Physical Growth of Children: The Association between Primary Carer's Smoking, Alcohol status and Physical Characteristics of Children - Based on the Nine Year Old Cohort Data from Growing Up In Ireland

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Ranjini Manjunatha Rani

Table of Contents

List of Tables

List of Figures

Abstract

Despite having many programs to work towards the children's physical growth, there are still certain concepts that need to be highlighted and taken into consideration on the grounds of children's growth and development. The Growing Up In Ireland study data contains information of nine-year-old children which was collected between August 2007 and May 2008. This dataset contains essentially every attribute relevant to children and acts as a stepping stone to learn more about the factors that influence children's physical growth. This dataset can aid researchers in learning more about the factors that influence children's physical growth, as well as serve as evidence for policymakers working in the field of child growth and development. The Growing Up In Ireland dataset contained 8,568 children representing the nine-year cohort who were born between November 1, 1997, and October 31, 1998, and the data was collected between August 2007 and May 2008. By examining the Growing Up In Ireland dataset this research seeks to analyse the physical characteristics of children. This thesis focuses on the nature of Body Mass Index (BMI) of children, the association between smoking status of primary carer and physical characteristics of children and concludes by analysing the association between drinking alcohol status of primary carers and physical characteristics of children using Regression analysis. This research draws three important conclusions. Firstly, on average girls have higher BMI than boys. Secondly, the child's birth weight (kgs) of primary carers who never smoked is significantly higher when compared with the primary carers who smoked daily. And daily smoking primary carers saw a decrease in their child's birth weight. Lastly, when primary carers who never drank alcohol and carers who drink alcohol 1-2 times a week or more are compared, the carers who drink alcohol saw a decrease in their child's measured weight (kgs). This research systematically demonstrates how the Growing Up In Ireland dataset can be utilised to provide a complete picture of children's physical growth in Ireland.

Key Words: GUI, Ireland, BMI

Chapter 1. Introduction

Children are the future of society and their development plays a very important role in shaping our world. It is very important to understand the problems faced by the children to work towards the welfare of children. With data from the Growing Up In Ireland (GUI) study, the goal of this research is to outline and investigate the breadth and significance of physical growth of children in Ireland. Growing Up in Ireland is the national longitudinal study of children in Ireland (Williams, 2009). It is one of the most comprehensive and sophisticated studies of its kind ever conducted in Ireland. Growing Up in Ireland aims to

"examine the factors which contribute to or undermine the wellbeing of children in contemporary Irish families, and, through this, contribute to the setting of effective and responsive policies relating to children and to the design of services for children and their families". (Williams, 2009, p. 5)

According to Williams (2009), when it comes to describing the lives of children, it is important to establish what is atypical and problematic and to identify the key factors that most help and also hinder children's growth and development. It is also critical to recognise the long-term negative consequences of social disadvantage and exclusion, as well as educational difficulties, poor health, and deprivation (Williams, 2009). The GUI study data gives a descriptive summary of the characteristics and circumstances of nine-year-olds in Ireland. The breadth of information recorded in the GUI dataset results in it as an extremely rich resource for any researcher in the field of children growth and development.

The Growing Up In Ireland data collection included 8,568 children from the nine-year cohort who were born from the period 1 November 1997 to 31 October 1998. The data was collected between August 2007 and May 2008. This research aims at analysing the physical characteristics of children by examining the Growing Up In Ireland dataset. The research undertaken in this study aims to increase the understanding of children's physical growth by posing three specific research questions :

1. What is the nature of the Children Body Mass Index (BMI) in Ireland?

2. Is there an association between smoking status of primary carers and physical characteristics of children?

3. Is there an association between alcohol status of primary carers and physical characteristics of children?

The structure of the rest of the paper is: Firstly, the literature review outlines the evidence in the literature regarding the physical growth of children in Ireland. It explains the importance of children's growth and development in Ireland. It discusses the measures implemented by the Irish government in terms of children's welfare and development. It also focuses on Ireland's growth standards, which are outlined in detail. It discusses in detail about how children's BMI fluctuates as they grow up in Ireland. The influence of primary caregivers' smoking on children, the effect of parents' drinking on early children's alcohol use, and alcohol usage among adolescents are all explored in detail. To describe the topics investigated in this study, it draws on both theoretical and empirical studies. Secondly, the methodology chapter describes the nature of the data used for data analysis, as well as how and why it was collected and the advantages of using such data. A description of the software used and research design techniques employed to examine and analyse the data are discussed. This chapter finishes with details on what this study comprises, as well as specific methodologies. The results chapter demonstrates the evidence contained in the dataset in relation to children's physical growth in Ireland. Each piece of analysis is followed by a detailed explanation, which is supported by charts and tables where appropriate. This chapter seeks to present the results of the study in a clear, cohesive, and understandable manner. Finally, the discussion chapter concludes the study by summarising the key findings of the data analysis in light of the existing research and evidence. The limitations of this research study and suggestions for further research analysis is addressed.

Chapter 2. Literature Review

This chapter aims to provide an extensive and comprehensive review of both theoretical and empirical research that has been conducted in relation to children's physical growth and development in Ireland. Firstly, a brief history of how Ireland began to strive towards the growth and development of children by developing policies and strategies to improve child growth and development is discussed. Growth standards in Ireland are discussed with a particular focus on UK-WHO growth charts. Secondly, body mass index (BMI) changes in early childhood among Irish children has been explored and discussed in detail. The review continues with the exploration of the impact of a carer's smoking status on children's physical growth and development. Following sections aim to deal with the young and adolescents (higher cohort). Thirdly, the exploration of the association between parent's drinking and alcohol use in young adults has been discussed. Finally this chapter concludes by discussing the alcohol and drug consumption among young people in Ireland. This chapter aims to provide a backdrop to the research and analysis that is to follow in this study, and to offer the reader an insight to the physical growth and development of children in Ireland.

2.1. Importance of Children Growth and Development in Ireland

According to Hayes (2010), Ireland experienced a dramatic decade from 1997 to 2007. It had low unemployment and attracted a big number of immigrant workers contributing to a successful economy. These changes had a direct impact on family life, particularly in the area of early childhood education and care. Hayes (2010: p. 67) says

"Irish macro-economic policy has, structurally and conceptually, maintained a clear distinction between childcare and early education, with childcare considered to be part of the equality and work agenda and early education part of the strategy for combating educational disadvantage."

In Ireland, the primary focus of the government has been on developing childcare spaces (Hayes, 2010). Childhood, children and children's rights received

significant governmental and legislative attention around the world in the latter half of the twentieth century. This was made visible by the universal ratification of the United Nations Convention on the Rights of the Child (Unicef, 1989) which Ireland ratified in 1992.

Hayes (2010) says that Ireland established a clear commitment to protect children's rights when it became a State Party. To work towards the protection of children's rights two important children's policy documents were developed. As a result, The National Childcare Strategy (Department of Justice, Equality and Law Reform, 1999) and the National Children's Strategy (Department of Health and Children, 2000) were developed (Hayes, 2010). According to Hayes (2010), this growing trend of prioritizing children's rights led to the creation of policies that are helpful for children and their growth and development in changing societies. As a result, the importance of children's growth is analyzed and has given rise to the making of certain policies.

To work towards the children's growth several nations have given rise to the birth of many government policies and have taken action to work towards the future. Hayes (2010), focuses on recent Irish Early Childhood Care and Education (ECCE) policy and their findings of children and childhood perspectives and also gives information about where Ireland stands in terms of early childhood provision.

2.1.1. Measures taken by Ireland for the Children Development

Since the 1990s, there has been an increase in the number of governmental working groups that are formed with a rush of official publications, all of which have been targeted towards childcare. Hayes (2010) says that there exists a difficulty in Irish policymaking, that is childcare service refers to two types of service. Firstly, for younger children, early childhood care and education refer to the environments which include public, private, and home where the child is raised with family and are taken care of. These environments also include childcare homes and other forms of environments where children are monitored and are taken care of. Secondly, for the older children who are above or aged 12 years, the childcare service refers to the activities arranged either by parents or

school after children are done with the school. These activities may include singing classes, guitar classes, sports classes, poetry, dance, academic tuitions, and many more according to children's needs.

The Commission on the Family's report Strengthening families for life (Ireland, 1998) provided recommendations relating to childcare and the family. The Equal Opportunities Childcare Programme (EOCP) was established under the National Development Plan (2000 – 2006) in response to the report of the National Childcare Strategy (Department of Justice, Equality and Law Reform, 1999), and it represents the largest investment in childcare in Ireland's history, when combined with its successor, the National Childcare Investment Programme (NCIP). These programs were administered by the Childcare Directorate at the Office of the Minister for Children and Youth Affairs (OMCYA).

In 1999, the Department of Education and Science established a White Paper on early childhood education, Ready to Learn (Back to Education Initiative, 1999) mainly focused on early educational needs of children from birth to the age of six (the compulsory school age in Ireland) and also consisted recommendations for a wide range of early childhood services. Hayes (2010) says that this document is of particular importance as it outlines, for the first time, a coherent strategy for developing the ECCE sector for children from birth through to six years of age and recognizes the need for action across the whole system. An expert working group on Childcare took into account various forms of childcare services for children from birth to the age of 12 which brought after school and preschool childcare together into the policy arena for the first time (Hayes, 2006).

Hayes (2010) says that as Ireland has a history of ECCE policy, it's more likely that the government's decision to support a free preschool year for all children is a reaction to the economic arguments in favor of such an initiative rather than a dramatic move toward a policy based on children's needs and rights. The degree to which a state is engaged in early education, and whether it is viewed as a care/welfare or an educational part of the policy, influences the funding, focus, and status of early education, and also the process of early education itself.

According to Hayes (2010), the introduction of a commitment to free universal preschool - an educational policy that is already in place at the primary, secondary, and higher education levels – has created a framework for deepening the conceptual and structural integration of care and education. This new policy environment presents an important opportunity to evaluate and reflect on ECCE policy, practice, and pedagogy, with a focus on children and their rights. Hayes (2010) also says that if works are carried out in the same manner, the issues faced by today's diverse constituency of young children can be met to the advantage of the children, their families, and society as a whole.

2.2. Growth Standards of Children in Ireland

According to Growth Monitoring Resources (2021), one of the most sensitive measures of a child's health is their growth. Children's growth is usually characterized by physical health and nutrition. Evaluation of the growth is an essential component when it comes to children's growth and development. Monitoring growth enables for the early and objective detection of growth abnormalities at the population level. This allows for early detection and intervention, which improves long-term results and allows for the detection of under or over nutrition (Growth Monitoring Resources, 2021). The measurements of length/height, weight, and head circumference are all part of the growth process. Usually , length/height, weight, and head circumference are used to assess the growth process. Age - appropriate length - whether or not an infant is the right length for their age; Weight for age - whether or not an infant is the right weight for his or her age; Weight for length – whether an infant's weight and length are proportionate; Age-related head circumference - information on brain development (Growth Monitoring Resources, 2021).

2.2.1. Growth Charts

According to Growth Monitoring Resources (2021), after a 15-year process of planning, data gathering, and evaluation, the World Health Organization (WHO) released improved Child Growth Standards and recording charts in 2006. The foundation for this development was that weight differences between breastfed and formula-fed newborns were being observed. The new charts were created

using data from breastfed babies' growth, with the goal of normalizing nursing as the best feeding strategy.

The Royal College of Paediatrics and Child Health (RCPCH) was commissioned by the Department of Health in 2008 to design new growth charts and develop new evidence based instructions for their use with supporting educational materials following a recommendation made by the Scientific Advisory Committee on Nutrition (SACN) that the new World Health Organisation (WHO) growth standard for children under 5 years should be introduced into general use in the UK (Moy, 2014).

Based on the suggestion of the Scientific Advisory Committee on Nutrition and the design of new charts by the Royal College of Paediatrics and Child Health, the United Kingdom adopted the revised WHO growth charts in 2009 (UK-WHO charts). The Department of Health and Children in Ireland made a national policy decision in October 2010 to adopt the UK-WHO growth charts and integrate them into child health services in Ireland. The Health Service Executive (HSE) adapted the WHO Growth Charts for Ireland and issued them in January 2013 (Growth Monitoring Resources, 2021).

2.2.2. UK-WHO Growth Charts:

According to Growth Monitoring Resources (2021), the UK-WHO growth charts were created using data from healthy breastfed children from all around the world who did not have any known health or environmental limits to their growth. Breastfeeding is the standard against which all other feeding methods are measured in these charts. This section will discuss the UK Growth Charts for 2-18 years in detail.

According to Moy (2014), the growth chart for children aged 2 to 18 years is designed to examine growth in school-aged children and is most typically used from the age of four years onwards for individual child evaluation rather than population growth tracking. He states that these growth charts start at age 2 years and there is a plotting scale on the chart where birth weight (and length, if

measured) for children delivered at term (after 37 full weeks) can be plotted to allow comparison of the birth centile with subsequent growth.

Moy (2014) describes growth charts in detail. Growth charts contain a BMI centile calculator, an adult height prediction, and a scale that converts parental height to a mid-parental centile. Because very tall and short parents tend to have children with less extreme heights, this scale adjusts for this, making it easier and more statistically valid than the usual target height calculation. When compared to the child's present height centile, it's possible from growth charts to predict if the child's growth is on track. Only one percent of children's height centiles are more than three centile spaces below the mid-parental centile, and nine out of 10 children's height centiles are within two centile spaces above or below the mid-parental centile. A height centile significantly below the mid-parental centile should be studied further if there are additional concerns about the child's growth pace. However, comparing a child's height to that of his or her parents is not a pass/fail test for normal height, and a child who is developing abnormally moderate and limited be in the middle of his or her parents' height range (Moy, 2014).

