



PAEDIATRICS

A NATIONAL MODEL OF CARE FOR PAEDIATRIC HEALTHCARE SERVICES IN IRELAND

CHAPTER 3: BACKGROUND



Féidhmeannacht na Seirbhíse Sláinte
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**ROYAL
COLLEGE OF
PHYSICIANS
OF IRELAND**

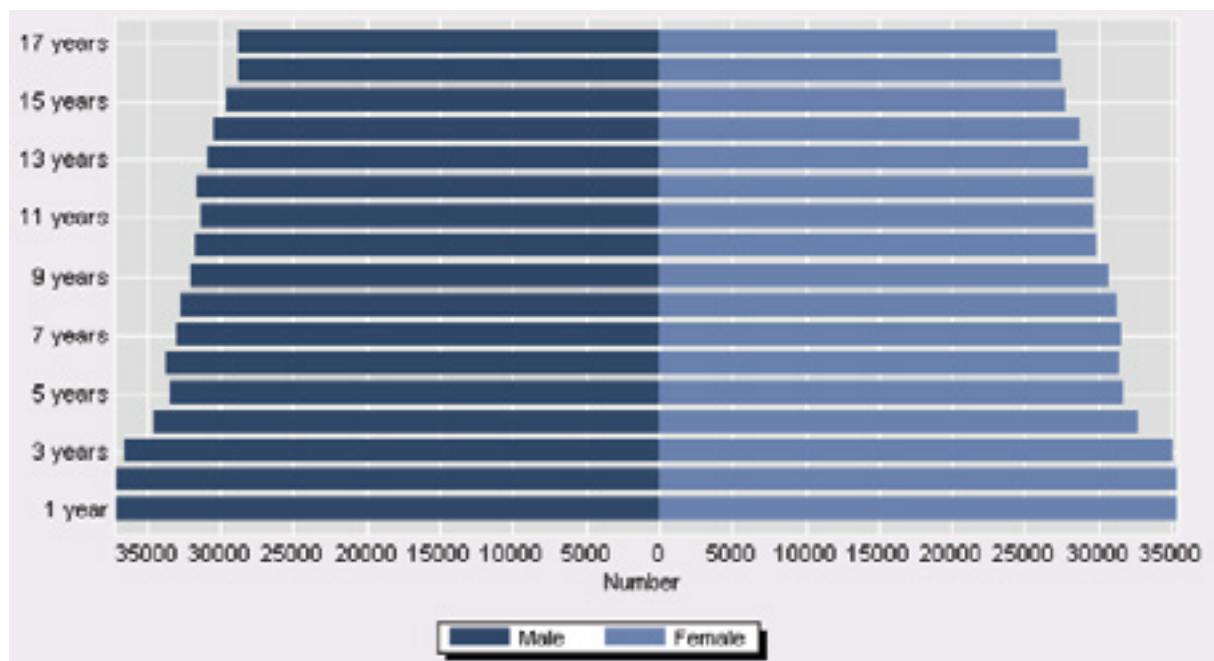
3.1 INTRODUCTION

A vital and productive society is built on the foundation of its children's health and development. Health in the earliest years – beginning with the future mother's health before she becomes pregnant – lays the groundwork for well-being not only in childhood but also throughout adult life.

Population

There were just over one million children living in Ireland in 2011 (or 1,148,687 people aged less than 18 years of age) according to the Central Statistics Office (see Figure 1).

