exploring how lifestyle weight management programmes for children are commissioned and evaluated in England: a mixed methodology study.' *BMJ Open*, 9, e025423. [Online] [Accessed on 26th September 2022] https://bmjopen.bmj.com/content/9/12/e025423

McColl, E., Jacoby, A., Thomas, L., Soutter, J., Bamford, C., Steen, N., Thomas, R., Harvey, E. et al. (2001) 'Design and use of questionnaires: a review of best practice applicable to surveys of health service staff and patients.' *Health Technology Assessment*, 5(31). [Online] [Accessed on 7th August 2022] https://www.academia.edu/25804234/Design_and_use_of_questionnaires_a_review_of_best_practice_applicable_to_surveys_of_health_service_staff_and_patients?auto=citations&from=cover_page

Ming Wen, L., Rissel, C. and He, G. (2017) 'The effect of early life factors and early interventions on childhood overweight and obesity 2016.' *Journal of Obesity*. DOI 10.1155/2017/3642818 [Online] [Accessed 20th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5316452/

Murano, M.C., Feldt, M.M. and Lantos, J.D. (2020) 'Parental concerns on short stature: a 15 years follow-up.' *The Journal of Pediatrics*, 220, pp.237-240. [Online] [Accessed on 26th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7186152/

Muttock, S. and Butcher, J. (2005) *A report for the Children's Commissioner's Office on NCB's consultations with primary school children on measuring children's height and weight in school*. National Children's Bureau *In* Department of Health. (ed.) Measuring childhood obesity; guidance to Primary Care Trusts. London. [Online] [Accessed on 26th September 2022] https://dera.ioe.ac.uk/5832/1/dh_4126406.pdf

National Audit Office. (2020) *Childhood Obesity*. [Online] [Accessed on 5th September 2022] https://www.nao.org.uk/wp-content/uploads/2020/09/childhood-obesity.pdf

NHS (2019) *What is the body mass index (BMI)?* [Online] [Accessed 3rd August 2022] https://www.nhs.uk/common-health-questions/lifestyle/what-is-the-body-mass-index-bmi/

NHS (2020) *Your baby's weight and height*. [Online] [Accessed 9th February 2022] https://www.nhs.uk/conditions/baby/babys-development/height-weight-and-reviews/baby-height-and-weight/

NHS. (2021) Hearing tests for children. [Online] [Accessed 8th September 2022] https://www.nhs.uk/conditions/hearing-tests-children/

NHS Digital. (2018) *National Child Measurement Programme, England 2017/18 School Year*. Unknown place of publication: NHS Digital. [Online] [Accessed on 10th February 2022] https://digital.nhs.uk/data-and-information/publications/statistical/national-child-measurement-programme/2017-18-school-year/introduction-footnotes

NHS Digital. (2019) *National Child Measurement Programme, England 2018/19 School Year*. Unknown place of publication: NHS Digital. [Online] [Accessed on 10th February 2022] https://digital.nhs.uk/data-and-information/publications/statistical/national-child-measurement-programme/2018-19-school-year/data-quality

NHS Digital. (2020) *National Child Measurement Programme, England 2019/20 School Year*. Unknown place of publication: NHS Digital. [Online] [Accessed on 9th April 2021] https://digital.nhs.uk/data-and-information/publications/statistical/national-child-measurement-programme/2019-20-school-year/age

NHS Digital. (2021) *National Child Measurement Programme, England 2020/21 School Year.* Unknown place of publication: NHS Digital. [Online] [Accessed 14th February 2022] https://digital.nhs.uk/data-and-information/publications/statistical/national-child-measurement-programme/2020-21-school-year/introduction

NHS England. (no date) *Complications from excess weight (CEW) clinics for children*. [Online] [Accessed 8th September 2022] https://www.england.nhs.uk/get-involved/cyp/specialist-clinics-for-children-and-young-people-living-with-obesity/

NHS England and NHS Improvement. (2020) *COVID-19 restoration of community health services for children and young people: second phase of NHS response*. London: NHS England and NHS Improvement. [Online] [Accessed on 1st December 2021] https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/C0552-Restoration-of-Community-Health-Services-Guidance-CYP-version-3-June-2020-1.pdf

NHS Hampshire Child and Adolescent Mental Health Service. (2021) *Eating difficulties*. [Online] [Accessed on 15th December 2021] https://hampshirecamhs.nhs.uk/issue/eating-difficulties-professionals/

NHSX. (2021) *Digital health partnership award application information*. [Online] [Accessed 16th January 2022] https://www.nhsx.nhs.uk/key-tools-and-info/digital-health-partnership-award/digital-health-partnership-award-application-information/

NHSX. (2021) *NHSX annual report 2020 to 2021*. [Online] [Accessed 16th January 2022] https://www.nhsx.nhs.uk/about-us/nhsx-annual-report-2020-to-2021/

National Institute for Health and Care Excellence. (2022) *Obesity: identification and classification of overweight and obesity. Draft for consultation, April 2022*. National Institute for Health and Care Excellence. [Online] [Accessed 27th September 2022] https://www.nice.org.uk/guidance/cg189/documents/draft-guideline

Nihiser, A.J., Lee, S.M., Wechsler, H., McKenna, M., Odom, E., Reinold, C., Thompson, D. and Grummer-Strawn, L. (2007) 'Body mass index measurement in schools.' *Journal of School Health*, 77 (10), pp.651-671. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/18076411/

Nnyanzi, L. A., Summerbell, C. D., Ells, L. and Shucksmith, J. (2016) 'Parental response to a letter reporting child overweight measured as part of a routine national programme in England: results from interviews with parents.' *BMC Public Health*, 16:846. [Online] [Accessed 26th September 2022] https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-3481-3

O'Donnell, J.E., Foskett-Tharby, R. and Gill, P.S. (2017) 'General practice views of managing childhood obesity in primary care: a qualitative analysis.' *Journal of the Royal Society of Medicine Open*, 8(6) pp.1-9. [Online] [Accessed 26th September 2022] https://journals.sagepub.com/doi/pdf/10.1177/2054270417693966

Ofcom. (2021) *Online nation*. [Online] [Accessed 2nd June 2022] https://www.ofcom.org.uk/__data/assets/pdf_file/0013/220414/online-nation-2021-report.pdf

Office for Health Improvement and Disparities. (2022) *Local authority health profiles*. [Online] [Accessed 30th May 2022] https://fingertips.phe.org.uk/profile/health-profiles

Office for Standards in Education, Children's Services and Skills. (2018) *Obesity, healthy eating and physical activity in primary schools.* Manchester: OFSTED. [Online] [Accessed on 15th December 2021] https://www.gov.uk/government/publications/obesity-healthy-eating-and-physical-activity-in-primary-schools

Ogilvie, D., Cummins, S., Petticrew, M., White, M., Jones, A. and Wheeler, K. (2011) 'Assessing the evaluability of complex public health interventions: five questions for researchers, funders and policymakers.' *The Milbank Quarterley*, 89(2) pp. 206-225. [Online] [Accessed 26th September 2022] https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1468-0009.2011.00626.x

Paina, L. and Peters, D. H. (2012) 'Understanding pathways for scaling up health services through the lens of complex adaptive systems.' *Health Policy and Planning*, 27, pp.365-373. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/21821667/

Porter, M. E. (2010) 'Measuring health outcomes: the outcome hierarchy.' *In* Porter, M. E. (ed.) *What is value in health care?* Appendix 2., *The New England journal of Medicine,* 363 pp. 2477-2481.

Prebeg, Z. (1998) 'Changes in growth patterns in Zagreb school children related to socioeconomic background over the period.' *Annals of Human Biology*, 25(5) pp.425-439. [Online] [Accessed 26th September 2022] https://pubmed.ncbi.nlm.nih.gov/9741486/

Prochaska, J.O. and DiClemente, C.C. (1983) 'Stages and processes of self-change of smoking: toward an integrative model of change.' *Journal of Consulting and Clinical Psychology,* 51(3) pp.390-395. [Online] [Accessed 26th September 2022] https://cpb-eu-w2.wpmucdn.com/mypad.northampton.ac.uk/dist/5/6345/files/2016/05/Stages-of-Change-Prochaska-1983-typs6q.pdf

Propper, C., Rees, H. and Green, K. (2001) 'The demand for private medical insurance in the UK: a cohort analysis.' *The Economic Journal*, 111, pp.C180-C200. [Online] [Accessed 26th September 2022] https://www.jstor.org/stable/2667837

Public Health England. (2013) *National Child Measurement Programme: operational guidance for the 2013/14 school year*. London: Public Health England. [Online] [Accessed 15th September 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/231043/NCMP_guidance_201314.pdf

Public Health England. (2017) *Health matters: obesity and the food environment.* London: Public Health England. [Online] [Accessed 13th September 2022] https://www.gov.uk/government/publications/health-matters-obesity-and-the-food-environment/health-matters-obesity-and-the-food-environment--2

Public Health England. (2017) *Let's talk about weight: a step-by-step guide to conversations about weight management with children and families for health and care professionals*. London: Public Health England. [Online] [Accessed 20th September 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/649095/child_weight_management_lets_talk_about_weight.pdf