According to Moy (2014), the UK school age chart for children aged 2 to 18 also shows us when typical puberty should start and progress. These charts have three phases for the puberty development process namely, “Pre-puberty”, “In Puberty” and “Completing Puberty”. These charts additionally provide additional information regarding the lower limit (0.4th) for height in girls aged 8 to 13 and boys aged 9 to 14 who are still in the pre-puberty stage.

2.3 Body Mass Index Changes in Early Childhood

According to the *World Health Organization (2021),* BMI is a metric for determining an adult's nutritional health. It is calculated by dividing a person's weight in kilograms by the square of their height in metres (kg/m2).

In research from MedMedia Group (2014) it is stated that by 2030 Ireland is likely to have the highest prevalence of adult OWOB (BMI ≥ 25) of all European countries. In addition, currently ,one in every four youngsters is currently

overweight or obese (Perry, 2017). Studies in the Irish context (Walsh, 2015) and internationally (Zeiher, 2016; Weng, 2012; Baidal, 2016; Blake-Lamb, 2016) have showed that there are number of influencing factors like lifestyle, environmental, social, and familial traits which can put children at risk of having OWOB. In addition, overweight or obese children tend to become obese or overweight adults in future (Simmonds 2016). Many of the factors linked to OWOB may be changed, making them good targets for obesity prevention (Robinson 2015).

2.3.1. Body Mass Index Changes in Early Childhood in Irish Children

Jabakhanji (2018) studied BMI changes in early childhood to look for the factors causing OWOB in Ireland by taking the BMI development factor over the first 5 years of life. They also worked on the hypothesis that the risk factors mentioned may not be able to predict the state of excess weight but show us the roles those risk factors play in the longitudinal development at certain time points in children's lives. Now, let us see how the methodology was undertaken in-order to gain some interesting insights during the study.

2.3.2. Methodology

In order to capture the BMI changes in children over children's lifetime, the infant cohort from the Growing Up in Ireland (GUI) National Longitudinal Study of Children was used. Almost 11,134 children and their families took part in the GUI study and data was collected in the 3 waves, starting at 9 months (in 2008-2009), at 3 years (2011) and at 5 years (2013). It is also stated that GUI infant data that was used can be viewed as having a 2-level hierarchical structure. Level 1 which describes how BMI changes within children and how it changes over the course of life. Level 2 describes the differences in BMI between children over time (Jabakhanji, 2018). In their analysis they have captured the BMI changes over time taking into account several risk factors and this helped them to analyse and therefore provided information about the child's initial BMI and later trajectory. Next section focuses on the results of the analysis.

2.3.3. Results of the Study:

As a result of Jabakhanji (2018) study there was a clear and significant decrease in the BMI of the children. When the 9 months and 3 years children's BMI was

analysed, there was a significant decrease from 9 months to 3 years old. Analysis showed that 3 year old children had low BMI when compared to 9 months old infants. When compared with the 5 year old children's BMI with 9 months children, the BMI of the former still tends to be decreasing. Across all ages studied, exposure to events that occurred at birth or during infancy had the greatest impact on BMI (Jabakhanji, 2018).

When the BMI's rate was analysed based on different sex, girls had a lower BMI than boys at 9 months. Surprisingly, the difference of BMI was also seen between children from different ethnic backgrounds. When compared with white Irish children , non-Irish white children tend to have a lower BMI and this continued over time. When the Irish white children's BMI were compared with Asian children(excluding China),Asian children had a lower BMI at 9 months. There tend to be no major differences of BMI when African children were compared with Irish white children when they were 9 months old, but later a small decline of BMI was seen in African children (Jabakhanji, 2018).

When the data was categorised based on socio-economic status (SES), there were 2 factors which came into light. Firstly, children who were living in a low-income household had a high BMI at all ages of life when compared with a high-income population group. Secondly, when children whose caregiver had a third level education compared with children whose primary caregiver had lower secondary education or less, they tend to have a decrease in BMI until the age of 5. Another significant fact to note here is that children in urban regions had a low BMI and this remained unchanged over time. When a child had 2 care givers and 1 or more siblings, the child tended to have a high BMI in comparison to a child with 2 care givers and no siblings. The great difference of BMI was seen in relation to birth and early life factors of children. When BMI was measured between children who were born very early and somewhat early, the child (infant) had low BMI. But the BMI was high when the child was born late. Until the children reach 3 years and 5 years of their life this trend of early born children having low BMI and late born child having high BMI continues (Jabakhanji, 2018).

By this study we can see that common factors like weight of the caregivers also impacted on BMI status of children. When the primary caregiver was overweight,

this resulted in low BMI of the child from 3 to 5 years. In addition to that when primary caregiver was obese, the BMI decreased between 9 to 5 years of child's age and when the secondary caregiver was overweight or obese, then also the BMI decreased as well (Jabakhanji, 2018).

In this study, differences of BMI at birth and in infancy appear to be most strongly related with variation in BMI at all ages (Jabakhanji, 2018). Furthermore, Jabakhanji (2018) notes that when dominant risk factors are still modifiable, policymakers should target families with interventions before and throughout pregnancy. To explore associations later in childhood, a longer-term follow-up of children may be required.

2.3.4. Summary of section:

As the result of the study (Jabakhanji, 2018) ,it was found that the exposure to events that occurred at birth or throughout infancy had the highest impact on BMI across all ages investigated. When the BMI rate was compared between the sexes at 9 months, girls had a lower BMI than boys. The tendency of early born children having low BMI and late born children having high BMI remained until the children reached the ages of 3 and 5 was also discussed. This study also presented that weight status of primary and secondary carers did impact on a child's BMI.

2.4. Growth and Development of Children

Parents play an important role in children's lives. Parents have many roles to play when it comes to parenthood in-order to build a healthy relationship with their children. Home is the first place where a child learns the basic discipline and values. Healthy development means that children of all abilities, including those with unique health care needs, can grow up in an environment that meets their social, emotional, and educational demands *(Child Development Basics | CDC,2020a)*.

According to the *Child Development Basics | CDC (2020a)*, in the process of growth children at a certain age reach developmental milestones which include things like taking the first step, smiling for the first time, and waving "bye-bye." This development basically depends on how a child plays, learns, communicates,

and moves (for example, crawling and walking). As children develop at their own rate and development rate can vary from child to child, it's hard to predict when they will learn a specific skill or when they might have learnt some skills.

In early years, spending time with peers can have a huge impact on a child's physical and mental development. As children enjoy playing and spend most of their time engaging in this activity, it is during playtime where a child learns how to behave, how to interact with others and starts building healthy relations like friendship. So, what are the important factors that affect children's growth physically? Is there a formula for success when it comes to parenting and children development? What does child's growth mean in terms of physical well-being? The following section will look at the impact of primary carers smoking status on children's physical growth.

2.5. Impact of Carers' Smoking Status on Childhood Obesity

The study has been undertaken by Sunday (2019) to evaluate the impact of the caretaker's smoking status on children and children obesity using the Growing Up In Ireland cohort study. This study is one of the first in Ireland to assess the impact of second hand smoking (SHS) exposure during early childhood through carers' smoking status (mostly biological mothers smoking postnatally) on childhood obesity using the GUI dataset which is a large nationally representative cohort of Irish children (Sunday, 2019). This study mainly focuses on how care taker's smoking status can impact children over time. Childhood overweight/obesity was substantially linked with exposure to both carers' smoking status (Sunday, 2019). This calls us to consider the carer's smoking status as an important factor in the physical growth and development of children.

The World Health Organization (WHO) reported that the prevalence of overweight and obesity combined for children has increased from 4% to over 18% between 1975 and 2016 (Obesity and Overweight, 2021). 41 million children under the age of 5 and 340 million children in the age group of 5 to 19 year are either overweight or obese (Obesity and Overweight, 2021). The rates of childhood obesity are so

high in Ireland that it is ranked among the top countries dealing with childhood obesity (Lissau, 2004; Whelton, 2007).

Currently, around 7% of females and 6% of males between the age group of 4 to 16 are obese in Ireland putting the country at 58 out of 200 countries in the childhood obesity charts (Whelton, 2007). It is also stated that a greater number of children in Ireland are exposed to second-hand smoking (SHS) in Irish households (Kabir, 2010). When a child becomes obese during the early stages of life, it will have a great impact on the child's growth and physical development; and if proper measures are not taken to combat this problem it might lead to giving rise to many other health-related problems like type 2 diabetes, heart diseases, cancer and other illnesses throughout one's life course (Lobstein 2004). Hence it is very necessary for the nations to make policies to prevent childhood obesity.

According to *Healthy Ireland (2019)*, Ireland has taken some measures like the Healthy Ireland Framework to prevent similar issues and there is a scope for new policies specifically targeting child's growth and development. The Bogalusa Heart Study (Freedman, 2005) says that obese children within 6-13 years are more likely to be obese adults in the future when compared with children with underweight or lower Body Mass Index (BMI).

2.5.1. Methodology

The Infant cohort from the Growing Up In Ireland (GUI) was taken in this study (Sunday, 2019) which consisted of information from 11,134 infants (when born) until they reach the age of 5. Sunday (2019) says that at the start of the study the infants were nine months, in the second wave they were 3 years old, in the third wave five years and in the fourth wave 7/8 years old. He continues saying that the child's caretaker was categorized as primary carer and secondary carer and the findings relating to primary carers are discussed in his study. These carers were interviewed on the topic of their smoking status, economic status, household status, and all about the care that they provide to their child and about the relationship with the child.

2.5.2. Results of the Study

The main measuring factor which was considered in this study was childhood obesity and how the carer's smoking status is impacting children at an early age and that is now leading towards obesity in children. Primary and secondary carer's smoking status was to be measured hence they were separately interviewed. Questions like do both carers smoke or not? If so, how many times do they smoke in a day? and many questions related to the carer's smoking status were taken into main consideration. As a result, they were classified into 3 groups such as (a) neither carer smoked (b) only the primary carer smoked, (c) both carers' smoked (Sunday, 2019). As a result of the data analysis, Sunday (2019) came up with some important and interesting factors affecting childhood obesity.

In his analysis, he has presented the distribution of baseline characteristics of all the participating children (infants) which were formed based on the carer's smoking status. It is seen in their analysis that when neither of the carer's smoked (both primary and secondary), a superior number of infants was not exposed to smoking. By contrast, it was seen that when both of the child's carers smoked around 10.9% of the chidden were exposed to second-hand smoke (SHS). And when only the primary carer (98% are biological mothers) smoked, almost 13.4% of children were exposed to smoking (Sunday, 2019) .

According to the results of Sunday's (2019) study, it was seen that when primary carers smoked, it was more likely that they breastfed their babies less when compared to non-smoking caretakers. When we dive into the economic characteristics of smoking carers, it was seen that they were more justifiably consumed alcohol regularly, had low income, and were also experiencing unemployment. It is also seen in the results of the analysis that when both of the carers did not smoke, the primary carer maintained a good healthy BMI, had a good education, was employed, and was balancing their home duties along with their work as well (Sunday, 2019). This shows the advantages of not smoking and how that can affect our life and family in general.

Sunday (2019) has discussed the smoking status of the primary carer in detail. The smoking status was divided into 2 categories namely, yes (representing primary carer smoked) or no(representing primary carer who did not smoke) in wave 2 and wave 3 i.e., when children were 3 years and 5 years old respectively. In conclusion of his analysis, the percentage of primary carers who smoked was considerably higher in wave 2 when compared with wave 3. It shows that when children were young (3 years) their primary carer smoked more and as and when children got older primary carer's smoking percentage reduced. It was also seen that the percentage of primary carers who were not entitled to smoking increased from 73.6% (wave 2) to 76.6% in wave 3 (Sunday, 2019).

From the overall analysis of Sunday's (2019) study it was found that when children were exposed to smoking in their early stages of life through their primary carer's smoking status, children were bound to be obese or overweight at the age of 3 with the odds of 1.30 times when compared with the children of non-smoking primary carer (OR:1.30, 95% CI: 1.17–1.46). Correspondingly, it was also found that when children were exposed to primary carer's smoking in early stages, it increased the odds of being overweight/obese at 5 years when compared to children of non-smoking mothers (OR: 1.31, 95% CI: 1.16–1.49; Sunday, 2019).

Sunday (2019) argues that when children are exposed to maternal smoking in early childhood there was an increased risk of obesity/overweight at ages three and five when compared to children of non-smoking mothers. His study further implies that the risk of childhood overweight/obesity after childhood SHS exposure is unaffected by low birth weight or breastfeeding.

2.5.3. Summary

According to the results of Sunday's (2019) study, when neither of the caregivers smoked (both main and secondary), a higher percentage of newborns were not exposed to smoking. It is also evident from the study that when both of the carers did not smoke, the primary carer maintained a good healthy BMI, had a good education, was employed, and was balancing their home duties along with their

work as well. When both of the child's carers smoked, however, a significant amount of the children were exposed to second-hand smoke (SHS). When the economic characteristics of smoking carers were examined, it was seen that they were more justifiably consumed alcohol regularly, had low income, and were also experiencing unemployment.

Sunday (2019) in his study has discussed the smoking status of the primary carer in detail. Specifically when primary carers (98% are biological mothers) smoked, a considerable amount of children were exposed to smoking. It was also found that when children were young (3 years) their primary carer smoked more and as and when children got older primary carer's smoking percentage reduced. From the overall analysis of this study (Sunday, 2019) it was found that when children were exposed to smoking in their early stages of life through their primary carer's smoking status, children were bound to be obese or overweight when compared with the children of non-smoking primary carer. The findings from his study also highlighted the health impact of childhood obesity in Ireland, which may be linked to mother smoking throughout pregnancy and early infancy.