Figure 1: Population 0-17 years by age and sex, Ireland, 2011



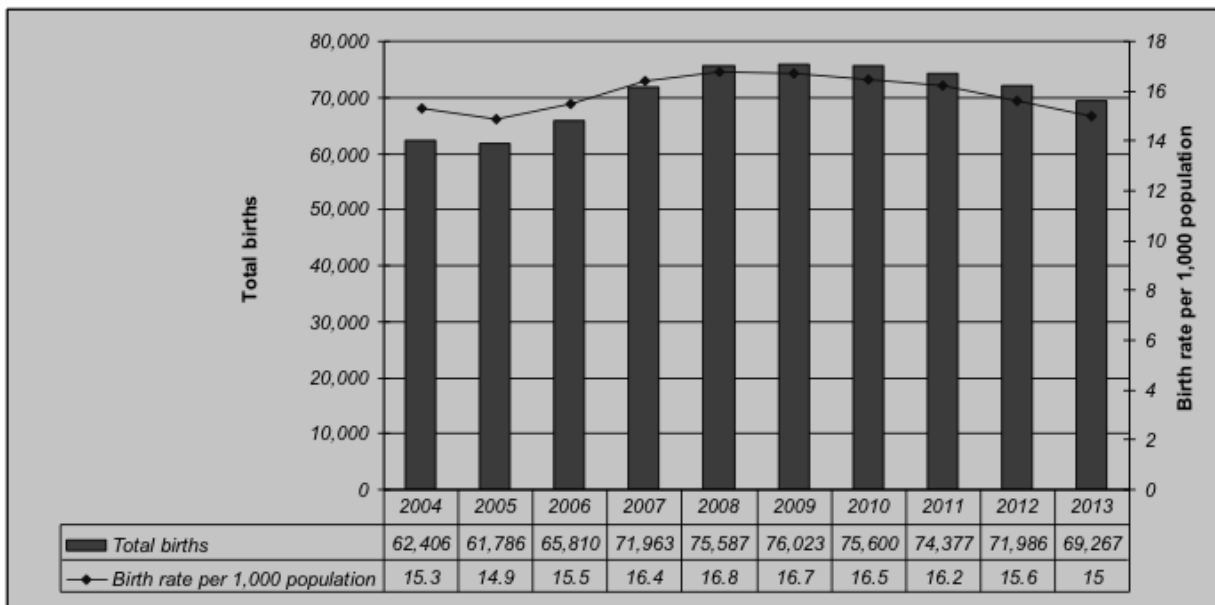
The number of children living in Ireland increased by 10.9% between 2006 and 2011, with the number of 0-4 year olds showing a larger increase (17.9%). This compares to an increase of 8.2% in the general population during this period. Children account for one-quarter of the total population of Ireland. Within the European Union (EU), Ireland has the highest proportion of its population who are children, 25% compared to an EU average of 19%.

In 2011, 8.3% of the total child population of Ireland were foreign nationals. This figure was an increase of nearly 50% from 2006. Traveller children accounted for 1.2% of the total Irish child population and for 48.2% of the total Traveller population. The number of Traveller children increased by 30.3% between 2006 and 2011. This increase was particularly seen in the 0-4 year age group.

Births

There were 69,267 births in Ireland in 2013, of which 5.5% were of low birth weight. This represents a 10% increase in the proportion of low birth weight babies over the previous decade. Irish birth numbers and rates peaked between 2008/2009 and a reducing trend has been evident since then (see Figure 2).

Figure 2: Births and birth rates in Ireland 2004 to 2013



Ireland's total fertility rate is 2.01, compared to 1.58 for the EU-28 countries in 2012, and is the highest among the EU-28 countries (Eurostat). The average age of all mothers with babies born in 2013 was 32.1 years. The increase of age of mothers shows a continuing upward trend (Healthcare Pricing Office, 2014). The trend in the decreasing number and rate of teenage mothers continued in 2013, with just 2% of all births to teenage mothers. In 2011, there were 399 births to mothers aged 10-17, a rate of 484 per 100,000. Of these births, 99% were to mothers aged 15-17.

Deaths

In 2011, the overall child mortality rate was 3.4 per 10,000, of which two thirds (65.6%) occurred in those aged less than 1 year (DCYA, 2012). The infant mortality rate in Ireland was 3.6 per 1,000. This was below the EU-27 average of 4.2 per 1,000. Infant mortality is significantly higher among lower income groups, and is 3.5 times higher among Travellers.

The causes of deaths in children vary by age group and sex. In 2011, the largest single cause of child deaths was 'congenital malformations' (see Table 1). This was followed by 'certain conditions in the perinatal period' and 'injury and poisoning'.

	Under 1 (N)	1-4 (N)	5-9 (N)	10-14 (N)	15-17 (N)	All children (N)
Total	258	34	28	20	53	393
Main cause						
Malignant neoplasms	2	2	8	9	7	28
Certain conditions in the perinatal period	93					93
Congenital malformations	111	4	5	2	2	124
Sudden infant death syndrome	13	3				16
Injury and poisoning	1	4	3	1	18	27
Other	38	21	12	8	26	105

Source: State of Nation's Children: Ireland 2012

The mortality rate for boys was higher than that for girls (4.0 compared to 2.9 per 10,000). This was particularly so in the category ‘injuries and poisoning’ where the ratio of boys to girls was over three to one.

