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KEY FINDINGS:
INFANT COHORT (at 3 years)

INTRODUCTION This is the fourth in a series of Key Findings from the second round of interviews with the Infant Cohort in Growing Up in Ireland. The families of 11,100 children were initially interviewed in 2008/2009 when the Study Child was nine months old. They were re-interviewed between January and August 2011, when the children were three years old. This Key Finding presents summary information on infant physical growth from birth to three years of age. Measures of the child’s height and weight were taken at both interviews and these data provide detailed information on patterns of growth that can be used to inform policy development.

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AT 3 YEARS
MAR 2012
An Irish Government Funded Initiative

GROWING UP IN IRELAND

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NO. 4
CHILDREN’S PHYSICAL GROWTH FROM BIRTH TO AGE 3

FIGURES ARE PRELIMINARY AND MAY BE SUBJECT TO CHANGE
The findings from the Growing up in Ireland study show that the majority of children in Ireland are very healthy and experiencing patterns of physical growth that are similar to those of children in other affluent countries. However, height and weight have long been seen as important indicators of children’s physical health and development.

**Figure 1**: Median height and weight of Irish boys relative to World Health Organisation (WHO) guidelines

**Figure 2**: Median height and weight of Irish girls relative to World Health Organisation (WHO) guidelines

Previous research suggests that patterns of growth in early infancy are important implications for children’s risk of obesity in adulthood, as well as their health and development in adulthood. A child’s rate of growth is highest in early infancy and slows thereafter. Children born prematurely may be associated with adult health problems.

**Figure 3**: shows that children whose parents have a higher level of education and income are more likely to be overweight and obese. This is statistically significant for both boys and girls.

**Figure 4**: shows the proportions of three-year-olds within each BMI category by household social class.

**ALMOST A QUARTER OF 3-YEAR-OLDS ARE OVERWEIGHT**

The heights and weights of the children were used to calculate the BMI (body mass index), a commonly used measure of the degree of body fat, at age three. This is calculated by dividing weight in kilograms by height in metres squared. BMI is grouped into healthy weight, overweight and obese using internationally agreed thresholds for the child’s age.

- 76% of the children were of healthy weight for their age, 13% were overweight and 11% were obese. This difference in BMI is statistically significant by household social class.

**Figure 5**: shows the relationship between household social class and BMI.

**RISK OF OBESITY BEGINS EARLY**

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**Figure 5**: shows the relationship between household social class and BMI.
Figure 1: Median height and weight of Irish boys relative to World Health Organisation (WHO) guidelines by age

• The median height and weight of children at birth in Ireland (see Figures 1 and 2) are very close to the WHO guideline lengths and weights’ provided for the UK population by the World Health Organisation (WHO).

• The median length remains close to the WHO guidelines up to three years for both boys and girls – at slightly higher than 100% (Figures 1 and 2).

• The shorter height and higher average weight of children from low class, education and income backgrounds is an important marker of their risk of obesity in childhood and adulthood, as well as their health and development in adulthood. A child’s rate of growth is highest in early childhood, as well as their health and development.

Figure 2: Median height and weight of Irish girls relative to World Health Organisation (WHO) guidelines by age

• Analysis shows that a large part of the difference in growth rates between children can be explained by length and weight at birth. ‘Rapid’ growth is defined as change of 0.67 or more.

• These results suggest that inequalities in the risk of overweight and obesity associated with social background begin early and are already established by the age of three. This means that the line for the latter is always zero as the other lines represent average differences from this.

Risk of Obesity Begins Early

Prior research suggests that patterns of growth in early infancy have important implications for childhood obesity. However, when children of average weight at birth, under 0.67 years of age, experience rapid growth in early infancy, this is an important marker of their risk of obesity in childhood and adulthood. A child’s rate of growth is highest in early childhood, as well as their health and development.

• The shorter height and higher average weight of children whose parents have semi/unskilled manual jobs are 78g lighter at birth on average than those from professional or managerial households. The children of parents with semi/unskilled manual occupations were 15kg heavier on average than children in professional or managerial households. The pattern for children whose parents had never worked was even more pronounced.

• Figure 3 shows that children whose parents have semi/unskilled manual jobs are 70g lighter at both three years of age than children whose parents are professional or managerial. By nine months they had caught up. By three years, the relationship had been reversed; the children of parents with semi/unskilled manual occupations were 15kg heavier on average than children in professional or managerial households. The pattern for children whose parents had never worked was even more pronounced.

Growth in Ireland shows that children who experience rapid weight growth are more likely to become overweight and obese, but that the line for breastfeeding infants and those who were weaned onto solids later, adjusting for birth weight, World Health Organisation (WHO) guidelines, and weight at midpoints, is always zero. This means that the line for the latter is always zero as the other lines represent average differences from this. This also alters their growth trajectory in infancy.

• Findings from Growing Up in Ireland show that children from lower class, educational and income backgrounds were less likely to be breastfed, more likely to be bottle-fed, and significantly more likely to experience rapid weight gain in early infancy, even after adjusting for birth weight.

• The shorter height and higher average weight of children from low class, education and income backgrounds is a very important marker of their risk of obesity in childhood and adulthood.

• The heights and weights of the children were used to calculate the child’s body mass index (BMI), a commonly used measure of the degree of body fat, at age three. This is calculated by dividing weight in kilograms by height in metres squared. BMIs are grouped into healthy weight, overweight and obese using internationally agreed thresholds for the child’s age.

• Statistically, girls and boys are equally likely to be overweight (19% and 18%).