Public Health England. (2018) *Standard Evaluation Framework for Weight Management Interventions*. London: Public Health England. [Online] [Accessed on 11th February 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/685545/SEF_weight_management_interventions.pdf

Public Health England. (2019) *Child vision screening: Guidance service specification*. [Online] [Accessed 8th September 2022] https://www.gov.uk/government/publications/child-vision-screening/service-specification

Public Health England. (2020) *National Child Measurement Programme – operational guidance 2020*. London: Public Health England. [Online] [Accessed on 16th September 2022] https://dera.ioe.ac.uk//36714/1/NationaChild_Measurement_Programme_operational_guidance_2020.pdf

Public Health England. (2021) *Best start in life and beyond. Improving public health outcomes for children, young people and families*. [Online] [Accessed 14th September 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1011409/Commissioning_guidance_for_FNP.pdf

Public Health England. (2021) *Guidance: child and family weight management services grant*. [Online] [Accessed 16th January 2022] https://www.gov.uk/government/publications/child-and-family-weight-management-services-grant-apply-for-funding/guidance-child-and-family-weight-management-services-grant#annex-b

Public Health England. (2021) *National Child Measurement Programme – operational guidance 2021*. London: Public Health England. [Online] [Accessed on 1st December 2021] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1016653/National_Child_Measurement_Programme_operational_guidance_2021.pdf

Puhl, R.M. and Heuer, C.A. (2010) 'Obesity stigma: important considerations for public health.' *American journal of Public Health*, 100(6) pp.1019-1028. [Online] [Accessed 25th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2866597/

Puhl, R.M., Peterson, J.L. and Luedicke, J. (2011) 'Parental perceptions of weight terminology that providers use with youth.' *Pediatrics*, 128(4) pp. e786-e793. [Online] [Accessed 27th September 2022] https://pubmed.ncbi.nlm.nih.gov/21949145/

Puhl, R.M. and Himmelstein, M.S. (2018) 'Adolescent preferences for weight terminology used by health care providers.' *Pediatric Obesity*, 13, pp.533-540. [Online] Accessed 27th September 2022] https://click.endnote.com/viewer?doi=10.1111%2Fijpo.12275&token=WzM1Mjc0NjUsIjEwLjExMTEvaWpwby4xMjI3NSJd.udwuPuuUNmmvUpqx_xup95XqZlQ

PwC. (2016) *More for less: five steps to strategic cost reduction*. [Online] [Accessed 7th September 2022] https://www.pwc.com/gx/en/insurance/publications/firing-on-all-cylinders-five-steps-to-strategic-cost-reduction.pdf

Rietmeijer-Mentink, M., Paulis, W.D., Van Middelkoop, M., Bindels, P.J.E. and Van der Wouden, J.C. (2013) 'Difference between parental perception and actual weight status of children: a systemic review.' *Maternal and Child Nutrition*, 9(1) pp. 3-22. [Online] [Accessed 25th September 2022] https://pubmed.ncbi.nlm.nih.gov/23020552/

Robinson, H. A., Dam, R., Hassan, L., Jenkins, D., Buchan, I. and Sperrin, M. (2019) 'Post-2000 growth trajectories in children aged 4-11 years: a review and quantitative analysis.' Preventative Medicine Reports, 14, 100834. [Online] [Accessed 25th September 2022] https://www.sciencedirect.com/science/article/pii/S2211335519300233

Rodriguez, M. and Stoyanova, A. (2004) 'The effect of private insurance access on the choice of GP/specialist and public/private provider in Spain.' *Health Economics*, 13, pp. 689-703. [Online] [Accessed 25th September 2022] https://pubmed.ncbi.nlm.nih.gov/15259047/

Royal College of Paediatric and Child Health. (No date) *Personal child health record (PCHR).* [Online] [Accessed 8th April 2022] https://www.rcpch.ac.uk/resources/personal-child-health-record-pchr#:~:text=The%20Personal%20Child%20Health%20Record,PCHR%20is%20constantly%20under%20review.

Royal College of Paediatric and Child Health. (No date) *Body mass index (BMI) chart*. [Online] [Accessed 3rd August 2022] https://www.rcpch.ac.uk/resources/body-mass-index-bmi-chart

Royal College of Paediatric and Child Health. (2017) *State of Child Health*. [Online] [Accessed 10th February 2022] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/167998/Health_Child_Programme.pdf

Royal College of Paediatric and Child Health. (2019) *The case for investing in early childhood interventions*. [Online] [Accessed on 10th February 2022] https://www.rcpch.ac.uk/sites/default/files/generated-pdf/document/The-case-for-investing-in-early-childhood-interventions.pdf

Royal College of Paediatrics and Child Health. (No date) *Growth charts* [Online] [Accessed on 9th February 2022] https://www.rcpch.ac.uk/resources/growth-charts

Royal College of Paediatrics and Child Health. (No date) *UK-WHO growth charts – 2-18years* [Online] [Accessed on 15th December 2021] https://www.rcpch.ac.uk/resources/uk-who-growth-charts-2-18-years

Rudolph, M. (2009) *Tackling obesity through the Healthy Child Programme: a framework for action*. University of Leeds. [Online] [Accessed 28th September 2022] https://www.henry.org.uk/sites/www.henry.org.uk/files/2017-11/Framework-for-Action-tackling-child-obesity-through-the-Healthy-Child-Programme.pdf

Sandelowski, M. (1995) ‘Sample size in qualitative research.’ *Research in Nursing and Health*, 18 pp.179-183. [Online] [Accessed 25th September 2022] https://onlinelibrary.wiley.com/doi/10.1002/nur.4770180211

Scheirer, M.A. (2005) ‘Is sustainability possible? A review and commentary on empirical studies of program sustainability’. *American Journal of Evaluation,* 26 pp.320–347. [Online] [Accessed 25th September 2022] https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.464.3880&rep=rep1&type=pdf

Scheirer, M. A. and Dearing, J. W. (2011) 'An agenda for research on the sustainability of public health programs.' *American Journal of Public Health*, 101(11) pp.2059-2067. [Online] [Accessed 25th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3222409/

Schell, S.F., Luke, D.A., Schooley, M.W., Elliott, M.B., Herbers, S.H., Mueller, N.B. and Bunger, A.C. (2013) ‘Public health program capacity for sustainability: a new framework.’ *Implementation Science*, 8 (15). [Online] [Accessed 25th September 2022] https://doi.org/10.1186/1748-5908-8-15

Schroeder, K., Schuler, B.R., Kobulsky, J.M. and Sarwer, D.B. (2021) ‘The association between adverse childhood experiences and childhood obesity: a systematic review.’ *Obesity Reviews*, 22(7), e13204. [Online] [Accessed 20th September 2022] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8192341/

Shediac-Rizkallah, M.C. and Bone, L.R. (1998) 'Planning for the sustainability of community-based health programs: conceptual frameworks and future directions for research, practice and policy.' *Health Education Research*, 13 pp. 87–108. [Online] [Accessed 25th September 2022] https://pubmed.ncbi.nlm.nih.gov/10178339/

Simmonds, M., Llewellyn, A., Owen, C. G. and Woolacott, N. (2016) 'Predicting adult obesity from childhood obesity: a systematic review and meta-analysis.' *Obesity reviews*, 17(2) pp. 95-107. [Online] [Accessed 25th September 2022] https://eprints.whiterose.ac.uk/94942/1/Simmonds_et_al_2015_Obesity_Reviews.pdf

Smith, Z. (2007) 'Faltering growth.' *In* Shaw, V. and Lawson, M. (ed.) *Clinical paediatric dietetics*. 3rd ed., Oxford: Blackwell, pp. 556-565.

Stansfield, J., South, J. and Mapplethorpe, T. (2020) 'What are the elements of a whole system approach to community-centred public health? A qualitative study with public health leaders in England's local authority areas.' *BMJ Open*, 10, e036044. [Online] [Accessed 25th September 2022] https://bmjopen.bmj.com/content/10/8/e036044

Statham, J., Mooney, A., Boddy, J. and Cage, M. (2011) *Taking stock: a rapid review of the National Child Measurement Programme*. April 2011. [Online] [Accessed on 1st December 2021] https://core.ac.uk/outputs/79527980

Storey, P. and Chamberlin, R. (2001) *Improving the take up of free school meals*. Department for Education Research Report RR270. London. [Online] [Accessed 8th September 2022] https://dera.ioe.ac.uk/4657/1/RR270.pdf

Stovitz, S.D., Demerath, E.W., Hannan, P.J., Lytle, L.A. and Himes, J.H. (2011) 'Growing into obesity: patterns of height growth in those who become normal weight, overweight or obese as young adults.' *American Journal of Human Biology*, 23(5) pp.635-641. [Online] [Accessed 25th September 2022] https://pubmed.ncbi.nlm.nih.gov/21630370/

Sullivan, S.A., Leite, K.R., Shaffer, M.L.,Birch, L.L. and Paul, I.M. (2011) 'Urban parents' perceptions of healthy infant growth.' *Clinical Pediatrics*, 50(8) pp. 698-703. [Online] [Accessed 25th September 2022] https://journals.sagepub.com/doi/abs/10.1177/0009922811398960

Suri, H. (2011) 'Purposeful sampling in qualitative research synthesis.' *Qualitative Research Journal*, 11(2) pp. 63-75. [Online] [Accessed 25th September 2022] https://www.emerald.com/insight/content/doi/10.3316/QRJ1102063/full/html

Swerissen, H. (2004) 'The sustainability of health promotion interventions for different levels of social organization.' *Health Promotion International*, 19 pp.123–130. [Online] [Accessed 25th September 2022] https://academic.oup.com/heapro/article/19/1/123/782136?login=false

Tashakkori, A., Teddlie, C. and Sines, M.C. (2013) 'Utilizing mixed methods in psychological research.' *In* Weiner, I.B., Schinka, J.A. and Velicer, W.F. (eds.) *Handbook of psychology. Volume 2: Research methods in psychology*. New Jersey: John Wiley and Sons, Inc., pp.428-450.