Disability

One in ten 9-year-olds (11%) have a chronic illness or disability (Williams et al., 2009). Nearly half of such children suffered from a respiratory condition while a further 19% had a mental or behavioural problem. Chronic illness or disability is slightly more heavily concentrated among children from lower socio-economic backgrounds. There were 5,461 children registered or reviewed between 2009 and 2013 on the national physical and sensory disability database (NPSDD) (Carew & Doyle, 2014). Approximately one in three children on the NPSDD are registered as having multiple disabilities. There were 10,181 children and young people aged 0-19 years registered on the national intellectual disability database in 2013 (Kelly & O’Donohoe, 2014). Boys are overrepresented on both databases compared to girls.

Carers of our Children

In 2011, nearly one in five children (18.3%) lived in a lone-parent household. However the proportion was greater among children with a disability and Traveller children at 27.3% and 23.5% respectively (DCYA, 2012). Relatives, and grandparents in particular, were identified as one of the most important sources of non-parental childcare for families of 9-month olds and 3-year olds (DCYA, 2011). There were 6,463 children in the care of the HSE in December 2014, with 93% placed in foster care (TUSLA, 2015). Of those living in foster care, approximately 30% were living with relative foster carers. The number of children in the care of the HSE increased by 21.8% between 2007 and 2014.

Children as Carers

In 2011, there were 6,449 children who provided regular unpaid personal help for a friend or family member with a long-term illness, health problem or disability in Ireland (DCYA, 2012). Of these, 28.5% were less than ten years of age.

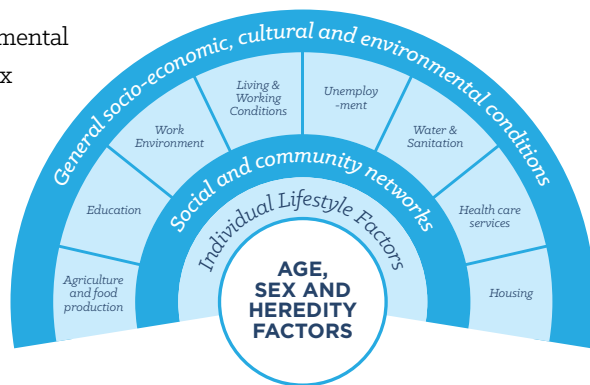
3.2 INFLUENCES ON CHILDREN’S HEALTH

Health is determined by a multiplicity of genetic, environmental and social influences, many of which interact in a complex matrix (see Figure 3).

Figure 3: Social determinants of health
Source: Dahlgren and Whitehead (1991)

While a person’s genetic architecture is set at the time of conception, it is now known that pre-natal and early childhood influences can affect gene expression, thus influencing child, and subsequent adult, health and well-being.

There is also good evidence that adverse early childhood experiences can cause weakened physiological changes and altered brain architecture, increasing the risk of, for example, heart disease, obesity, mental ill-health and diabetes, and can reduce future cognitive ability and non-cognitive skills, such as application, self-regulation and empathy. See Table 2 for early childhood influences on children’s health.



	Child characteristics	Parents and their parenting style	Family factors and life events	Community factors
Risk factors	Low birth weight/ birth injury Disability/ delayed development Chronic illness Early behavioural difficulties (difficult temperament, disruptive behaviour, impulsivity) Poor social skills Poor attachment	Single parent Young maternal age Drug and alcohol abuse Harsh or inconsistent parenting Lack of stimulation of child Lack of warmth and affection Rejection of child Abuse or neglect	Family instability, conflict or violence Marital disharmony/ divorce Large family size/ rapid successive births Absence of father Very low level of parental education	Socioeconomic disadvantage Poor housing conditions
Resilience factors	Social skills Easy temperament At least average intelligence Attachment to family Independence Good problem solving skills	Competent, stable care Breastfeeding Positive attention from parents Supportive relationship with other adults Religious faith	Family harmony Positive relationships with extended family Small family size Pacing of siblings by more than 2 years	Positive social networks Access to positive opportunities, e.g. education Participation in community activities

Source: Annual report of Chief Medical Officer England 2012, *Our Children Deserve Better: Prevention Pays*

Maternal Smoking

Low birth weight impacts on subsequent child and adult health. The most important determinant of low birth weight in children is maternal smoking during pregnancy (Layte & McCrory, 2014). Nearly one in five mothers (17.6%) of children in the infant cohort of the Growing Up in Ireland study reported smoking at some stage during their pregnancy. Women from lower income and social-class households and those with lower levels of education were significantly more likely to smoke during pregnancy.

