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International comparisons of health and wellbeing in early childhood

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In association with
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About the report

This report presents data on health and wellbeing for early childhood in the UK and 14 comparable countries, recognising the particular influence that a child's development in this period can have on his or her future health and quality of life. We consider the benefits and challenges of comparing child health indicators between countries, to inform local and national policy and practice that improves the health of children and families in this country. The findings show that while the UK is doing well in many areas relating to the health of young children, on certain indicators the UK lags far behind similarly developed countries. In others, where once we led the field, our rate of improvement has slowed to the extent that we have among the worst outcomes in comparable countries.

A technical annex containing data tables to support the information found in this main report is available at www.nuffieldtrust.org.uk/research/international-comparisons-of-health-and-wellbeing-in-early-childhood.

Acknowledgements

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Contents

1 Executive summary

Purpose

This report presents data on health and wellbeing for early childhood in the UK and 14 comparable countries, recognising the particular influence that a child's development in this period can have on his or her future health and quality of life. We consider the benefits and challenges of comparing child health indicators between countries, to inform local and national policy and practice that improves the health of children and families in this country.

Key findings

Life expectancy

- A boy born in the UK in 2015 can expect to live to just over 79 years; over a year longer than a boy born in Portugal, but more than a year less than one born in Sweden. The UK life expectancy for a boy is broadly similar to most European comparators. However, a girl born in the UK can expect to live to almost 83 years; three years less than a girl born in Spain, and the lowest of all European comparators. For both boys and girls, improvement in life expectancy has plateaued since 2011.

Size of the early childhood population

- In 2015 there were just over 4 million children aged 0 to 4 years in the UK. This represents 6.2% of the total population. Among the 14 countries examined, only Ireland, New Zealand and Australia see 0 to 4-year-olds make up a higher percentage of their overall populations.

Low birth weight

- In 2014, 6.9% of live births in the UK weighed less than 2,500 grams; around average when compared with the other 14 comparator countries.

Breastfeeding

- The UK has one of the lowest breastfeeding rates in the world: 34.0% of babies are receiving any breastmilk at six months, compared with 62.5% in Sweden.

Obesity

- The UK has considerably more overweight or obese children and young people than the average among high-income countries, for both boys and girls. In the UK in 2013, it is estimated that 26.1% of boys and 29.2% of girls aged 2 to 19 years were overweight or obese. In England in 2016/17, nearly a quarter (23.6%) of children in reception were obese or overweight.

Vaccination and immunisation

- Vaccine uptake in the UK generally compares well with other countries. However, data from 2016 show a slight reduction in uptake of all three major early childhood vaccines in the UK. Furthermore, MMR (measles, mumps and rubella) vaccine coverage is still below 95% for children receiving two doses by their fifth birthday, and around 50,000 children in England each year are at risk of measles, mumps and rubella because they have not been immunised against the diseases.

Social determinants of health (poverty, education and employment)

- When compared with the other 14 countries, the UK has a comparatively low rate of child income poverty, with approximately 10% of children living in income poverty (using the Organisation for Economic Co-operation and Development [OECD] definition). However, the proportion of children in relative income poverty (using UK government definitions) has risen back to the levels last seen in 2009/10.

- Among the countries studied, only Canada and Ireland have more young people educated to the highest level of education.

- When compared with the other 14 countries, the UK has the second highest proportion of children in households where no adult is working (15.4%).

Stillbirths and deaths in early childhood

- Rates of stillbirths, neonatal, infant and child death have seen a decline over the past 20 years in the UK, as they have across developed countries in general. However, rates have declined more slowly than in other comparable countries and, in 2015, over 3,500 children died before their fifth birthday.

- Improvements in infant and neonatal mortality rates have stalled since 2013.

- In England and Wales, the most common cause of death in the 1 to 4-year-old age group is cancer. Among the countries studied, the UK has the lowest incidence of cancer in 0 to 4-year-olds. Five-year survival for all childhood cancers in the UK and Ireland rose from 74.4% in 1999–2001 to 77.8% in 2005–2007.

- The number of deaths in children under five from injury and poisoning in the UK is similar to that in the other 14 countries.

Conclusion

International comparisons of child health allow us to understand where the health and wider outcomes of children and families in the UK are similar to those in other countries. Where outcomes are better or improving, it is possible to consider how this might be sustained. Where outcomes are worse, this presents the opportunity to prioritise activity at a local and national level to achieve improvement. However, there are many challenges involved, reflected in the relatively limited number of indicators which it was possible to include in this report.

Country-level comparisons should be interpreted with a degree of caution, since there are significant societal, population and economic differences which may be impacting individual health outcome indicators far in excess of specific health or policy interventions.

With these limitations in mind, the findings in this report show that the UK is doing well in many areas relating to the health of young children. By and large, trends over the past decade show improvements in the majority of indicators, and broadly support the argument that this decade's young children in the UK enjoy better health than the last.

But in none of these fields is there a convincing argument that the UK is among the best performing of any comparable country. Moreover, for certain indicators, such as the percentage of children who are overweight or obese, or breastfeeding, the UK lags far behind similarly developed countries. In others, notably in childhood mortality, we can see that, where once we led the field, our rate of improvement has slowed to the extent that we have among the worst outcomes in comparable countries.

Even those indicators which had previously shown encouraging progress have stalled or worsened over the past two to three years. Worryingly, these include life expectancy, mortality, immunisation rates and low birth weight – indicators that are most susceptible to public health interventions and therefore most at risk in the face of increasing threats to children's (and particularly early years) services.

While international comparisons of health outcomes should be handled with care, this research has an unequivocal message: we must do much better for our children and young people. The recent changes to the UK's trajectory on life expectancy, premature deaths and immunisation should set alarm bells ringing for policymakers about the effects of cuts to public health and early years services.