Taylor, C. (2018) 'The reliability of free school meal eligibility as a measure of socio-economic disadvantage: evidence from the Millennium Cohort Study in Wales.' *British Journal of Educational Studies*, 66(1) pp. 29-51. [Online] [Accessed 25th September 2022] https://www.tandfonline.com/doi/full/10.1080/00071005.2017.1330464

Terwindt, F. and Rajan, D. (2016) 'Chapter 5. Strategic planning: transforming priorities into plans.' *In* Schmets, G., Rajan, D. and Kadandale, S. (ed.) *Strategizing national health in the 21st century: a handbook.* Geneva: World Health Organisation [Online] [Accessed on 6th January 2022] https://apps.who.int/iris/bitstream/handle/10665/250221/9789241549745-chapter5-eng.pdf?sequence=17&isAllowed=y

Tesco Community Grants. (No date) *Apply for a grant*. [Online] [Accessed 16th January 2022] https://tescocommunitygrants.org.uk/apply-for-a-grant/

The Rowntree Charitable Trust. (2022) *1. Narrative proposal*. [Online] [Accessed 16th January 2022] https://www.jrct.org.uk/narrative-proposal.aspx

Theis, D. and White, M. (2021) 'Is obesity policy in England fit for purpose? Analysis of government strategies and policies, 1992-2020.' *The Milbank Quarterly*, 99 (1), pp.126-170. [Online] [Accessed 25th September 2022] https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/1468-0009.12498

Thorstensson, S., Blomgren, C., Sundler, A.J. and Larsson, M. (2018) 'To break the weight gain – a qualitative study on the experience of school nurses working with overweight children in elementary school.' *Journal of Clinical Nursing*, 27 (1), pp. e251-e258 [Online] [Accessed 15th September 2022] DOI:10.1111/jocn.13924.

Tomiyama, A.J., Carr, D., Granberg, E.M., Major, B., Robinson, E., Sutin, A.R. Brewis, A. (2018) 'How and why weight stigma drives the obesity 'epidemic' and harms health.' *BMC Medicine*, 16:123. [Online] [Accessed 25th September 2022] https://bmcmedicine.biomedcentral.com/articles/10.1186/s12916-018-1116-5?fbclid=IwAR17UuHTs18rl3JEjFiQK4crFgLGJA0-RqrtUr_HCQxUSZkGI0jowdCmrb8

Trace, S. (2021) 'Outpatient paediatric growth monitoring practices following a global pandemic-what is needed to enable continued good practice?' *Dietetics Today*, December, pp.26-28.

Turner, K.M., Salisbury, C. and Shield, J.P.H. (2012) 'Parents' views and experiences of childhood obesity management in primary care: a qualitative study.' *Family Practice*, 29(4) pp. 476-481. [Online] [Accessed 25th September 2022] https://academic.oup.com/fampra/article/29/4/476/492682?view=extract&login=false

University of Birmingham. (2020) Supporting healthcare professionals to help parents address overweight in children (SUPPORT) study: executive summary [Online] [Accessed 5th January 2022] https://www.birmingham.ac.uk/documents/college-mds/applied-health/support-study/final-exec-summary.pdf

van der Kruk, J.J., Kortekaas, F., Lucas, C. and Jager-Wittenaar, H. (2013) 'Obesity: a systematic review on parental involvement in long-term European childhood weight control interventions with a nutritional focus.' *Obesity Reviews*, 14(9) pp.745-760. [Online] [Accessed 28th September 2022] https://pubmed.ncbi.nlm.nih.gov/23734625/

Viner, R.M., Kinra, S., Christie, D., Cole, T.J., Costa, S., Croker, H., Fry, T., Hsia, Y. et al. (2020) 'Improving the assessment and management of obesity in UK children and adolescents: the PROMISE research programme including a RCT.' *Programme Grants for Applied Research*, 8(3). [Online] [Accessed 25th September 2022] https://doi.org/10.3310/pgfar08030

Walker, O., Strong, M., Atchinson, R., Saunders, J. and Abbott, J. (2007) 'A qualitative study of primary care clinicians' views of treating childhood obesity.' *BMC Family Practice*, 8(50). [Online] [Accessed 25th September 2022] http://doi.org/10.1177/2054270417693966

Walugembe, D.R., Sibbald, S., Le Ber, M.J. and Kothari, A. (2019) 'Sustainability of public health interventions: where are the gaps?' *Health Research Policy and Systems*, 17(8). [Online] [Accessed 25th September 2022] https://doi.org/10.1186/s12961-018-0405-y

Warren, M.R., Homg, S., Rubin, C.L. and Uy, P.S. (2009) 'Beyond the cake sale: a community-based relational approach to parent engagement in schools.' Teachers College Record, 111(9), pp.2209-2254. [Online] [Accessed 16th September 2022] https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.615.9522&rep=rep1&type=pdf

Waszack, C. and Sines, M. (2003) 'Mixed methods in psychological research' *In* Tashakkori, A. and Teddlie, C. (eds.) '*Handbook of mixed methods in social and behavioural research.'* Thousand Oaks, California: Sage, pp.557-576. [Online] [Accessed 25th September 2022] https://d1wqtxts1xzle7.cloudfront.net/52342902/SAGE_Handbook_of_Mixed_Methods_in_Social_Behavioral_Research-with-cover-page-v2.pdf

Whitfield, K.C., Wozniak, R., Pradinuk, M., Karakochuk, C.D., Anabwani, G., Daly, D., MacLeod, M. S., Larson, C.P., et al. (2017) 'Anthropometric measures are simple and accurate paediatric weight-prediction proxies in resource-poor settings with a high HIV prevalence.' *Archives of Disease in Childhood*, 102 pp. 10-16. [Online] [Accessed 25th September 2022] https://adc.bmj.com/content/102/1/10

Yarber, L., Brownson, C.A., Jacob, R.R., Baker, E.A., Jones, E., Baumann, C., Deshpande, A.D., Gillespie, K.N. et al. (2015) 'Evaluating a train-the-trainer approach for improving capacity for evidence-based decision making in public health.' *BMC Health Services Research*, 15(547). [Online] [Accessed 7th September] https://click.endnote.com/viewer?doi=10.1186%2Fs12913-015-1224-2&token=WzM1Mjc0NjUsIjEwLjExODYvczEyOTEzLTAxNS0xMjI0LTIiXQ.6lMaRzTNmmCgcVOA-ySaDAIy6ls

APPENDICES

Appendix 1.

Child Growth - An indication of physical health and emotional wellbeing.

This short survey seeks to understand the importance of child growth information to parents. Please read the Participant Information Sheet before completing the survey.

https://stummuac-my.sharepoint.com/:w:/g/personal/21419748_stu_mmu_ac_uk/EQ0Rn8jKzQNAq9VHisU4l3sB-s- DE6QxvuhWM8Jbm3_Itw?e=JOhD6d (https://stummuac-my.sharepoint.com/:w:/g/personal/21419748_stu_mmu_ac_uk/EQ0Rn8jKzQNAq9VHisU4l3sB-s- DE6QxvuhWM8Jbm3_Itw?e=JOhD6d)

* Required

1. I confirm that I have read the participant information for the study (link above...please email 21419748@stu.mmu.ac.uk (mailto:21419748@stu.mmu.ac.uk) for a pdf copy if required) *

Yes

No

2. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily *

Yes

No

3. I understand that my participation is voluntary and that I am free to withdraw from the study up until I have submitted my survey answers *

Yes

No

4. I agree to participate in the project to the extent of the activities described to me in the participant information *

Yes

No

5. Please state the age/s of your child/children in years

6. Please list the **primary school/s** that your child/children will attend, did attend or are attending...

7....**and the town** of the primary school/s...

8. Children's weight and length measurements are plotted on graphs by Health Visitors to ensure that they are growing well (usually in the Red Book). Did you feel that this information was....(please select any that apply)?

Useful

Interesting

Reassuring

Concerning

Alarming

Unimportant

9. Do you wish to add any further comments about the Red Book graph?

10. The National Child Measurement Programme (NCMP) measures children's growth in Reception and Year 6 of primary school, and sometimes sends feedback to parents. The Covid pandemic has disrupted this programme. Have you had any experience of the NCMP?

Yes, measuring only

Yes, measuring and feedback

No due to Covid disruption

No experience of NCMP

11. The NCMP measurement of children takes place in primary schools. This means that parents can receive growth feedback and that children are unaware of their results. Do you have any reservations regarding measuring children in primary schools?