2.6. The Effect of Parental drinking on Alcohol Use in Young Adults

Family influences and parental behavior are important in determining how young people use alcohol and whether they suffer from alcohol-related problems (Ryan, 2010; Rossow, 2016). Parental alcohol consumption, the provision of alcohol to adolescents, low levels of parental surveillance, a poor parent–child connection, and a lack of parental support are all linked to young people starting to drink earlier and whether they continue to drink during their adolescence (Ryan, 2010; Yap, 2017).

Rossow (2016) argues that while there is a substantial body of evidence demonstrating the impact of parental alcohol use on child alcohol use, more research is needed to better understand the mechanisms underlying the wide range of potential parental influences that can influence intervention design and policy. However, inaccurate metrics and inconsistent application restrict the impact of parenting on childhood outcomes (Ryan, 2010). A recent detailed

analysis of prospective cohort studies (Rossow, 2016) found a lack of studies capable of inferring causal relationships between parental and adolescent alcohol use. Four studies found that parental alcohol use predicts their children's alcohol use and the prevalence of related problems (Pears, 2007; Latendresse, 2008; Mares, 2011; Alati, 2014). Mahedy (2018) argues that because of the limited use of theory-driven research, small data sets, and a lack of control for confounding factors, there is still a lot of doubt about the strength of causal inference and the mechanisms of parental influence, or effect pathways. Furthermore, there was inconsistency found when it came to the impact of maternal versus paternal drinking habits (Rossow, 2016; Mares, 2011; Harburg, 1990; Casswell, 2002; Poelen, 2007; Poelen, 2009) thus it's still unknown how features of the parent–child interaction influence results.

Mahedy (2018), looked at the impact of parental alcohol consumption (reported when their children were 12 years old) on the characteristics of their children's alcohol usage as young people (18 years of age), and determined how much parental monitoring of their children's activities mediated any relationships, as well as whether children had already started drinking by the age of 14, and whether children linked with deviant peers by the age of 15.5 years.

Mahedy (2018) was informed by recommendations made by Rossow and colleagues (Rossow, 2016) and have used their criteria for strengthening capacity for causal inference. Mahedy (2018: p. 2041-2050) says he has utilised

“a theory-driven analytic approach (examining mechanisms from parental to young adult alcohol use and the inclusion of important covariates; analytical rigour (using path analysis to examine the suggested mechanisms in rich longitudinal data; and minimizing sources of bias (including separate graded measures of maternal and paternal alcohol use collected at an age which could plausibly influence offspring alcohol use and could assess whether a dose–response relationship exists)."

Mahedy (2018) states that the link between parental and young adult alcohol consumption was investigated using path models in a structural equation

modeling framework to see if these associations were mediated by early alcohol initiation, parental surveillance, and interacting with deviant peers. When the young person was 12 years old, the mother's assessments of their own and their partner's frequency of alcohol consumption were evaluated. At the age of 14, the young person supplied self-reported information on early alcohol initiation and perceived parental supervision; associating with deviant friends at the age of 15.5 years; and alcohol use at the age of 18.

2.6.1. Methodology

Data was collected from the Avon Longitudinal Study of Parents and Children (ALSPAC), which enrolled 14,541 expectant mothers who lived in the old Avon Health Authority in the South West of England and expected to give birth between April 1 and December 31, 1992. For the analysis of the study (Mahedy, 2018) mothers completed a postal questionnaire about their daily alcohol consumption during the past week when their children were aged 12 years. The responses were transformed into UK standard units, including the sort of beverage and the amount drunk. A three-category variable was created to capture light (drinking < 4 units on any single day; *n* = 3593/6356 (56.5%), moderate (drinking ≥ 4 units on 1–3 days; *n* = 2210/6356 (34.8%) and high-risk alcohol use (drinking ≥ 4 units on ≥ 4 days in one-week; *n* = 553/6356 (8.7%). Also the same questionnaire was used to analyze maternal reports of partner's frequency of drinking four or more units of alcohol. The reference group taken in the study (Mahedy, 2018) for all data analyses is light parental drinking. Author says that by focusing on these distinct indicators it was helpful to explore whether there is a potential dose–response association between parental and young adult alcohol usage. When responders were around 18 years old, the Alcohol Use Disorders Identification Test (AUDIT) was used to measure alcohol use during a computer-based session at a research clinic (Babor, 2001). Mediators taken by Mahedy for his study (2018) is as follows:

2.6.1.1. Early alcohol use

When the young person was around 14 years old (mean = 13.8 years; SD = 0.21) and attended a study clinic, they filled out a computer-assisted survey about their alcohol usage in early adolescence. Participants answered yes or no to a question about how many times they had consumed a full drink of alcohol in the previous six months. To capture early alcohol initiation, a cut-off of three or more full drinks consumed in the previous six months was used (Mahedy, 2018).

2.6.1.2. Parental monitoring

Using a computerized 12-item self-report, the young person provided information about parental surveillance (completed independently of their parents). A recent study (Abar, 2012) indicated that adolescent reports on parental surveillance were more accurate than parental reports, so offspring reports were employed.

2.6.1.3. Association with deviant peers

Self-reports at age 12 were used to assess deviant behavior in the young person's peer group. The response options were yes/no, and the items were added together to create a total score. The higher the score, the higher the level of peer deviation (Mahedy, 2018).

To perform statistical analysis in the study Mahedy (2018) used a mediation model to see if there was any evidence of an indirect pathway from parental alcohol consumption before adolescence to alcohol usage at the age of 18.

2.6.2. Results of the study

According to Mahedy (2018), there was weak evidence to suggest that parental monitoring accounted for some of the association between partner alcohol use and young adult alcohol use. Strong evidence of a total indirect effect from parental alcohol use (moderate and high-risk) to young adult alcohol use through parental monitoring, early alcohol use and peer deviance was explored. There was also evidence of a remaining direct effect apart from partner high-risk alcohol use and young adult alcohol use. From the results of study (Mahedy, 2018) it was

found that strong evidence of an indirect effect between parental alcohol use and their children's alcohol use in young adulthood, primarily through early alcohol initiation and associating with deviant peers. It was also evident from the results that there was insufficient evidence to indicate a direct pathway from partner high-risk alcohol use to alcohol use in young adulthood.

Findings from the study (Mahedy, 2018) corroborate those of systematic reviews and meta-analyses that show a link between parental alcohol consumption and both the initiation and levels of alcohol consumption among adolescent offspring (Rossow, 2016; Yap, 2017; Allen, 2003). Building upon social cognitive theory and recent models of cognitive transference (Bandura, 1986; Campbell, 2010; Campbell, 2010) low parental monitoring may increase the likelihood of early alcohol initiation and association with deviant peers via the perception of more tolerant or more permissive parental attitudes towards adolescent alcohol use, which may be modelled directly by young people or indirectly through the transference of attitudes that are positive or approving towards alcohol use and its consequences. Indeed, even before children start drinking, children are exposed to reasons and expectations about how alcohol will affect them, which might come from parental monitoring and determine later behavior (Campbell, 2010). Author Mahedy (2018), says that all of these factors, if present, can minimize the risk of early adolescent commencement of alcohol use and misuse; however, if lacking, they can increase the risk of early adolescent initiation of drinking (Yap, 2017). He continues saying that as children enter puberty, peer bonds become increasingly crucial. A number of studies show that selecting friends with comparable drinking levels, as well as the influences of peers' perceived or actual drinking behaviors, play a role (Wang, 2015; Mercken, 2012 ; Mundt, 2012 ; Huang, 2014; Leung, 2014).

Alcohol consumption with deviant alcohol-using role models, according to a social learning viewpoint, might contribute to the maintenance or escalation of use through modeling behavior or the perception of peer norms (Petraitis ,1995; Halim, 2012). As a result, early drinking and continued drinking may stimulate the selection of similar higher-level drinking peers, as well as future effects that raise alcohol consumption (Osgood, 2013). According to results of study (Mahedy,

2018) they detected unique effects of each parent/guardian in this study by assessing separate measures of maternal and paternal alcohol consumption, with mothers playing both a direct and indirect role. Maternal partners played a less consistent role. There was evidence of a direct and indirect effect for partners who were moderate drinkers, but only an indirect effect for partners who were high-risk drinkers. Overall, the hypothesized mediators explained roughly 25% of the entire effect in models assessing maternal alcohol use and nearly 40% of the total effect in models examining partner alcohol use (Mahedy, 2018). Till date, data on the relative influence of each parent have been equivocal, with some research indicating stronger consequences of mother (Alati, 2014; Casswell, 2002; Poelen, 2007; Macleod, 2008) over paternal alcohol use, while others finding links between paternal, but not maternal, alcohol use and adolescent alcohol consumption (Mares, 2011; Poelen, 2009). Mahedy (2018) says, this may be due, in part, to the use of different measures of alcohol use among adolescents and parents between studies, using maternal self-reports and maternal reports of partner alcohol use, assessing alcohol use at different time-points and geographic location of studies, which could influence cultural practices.

2.6.3. Summary

In the research (Mahedy, 2018) the evidence for potential ‘transmission' of harmful alcohol use from parents to their children is strengthened. Many of the principles outlined in the Rossow (Rossow, 2016)et al. comprehensive review were integrated into the research, and it offered the greatest evidence of a relationship between parental and offspring alcohol use to date. This study does not want to over-interpret the results as drawing causal inference, therefore they have included numerous tips for strengthening causal inference in observational studies. They have also discovered both direct and indirect parental influences on adolescent alcohol consumption. The findings from this study suggest that prevention efforts should concentrate on parental alcohol use, behaviors, and attitudes, as well as the influence of parental alcohol use on early initiation and peer associations and influences. Mahedy (2018), argues that as combined parent-child alcohol prevention programs have been shown to be effective in

reducing the initiation and frequency of alcohol use during adolescence (Koning, 2009; Newton, 2017) targeting prevention efforts early in life, while engaging parents, may play an important role in delaying initiation of alcohol use and reducing susceptibility to peer influences throughout adolescence and thus alcohol-related damages can be reduced in the long run.

2.7. Alcohol and Drug Consumption among Young People and Adolescents in Ireland

This section focuses on young people and adolescents. As the previous section dealt with the effect of the parents' drinking on alcohol use in children and young people, this section aims at discussing the alcohol and drug consumption among young people in Ireland.

According to Sawyer (2018), adolescence is the period of life that spans from childhood through maturity. Adolescence comprises biological growth as well as fundamental social role shifts, both of which have changed dramatically over the last century.

My World Survey 2 (Dooley, 2019) and the National Centre for Youth Mental Health (2012), which is a comprehensive study of young people's mental health and wellbeing, provide a glimpse into the consumption of alcohol and other drugs by young people in Ireland. My World Survey 2 had a population of 19,407 people, with 10,459 adolescents (aged 12–19 years) from 83 secondary schools and 8,290 young adults (18–25 years) in higher education or employment. Seldom-heard young adults consisted of 314 young people in Youthreach, 292 young people in Colleges of Further Education (CFE) / community training, and 52 young people with physical disabilities were included. A cohort of children born in 1998 was included in the Growing Up in Ireland (GUI) survey, which is a national longitudinal study of children and young people in Ireland. This cohort of children was interviewed four times namely when they were 9,13,17,18 and 20 years old (O'Dwyer, 2020). The findings of 5,191 interviews with 20-year-olds conducted in 2018 and 2019 (ESRI; Trinity College Dublin; and Department of Youth and Community Affairs, 2018) are taken into consideration to assess

alcohol and drug consumption among young people and adolescents in Ireland.

2.7.1. Results from My World Survey 2

The AUDIT (Alcohol Use Disorders Identification Tool) is used to screen for dangerous and toxic drinking and was used to categorize young people into four groups namely, low risk group; problem drinking group; harmful and hazardous drinking group and possible alcohol dependence group (Saunders, 1993). The Drug Abuse Screen Test (DAST), a self-report questionnaire that evaluates drug usage in the last 12 months, was used to assess drug use.

As a result of research from (O'Dwyer, 2020), it was found that 57% of adolescents had never consumed alcohol, when compared with 49% of adolescents in My World Survey -1 (Dooley, 2012). Also when compared with the results of My World Survey -1, a greater number of adolescents who drank alcohol were in the problematic drinking group. According to O'Dwyer (2020) there was a significant association seen between anxiety and depression among adolescents and problematic drinking. Also adolescents who reported attempting suicide had considerably higher levels of problematic drinking and were also more likely to have tried cannabis. Around 15% of respondents (18% males vs. 13% females) said they have tried cannabis.

In research from (O'Dwyer, 2020), it was found that 10% of young adults confessed that they never consumed alcohol. Considering young adults who drank alcohol, it was found that 47% of adults were included in the low-risk drinking range, 39% of young adults were seen as problem drinkers, 8% of adults being considered as harmful and hazardous drinkers, and 6% of adults as having possible alcohol dependence. Young females were more likely to be in the low-risk drinking range (50% females) when compared to young males (45% males). Also young males were found to be in the hazardous range and possible alcohol dependence range.

According to O'Dwyer (2020), when My World Survey 2 (Dooley, 2019) and My World Survey -1 (Dooley, 2012) were compared, the percentage of problem

drinkers who come under problematic, dangerous, and possible alcohol dependence groups was much lower among young adults in My World Survey 2 than My World Survey -1. It was also seen that lower levels of family support may be one of the causes of problematic drinking among young adults. 53% of young adults (59% males and 50% females) reported that they had smoked cannabis in their lifetime. Surprisingly, 83% of young adults reported that they tried cannabis for the first time when they were between 15 and 19 years.