Breastfeeding

In 2011, the percentage of babies that were breastfed on discharge from hospital was 55.2%, with 46.6% who exclusively breastfed and a further 8.6% who fed using a combination of bottle and breastfeeding (DCYA, 2012). The percentage of infants who were breastfed (either exclusive or combined) is higher among older mothers and also higher among mothers in 'higher' and 'lower professional groups' (72.6% and 70.7% respectively) compared to mothers who reported to be 'unemployed' (35.7%).

Ireland has one of the lowest rates of breastfeeding in the world and the lowest rate in Europe (Layte & McCrory, 2014). The percentage of infants who were breastfed, either exclusive or combined, on discharge from hospital increased over the 5-year period 2007-2011. However, part of this increase is due to migration, with non-Irish-born mothers having higher breastfeeding rates compared to Irish-born mothers (Layte & McCrory, 2014).

Maternal Mental Health

There is evidence that mental health problems in pregnancy and the post-natal period are associated with adverse outcomes for the child, both in the short term and long term (NCCMH, 2014). Up to 20% of women have mental health problems (including depression anxiety, psychosis, and post-traumatic stress disorder) in the antenatal and postnatal periods (Bauer et al., 2014). A high proportion of such cases go undetected.

Maternal Education

Parental education, particularly the mother's, is a central factor in a child's early development (Williams et al., 2009; Doyle & Timmins, 2010). Nearly a third of mothers (31%) of 9-year-old children had achieved an educational level of lower secondary school or less; a further 37% had reached Leaving Certificate level while the remaining 32% had achieved a third level qualification (Williams et al., 2009).

Parenting Styles

Parenting styles are shown to be linked with infant development. Three quarters of mothers (77%) and 68% of fathers of 9-year-olds used an authoritative style of parenting, which is considered the optimal style. Children whose parents used an authoritarian style of parenting (4% mothers and 7% fathers) or an indulgent or permissive style (16% mothers and 20% of fathers) had more social and emotional problems (Williams et al., 2009).

Immunisation

Immunisation uptake rates for the childhood immunisation schedule have increased gradually over the last number of years, with the rate of MMR uptake at 24 months increasing from 69% in Q4 2000 to 93% in Q3 2014. However, for some vaccines (MMR, PCV, MenC and Hib booster) and in some local areas, rates have not yet reached the recommended 95% uptake rate. In recent years, hepatitis B, MenC, HPV and Tdap vaccines have been added to the vaccination schedule.

Housing

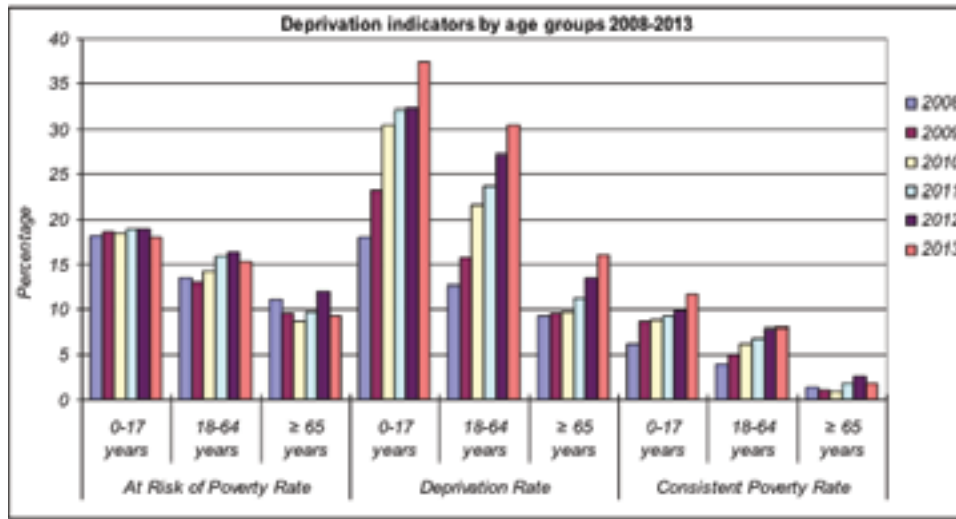
One of the most prevalent risk factors for children at risk of poor outcomes is living in social housing (Blank et al., 2012). In 2011, there were 43,578 households with children in need of social housing (CSO, 2012). On the night of the last census (10th April 2011), there were 249 families with children who were homeless (CSO, 2012). On that night, there were 498 people aged less than 20 years who were homeless, of whom 55% (353) were aged less than ten years and a further 29% (184) who were aged 15-19 years of age.