12. Child growth can be a sensitive topic and parents may feel judged when receiving growth feedback. How important is it to you that anyone who measures children and offers parents feedback is.....**Appropriately qualified in healthcare** (1=not important, 4=very important)

13. ...**Experienced in child measurement and parent feedback** (1=not important, 4=very important)

14. In England there is no healthcare system that gives parents confidential growth information every year between Reception and Year 6. Is this something that you would find helpful?

15. Why would you find this helpful or not helpful?

16. If annual child measurement and confidential growth feedback was offered as a service, for an affordable fee, how likely would you be to access it? (1=very unlikely, 4=very likely)

17. What would you consider to be an affordable annual fee per. child?

£1.00

£2.00

£3.00

£4.00

£5.00

More than £5.00

18. Finally, how likely would you be to support a parent funded, primary school based, annual child measurement and growth feedback programme? (0= Not at all likely, 10=Extremely likely)

19. Thank you for your time. Any further thoughts or comments that you may have regarding this study are very welcome. Once submitted, survey answers will not be able to be withdrawn.

Appendix 2.

Participant Information Sheet

Could a parent funded, primary school based, child growth programme be sustainable in England?

1. Invitation to research

I would like to invite you to take part in a research project that will form the basis of my self-funded Masters by Research award at Manchester Metropolitan University.

My name is Sarah Vince-Cain, I am a dietitian registered with the Health and Care Professions Council and I am exploring whether a parent funded, primary school based, child growth programme could be sustainable in England.

2. Why have I been invited?

My research will be seeking the views of a) parents of children aged between 0-16 years of age and who will attend, are currently attending or have attended a primary school in Greater Manchester and b) primary school senior leadership within Greater Manchester.

3. Do I have to take part?

It is up to you to decide. We will describe the study through the participant information sheet, which you will have access to. The on-line parent questionnaire will include consent questions. Once answers have been submitted, you are unable to withdraw from the study.

Prior to a school leadership interview, we will ask for a signed consent form to show that you agreed to take part. You are free to withdraw from the interview at any time, without giving a reason.

4. What will I be asked to do?

I shall be asking 250 parents to answer one short online questionnaire that should take less than 5 minutes to complete and I shall be asking 6 primary school leadership to have one video/telephone (or face-to-face if preferred) conversation lasting approximately 20-30 minutes.

It is anticipated that the questionnaires and interviews will be completed in March 2022 and April 2022.

5. Are there any risks if I participate?

No risks have been identified.

6. Are there any advantages if I participate?

There are no rewards or recompense available as part of this research. Participants will be making an extremely useful contribution to furthering understanding around child growth perception.

7. What will happen with the data I provide?

The questionnaire is anonymous and does not contain any personal data. In order to organise an interview, we may collect personally-identifiable information from you such as name and email addresses. The interviews will be audio recorded and transcribed; this will form non-identifiable personal data.

The Manchester Metropolitan University ('the University') is the Data Controller in respect of this research and any personal data that you provide as a research participant.

The University is registered with the Information Commissioner's Office (ICO), and manages personal data in accordance with the General Data Protection Regulation (GDPR) and the University's Data Protection Policy.

As a public authority acting in the public interest, we rely upon the 'public task' lawful basis. When we collect special category data (such as medical information or ethnicity) we rely upon the research and archiving purposes in the public interest lawful basis.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained.

We will not share your personal data collected in this form with any third parties.

We will only retain your personal data for as long as is necessary to achieve the research purpose. Any personal identifiable information, such as email addresses, that is used to communicate with participants during the interview process will be destroyed after 6 months. Anonymous completed questionnaires and interview recordings with be archived in line with Manchester Metropolitan University's policy and procedure.

For further information about use of your personal data and your data protection rights please see the University's Data Protection Pages.

8. What will happen to the results of the research study?

The results of the research study will be presented for peer review and for journal publication.

9. Who has reviewed this research project?

This research is supported by a Principal Supervisor and has been reviewed by the University's ethics committee and by academic peers.

10. Who do I contact if I have queries about this study?

Sarah Vince-Cain Dr Orla Flannery

Principal Investigator

Department of Health Professions,

Manchester Metropolitan University

Cavendish South, 3 Bonsall Street,

Manchester M15 6GX

Tel: 0161 247 2819

E-mail: sarah.vince-cain@mmu.ac.uk

Principal Supervisor

Senior Lecturer in Nutrition

Department of Health Professions,

Manchester Metropolitan University

Cavendish South, 3 Bonsall Street

Manchester M15 6GX

Tel: 0161 247 2819

E-mail: o.flannery@mmu.ac.uk

11. Who do I contact if I have concerns about this study or I wish to complain?

Dr Claire Fox

Head of Research Ethics and Governance for the Faculty of Health and Education, Manchester Metropolitan University.

Email FOHE-ethics@mmu.ac.uk

If you have any concerns regarding the personal data collected from you, our Data Protection Officer can be contacted using the legal@mmu.ac.uk e-mail address, by calling 0161 247 3331 or in writing to: Data Protection Officer, Legal Services, All Saints Building, Manchester Metropolitan University, Manchester, M15 6BH.

You also have a right to lodge a complaint in respect of the processing of your personal data with the Information Commissioner's Office as the supervisory authority. Please see: https://ico.org.uk/global/contact-us/

THANK YOU FOR CONSIDERING PARTICIPATING IN THIS PROJECT

Appendix 3.

CONSENT FORM

Could a parent funded, primary school based, child growth programme be sustainable in England?

	Please tick your chosen answer	YES	NO
1.	I confirm that I have read the participant information sheet version ..... , date ..... for the above study.	☐	☐
2	I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐	☐
3	I understand that my participation is voluntary and that I am free to withdraw up to 2 weeks after the date of my interview	☐	☐
4	I agree to participate in the project to the extent of the activities described to me in the above participant information sheet.	☐	☐
5	I agree to my participation being audio recorded for analysis.	☐	☐
6	I understand and agree that my words may be quoted anonymously in research outputs.	☐	☐

Name of participant Date Signature

IF YOUR INTERVIEW IS IN-PERSON, YOUR INTERVIEWER WILL BRING HARD COPIES OF THE CONSENT FORM TO COMPLETE ON THE DAY, ONE FOR YOU TO KEEP, AND ONE OF THEM TO TAKE AWAY.

IF YOUR INTERVIEW IS ONLINE:

IF YOU HAVE ACCESS TO A PRINTER, PLEASE PRINT OFF THIS FORM, SIGN IT, SCAN IT, AND EMAIL IT BACK TO THE RESEARCHER. KEEP A COPY FOR YOUR OWN RECORDS.

IF NOT, PLEASE COMPLETE THE SIGNATURE SECTION USING BLOCK CAPITALS (OR AN E-SIGNATURE) AND SIMPLY EMAIL IT BACK TO THE RESEARCHER. KEEP A COPY FOR YOUR OWN RECORDS.

Appendix 4.

Semi Structured School Leadership Interview

Introductions (confirm name of primary school) and thanks

Purpose of the discussion *To understand the decision making processes within primary schools around external health programmes*

Time allocated to discussion *Around 15 minutes if that's ok?*

Recording and transcription *Just so I don't miss anything*

Confidentiality

Context – *So, I'm a registered dietitian and I've worked in/studied child growth tracking and parent feedback for several years.*

We know that parents want their children to grow well through childhood and they appreciate high quality, objective information.

This research that I'm undertaking is showing that parents are happy for their children to be measured in school and that they would consider paying an affordable fee for such a service.

What I am unclear about at this stage is the feasibility of such a service from the school leaderships perspective?

Do you use external services for which parents pay a fee, to provide services in your school?

How does that come about?

What is the decision-making process?

How would you feel about offering a growth graph service?

Do you think that school leadership be keen to have any child growth related information?

Are there any further comments or considerations that you are able to share with me before we finish?

Finish the interview

Reiterate thanks

Ensure contact details if any further comments spring to mind or if any queries arise

Appendix 5.

Data summary of responses to Qu. 14

Table A.1 Data summary of responses to question 14: In England there is no healthcare system that gives parents confidential growth information every year between Reception and Year 6. Is this something that you would find helpful?

	Not Helpful	Helpful
No. of respondents (n=110)	38	72
No. of children (n=186)	70	116
Average age (years)	9.8	9.2
Average no. of children per. respondent	1.84	1.61
% Nursery 0-4 years of total	7.1	11.2
% Primary 5-11 years of total	48.6	56.9
% Secondary 12-16 years of total	44.3	31.8
No. of primary children (n=100)	34	66
% Children potential programme participants	34	66

Table A.1 shows that children of respondents who felt that an annual child growth monitoring system would not be helpful were older and more likely to fall into the secondary classification, than children of those who felt that such a system would be helpful. The former group of respondents had a higher number of children on average than the latter group.

Appendix 6.