The findings of My World Survey -1 and My World Survey 2 both demonstrated a relationship between problematic alcohol usage and depression and anxiety (O'Dwyer, 2020). According to the Drug Abuse Screen Test (DAST) cut-off points, 49% of young adults had no drug problems, 37 percent had minor drug problems, 10% had moderate drug problems, 2% had significant drug problems, and 1% had severe drug problems.

O'Dwyer (2020) argues that no significant difference was seen in alcohol consumption between young people having a physical disability and the young adult or adolescent samples. He continues stating that there were no associations seen between alcohol behavior and mental health or drug use for the seldom-heard group. Also, 45% of Youthreach participants (young people) reported that they had used drugs and 66% of young people said they had smoked cannabis which was much higher than the young adult or adolescent sample.

2.7.2. Results from Growing Up In Ireland study

The information about the frequency of alcohol use and the age of the first use was analyzed by the GUI (2019) study. It was found from the results (O'Dwyer, 2020) that 96% of 20-year-olds said they had drunk alcohol at some point in their lives, and 93% claimed they currently drink alcohol. On average, it was when people were 15.9 years old when they had tried alcohol for the first time. Almost 24% of 20 years olds confirmed that they consume alcohol twice a week. It was also found in the results that 15% of the respondents were introduced to alcohol when they were 13 years old and this rose to 89% when they had become 17-18

years old. 59% of participants stated that they had tried cannabis. O'Dwyer (2020) states that 1% of participants had tried cannabis at 13 years and 30% of participants had tried when they were 17/18 years old. He also stated that a significant rise of about 59% of participants had consumed cannabis until they had become 20 years old.

2.7.3. Summary

In a nutshell, the statistics show that a growing number of young people are avoiding alcohol when it comes to alcohol consumption. Adolescents who do drink, on the other hand, are seen indulging in riskier drinking behavior than previously observed. In their lifetime, the majority of young people had used illicit drugs at least once. O'Dwyer (2020) argues that six out of ten young individuals had tried cannabis at least once, with a significant number using it on a weekly or even daily basis and strong connections between alcohol and illicit drug use and anxiety and depression were discovered, which suggested that there is a link between substance abuse and poor mental health among Irish teenagers.

2.8. Research Gaps

Most existing studies on the growth and development of children focus on individual characteristics of children (height, weight, diet), and few studies have shown associations between children’s physical growth and characteristics of primary carers. Hence, under the premise that there may be an association between children’s physical growth and characteristics of primary carers, this study chose smoking status and alcohol status of primary carers for analysis. Hence, it is probably to explore whether or not there exists an association between children’s physical growth and smoking status and alcohol status of primary carers the research has been conducted. Although the research conducted in this way may have some limitations, it is relatively more targeted and can draw a more subjective conclusion.

This chapter began with an overview of the importance of children's growth and development in Ireland. A brief history of the UK-WHO growth standards which

have been adopted by Ireland was discussed. Body mass index (BMI) changes in early childhood among Irish Children was explored in regard to empirical evidence on this subject. The chapter then discussed the impact of carer's smoking status on childhood obesity. The chapter also discussed the exploration of association between parent's drinking and alcohol use in young children. This chapter concluded by discussing the alcohol and drug consumption among young people in Ireland. This chapter sought to exhibit the existing literature on child's physical growth in Ireland and highlight some of the research that this study seeks to address.

Chapter 3: Methodology and Data Analysis

3.1 Introduction:

This chapter discusses the explanation for the research design employed in this research. Firstly, data and the basic principles used for the research are discussed to provide an overview of the dataset. Secondly, a detailed description on the data collection, data processing and data analysis techniques are discussed. Benefits of using the secondary datasets are outlined and thorough discussion of techniques are presented. Lastly, the ethical concerns that must be considered during the research are discussed.

3.2. Data and Basic Principles Used in Research

In my research I have used the dataset provided by Growing Up In Ireland Study. Growing Up in Ireland - the National Longitudinal Study of Children (Economic and Social Research Institute, Trinity College Dublin, & Office of the Minister for Children and Youth affairs, 2010) is the first study of its kind in Ireland and aims to explore the many factors that contribute to or undermine the wellbeing of children currently living there. Growing Up in Ireland was commissioned by the Irish Government and funded by the Department of Health and Children through the Office of the Minister for Children (OMC) in association with the Department of Social and Family Affairs and the Central Statistics Office (Economic and Social

Research Institute, Trinity College Dublin, & Office of the Minister for Children and Youth Affairs, 2010).

Growing Up in Ireland provides a very important input to the implementation of The National Children's Strategy - a major national plan for children, published in 2000 by the Department of Health and Children (Collins 2001; Economic and Social Research Institute, Trinity College Dublin, & Office of the Minister for Children and Youth affairs, 2010). The main goal of Growing Up in Ireland is to do evidence-based research on childhood and children's well-being (Economic and Social Research Institute, Trinity College Dublin, & Office of the Minister for Children and Youth affairs, 2010).

The Growing Up In Ireland study includes one cohort of 8,568 nine-year-olds and the other of 11,100 newborns (aged nine months) indicating a two-age cohort longitudinal design which is used to better understand children's development across a range of dimensions. The 8,568 children representing the nine-year cohort were born between November 1, 1997, and October 31, 1998, and data was collected between August 2007 and May 2008 (Economic and Social Research Institute, Trinity College Dublin, & Office of the Minister for Children and Youth affairs, 2010). In our research we have used a nine-year cohort dataset as this dataset can help us in the analysis and visualisation of several attributes of school age children.

3.3 Data Collection

I requested the Irish Social Science Data Archive (ISSDA) to provide the Growing Up In Ireland dataset by completing the Researcher Data Request form. ISSDA provided me with the two waves of Growing Up In Ireland Data which consisted of 9 year cohort data and 13 year cohort data. The dataset was uploaded by ISSDA to HEAnet Filesender. I was granted permission to access the file along with the decryption information and password. The dataset provided was decrypted and I used a software called PKWARE (reader) to unzip the files. As my operating system is Mac Operating System, I used Keka software to extract the dataset to store it on my system.

3.4. Data Processing and Data Analysis

In this study, the SPSS statistical software program (version 28) is used to properly process the data and to perform statistical analysis such as regression analysis. I also used SPSS statistical software to understand the data and to perform data preprocessing techniques as the data files received from ISSDA were very large. A considerable time was spent investigating the dataset for errors and correcting those errors when encountered as the data was collected from many years and included 8,568 participants.

3.5. Hypothesis :

The following subsection states the hypothesis statements taken in our research.

3.5.1. Hypothesis 1 (H1)

H1 : On average females have high BMI than males when they are 9 years old.

3.5.2. Hypothesis 2 (H2)

H2 : Gender and smoking status of primary carer may have an association.

3.6. Variables

The dataset included 850 columns with 8,568 entries. I have included the relevant columns supporting my research to perform data analysis. Also a considerable amount of time was spent to understand the 850 columns and to filter the required columns in order to perform data analysis. Variables contained in this dataset can be seen in the table below.

Table 1: Table of Variables

Variable Name	Description	Example
Birth weight (kgs)	Birth Weight of Study Child in Kilograms	3.9
Sex	Gender of Study Child	Male
Weight (kgs)	Weight Of Study Child in Kilograms	28
Height (cms)	Height Of Study Child in centimetres	131.0
BMI	Body Mass Index(BMI) of the study child	16.31
Sex of primary carer	Gender of the primary carer	Female
Smoking status during pregnancy	Smoking status of primary carer during pregnancy 1 = never 2 = occasionally 3 = daily	Never
Smoking status	Smoking status of primary carer 1 = daily 2 = occasionally 3 = never	Occasionally

Alcohol status	Alcohol Drinking status of primary carer 1 = Never 2 = Less than once a month 3 = 1-2 times a month 4 = 1-2 times a week 5 = 3-4 times a week 6 = 5-6 times a week 7 = everyday	1-2 times a week

As the dataset contained a large volume of entries, it was my intention to use the descriptive statistical measures such as mean and frequencies, to describe the nature of children's Body Mass Index (BMI) in Ireland. Descriptive analysis is very good to measure the scale and in this research to analyse the nature of a child's BMI. Statistical analysis is a good tool to check for the various factors in order to assess our dataset to gain some important insights underlying the data. Having been provided with a large dataset containing 8,568 entries it was my intention that descriptive statistics and inferential statistics would be the best suited methods to demonstrate the nature of children's physical growth and to find association between smoking, alcohol status of primary carer and children's physical characteristics.

Inferential statistics focus on making predictions about large datasets by using samples of the dataset. Inferential statistical techniques like T-test, Chi-Square Tests, Cross Tabulation and Regression analysis are used to analyse BMI distribution, association between smoking and alcohol status of primary carers with the physical characteristics of children. I hope that further research can be done using the dataset and this initial analysis can act as a stepping-stone for future attempts.

Initially my analysis focused on physical characteristics of children like height, weight and BMI. BMI was calculated using weight and height using formula kg/m2 (World Health Organization, 2021). I have utilised the dataset provided to analyse the nature of BMI of the children in Ireland. Following the general description of a child's physical characteristics, I have separated the dataset on the basis of gender to compare the BMI differences between males and females. This helped me to investigate more on the terms of gender on the basis of BMI. I have also analysed the birthweight of the children using the dataset which helped me to gain insight about the birth weight status of the children in Ireland. The results of this analysis are discussed in chapter 4.

Following the description of the child's physical characteristics, I have also utilised the variables relating to primary carers for my data analysis. Gender distribution of smoking status of primary carers are analysed. Association between smoking status of primary carers during pregnancy and child's birth weight are discussed. Also association between alcohol status of primary carers and child's measured weight are analysed and the results are discussed in chapter 4.

3.7. Secondary Data Analysis

I have not collected the data used in the research on my own, hence I have made use of the secondary data analysis which was available for the researcher by ISSDA. Secondary data analysis can be defined as :

"Any further analysis of an existing data-set which presents interpretations, conclusions, or knowledge additional to, or different from, those presented in the first report on the data collection and its results", (Hakim, 1982, p. 1).

"The study of a problem by analysing data that were originally collected for another study with a different purpose", (Woods, 1988, p. 334).

As data is collected globally in a vast volume and is readily accessible to scholars worldwide, secondary data analysis is becoming more prominent as a research tool (Hakim, 2012). Therefore, using existing data that has been correctly collected is more efficient and cost-effective than trying to obtain primary data. As with any approach of social research, there is substantial debate in the literature

about the benefits and drawbacks of secondary data analysis (Kolb, 2012; Hakim, 2012; Brewer, 2012; Vartanian, 2010; Cheng & Philips, 2014). Among the several benefits of using existing data in research is the convenience with which such information can be accessed. Many nations have open access archives of datasets, including Ireland, which has both the Irish Social Science Data Archive (ISSDA) and the Irish Qualitative Data Archive (IQDA), which hold both qualitative and quantitative data respectively.

The Growing Up In Ireland database is not available for the researchers to view the contents, however after submitting the data request form to ISSDA and having received permission and access, the data was made available for my research.

3.8. Advantages of Growing Up In Ireland (GUI) Study

There are several advantages of using data from the Growing Up In Ireland Study. Results from this study will provide the government with a wide range of information about children and their families (Economic and Social Research Institute, Trinity College Dublin, & Office of the Minister for Children and Youth affairs, 2010). As this study accounts for a number of children and their families, the data obtained from this study can give us many valuable insights with regards to children, their childhood including growth and physical development. The datasets of GUI are large and therefore are informative as these datasets contain data from a large number of attributes associated with the child. Growing Up In Ireland (GUI) study includes almost every attribute that a child can relate and will come across in life. GUI data contains information from children, their primary carer, secondary carer and gathers information from the school as children spend the majority of early years at school (Economic and Social Research Institute, Trinity College Dublin, & Office of the Minister for Children and Youth affairs, 2010). Information about all these attributes of children can help us in analysing the factors which are impacting a child's physical health and development, social/emotional/behavioural wellbeing, and educational achievements.

The aim of this research is to analyse the physical characteristics of 9 year old children in Ireland. My research intends to understand and verify the association between smoking status and alcohol status of primary carers with physical

characteristics of children. The primary objective of GUI study is to understand the lives of Irish children, to describe children's life over time ,to analyse the progress and wellbeing of children at critical periods from birth to adulthood and also to find the key factors which are hampering the children's growth and development (Economic and Social Research Institute, Trinity College Dublin, & Office of the Minister for Children and Youth affairs, 2010). The GUI data provided has all the information with regards to the aims of my research. My research is mainly focused on the physical characteristics of children and factors of primary carers which might be influencing children's physical growth.

3.9. Ethical Considerations

As with any research study ethical considerations are a very important aspect of research and it had to be taken into account prior to and during the research process. Murphy and Dingwall (2007: p. 2231) state that:

"The good reputation of social scientists is critical to the institutional legitimacy and the public standing of our disciplines, unethical behaviour by one member of our community many compromise society's support for us all"

Hammersley (2015) highlights the significance of ethical standards that are widely accepted in the field of social research. Hammersley (2015) argues that even though individual institutions have their own code of ethical principles, what is important to be noted is the principles that are underlying them. Most common ethical principles are used to protect individual privacy and to protect participants from harm.

In our research no identifying information about any of the participants is included in the dataset. The anonymised dataset was received in .SAV format and was decrypted. The decryption information and the password were shared with the researcher by ISSDA. I assure that I have used valid data and I have not included any misleading information of any kind in my thesis. I promise that all the data that I have used was obtained from ISSDA and I was granted permission to access the data and dissolve the data once my research is done. Data that I have used are securely stored and will also be archived.