Poverty

There is a complex interplay between the influence of poverty on health and other influences on health (Marmot, 2010). In addition, some of the effects of poverty are also the causes of poverty in the next generation. This is reflected in the inter-generational element of poverty. For example, peri-natal mortality and low birth weight are significantly higher among lower income groups (McAvoy et al., 2006). Babies born to parents who are unemployed or whose socio-economic status was unknown were twice as likely to be of low birth weight when compared with those whose parents were recorded as higher professionals.

Trends from the Surveys on Income and Living Conditions show that children aged 0-17 years were the population group most likely to be at risk of poverty, of being deprived and to live in consistent poverty, between 2008 and 2013 (CSO, 2009-14) (see Figure 4). All age groups experienced an increase in deprivation in the years between 2008 and 2013. However children bear the burden of deprivation. In 2013, over one in ten children aged 0-17 years (11.7%) lived in consistent poverty, an 89% increase since 2008.

Figure 4: Deprivation indicators by age group 2008-2013



A recent UNICEF report (2014) looking at the impact of the recession on children in developed countries showed that Ireland's increase in child poverty in the four years from 2008 to 2012 ranked fifth highest among a group of 41 developed countries.

3.3 HEALTH AND OTHER OUTCOMES FOR IRISH CHILDREN

Obesity

Over a quarter of Irish 9-year-olds are overweight or obese (Layte & McCrory, 2011). Children from less socio-economically advantaged households have higher levels of overweight compared to children from professional households.

Physical activity

The HBSC study reported that 51% of children report exercising four or more times a week. Overall, 60% of boys report exercising four or more times a week compared to 40% of girls (Kelly et al., 2012). Younger children are significantly more likely to report exercising four or more times a week compared to older children with reported rates of 62% in 10-11 year olds, 54% in 12-14 year olds, and 41% in 15-17 year olds.

Smoking

The HBSC survey for 2010 showed that overall 27% of children report that they have ever smoked tobacco (Kelly et al., 2012). This is a decrease of nine percentage points from the 2006 figure. In 2010, 12% of children report that they are current smokers, i.e. smoke monthly or more frequently. This represents a three percentage point decrease from the 2006 figure of 15%. There are statistically significant differences across social class groups in current smoking status, with children from higher social class groups less likely to report current smoking behaviour.

Alcohol

One in five teenagers by the age of 16 years are weekly drinkers and over half report having ever been drunk, with one in seven drunk at least ten times (Kelly et al., 2012). Consumption and drunkenness increased with each year of

age. The average age of first alcohol use in children decreased from 15 years for children born in 1980 to 14 years for children born in 1990. A survey of older adolescents in Ireland indicated that those with the most serious drug and alcohol problems had commenced alcohol use at a much earlier age than their counterparts without significant drug or alcohol problems (DOH, 2012). This suggests that early age of onset of regular drinking increases the risk of both later alcohol and later drug abuse.

Mental Health

In 2011, there were 435 admissions of children to psychiatric hospitals of which 82.5% admitted were aged 15-17 years. Almost 44% were boys and 56.3% were girls, equating to a rate of 32.3 per 100,000 boys and 43.7 per 100,000 girls respectively (DCYA, 2012). In 2011, 904 children aged 10-17 presented at a hospital emergency department following deliberate self-harm (with a rate per 1000 of 1.3 for males and 2.6 for females).

In 2011, there were 16 suicides by children aged 10-17. Overall, suicide accounted for just over one in five (21.9%) of all deaths of children aged 10-17 in 2011 (with a rate per 100,000 of four for females and 15 for males). In 2010, the rate of suicide in the 15-19 year age group in Ireland was the fourth highest of twenty six European countries (NOSP, 2014).