• The shorter height and higher average weight of children from low class, education and income backgrounds is a very important marker of their risk of obesity in childhood and adulthood.

• Among children whose primary caregiver had lower secondary education or less, 9% were obese compared to 1% in those whose parents had never worked (Figure 4).

Almost a Quarter of Three-year-olds are Overweight

The heights and weights of the children were used to calculate the child’s body mass index (BMI), a commonly used measure of the degree of body fat, at age three. This is calculated by dividing weight in kilograms by height in metres squared. BMIs are grouped into healthy weight, overweight and obese using internationally agreed thresholds for the child’s age.

• 76% of the children were of healthy weight for their age, 19% were overweight and 6% were obese. This highlights the importance of breastfeeding and the timely introduction of solid foods, as well as the positive impact of breastfeeding and the timely introduction of solid foods on the BMIs of three-year-olds.

• The shorter height and higher average weight of children from low class, education and income backgrounds is a very important marker of their risk of obesity in childhood and adulthood.

• Children from low class, education and income backgrounds are more likely to be overweight and obese, and this also alters their growth trajectory in infancy.

• These results suggest that inequalities in the risk of overweight and obesity associated with social background begin early and are already established by the age of three.

Figure 3 shows that children whose parents have semi/unskilled manual jobs are 70g lighter at both three years of age than children whose parents are professional or managerial. By nine months they had caught up. By three years, the relationship had been reversed; the children of parents with semi/unskilled manual occupations were 15kg heavier on average than children in professional or managerial households. The pattern for children whose parents had never worked was even more pronounced.

Figure 4: The proportion of three-year-olds within each BMI category by household social class

• Analysis shows that a large part of the difference in growth rates between children can be explained by rapid weight gain. Lastly, it is also possible that children from lower class, education and income backgrounds experienced different conditions before birth and that this also alters their growth trajectory in infancy.

• Analysis shows that a large part of the difference in growth rates between children can be explained by rapid weight gain.
The findings from the Growing Up in Ireland study show that the majority of children in Ireland are very healthy and experiencing patterns of physical growth that are similar to those of children in other developed nations such as Britain and the USA. Height and weight have long been used as important indicators of children’s physical health and development.

**Figure 1:** Median height and weight of Irish boys relative to World Health Organisation (WHO) guideline weights by age

*The median length and weight of children at birth in Ireland (see Figures 1 and 2) are very close to the WHO guidelines and are higher at the age of three.*

**Figure 2:** Median height and weight of Irish girls relative to World Health Organisation (WHO) guideline weights by age

*Risk of obesity begins early*

Previous research suggests that patterns of growth in early infancy have important implications for children’s risk of obesity in adulthood. A child’s rate of growth is highest in early infancy and slows down thereafter. Children born prematurely and/or of low birthweight usually experience ‘catch-up’ growth in terms of length and weight, which is considered healthy. However, when children of average weight at birth experience rapid growth in early infancy, this is an important marker of their risk of obesity in childhood and adolescence.

**Figure 3:** Average weight of children at birth, nine months and three years relative to professional/m managerial class

*The shorter height and higher average weight of children born to parents in professional and managerial households remain so at all ages. Their rapid weight gain is therefore disproportionate to their growth in height, leading to a higher risk of overweight and obesity.*

Analyses show that a large part of the difference in growth trajectories between children can be explained by duration of breastfeeding and the timing of the introduction of solid foods (adjusting for the child’s birthweight and other factors). The GUS study did not measure the quantities of milk consumed, evidence from other studies suggests that bottle-fed babies receive a larger quantity of milk on average. Formula milk is also higher in protein than breast milk, which can also contribute to rapid weight gain. Lastly, it is also possible that children from lower social class backgrounds experience different conditions before and birth and this also alters their growth trajectory in infancy.

**Figure 4:** The proportion of three-year-olds within each BMI category by household social class

*Almost a quarter of 3-year-olds are overweight.*

The heights and weights of the children were used to calculate the child’s BMI score (a commonly used measure of the degree of body fat, at age three. This is calculated by dividing weight in kilograms by height in metres squared. BMI scores are grouped into healthy weight, overweight and obese using internationally agreed thresholds for the child’s age. 76% of the children were of healthy weight for their age, 15% were overweight and 9% were obese. This is consistent with the majority of children born in Ireland being classified as a BMI beyond the range that is considered healthy.

**Analysis**

- Statistically, girls and boys are equally likely to be overweight (15% vs 16%)
- The shorter height and higher average weight of children from less advantaged social backgrounds leads to higher BMI scores and a greater risk of overweight and obesity (see Figure 4).
- Among children whose primary caregiver had lower secondary education or less, 9% were classified as overweight whereas 8% of those whose parents had never worked (see Figure 4).
- Children from lower social class backgrounds are more likely to be overweight and obesity associated with social background begin early and are already established by the age of three.
**IN TRODUCTION**
This is the fourth in a series of **Key Findings** from the second round of interviews with the Infant Cohort in **Growing Up in Ireland**. The families of 11,100 children were initially interviewed in 2008/2009 when the Study Child was nine months old. They were re-interviewed between January and August 2011, when the children were three years old. This Key Finding presents summary information on infants’ physical growth from birth to three years of age.

Measures of the child’s height and weight were taken at both interviews and these data provide detailed information on patterns of growth that can be used to inform policy development.

**KEY FINDINGS:**

**INFANT COHORT (at 3 years)**

**GROWING UP IN IRELAND**

No. 4  
**CHILDREN’S PHYSICAL GROWTH FROM BIRTH TO AGE 3**

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Some of the information may be repeated in this document.

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