Sub-thematic analysis table of comments submitted by respondents who stated that they would not find annual child growth information helpful

Table A.2 Sub-thematic analysis table of comments submitted by respondents who stated that they would not find annual child growth information helpful

Theme	Sub-theme	Reported no. of children	Average age in years
Professionals would raise a concern if my child was not healthy	Ongoing professional support is already being received	1	12
	Growth charts highlight issues to health professionals rather than to parents	2	14
This process could have negative emotional impact	Parents are sensitive to growth feedback	4	9
	Children are sensitive to conversations around weight	8	11.8
This information is irrelevant	Children grow differently and comparing them to charts is not meaningful	8	11
	The information generated is of no practical use to parents	4	10.8

I instinctively know that my child is healthy	Parents are able to identify health concerns without external measurement or assessment	23	9.7
	It is a parents' perogative to decide whether health support is required	9	10.3
Total		59	10.5

Table A.2 organises the themes and sub-themes of narrative offered by respondents who stated that they would not find annual child growth information helpful. The ages of the respondents' children for all sub-themes ranged between 9 years and 14 years with the overall average age being 10.5 years (Year 6). The sub-theme expressed most frequently amongst this cohort of respondents was that parents are able to identify health concerns without external measurement or assessment.

Appendix 7.

Sub-thematic analysis table of comments submitted by respondents who stated that they would find annual child growth information helpful

Table A.3 Sub-thematic analysis table of comments submitted by respondents who stated that they would find annual child growth information helpful

Theme	Sub-theme	Reported no. of children	Average age in years
A lot can change between Reception and Year 6	A child's development is significant between Reception and Year 6	5	6.4
	Child growth information adds to the holistic picture	1	11
To help me consider lifestyle changes	To highlight the need for lifestyle changes	13	11.1
	To prevent weight related health issues	7	11.6
To identify health and wellbeing issues early	Early identification can lead to early treatment and better outcomes	21	10.6

	Reassuring that growth is progressing well despite diagnosed health concerns	7	10
It's hard to know whether my child's growth is on track	Child growth information would be reassuring and interesting	16	8.1
	It would be helpful to compare my child's growth to population data	22	8.9
Total		92	9.6

Table A.3 organises the themes and sub-themes of narrative offered by respondents who stated that they would find annual child growth information helpful. The ages of the respondents' children for all sub-themes ranged between 6.4 years and 11.6 years with the overall average age being 9.6 years (Year 5). The sub-theme expressed most frequently amongst this cohort of respondents was the usefulness of comparing child growth to population data, closely followed by the role of child growth information in early identification of health issues.

Appendix 8

Data summary of responses to question 18: Finally, how likely would you be to support a parent funded, primary school based, annual child measurement and growth feedback programme?

Table A.4 Data summary of responses to question 18: Finally, how likely would you be to support a parent funded, primary school based, annual child measurement and growth feedback programme?

(0 = Not at all likely and 10 = Extremely likely)	0-4	5	6-10
No. of respondents (n=110)	38	15	57
No. of children (n=186)	71	26	89
Average age (years)	10.2	9.8	9.8
Average no. of children per. respondent	1.87	1.73	1.56
% Nursery 0-4 years of total	9.9	7.7	11.2
% Primary 5-11 years of total	46.6	65.4	56.2
% Secondary 12-16 years of total	43.7	26.9	33.7
No. of primary children (n=100)	33	17	50
% Of total primary children potential participants	33	17	50

Table A.4 shows that children of respondents offered a score of 0, 1, 2, 3 or 4 were older, and more likely to fall into the secondary classification, than children of those who offered a score of 6, 7, 8, 9 or 10. The former group of respondents had a higher number of children on average (1.87) than the latter group (1.56) with respondents who offered a score of 5 having 1.73 children on average. The respondents who offered a score of 5, had the highest

percentage of primary aged children followed by respondents who offered a score between 6-10 inclusive. This data suggests that 50% of primary school children would be more likely than not to be included into a parent funded, primary school based, child growth programme.

Appendix 9.

Acceptability of a parent funded child growth service by all respondents

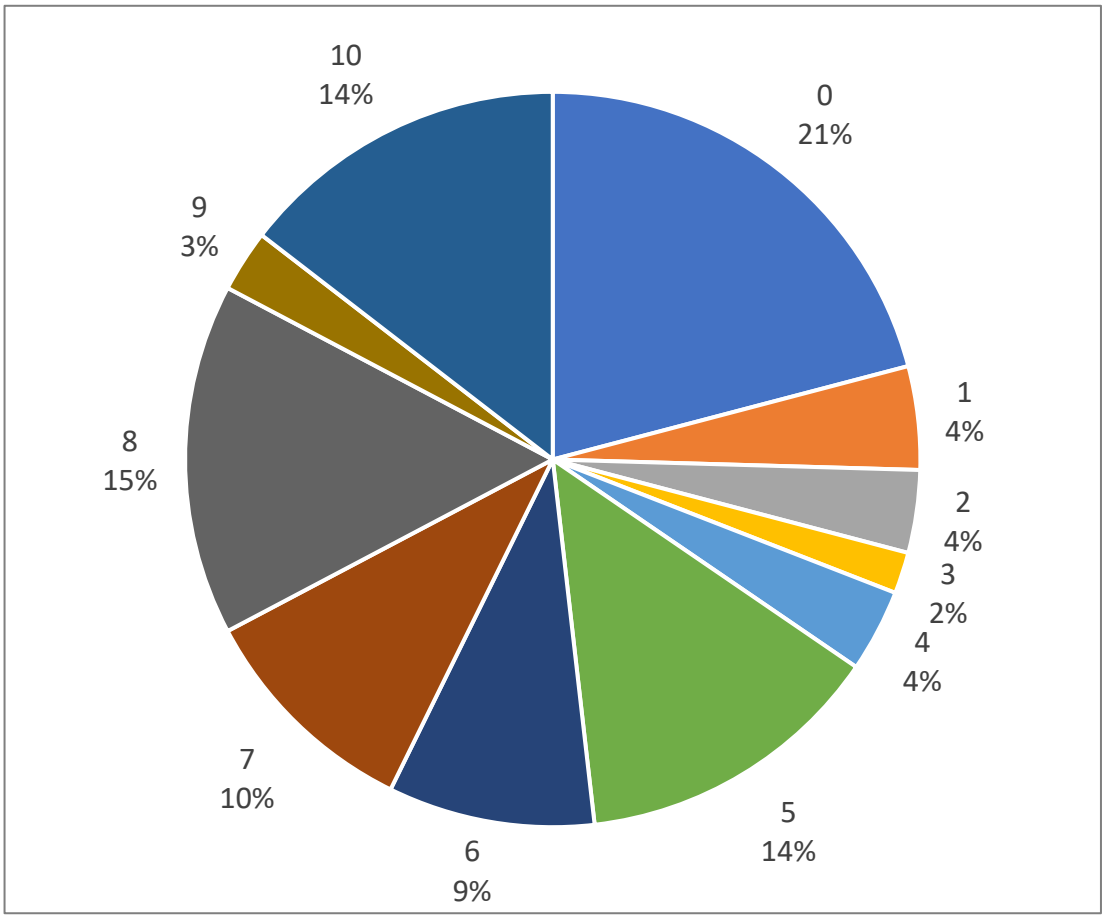


Figure A.1 Acceptability of a parent funded child growth service by all respondents

Acceptability of a parent funded child growth service by respondents according to % FSM eligibility

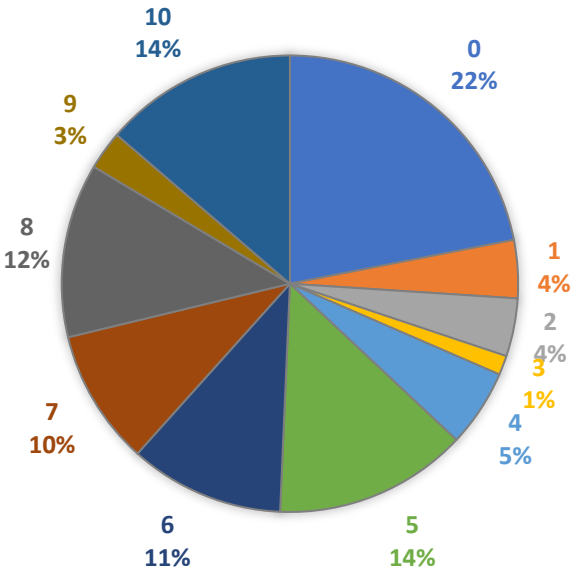


Figure A.2 Acceptability of a parent funded child growth service by respondents who named a primary school with less that national average % FSM eligibility

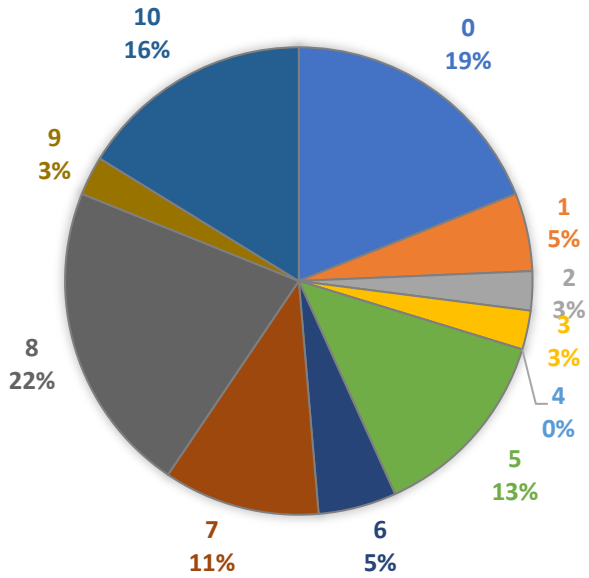


Figure A.3 Acceptability of a parent funded child growth service by respondents who named a primary school with more that national average % FSM eligibility (RHS)

Appendix 10.