Ethical approval was also sought and obtained from the chair of the Ethics Committee from the School of Sociology on the 27th March 2021.

3.10. Conclusion

This chapter began by explaining the research design principles and providing justification for using such research design. Following this, the nature of the Growing Up In Ireland dataset was examined and was explained in detail. The dataset, its variables, and the processing and analysis methodologies were all explained in great detail. Finally, benefits of the dataset and ethical concerns were addressed.

Chapter 4: Results

4.1 Descriptive statistics

Table 2: Descriptive Summary Of Children BMI

	Child BMI
Count	8136.0000
Mean	17.842895
Std	2.9770511
Min	9.4590333
25%	15.752993
50%	17.141129
75%	19.428691
Max	37.070760

Table 2 shows the statistical summary of the Body Mass Index (BMI) of 9 year old children in Ireland. The minimum BMI seen in 9 year old children is 9.46 which

according to BMI-for-age (5–19 years), 2021 comes under Severe thinness category. Half of the BMI lies below 17.41 which shows that a half of the children's BMI lies in the normal range (BMI-for-age (5–19 years), 2021). The maximum BMI observed in the dataset is 37.07 according to BMI-for-age (5–19 years), 2021 comes under obese category.

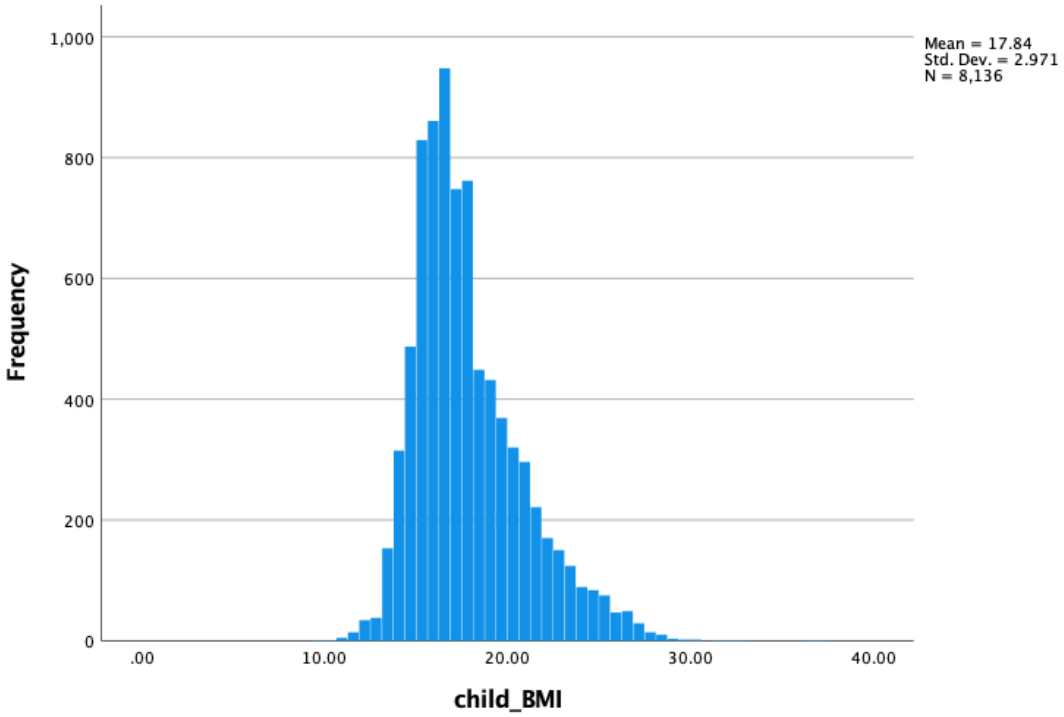


Figure 1: Distribution of Body Mass Index (BMI) of 9 year old Children in Ireland

Figure 1 shows the distribution of the Body Mass Index (BMI) of 9 year old children in Ireland. It is evident from the figure that the average BMI of 9 year old children in Ireland is 17.84 with the standard deviation 2.97. According to BMI-for-age charts for boys and girls from research ("BMI-for-age (5–19 years)," 2021) the BMI ranging from 13 - 18 are considered to be within the normal range for 9 year old children (BMI-for-age charts for boys and girls can be viewed in the Appendix A).

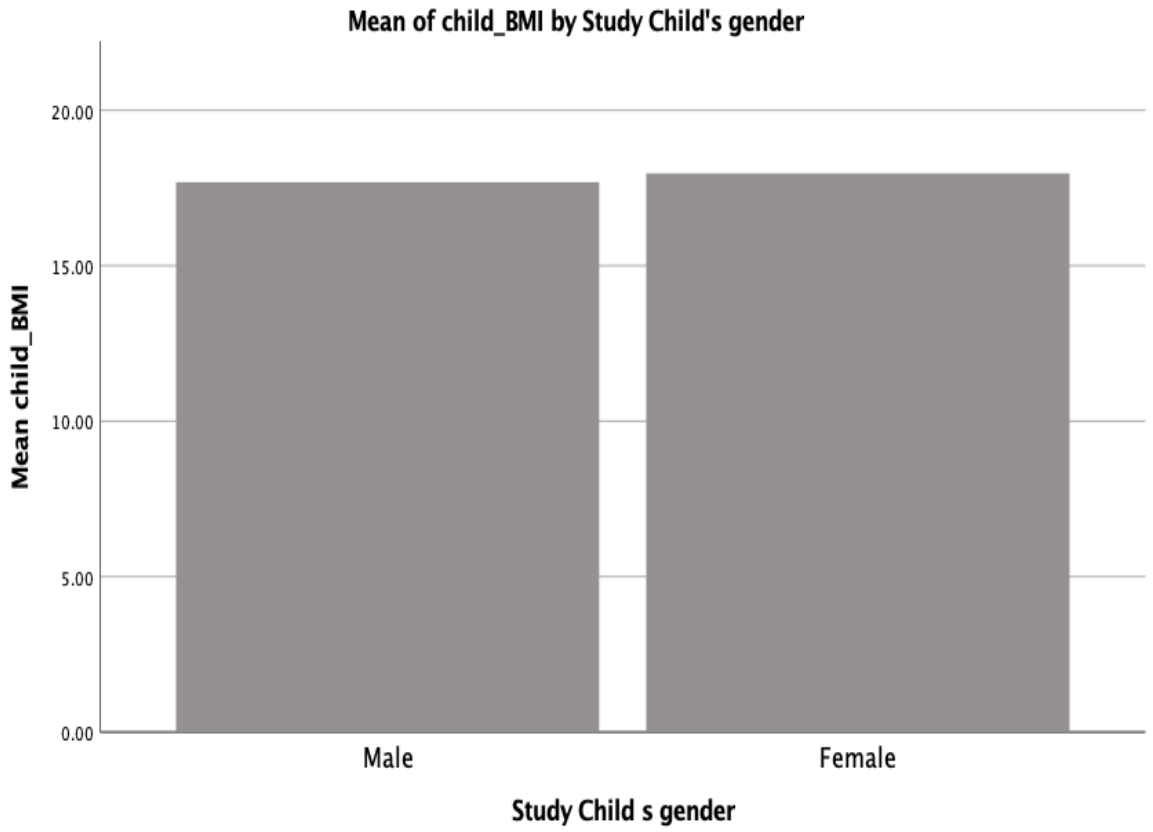


Figure 2: Average BMI of 9 year olds in Ireland

Figure 2 represents the gender distribution of average BMI of 9 year old children in Ireland. We can see that the BMI of males is slightly lower than that of females.

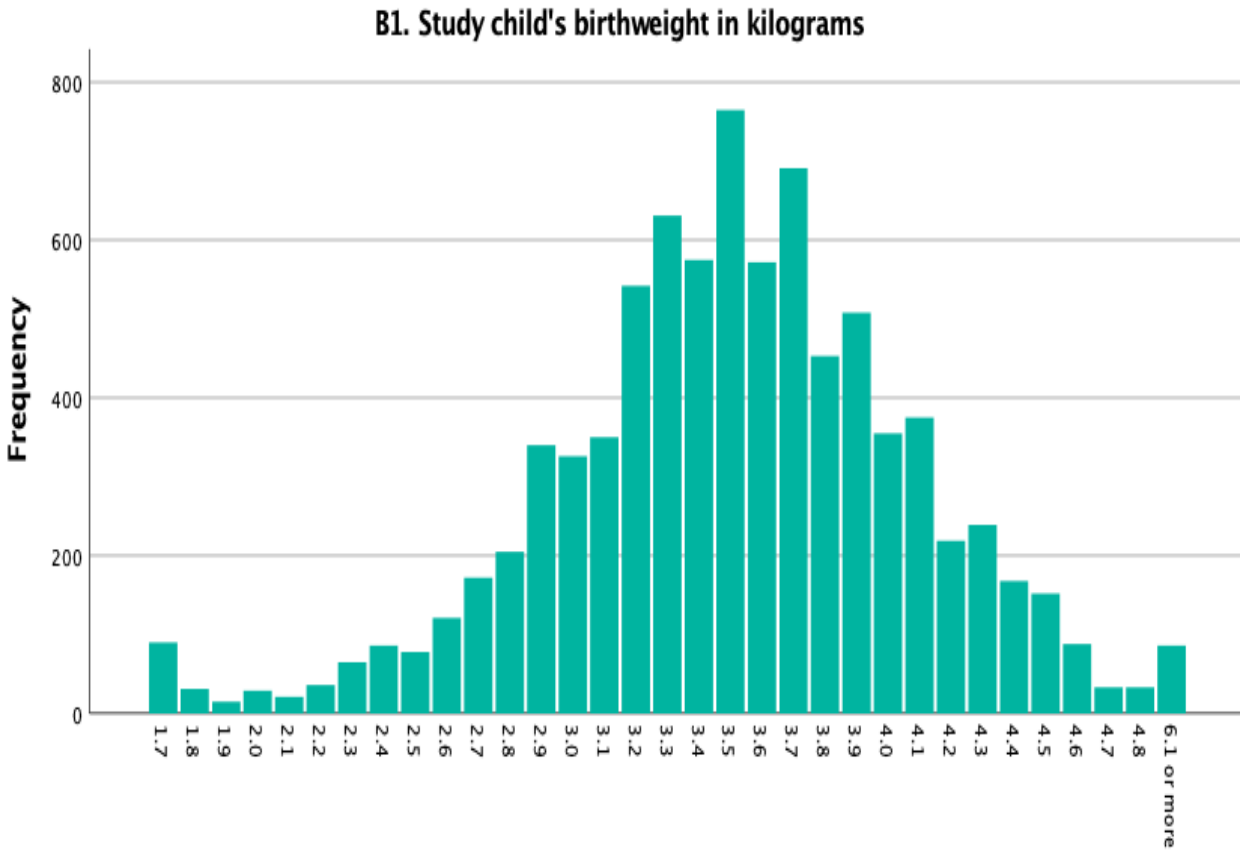


Figure 3: Birth Weight of children in Ireland

Figure 3 represents the birth weight of children in Ireland. It is evident from the figure that the majority of babies born in Ireland weigh about 3.5 kilograms. According to new research ("Physical Growth in Newborns | Michigan Medicine," 2021) the average birth weight for babies is around 7.5 lb (3.5 kg), although between 5.5 lb (2.5 kg) and 10 lb (4.5 kg) is considered normal.

4.2. Results of Hypothesis 1

In this study with Hypothesis 1, I would like to test whether females had higher BMI than males when they were 9 years old. In - order to perform the analysis I have used a T-test. T- test has two hypothesis statements namely: null hypothesis and alternate hypothesis. Hypothesis statements taken in our research are :

Ho (null hypothesis) : Ho states that females do not have high BMI than males

H1 (alternate hypothesis) : H1 states that females have high BMI on average

Table 3: Statistical Summary of Study Child's BMI and Child's Gender

Group Statistics

	2. Study Child s gender	N	Mean	Std. Deviation	Std. Error Mean
child_BMI	Male	3836	17.6871	2.79122	.04507
	Female	4034	17.9723	3.10843	.04894

Table 3 shows that there are 3836 male respondents and 4034 female respondents in our study. Mean is 17.69 with standard deviation of 2.79 for males and 17.97 with standard deviation of 3.10 for females. Also standard error with 0.045 for males and 0.049 for females is seen.

Table 4: Independent Sample Test for BMI and Gender

Independent- Sample Test for BMI and Gender

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance		Mean	Std. Error	95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Difference	Difference	Lower	Upper
child_BMI	Equal variances assumed	63.343	<.001	-4.274	7868	<.001	<.001	-.28515	.06671	-.41591	-.15438
	Equal variances not assumed			-4.286	7842.393	<.001	<.001	-.28515	.06653	-.41556	-.15473

Levene's Test for Equality of Variances tests is the test to check whether variances are equal. The null hypothesis in Levene's test is that the variances of the two populations are equal. The test statistic F, has a value of 63.343 and p value of <0.001 which is much lesser than 0.05 and hence can reject the null hypothesis and assume that variance is not equal. As equal variances are not

assumed we can see that t vales is -4.29 and has 7842.393 as the degree of freedom (N-1). The mean difference is -2.85 which is the difference of male and female mean. The column labelled 95% Confidence interval of the difference is divided into lower(-.42) and upper (-.15). The confidence interval is the range of values around the statistic that are believed to contain, with certain probability (eg: 95%) , the true value of that statistic.

Welch's t-test is used when variances and sample size taken are unequal. From table 3 we can see that sample size and variances of the data differs. Hence, we have performed Welch's t-test.