Hospitalisations

There were 153,905 hospital discharges of children (aged less than 18 years) in Ireland in 2011 (DCYA, 2012). More than half of these were of infants (21.9%) and children aged 1-4 years (29.0%). The most commonly reported principal diagnosis was 'diseases of the respiratory system' (12.4%), followed by 'injury, poisoning and certain other consequences of external causes' (9.2%). Thirty-one percent of the hospital discharges with a diagnosis of 'external causes of injury or poisoning' were of children aged 1-4 and 63.0% were of boys. Over the four years 2007-2010, the number of discharges did not vary but a 5% increase was seen in 2011.

Education

In a study in 2012 of students aged 15-16 years, the mean mathematics score for Ireland was ranked 13th out of 34 OECD countries and 20th out of all participating countries (OECD, 2012). Ireland's mean mathematics performance had increased significantly since 2009, but was not different to the Irish scores from 2003 and 2006. The mean print reading score of students in Ireland in 2012 was significantly above the average across OECD countries. Ireland's score is ranked 4th out of 34 OECD countries and 7th out of all 65 participating countries. The print reading performance of students in Ireland in 2012 was significantly higher than in 2009, but did not differ from the scores in 2000, 2003 or 2006. For science, the mean score of students in Ireland in 2012 was ranked 9th among 34 OECD countries and 15th among all participating countries. Ireland's mean science score in 2012 was significantly higher than the mean scores in 2006 and 2009. Ireland's science performance was significantly above the corresponding OECD average scores in each cycle since 2006. Retention rates to Leaving Certificate have increased from 82.3% in 1997 school entry cohort to 90.2% in the 2006 school entry cohort (State of the Nation's Children). The retention rate was 80.1% for children in disadvantaged (DEIS) schools compared to 92.7% for children in non-disadvantaged (non-DEIS) schools.

Crime and Disorder

In 2011, 12,809 children aged 10-17 were referred to the Garda Juvenile Diversion Programme (DCYA, 2012). The total number of referrals received amounted to 27,384, a rate of 2.1 referrals per child. Three quarters of children referred were aged 15-17 years (75.4%). The number and rate (per 1,000) of children referred was approximately three times higher among boys. 'Public order and other social code offences' were the highest cause of referrals (28.9%) to the Garda Juvenile Diversion Programme, with 'theft and related offences' next at 23.7%. While, over the 5-year period 2007-2011, the number of children referred has decreased by 41.6%, the overall number of incidents referred has been relatively stable.

3.4 HEALTH INEQUALITIES - FOUNDATIONS LAID IN EARLY CHILDHOOD

Health inequality and chronic disease in later life is caused by an unequal distribution of resources across individuals and families, not only in terms of wealth, but also in living conditions, levels of education, supportive families and parenting skills, social capital and community networks. These influences are evident at the individual and at the societal level and are cumulative over a person's lifetime.

While such influences on health occur at different life stages, early childhood is a special case. 'The foundations for virtually every aspect of human development – physical, intellectual and emotional – are laid in early childhood. What happens during these early years (starting in the womb) has lifelong effects on many aspects of health and well-being – from obesity, heart disease and mental health to educational achievement and economic status.' (Marmot, 2010).

An extensive body of literature now shows that many of the most common chronic diseases in adults – such as hypertension, diabetes, and stroke – are linked to processes and experiences occurring decades before, in some cases as early as pre-natally. This can happen due to the cumulative impact of adverse events in early childhood or due to disruptions occurring during sensitive developmental periods. Early environmental or social influences appear to have at least as much, if not more, impact than genes on the odds of having chronic problems in later life.

Brain architecture shows rapid development in-utero and in the first one to two years of life. Maternal stress during pregnancy, including mental stress, dietary deficiency, alcohol, tobacco and drug use, has a significant influence on brain development. Such influences can alter gene expression, and thus have lifelong effects on health. Neuro-development during the first year or two of life guides physiological and behavioural responses to stress, potentially for the remainder of a person's life. Insecure attachment with the primary care-giver, inconsistent or harsh parenting, physical, emotional or sexual abuse, domestic violence and other adverse childhood experiences alter neurobiological systems, reducing both cognitive capacity and non-cognitive skills, such as application, empathy and self-regulation, and setting the stress response system on a 'short fuse'.

Investment in early childhood development, starting from conception, provides one of the most cost effective interventions available to reduce health inequalities and chronic illness in later life. This is because its impact is seen not just on the health of the child but because it also provides the foundation for health, or predisposition to illness, over a person's lifetime (see Figure 5).