Qu.16 Hypothesis test summary

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of payformeasurement is the same across categories of FSMgroups.	Independent-Samples Mann-Whitney U Test	.829	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

Qu.18 Hypothesis test summary

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.[a,b]	Decision
1	The distribution of payQ18 is the same across categories of FSmgroup.	Independent-Samples Mann-Whitney U Test	.361	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

Appendix 11.

Image of WHO 0-1 Boys BMI chart

Copyright World Health Organisation. Online and accessed 23rd September 2022.

https://www.rcpch.ac.uk/resources/uk-who-growth-charts-0-4-years

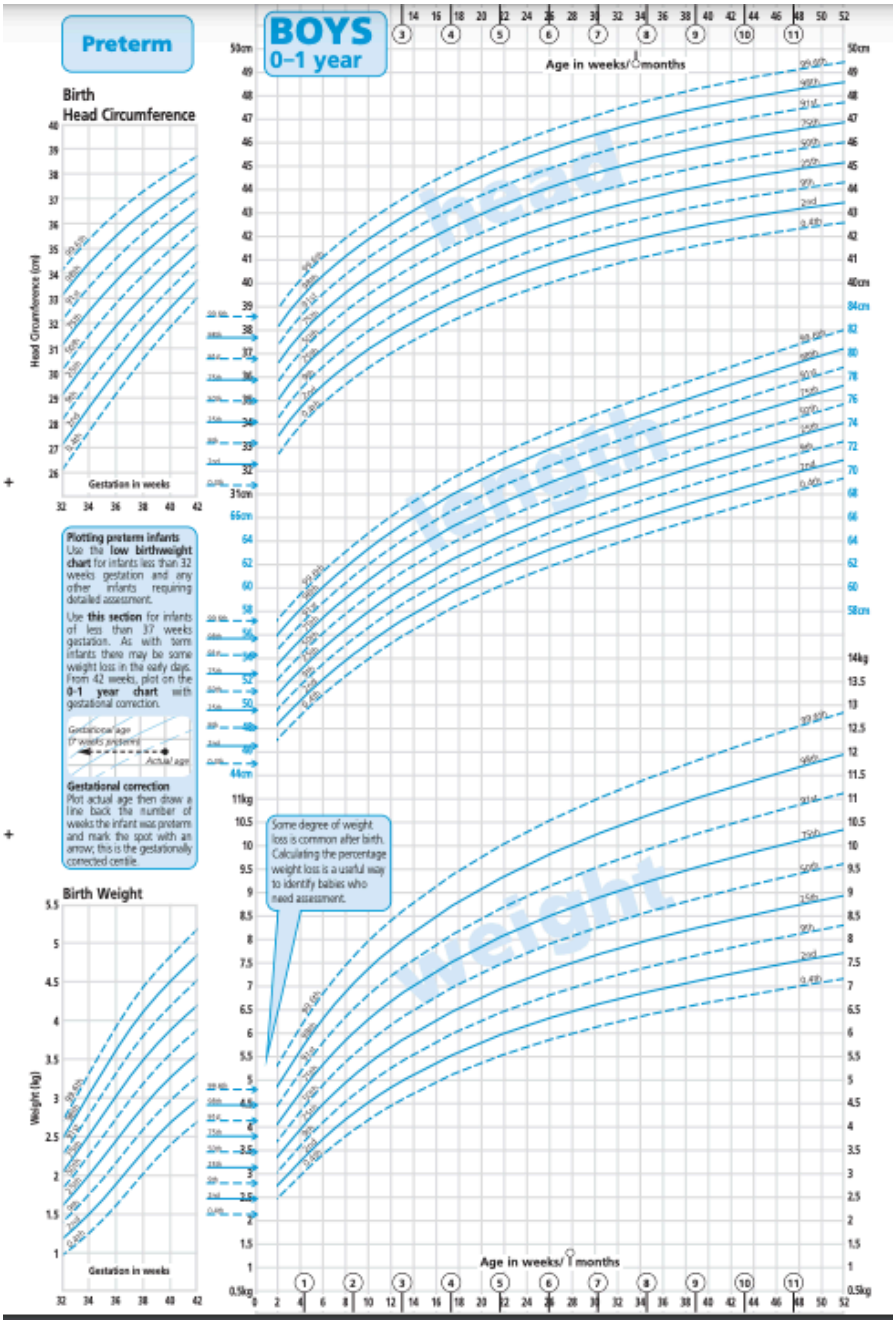
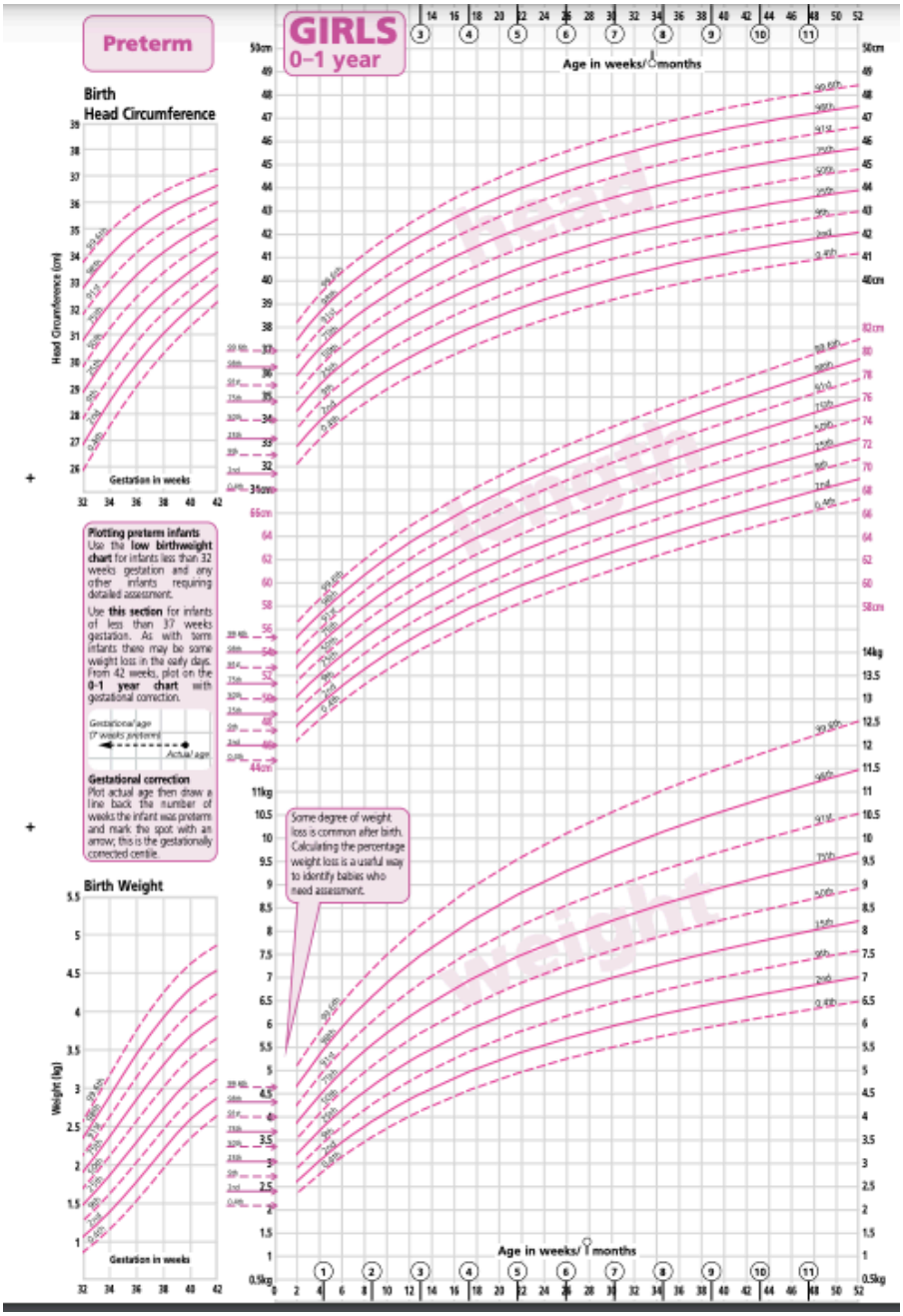


Image of WHO 0-1 Girls BMI chart

Copyright World Health Organisation. Online and accessed 23rd September 2022.

https://www.rcpch.ac.uk/resources/uk-who-growth-charts-0-4-years



Appendix 12.