Oneway

ANOVA

child_BMI

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	159.873	1	159.873	18.271	<.001
Within Groups	68846.340	7868	8.750		
Total	69006.214	7869			

Robust Tests of Equality of Means

child_BMI

	Statistic[a]	df1	df2	Sig.
Welch	18.370	1	7842.393	<.001
Brown-Forsythe	18.370	1	7842.393	<.001

a. Asymptotically F distributed.

Table 5: Welch's t-test results

From table 4 and table 5, it can be seen that p value is <0.001. As the significance value is < 0.001 which is much less than 0.05 so we can reject the null hypothesis which states females do not have higher BMI than males. (The significance values must be less than 0.05 for us to reject the null hypothesis). In this case the probability that this difference was due to chance is less than 0.001. Statistically significant simply means unlikely to be due to chance variation. We

can assume that there is statistically significant difference between the two BMI averages and conclude that on average females have high BMI.

In our data females have statistically significantly higher BMI than males on average (females mean 17.97 ± 3.10; males mean 17.69 ± 2.8), t(-4.29), p <0.001. Hence, we can reject the null hypothesis and accept the alternate hypothesis that on average females have higher BMI than males.

4.3. Results of Hypothesis 2

In this study with Hypothesis 2, I would like to test whether there is an association between gender and smoking status of primary carer. In order to find association between gender and smoking status, Chi Square is used in our study. To perform Chi-square we take into account two hypothesis statements namely :

Ho (Null hypothesis) : Gender and smoking status of primary carer do not have an association

H2 (Alternative hypothesis) : Gender and smoking status of primary care have an association

Table 6: Gender distribution of Smoking status of Primary Carer

Gender Cigarettes Smoking behaviour Crosstabulation

			F2. Have you ever smoked? Was it: daily/occ/never			
			Daily	Occasionally	Never	Total
A2. Record gender of Parent 1	male	Count	20	5	48	73
		% within A2. Record gender of Parent 1	27.4%	6.8%	65.8%	100.0%
	female	Count	1362	879	4001	6242
		% within A2. Record gender of Parent 1	21.8%	14.1%	64.1%	100.0%
Total		Count	1382	884	4049	6315
		% within A2. Record gender of Parent 1	21.9%	14.0%	64.1%	100.0%

From table 6, we can see that 27.4% of males and of 21.8 % females smoked on a daily basis. When seen smoking status on an occasional basis, the female percentage was higher (14.1%) than males (6.8%). Also we can see that 65.8% of

males and 64.1% females never smoked. On a whole it was seen that 64.1% of the population never smoked.

Table 7: Chi- Square Test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.753[a]	2	.153
Likelihood Ratio	4.301	2	.116
Linear-by-Linear Association	.163	1	.687
N of Valid Cases	6315		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.22.

From table 7 , we can see that Chi - square value is 3.753. Significance value (p value) is 0.153 is >0.05 ,hence we accept the null hypothesis stating that gender and smoking status of primary carer do not have an association.

4.4. Regression based on Smoking Status of Primary Carer

In order to find an association between primary carer's smoking status and physical characteristics of children we have performed Regression Analysis in our research. Here, I have performed regression analysis to find an association between primary carer's smoking status during pregnancy and child's birth weight.

Table 8: Regression model on Primary carers smoking status during pregnancy and child's birth weight (Reference variable : never)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.158[a]	.025	.025	.6104

a. Predictors: (Constant), daily, occasionally

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	80.165	2	40.082	107.586	<.001[b]
	Residual	3147.019	8447	.373		
	Total	3227.184	8449			

a. Dependent Variable: B1. Study child's birthweight in kilograms

b. Predictors: (Constant), daily, occasionally

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.566	.007		475.509	.000
	occasionally	-.177	.023	-.083	-7.678	<.001
	daily	-.271	.020	-.144	-13.329	<.001

a. Dependent Variable: B1. Study child's birthweight in kilograms

In table 8, we see that we have performed regression using dependent and independent variables. Dependent variable is the study child's birth weight (kgs) and independent variables are daily and occasionally smoking primary carers who smoked during pregnancy. Here, we have taken our reference variable as never

smoked or smoking primary carers. The results here are taken with the reference variable.

From table 8, we can see that Adjusted R square is 0.025 which tells that 2.5 % of the variance in the dependent variable (child's birth weight) is explained by the independent variables (primary carers smoking occasionally and carers who smoke daily). Through ANOVA results we can see that p- value is < 0.05 which means that the findings are statistically significant.

In relation to primary carers who never smoked and primary carers who are occasional smokers the unstandardised Coefficients B is -0.18 which is negative means that occasional smokers when compared to carers who never smoked will realise 0.18 fewer units (decrease) on the the child's birth weight (dependent variable). In relation to carers who never smoked and daily smokers the unstandardised Coefficients B value is -0.27 which is negative means that daily smokers will realise 0.27 fewer units (decrease) on the child's birth weight (dependent variable). Results for both occasionally and daily smoking carers were statistically significant ($p < 0.001$).

Table 9: Regression model on Primary careers smoking status during pregnancy and Child's Birth weight (Reference : daily)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.148[a]	.022	.022	.6113

a. Predictors: (Constant), occasionally, never

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	71.112	2	35.556	95.163	<.001[b]
	Residual	3156.072	8447	.374		
	Total	3227.184	8449			

a. Dependent Variable: B1. Study child's birthweight in kilograms

b. Predictors: (Constant), occasionally, never

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	3.336	.017		195.431	.000
	never	.231	.019	.161	12.366	<.001
	occasionally	.052	.028	.025	1.890	.059

a. Dependent Variable: B1. Study child's birthweight in kilograms

In table 9, we see that we have performed regression using dependent and independent variables. Dependent variable is the study child's birth weight (kgs) and independent variables are never smoked and occasionally smoking primary carers who smoked during pregnancy. Here, we have taken our reference variable as daily smoked or smoking primary carers. The results here are taken with the reference variable.

From table 9 , we can see that Adjusted R square is 0.022 which tells that 2.2 % of the variance in the dependent variable (child's birth weight) is explained by the independent variables (primary carers smoking occasionally and carers who never smoked). Through ANOVA results we can see that p- value is < 0.05 which means that the findings are statistically significant.

When compared with the primary carers who smoked daily and carers who never smoked, we see a positive 0.23 value, which means that carers who never smoked see a 0.23 increase in their child's birth weight (dependent variable) and the result is statistically significant with p <0.001. When compared with the primary carers who smoked daily and who smoked occasionally , a positive 0.05 value is seen which means that who smoked occasionally see a 0.052 increase in their child's birth weight (dependent variable) and result (p value = 0.059) mean that results are not statistically significant. Child's birth weight (kgs) of primary carers who never smoked is significantly higher when compared with the primary carers who smoked daily. Also the child's birth weight (kgs) of primary carers who smoked occasionally was higher but was not statistically significant.

4.5. Regression based on Drinking Alcohol Status of Primary Carer

In order to find an association between primary carer's drinking alcohol status and physical characteristics of children we have performed Regression Analysis in our research. Here, I have performed regression analysis to find an association between primary carer's drinking alcohol status and child's measured weight (kgs).

Table 10: Regression model on Primary careers alcohol status and Child's measured weight (independent variables : 1 - 2 times a month , less than once a month)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.035[a]	.001	.001	7.14338

a. Predictors: (Constant), 1-2 times a month, Less than once a month

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	524.796	2	262.398	5.142	.006[b]
	Residual	419245.082	8216	51.028		
	Total	419769.878	8218			

a. Dependent Variable: Study childs measured weight in kgs

b. Predictors: (Constant), 1-2 times a month, Less than once a month

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	33.598	.099		338.383	.000
	Less than once a month	.685	.216	.036	3.166	.002
	1-2 times a month	.244	.201	.014	1.213	.225

a. Dependent Variable: Study childs measured weight in kgs

In table 10, we see that we have performed regression using dependent and independent variables. Dependent variable is the study child's measured weight (kgs) and independent variables are primary carers drinking alcohol 1 -2 times a month and carers drinking alcohol less than once a month. Here, we have taken our reference variable as never drank or never drinking alcohol primary carers. The results here are taken with the reference variable.

From table 10, we can see that Adjusted R square is 0.001 which tells that 0.1 % of the variance in the dependent variable (child's measured weight) is explained by the independent variables (primary carers drinking alcohol 1 - 2 times a month and carers who drank less than once a month). Through ANOVA results we can see that p- value is < 0.05 which means that the findings are statistically significant.

When carers who never drank alcohol and carers who drink alcohol less than once a month are compared, the unstandardised Coefficient B is 0.68 which is positive means that carers who drink alcohol less than once a month carers will realise 0.68 unit increase on their child's measured weight (kgs) and the result is statistically significant with p value <0.05. When carers who never drank alcohol and carers who drink alcohol 1-2 times a month are compared, the unstandardised Coefficient B is 0.24 which is positive means that carers who drink alcohol 1-2 times a month will realise 0.24 unit increase on their child's measured weight (kgs) and the result is not statistically significant with p value > 0.05.

Child's measured weight of carers who drink alcohol less than a month when compared to never drinking alcohol carers is significantly higher. And child's measured weight for carers who drink alcohol 1 - 2 times a month is also higher but not statistically significant.

Table 11: Regression model on Primary carer's alcohol status and Child's measured weight (independent variables : 3 - 4 times a week, 1-2 times a week)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.039[a]	.001	.001	7.14252

a. Predictors: (Constant), 3-4 times a week, 1-2 times a week

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	625.429	2	312.714	6.130	.002[b]
	Residual	419144.449	8216	51.016		
	Total	419769.878	8218			

a. Dependent Variable: Study childs measured weight in kgs

b. Predictors: (Constant), 3-4 times a week, 1-2 times a week

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	34.021	.108		315.337	.000
	1-2 times a week	-.545	.169	-.037	-3.222	.001
	3-4 times a week	-.579	.270	-.024	-2.147	.032

a. Dependent Variable: Study childs measured weight in kgs

From table 11, we can see that Adjusted R square is 0.001 which tells that 0.1 % of the variance in the dependent variable (child's measured weight) is explained by the independent variables (primary carers drinking alcohol 3 - 4 times a week and carers drinking 1- 2 times a week). Through ANOVA results we can see that p- value is < 0.05 which means that the findings are statistically significant.

When carers who never drank alcohol and carers who drink alcohol 1-2 times a week are compared, the unstandardised Coefficient B is -0.54 which is negative means that carers who drink alcohol 1-2 times a week will realise 0.54 unit decrease on their child's measured weight (kgs) and the result is statistically significant with p value <0.05.

When carers who never drank alcohol and carers who drink alcohol 3-4 times a week are compared, the unstandardised Coefficient B is -0.58 which is negative means that carers who drink alcohol 3-4 times a week will realise 0.58 unit decrease on their child's measured weight (kgs) and the result is statistically significant with p value <0.05.

Table 12: Regression model on Primary carer's alcohol status and Child's measured weight (independent variables : 5 - 6 times a week, everyday)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.026[a]	.001	.000	7.14537

a. Predictors: (Constant), Everyday, 5-6 times a week

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	291.000	2	145.500	2.850	.058[b]
	Residual	419478.878	8216	51.056		
	Total	419769.878	8218			

a. Dependent Variable: Study childs measured weight in kgs

b. Predictors: (Constant), Everyday, 5-6 times a week

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	33.789	.080		424.352	.000
	5-6 times a week	-1.513	.668	-.025	-2.264	.024
	Everyday	-.789	1.014	-.009	-.778	.436

a. Dependent Variable: Study childs measured weight in kgs

From table 12, we can see that Adjusted R square is 0.000 which tells that no percent of variance of child's measured weight (dependent variable) is explained by primary carers drinking alcohol 5 - 6 times a week and carers drinking every day (independent variables). Through ANOVA results we can see that p- value is > 0.05 which means that there is no statistically significant difference.

When primary carers who never drank alcohol and carers who drink alcohol 5 - 6 times a week are compared, the unstandardised coefficient B is -1.51 which is negative means that carers who drink alcohol alcohol 5 - 6 times a week realise a

1.51 unit decrease on their child's measured weight and the result is statistically significant with p value 0.024 (p value < 0.05).

When carers who never drank alcohol and carers who drink alcohol everyday are compared, the unstandardised Coefficient B is -0.79 which is negative means that carers who drink alcohol everyday will realise 0.79 unit decrease on their child's measured weight and result is not statistically significant with p value 0.436 (p value > 0.05).

4.6. Conclusion:

This chapter demonstrated the descriptive and inferential statistics that can be performed using Growing Up In Ireland data. Firstly, the nature of BMI among the children in Ireland and BMI distribution among gender was presented. Secondly, the smoking status and alcohol drinking status of the primary carer with regards to physical characteristics of children was highlighted. Statistical approaches were used to analyze the contents of the dataset and to gain insight from the data. The nature of the data given by Irish Social Services Data Archive (ISSDA) helped me to perform the analysis.

Chapter 5: Discussion and Conclusion

This chapter summarises the findings of the analysis of the dataset utilised in this research and discusses them in light of the empirical and theoretical research conducted in the area of children's growth and physical development. This chapter also highlights the areas considered for future research.

In the Growing Up Ireland data, a child's BMI is not included. Instead weight and height are included which helped me to calculate the child's BMI. BMI value can help us understand the measures which can lead to obesity ,overweight and thinness ("BMI-for-age (5–19 years)," 2021). When the BMI measures are known it can help people understand the measures which can lead to obesity and more severe illnesses.

5.1. Conclusion:

This section aims to summarize and combine the findings of the analysis conducted in this study. This research study explored the factors affecting children's growth and development using the Growing Up In Ireland dataset which was collected between August 2007 and May 2008. Particular attention was given the Body Mass Index (BMI) of the children , smoking and drinking alcohol status of primary carer.