Cost benefit ratios of programmes were found to be greater in programmes with longer-term follow-up because they allowed measurement of outcomes at older ages. As most programmes measure outcomes in the shorter-term, the cost-benefit for most programmes are, therefore, likely to be conservative. Even from such conservative analyses,

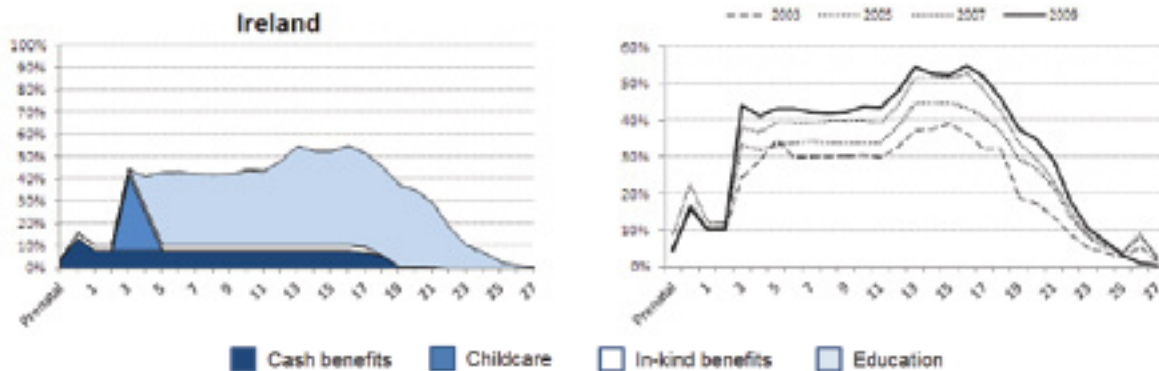
Figure 5: Rates of Return to Human Capital Investment



From: Carneiro and Heckman – Human Capital Policy

the rates of return on investment significantly exceed both their costs and stock market returns. There is, therefore, an economic as well as a social argument to invest in early childhood. At present, however, most developed countries spend proportionately more on children as they get older. This is particularly the case in Ireland (see Figure 6).

Figure 6: Average and Yearly Expenditure on Children and Young People by Benefit type, 2003-2009. Ireland.



OECD: Doing Better for Children (2009)

In addition, a disproportionate proportion of income disadvantage is borne by children and young people in this country.

In the broader policy frame, policies which address childhood poverty, parental leave and quality early childhood education have been shown to be effective in improving child, and adult, health and social outcomes. Looking at health and social services, the types of interventions in early childhood which improve health and social outcomes, and which are cost effective, include:

- home-visiting programmes
- promotion of parenting skills
- smoking cessation
- support for mothers with mental health problems.

Such interventions can have a greater impact on the development of those children who are more disadvantaged. In order to really impact on health inequalities and chronic disease, some interventions should be universally available while additional programmes should be provided based on need – progressive or proportionate universalism. The universal delivery of a basic service to the whole population has additional benefits – it both normalises and de-stigmatises such service - improving acceptability - and it can form the foundation of a needs assessment framework – allowing the identification of additional needs, so that families can be signposted or referred to additional services. However, unequal access, poor quality or inappropriate programmes can actually increase health inequality.

To have an impact on health inequalities and on chronic disease in later life, it is vital to address the social gradient in children's access to positive early experiences. Investment in early childhood services can break the inter-generational cycle of disadvantage. There is good evidence that health promotion and disease prevention policies focused on adults are less effective, and are more costly, where good early foundations are lacking. If we are serious about impacting on adult health and well-being, and reducing health inequalities, current models of resource allocation and of service delivery will need to be re-assessed, and additional resources identified, to order to invest in early childhood.

3.6 ABBREVIATIONS

CSO	Central Statistics Office
DCYA	Department of Children and Youth Affairs
DEIS	Delivering Equality of Opportunity in Schools
DOH	Department of Health
EU	European Union
HBSC	Health Behaviour in School-Aged Children
Hib	Haemophilus Influenzae
HPV	Human Papillomavirus
HSE	Health Service Executive
MenC	Meningitis C
MMR	Measles, Mumps and Rubella
NCCMH	National Collaborating Centre for Mental Health
NOSP	National Office for Suicide Prevention
NPSDD	National Physical and Sensory Disability Database
OECD	Organisation for Economic Co-operation and Development
PCV	Pneumococcal Conjugate Vaccine
Tdap	Tetanus, Diphtheria and Pertussis
UNICEF	United Nations Children's Fund

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