Image of UK90 Boys BMI chart

Copyright Child Growth Foundation. Online and accessed 23rd September 2022.

https://www.healthforallchildren.com/product-category/shop/growth-charts/

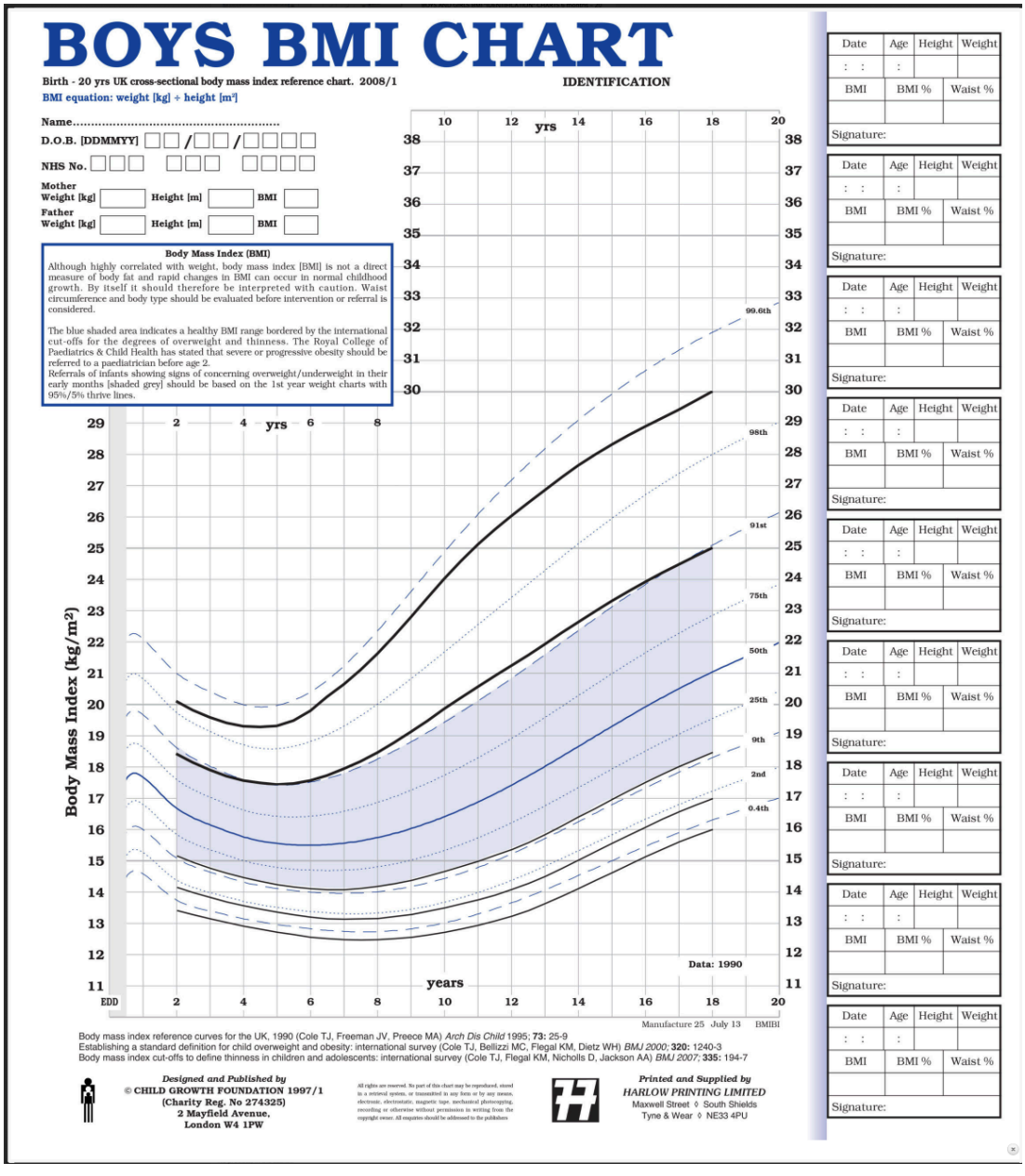
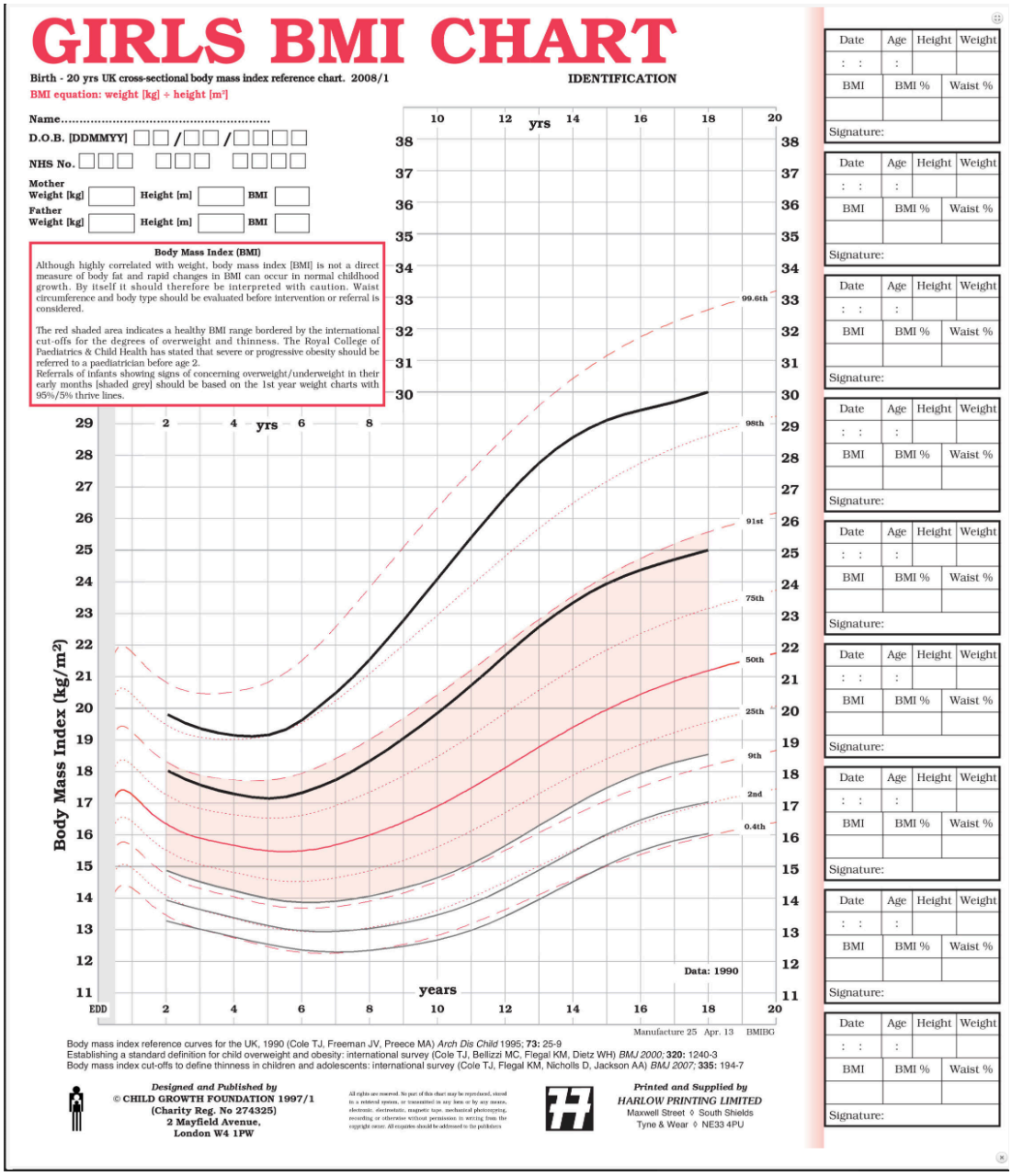


Image of UK90 Girls BMI chart

Copyright Child Growth Foundation. Online and accessed 23rd September 2022.

https://www.healthforallchildren.com/product-category/shop/growth-charts/



Appendix 13.

NCMP specimen result letters

Online and accessed 23rd September 2022

https://www.gov.uk/government/publications/national-child-measurement-programme-operational-guidance

National Child Measurement Programme specimen parent result letters

Producing result letters

The template letter (located on the NCMP IT system), or specimen letters (available in this document) can be used by local areas when sharing results with parents. The NCMP IT system can generate result letters for parents using the editable NCMP parent result letter template, through mail merging with the "Letter Generation" extract that is produced by the NCMP system.

- The *parent result letter template* is set up to produce different letters depending on the child's BMI category and school year.
- The *specimen parent result letters* show each of the four BMI category letters showing the highlighted sections where local authorities can add bespoke text, such as information about local services and contact numbers.

Guidance on producing the letters is provided in NCMP IT System User Guide part 4; Generating Feedback Letters.

Sending the letters

The letters should be posted to parents or carers as soon as possible (at most within six weeks of measurement). It is recommended that the post-measurement leaflet is enclosed with result letters to parents. This provides relevant messaging and signposts to the Better Health – Families website for further information. This leaflet can be ordered or downloaded from the OHID Campaign Resource Centre.