In the verification of Hypothesis 1, I found that females have statistically significantly higher BMI than males on average when they were 9 years old. According to Jabakhanji (2018), girls had a lower BMI than boys at 9 months. A variety of other variables have been linked to changes in BMI. Jabakhanji (2018) indicates that girls had a BMI that is below the age of 9 months to 3 years prior to crossing the male trajectory to achieve a similar BMI at 5 years old. According to growth standards a trend towards lower BMI in girls seems normal for 9 months and three years of age, and discrepancies are expected to be eliminated by or even reversed by 5 years (WHO Expert Committee on Leprosy, & World Health Organization,1998). Li et al discovered that boys were more likely to follow BMI trajectories that predispose them to the start of overweight between the ages of 2 and 12 years old, although other researchers did not find this tendency (Li, 2007 ; Peneau, 2017).

With respect to my findings, 27.4 percent of male primary carers and 21.8 percent of female primary carers smoke on a daily basis. When smoking status was observed on an occasional basis, female primary carers had a higher percentage (14.1 percent) than males (6.8 percent). I also discovered that 65.8 percent of males and 64.1 percent of females never smoked. By Chi Square Test results, I found that gender and smoking status of primary carers do not have an association.

Through my analysis, I found that primary carers who smoked occasionally during pregnancy saw a decrease in the birth weight of their child when compared to carers who never smoked during pregnancy. It was seen that primary carers who smoked daily during pregnancy also saw a decrease in the birth weight of their

child when compared to carers who never smoked during pregnancy. And results for both occasionally and daily smoking carers were statistically significant ($p < 0.001$). Using my research, I discovered that primary carers who never smoked during pregnancy saw an increase in the birth weight of their child when compared with the primary carers who smoked daily and the result is statistically significant with $p<0.001$. It was seen that primary carers who smoked occasionally also saw an increase in their child's birth weight when compared to carers who smoked daily and results are not statistically significant.

Through my analysis, I found that primary carers who drink alcohol 1-2 times a month saw an increase in their child's measured weight (kgs) when compared with carers who never drank alcohol and the result is not statistically significant with p value > 0.05. Based on my findings, I found that primary carers who drink alcohol 1-2 times a week saw a decrease in their child's measured weight (kgs) when compared with carers who never drank alcohol and the result is statistically significant with p value <0.05. It was seen that primary carers who drink alcohol 3-4 times a week also saw a decrease in their child's measured weight (kgs) when compared with carers who never drank alcohol and the result is statistically significant with p value <0.05. Using my research, I discovered that primary carers who drink alcohol 5 - 6 times a week saw a decrease in their child's measured weight (kgs) when compared with primary carers who never drank alcohol and the result is statistically significant with p value < 0.05. It was seen that primary carers who drink alcohol everyday also saw a decrease in their child's measured weight (kgs) when compared with primary carers who never drank alcohol and the result is not statistically significant with p value > 0.05.

The literature review documented the nature of children's physical growth and development in Ireland. Policies and measures taken by Ireland towards the welfare of the children are explored and discussed. Literature survey in the Irish context with regards to children's growth and development is also discussed.

The methodology chapter contained the nature of the dataset and legitimacy in conducting this research study. There was a great deal of information about how

data was collected by the proper bodies. Appropriate softwares used for the data analysis are also mentioned.

The results outlined the findings of the research analysis using the dataset from the Growing Up In Ireland study. Primary analysis concentrated on the nature of BMI among nine year old Irish Children and continued with a focus on the smoking and drinking alcohol status of primary carers. In view of the foregoing research, the outcomes of the research analysis were discussed.

5.2. Limitations of Research

There are still many limitations to this research. Firstly, secondary carers and their characteristics are not considered in this study. Smoking and alcohol status of both primary and secondary carers can give insights about the factors affecting physical characteristics of children. Secondly, the regression analysis on smoking and alcohol status of primary carers have been taken with a reference variable of the choice. The results obtained from the regression analysis are relative to reference variables. Finally, the dataset used in the research was collected between August 2007 and May 2008. It contained information about all the aspects of children which were relevant 10 years ago. There have been numerous changes in recent years that are having impacts on children's physical growth and development. Factors affecting children's physical growth before ten years might not be the factors affecting the children of today's generation.

5.3. Future Work and Suggestions

This section aims to indicate aspects that could be investigated further in the future. Firstly, secondary carer data can be used for analysis and a comparison of both secondary and primary carer can help us analyse how each carer has an impact over children. Secondly, neighbourhood and community data can be used to analyse the impact over children during early phases of life. Lastly, to encourage healthy lifestyles, public health interventions and policies should target pregnant women, young couples, and families.

References

Abar, C. C. (2012). Examining the relationship between parenting types and patterns of student alcohol-related behavior during the transition to college. *Psychology of Addictive Behaviors*, *26*(1), 20.

Alati, R., Baker, P., Betts, K. S., Connor, J. P., Little, K., Sanson, A., & Olsson, C. A. (2014). The role of parental alcohol use, parental discipline and antisocial behaviour on adolescent drinking trajectories. *Drug and alcohol dependence*, *134*, 178-184.

Allen, M., Donohue, W. A., Griffin, A., Ryan, D., & Turner, M. M. M. (2003). Comparing the influence of parents and peers on the choice to use drugs: A meta-analytic summary of the literature. *Criminal Justice and Behavior*, *30*(2), 163-186.

Babor, T. F., Higgins-Biddle, J. C., Saunders, J. B., & Monteiro, M. G. (2001). The alcohol use disorders identification test.

Back to Education Initiative. (1999). Ready to Learn: White Paper on Early Childhood Education.

Baidal, J. A. W., Locks, L. M., Cheng, E. R., Blake-Lamb, T. L., Perkins, M. E., & Taveras, E. M. (2016). Risk factors for childhood obesity in the first 1,000 days: a systematic review. *American journal of preventive medicine*, 50(6), 761-779.

Bandura, A. National Inst of Mental Health.(1986). Social foundations of thought and action: A social cognitive theory.

Blake-Lamb, T. L., Locks, L. M., Perkins, M. E., Baidal, J. A. W., Cheng, E. R., & Taveras, E. M. (2016). Interventions for childhood obesity in the first 1,000

days a systematic review. *American journal of preventive medicine*, 50(6), 780-789.

BMI-for-age (5–19 years). (2021). Retrieved August 8, 2021, from https://www.who.int/toolkits/growth-reference-data-for-5to19-years/indicators/bmi-for-age

Brewer, E. W. (2012). Secondary data analysis. *Sage secondary data analysis*, 165-176.

Campbell, J. M., & Oei, T. P. (2010). A cognitive model for the intergenerational transference of alcohol use behavior. *Addictive Behaviors*, *35*(2), 73-83.

Campbell, J. M., & Oei, T. P. (2010). The intergenerational transference of alcohol use behaviour from parents to offspring: A test of the cognitive model. *Addictive behaviors*, *35*(7), 714-716.

Casswell, S., Pledger, M., & Pratap, S. (2002). Trajectories of drinking from 18 to 26 years: identification and prediction. *Addiction*, *97*(11), 1427-1437.

Cheng, H. G., & Phillips, M. R. (2014). Secondary analysis of existing data: opportunities and implementation. *Shanghai archives of psychiatry*, *26*(6), 371.

Child Development Basics | CDC. (2020, March 5). Retrieved August 1, 2021, from https://www.cdc.gov/ncbddd/childdevelopment/facts.html

Collins, C., Greene, S., Hyland, A., Kelleher, C., Mennell, S., Whelan, B., & Wilde, J. (2001). Design of the national children's strategy longitudinal study of children. *Unpublished report submitted to the health research board by the consortium represented by Greene, S., Hyland, A., Kelleher, C., Mennell, S., Whelan, B., & Wilde, J*.

Department of Health and Children. (2000). The National Children's Strategy: Our

Children–Their Lives.

Department of Justice, Equality and Law Reform. (1999). National Childcare Strategy, Report of the Partnership 2000 Expert Working Group on Childcare.

Dooley, B. and Fitzgerald, A. (2012). My World Survey: National Study of Youth Mental Health in Ireland.Headstrong: Dublin.

Dooley, B., O'Connor, C., Fitzgerald, A. and O'Reilly, A. (2019). My World Survey 2: National Study of Youth Mental Health in Ireland, UCD and Jigsaw: Dublin.

Economic and Social Research Institute, Trinity College Dublin, & Office of the Minister for Children and Youth affairs. (2010). guide to the datasets wave 1 of the nine-year cohort of growing up in ireland. Retrieved from https://www.ucd.ie/issda/static/documentation/esri/GUI-Guide9YearCohort.pdf

ESRI; Trinity College Dublin; and Department of Youth and Community Affairs. (2018). Growing Up in Ireland. Wave 4 at 20-years. - Drugs and Alcohol. Retrieved August 2, 2021, from https://www.drugsandalcohol.ie/31381/

Freedman, D. S., Khan, L. K., Serdula, M. K., Dietz, W. H., Srinivasan, S. R., & Berenson, G. S. (2005). The relation of childhood BMI to adult adiposity: the Bogalusa Heart Study. *Pediatrics*, 115(1), 22-27.

Growth Monitoring Resources. (2021). Retrieved August 4, 2021, from https://www.hse.ie/eng/health/child/growthmonitoring/

Hakim, C. (1982). *Secondary analysis in social research: A guide to data sources and methods with examples*. Allen and Unwin/Unwin Hyman.

Hakim, C. (2012). Secondary Analysis and the Relationship Between Official and Academic Social Research. *Secondary Data Analysis. SAGE*.

Halim, A., Hasking, P., & Allen, F. (2012). The role of social drinking motives in the relationship between social norms and alcohol consumption. *Addictive behaviors*, *37*(12), 1335-1341.

Hammersley, M. (2015). On ethical principles for social research. *International Journal of Social Research Methodology*, *18*(4), 433-449.

Harburg, E., DiFranceisco, M. A., & Webster, D. W. Gleiberman. L., & Schork, A.(1990). Familial transmission of alcohol use: 1. Parent and adult offspring alcohol use over 17 years—Tecumseh, Michigan. *Journal of Studies on Alcohol*, *51*, 245-256.

Hayes, N. (2006, November). Early Childhood Education and Care A Decade of Reflection 1996-2006. In *Proceedings of CSER Early Childhood Care and Education Seminar Series I*(pp. 3-9).

Hayes, N. (2010). Childcare? Early childhood education and care? Towards an integrated early years policy for young children in Ireland. *Early Years*, *30*(1), 67-78.

Headstrong – The National Centre for Youth Mental Health; UCD School of Psychology. (2018). My world survey: national study of youth mental health in Ireland. - Drugs and Alcohol. Retrieved August 2, 2021, from https://www.drugsandalcohol.ie/17589/

Healthy Ireland. (2019, April 4). Retrieved July 30, 2021, from https://www.gov.ie/en/campaigns/healthy-ireland/#

Huang, G. C., Soto, D., Fujimoto, K., & Valente, T. W. (2014). The interplay of friendship networks and social networking sites: longitudinal analysis of

selection and influence effects on adolescent smoking and alcohol use. *American journal of public health*, *104*(8), e51-e59.

Ireland. Commission on the Family, & Dunne, M. (1998). *Strengthening Families for Life: Final Report of the Commission on the Family to the Minister for Social, Community and Family Affairs*. Stationery Office.

Jabakhanji, S. B., Boland, F., Ward, M., & Biesma, R. (2018). Body mass index changes in early childhood. *The Journal of pediatrics*, *202*, 106-114.

Kabir, Z., Manning, P. J., Holohan, J., Goodman, P. G., & Clancy, L. (2010). Active smoking and second-hand-smoke exposure at home among Irish children, 1995–2007. *Archives of disease in childhood*, 95(1), 42-45.

Kolb, B. (2012). Conducting secondary research. *Sage secondary data analysis*, 111-128.

Koning, I. M., Vollebergh, W. A., Smit, F., Verdurmen, J. E., Van Den Eijnden, R. J., Ter Bogt, T. F., ... & Engels, R. C. (2009). Preventing heavy alcohol use in adolescents (PAS): cluster randomized trial of a parent and student intervention offered separately and simultaneously. *Addiction*, *104*(10), 1669-1678.

Latendresse, S. J., Rose, R. J., Viken, R. J., Pulkkinen, L., Kaprio, J., & Dick, D. M. (2008). Parenting mechanisms in links between parents' and adolescents' alcohol use behaviors. *Alcoholism: Clinical and Experimental Research*, *32*(2), 322-330.

Leung, R. K., Toumbourou, J. W., & Hemphill, S. A. (2014). The effect of peer influence and selection processes on adolescent alcohol use: a systematic review of longitudinal studies. *Health psychology review*, *8*(4), 426-457.

Li, C., Goran, M. I., Kaur, H., Nollen, N., & Ahluwalia, J. S. (2007). Developmental trajectories of overweight during childhood: role of early life factors. *Obesity*, *15*(3), 760-771.

Lissau, I. (2004). Overweight and obesity epidemic among children. Answer from European countries. *International Journal of Obesity*, 28(3), S10-S15.

Lobstein, T., Baur, L., & Uauy, R. (2004). Obesity in children and young people: a crisis in public health. *Obesity reviews*, 5, 4-85.

Macleod, J., Hickman, M., Bowen, E., Alati, R., Tilling, K., & Smith, G. D. (2008). Parental drug use, early adversities, later childhood problems and children's use of tobacco and alcohol at age 10: birth cohort study. *Addiction*, *103*(10), 1731-1743.