Specimen letter for children with a weight status of underweight

Private and confidential

[LA_Name]
[LA_Address1]
[LA_Address2]
[LA_Address3]
[LA_Postcode]
Tel: [LA_Telephone]
Email: [LA_Email]

Parent/Carer of «FirstName» «LastName»

«Address1»
«Address2»
«Address3»
«Address4»
«Address5»
«Postcode»

NHS number «NHSNumber»

Dear Parent/Carer of «FirstName» «LastName»,

We recently wrote to you about measuring «FirstName»'s height and weight as part of the National Child Measurement Programme. Here are «FirstName»'s measurements.

«FirstName» «LastName»

Height (cm) «Height» **Weight (kg)** «Weight»
Weight Status: underweight

Date of measurement «DateOfMeasurement»

When compared to the national growth charts, which show whether a child is growing as expected for their age, sex and height, «FirstName» would be considered to be underweight.

Most children who are underweight are perfectly healthy but some can develop health and wellbeing problems. If you would like to speak to us about your child's weight please call us on [LA to insert contact number].

A good diet and physical activity are essential to maintaining a healthy weight and healthy growth. Visit https://www.nhs.uk/healthier-families/childrens-weight/#underweight for lots of handy tips.

You can find out how «FirstName»'s result was calculated, and check how «FirstName» is growing over time, by going to www.nhs.uk/bmi.
This information has not been shared with «FirstName», other children or school staff. Locally, this information is held by your [local NHS/local authority public health team] and is treated confidentially. The results are sent to you, so the decision of whether to talk to your child about them is entirely yours. More information is available at https://www.nhs.uk/healthier-families/childrens-weight/#underweight.

Some medical conditions or treatment that your child is receiving may mean that BMI centile is not the best way to measure your child. Your GP or other health professional caring for your child will be able to discuss this with you.

If you wish to discuss these results please contact the NCMP Team on [local authority to insert team and contact number].

Yours sincerely,
[Sender name and job title]

Specimen letter for children with a weight status of healthy weight

Private and confidential

[LA_Name]
[LA_Address1]
[LA_Address2]
[LA_Address3]
[LA_Postcode]
Tel: [LA_Telephone]
Email: [LA_Email]

Parent/Carer of «FirstName» «LastName»

«Address1»
«Address2»
«Address3»
«Address4»
«Address5»
«Postcode»

NHS number «NHSNumber»

Dear Parent/Carer of «FirstName» «LastName»,

We recently wrote to you about measuring «FirstName»'s height and weight as part of the National Child Measurement Programme. Here are «FirstName»'s measurements.

«FirstName» «LastName»

Height (cm) «Height» **Weight (kg)** «Weight»
Weight Status: healthy weight

Date of measurement «DateOfMeasurement»

When compared to the national growth charts, which show whether a child is growing as expected for their age, sex and height, «FirstName» would be considered to be a healthy weight.

This is good news. It is important that «FirstName» maintains a healthy weight throughout childhood and into adulthood.

A good diet and physical activity are essential to maintaining a healthy weight and healthy growth. Visit https://www.nhs.uk/healthier-families/childrens-weight/#healthy-weight for lots of handy tips.

You can find out how «FirstName»'s result was calculated, and check how «FirstName» is growing over time, by going to www.nhs.uk/bmi.

This information has not been shared with «FirstName», other children or school staff. Locally, this information is held by your [local NHS/local authority public health team]

and is treated confidentially. The results are sent to you, so the decision of whether to talk to your child about them is entirely yours. More information is available at https://www.nhs.uk/healthier-families/childrens-weight/#healthy-weight.

Some medical conditions or treatment that your child is receiving may mean that BMI centile is not the best way to measure your child. Your GP or other health professional caring for your child will be able to discuss this with you.

If you wish to discuss these results please contact the NCMP Team on [local authority to insert team and contact number].

Yours sincerely,
[Sender name and job title]

Specimen letter for children with a weight status of overweight

Private and confidential

[LA_Name]
[LA_Address1]
[LA_Address2]
[LA_Address3]
[LA_Postcode]
Tel: [LA_Telephone]
Email: [LA_Email]

Parent/Carer of «FirstName» «LastName»

«Address1»
«Address2»
«Address3»
«Address4»
«Address5»
«Postcode»

NHS number «NHSNumber»

Dear Parent/Carer of «FirstName» «LastName»,

We recently wrote to you about measuring «FirstName»'s height and weight as part of the National Child Measurement Programme. Here are «FirstName»'s measurements.

«FirstName» «LastName»

Height (cm) «Height» **Weight (kg)** «Weight»
Weight Status: overweight

Date of measurement «DateOfMeasurement»

When compared to the national growth charts, which show whether a child is growing as expected for their age, sex and height, «FirstName» would be considered to be overweight.

It is important to be aware that when a child is a higher weight for their age it can lead to health problems like high blood pressure and early signs of type 2 diabetes as they grow up. Being overweight can also lead to low self-esteem and poor confidence.

What should I do now?

«FirstName» could come to the [LA to insert name of local child and family weight management service] which is a free and fun after school club to help children and their families achieve and maintain a healthier weight. See the enclosed leaflet or call [LA to insert contact number for local family weight management service].

or email [LA to insert email address for local family weight management service]

{Delete lines above if there are no local child and family weight management services available, include the following line}:

Contact your school nurse or doctor for further advice and support on how to help your child achieve and maintain a healthier weight.

A good diet and physical activity are important to ensure «FirstName» is a healthy weight as they grow up. Visit https://www.nhs.uk/healthier-families/childrens-weight/#overweight for lots of handy tips.

The Chief Medical Officer has advised that most children need at least 60 minutes of physical activity per day. This should be a mix of moderate activity like brisk walking and vigorous activity like running or fast cycling that make your heart beat faster. We have provided a leaflet on activities in your area [LA to include leaflet or remove this sentence].

You can find out how «FirstName»'s result was calculated, and check how «FirstName» is growing over time, by going to www.nhs.uk/bmi.

This information has not been shared with «FirstName», other children or school staff. Locally, this information is held by your [local NHS/local authority public health team] and is treated confidentially. The results are sent to you, so the decision of whether to talk to your child about them is entirely yours. More information is available at https://www.nhs.uk/healthier-families/childrens-weight/#overweight.

Some medical conditions or treatment that your child is receiving may mean that BMI centile is not the best way to measure your child. Your GP or other health professional caring for your child will be able to discuss this with you.

If you wish to discuss these results please contact the NCMP Team on [local authority to insert team and contact number].

Yours sincerely,
[Sender name and job title]

Specimen letter for children with a weight status of very overweight

Private and confidential

[LA_Name]
[LA_Address1]
[LA_Address2]
[LA_Address3]
[LA_Postcode]
Tel: [LA_Telephone]
Email: [LA_Email]

Parent/Carer of «FirstName» «LastName»

«Address1»
«Address2»
«Address3»
«Address4»
«Address5»
«Postcode»

NHS number «NHSNumber»

Dear Parent/Carer of «FirstName» «LastName»,

We recently wrote to you about measuring «FirstName»'s height and weight as part of the National Child Measurement Programme. Here are «FirstName»'s measurements.

«FirstName» «LastName»

Height (cm) «Height» **Weight (kg)** «Weight»
Weight Status: very overweight

Date of measurement «DateOfMeasurement»

When compared to the national growth charts, which show whether a child is growing as expected for their age, sex and height, «FirstName» would be considered to be very overweight. It is important to be aware that when a child is a higher weight for their age it can lead to health problems like high blood pressure and early signs of type 2 diabetes as they grow up. Being overweight can also lead to low self-esteem and poor confidence.

«FirstName» has been reserved a place at the [LA to insert name of local child and family weight management service].

This is a free and fun after school club to help families achieve and maintain a healthier weight. Please see the enclosed leaflet and contact us to take up this offer by post, phone or email.

Post: Return the enclosed registration form in the FREEPOST envelope enclosed.
Phone: Call the local child and family weight management service on [LA to insert contact number]
Email: [LA to insert contact email address]

[LA to amend wording as required reflecting local child and family weight management services]
{Delete lines above if there are no local child and family weight management services available, include the following line}:

Contact your school nurse or doctor for further advice and support on how to help your child achieve and maintain a healthier weight.

A good diet and physical activity are important to ensure «FirstName» is a healthy weight as they grow up. Visit https://www.nhs.uk/healthier-families/childrens-weight/#very-overweight for lots of handy tips.

The Chief Medical Officer has advised that most children need at least 60 minutes of physical activity per day. This should be a mix of moderate activity like brisk walking and vigorous activity like running or fast cycling that make your heart beat faster. We have provided a leaflet on activities in your area [LA to include leaflet or remove this sentence].

You can find out how «FirstName»'s result was calculated, and check how «FirstName» is growing over time, by going to www.nhs.uk/bmi.

This information has not been shared with «FirstName», other children or school staff. Locally, this information is held by your [local NHS/local authority public health team] and is treated confidentially. The results are sent to you, so the decision of whether to talk to your child about them is entirely yours. More information is available at https://www.nhs.uk/healthier-families/childrens-weight/#very-overweight.

Some medical conditions or treatment that your child is receiving may mean that BMI centile is not the best way to measure your child. Your GP or other health professional caring for your child will be able to discuss this with you.

If you wish to discuss these results please contact the NCMP Team on [LA to insert team and contact number]

Yours sincerely,
[Sender name and job title]