Mahedy, L., MacArthur, G. J., Hammerton, G., Edwards, A. C., Kendler, K. S., Macleod, J. & Heron, J. (2018). The effect of parental drinking on alcohol use in young adults: the mediating role of parental monitoring and peer deviance. *Addiction*, *113*(11), 2041-2050.

Mares, S. H., van der Vorst, H., Engels, R. C., & Lichtwarck-Aschoff, A. (2011). Parental alcohol use, alcohol-related problems, and alcohol-specific attitudes, alcohol-specific communication, and adolescent excessive alcohol use and alcohol-related problems: An indirect path model. *Addictive behaviors*, *36*(3), 209-216.

MedMedia Group. (2014). IrishHealthPro - Ireland’s premier independent health site for professionals. Retrieved July 30, 2021, from https://www.irishhealthpro.com

Mercken, L., Steglich, C., Sinclair, P., Holliday, J., & Moore, L. (2012). A longitudinal social network analysis of peer influence, peer selection, and

smoking behavior among adolescents in British schools. *Health Psychology*, *31*(4), 450.

Moy, R., Wright, C., & Child Health Growth Chart Working Group. (2014). Using the new UK-WHO growth charts. *Paediatrics and child health*, *24*(3), 97-102.

Mundt, M. P., Mercken, L., & Zakletskaia, L. (2012). Peer selection and influence effects on adolescent alcohol use: a stochastic actor-based model. *BMC pediatrics*, *12*(1), 1-10.

Murphy, E., & Dingwall, R. (2007). Informed consent, anticipatory regulation and ethnographic practice. *Social science & medicine*, *65*(11), 2223-2234.

Newton, N. C., Champion, K. E., Slade, T., Chapman, C., Stapinski, L., Koning, I.,. & Teesson, M. (2017). A systematic review of combined student‐and parent‐based programs to prevent alcohol and other drug use among adolescents. *Drug and alcohol review*, *36*(3), 337-351.

Obesity and overweight. (2021, June 9). Retrieved July 30, 2021, from https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight

O'Dwyer, C., & Mongan, D. (2020). Alcohol and drug use among young people and adolescents in Ireland–results from My World and Growing Up in Ireland surveys. *Drugnet Ireland*, 12-14.

Osgood, D. W., Ragan, D. T., Wallace, L., Gest, S. D., Feinberg, M. E., & Moody, J. (2013). Peers and the emergence of alcohol use: Influence and selection processes in adolescent friendship networks. *Journal of research on adolescence*, *23*(3), 500-512.

Pears, K., Capaldi, D. M., & Owen, L. D. (2007). Substance use risk across three generations: the roles of parent discipline practices and inhibitory control.

Psychology of Addictive behaviors, *21*(3), 373.

Peneau, S., Giudici, K. V., Gusto, G., Goxe, D., Lantieri, O., Hercberg, S., & Rolland-Cachera, M. F. (2017). Growth trajectories of body mass index during childhood: associated factors and health outcome at adulthood. *The Journal of pediatrics*, *186*, 64-71.

Perry, I. J., Millar, S. R., Balanda, K. P., Dee, A., Bergin, D., Carter, L., & Webbe, L. (2017). What are the estimated costs of childhood overweight and obesity on the island of Ireland. *Cork: Safefood.*

Petraitis, J., Flay, B. R., & Miller, T. Q. (1995). Reviewing theories of adolescent substance use: organizing pieces in the puzzle. *Psychological bulletin*, *117*(1), 67.

Physical Growth in Newborns | Michigan Medicine. (2021). Retrieved August 8, 2021, from https://www.uofmhealth.org/health-library/te6295

Poelen, E. A., Engels, R. C., Scholte, R. H., Boomsma, D. I., & Willemsen, G. (2009). Predictors of problem drinking in adolescence and young adulthood. *European child & adolescent psychiatry*, *18*(6), 345-352.

Poelen, E. A., Scholte, R. H., Willemsen, G., Boomsma, D. I., & Engels, R. C. (2007). Drinking by parents, siblings, and friends as predictors of regular alcohol use in adolescents and young adults: a longitudinal twin-family study. *Alcohol & Alcoholism*, *42*(4), 362-369.

Robinson, S. M., Crozier, S. R., Harvey, N. C., Barton, B. D., Law, C. M., Godfrey, K. M., ... & Inskip, H. M. (2015). Modifiable early-life risk factors for childhood adiposity and overweight: an analysis of their combined impact and potential for prevention. *The American journal of clinical nutrition*, 101(2), 368-375.

Rossow, I., Keating, P., Felix, L., & McCambridge, J. (2016). Does parental drinking influence children's drinking? A systematic review of prospective cohort studies. *Addiction*, *111*(2), 204-217.

Ryan, S. M., Jorm, A. F., & Lubman, D. I. (2010). Parenting factors associated with reduced adolescent alcohol use: a systematic review of longitudinal studies. *Australian & New Zealand Journal of Psychiatry*, *44*(9), 774-783.

Saunders, J. B., Aasland, O. G., Babor, T. F., De la Fuente, J. R., & Grant, M. (1993). Development of the alcohol use disorders identification test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction*, *88*(6), 791-804.

Sawyer, S. M., Azzopardi, P. S., Wickremarathne, D., & Patton, G. C. (2018). The age of adolescence. *The Lancet Child & Adolescent Health*, *2*(3), 223-228.

Simmonds, M., Llewellyn, A., Owen, C. G., & Woolacott, N. (2016). Predicting adult obesity from childhood obesity: a systematic review and meta-analysis. *Obesity reviews*, *17*(2), 95-107.

Sunday, S., & Kabir, Z. (2019). Impact of carers' smoking status on childhood obesity in the growing up in Ireland cohort study. *International journal of environmental research and public health*, *16*(15), 2759.

UCD and Jigsaw. (2018). My world survey 2: national study of youth mental health in Ireland. - Drugs and Alcohol. Retrieved August 2, 2021, from https://www.drugsandalcohol.ie/31343/

Unicef. (1989). Convention on the Rights of the Child.

Vartanian, T. P. (2010). *Secondary data analysis*. Oxford University Press.

Walsh, B., & Cullinan, J. (2015). Decomposing socioeconomic inequalities in childhood obesity: Evidence from Ireland. *Economics & Human Biology*, 16, 60-72.

Wang, C., Hipp, J. R., Butts, C. T., Jose, R., & Lakon, C. M. (2015). Alcohol use among adolescent youth: The role of friendship networks and family factors in multiple school studies. *PloS one*, *10*(3), e0119965.

Weng, S. F., Redsell, S. A., Swift, J. A., Yang, M., & Glazebrook, C. P. (2012). Systematic review and meta-analyses of risk factors for childhood overweight identifiable during infancy. *Archives of disease in childhood*, 97(12), 1019-1026.

Whelton, H., Harrington, J., Crowley, E., Kelleher, V., Cronin, M., & Perry, I. J. (2007). Prevalence of overweight and obesity on the island of Ireland: results from the North South Survey of Children's Height, Weight and Body Mass Index, 2002. *BMC public health*, 7(1), 1-9.

WHO Expert Committee on Leprosy, & World Health Organization. (1998). *WHO Expert Committee on Leprosy: Seventh Report* (Vol. 7). World Health Organization.

Williams, J., Greene, S., Doyle, E., Harris, E., Layte, R., McCoy, S., & Thornton, M. (2009). *Growing up in Ireland national longitudinal study of children. The lives of 9 year olds*. The Stationery Office.

Woods, N. (1988). Using existing data sources: Primary and secondary analysis. *Nursing research: Theory and practice*, 334-347.

World Health Organization. (2021). Body mass index - BMI. Retrieved August 7, 2021, from

https://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi

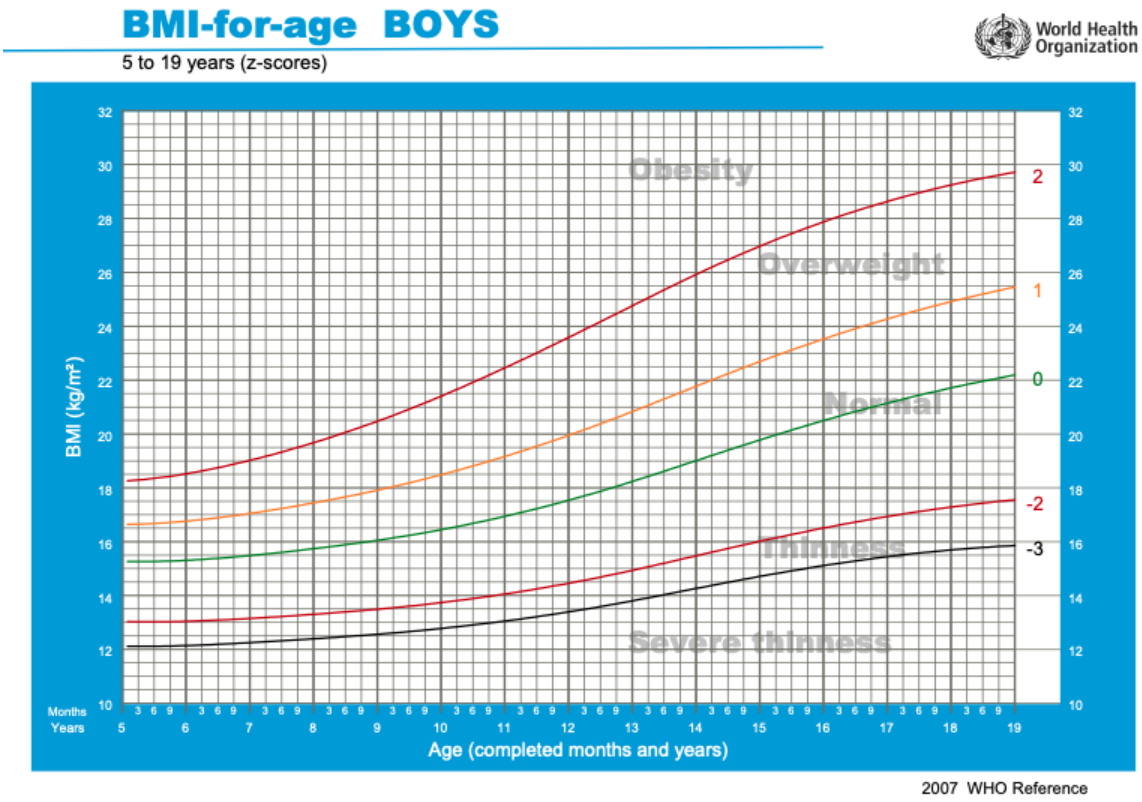
Yap, M. B., Cheong, T. W., Zaravinos-Tsakos, F., Lubman, D. I., & Jorm, A. F. (2017). Modifiable parenting factors associated with adolescent alcohol misuse: a systematic review and meta-analysis of longitudinal studies. *Addiction*, *112*(7), 1142-1162.

Zeiher, J., Varnaccia, G., Jordan, S., & Lange, C. (2016). What are the determinants of childhood obesity?: A literature review as part of the project" Nationwide Monitoring of Childhood Obesity Determinants". *Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz*, *59*(11), 1465-1475.

Appendices

Appendix A :

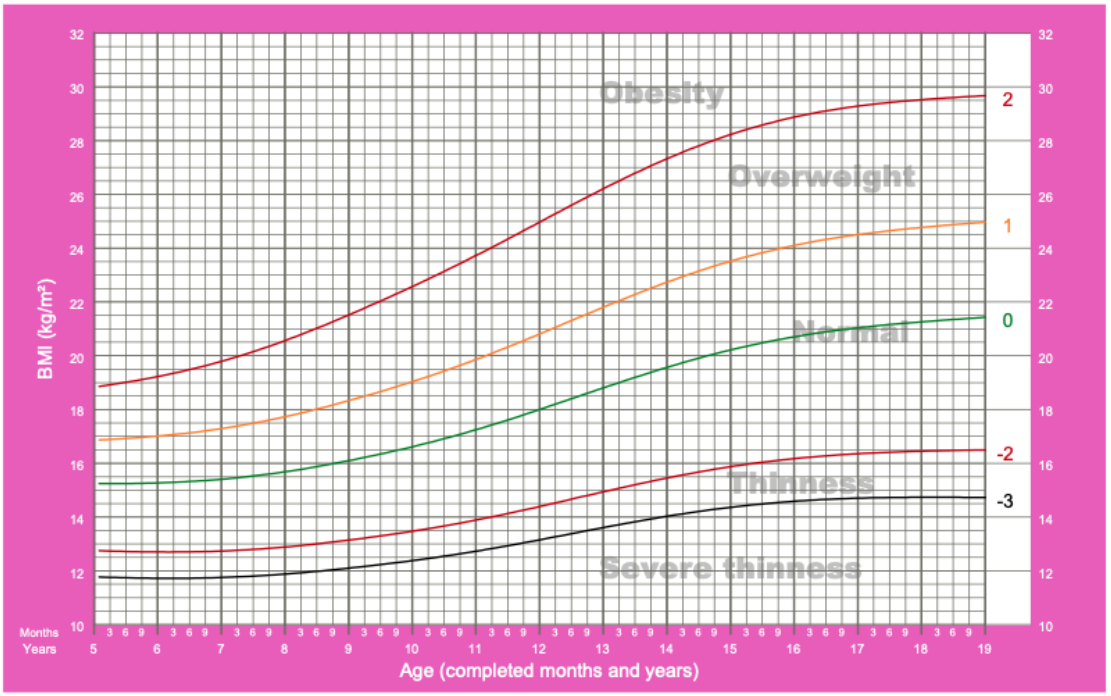
Source : World Health Organization



BMI-for-age GIRLS

5 to 19 years (z-scores)

World Health Organization



2007 WHO Reference