Summary of findings

Indicator	Trend over past decade	UK relative to others
Life expectancy	Stable	Worse
Children aged 0–4 years as proportion of population	Increasing	Larger
Low birth weight (born at <2500 grams)	Stable	Similar
Breastfeeding rates – exclusive breastfeeding up to 6 months	Stable	Worse
Obesity	Deteriorating	Worse
Vaccine uptake	Improving	Similar
Income poverty (OECD definition)	Stable	Better
Education to tertiary level	Improving	Better
Employment – children living in workless family	Improving	Worse
Stillbirth	Improving	Similar
Infant mortality	Improving	Worse
Neonatal mortality	Improving	Similar
Early childhood mortality (aged 1–4 years)	Improving	Worse
Childhood cancer 5-year age-standardised survival	Improving	Similar
Congenital heart disease incidence		Better
Neural tube defects incidence		Worse
Death due to unintentional injury	Improving	Similar

2 Foreword

As the NHS approaches its 70th birthday, it is right to reflect on the incredible achievements that we have made in improving child health outcomes. Before the NHS was set up in 1948, around one in 20 children died before their first birthday and illnesses like polio, tuberculosis and measles were commonplace.

70 years on and child health has been transformed. Overall child mortality rates have fallen to an all-time low, vaccination programmes have drastically reduced the numbers of children and young people contracting preventable illnesses like measles, rubella and tuberculosis, and some illnesses like polio have been eradicated.

But, despite these achievements, many children and young people in the UK now experience worse health outcomes than those in other similar countries, as this report shows. Despite overall child mortality rates being reduced, our progress in reducing infant mortality has stalled and we are now lagging behind most other high-income countries. We are bottom of the pack when it comes to breastfeeding, and young girls in the UK are some of the most overweight in the developed world.

Inequality, which is proven to have a negative effect on child health, is rising and the impact on the poorest in society is being sorely felt. The Nuffield Trust's recent briefing on health inequalities among children and young people found that the poorest school-aged children are now more likely to be admitted to hospital in an emergency for asthma than they were 10 years ago. Children and young people living in poverty are also far more likely to have poor mental health. At the same time, some of the totemic diseases of the 1940s are on the rise again, with cases of scarlet fever reaching a 50-year high and measles outbreaks confirmed in five parts of the UK over the past few months.

So why the poor picture? In England, public sector austerity, cuts to health visiting services, and growing income inequality all play a role. And despite some specific initiatives like the soft drinks industry levy, the Childhood Obesity Plan, money allocated for improving child and adolescent mental

health and some national service reviews, child health remains a low priority area. A year ago the Royal College of Paediatrics and Child Health's State of Child Health report 2017 documented the absence of child health initiatives from the vast majority of the NHS's 44 place-based plans to improve health care in local areas. It also highlighted several areas where government action is required – from developing a cross-departmental child health strategy to reducing child poverty and inequality.

In an update to the report published at the start of this year, the RCPCH criticised the absence of political focus on child health – pointing out that despite some bright spots, in many areas there had been no progress and in some the state of play had actually got worse. It's clear that a fragmented approach to children and young people's health will not lead to a healthy and prosperous nation.

Our report compares health outcomes for children and young people across a range of countries to provide a snapshot of how the UK is performing in relation to comparable countries. International comparisons are fraught with difficulty. Although this report has tried to use comparable data where possible, it is sometimes difficult to make direct comparisons with other countries included in this report due to variable data quality and lack of standardised definitions. This should be taken into account when drawing any conclusions about the potential implications of the findings in this report. Despite these limitations, reports such as this enable us to see how we are doing but also where there is room for improvement.

So while it is absolutely right to celebrate the considerable achievements we have made in improving child health, as this report shows, internationally the UK is not faring as well as it should be. We are still running in the race to improve our children's health – but we have been passed and left behind by runners from many other comparable countries. As well as a moral duty to preserve the health and wellbeing of our children and young people, there is a strong economic argument. Healthy children become healthy adults.

It's time for policy makers to take child health seriously.

Nigel Edwards
Chief Executive
Nuffield Trust

Professor Russell Viner
President
Royal College of Paediatrics and Child Health

3 Introduction

The importance of health and wellbeing in early childhood (0 to 4 years of age) on later outcomes in adult life is well established. Poverty and adverse childhood experiences (such as abuse or living in a dysfunctional family environment) are related to a higher risk of developing later harmful behaviours (such as substance misuse and smoking), development of physical illness and poorer life chances (Bellis and others, 2014). Physical health in early childhood, such as low birth weight, whether or not a baby is breastfed, and being overweight, all have lasting effects on the risk of developing physical ill health as an adult.

Health in early childhood has direct economic consequences for nations, with poor early health producing later educational failure, unemployment and poor productivity. This understanding, combined with emerging evidence that some health outcomes for children in England lag behind those in other similarly developed countries (Wolfe and others, 2011), has resulted in an increasing focus both on improving the health of young children, but also on comparative measures of health and health care in early childhood across different countries.

Comparing the relative performance of health care systems, and health outcomes for children and young people, across different countries is conceptually appealing but fraught with challenge. Indeed, there is potential for such comparisons to misinform if the underlying concepts such as data quality and standardised definitions are misunderstood.

This report explores how key indicators of the health of children aged 0 to 4 years, and factors which impact upon health, compare internationally, and the challenges of interpreting comparative data for this age group. Readers are encouraged to take account of the limitations identified when drawing any conclusions about the potential implications of findings for their own areas of work.

The report is intended to inform decision-making for those working to improve child outcomes at both a national and a local level by presenting available evidence on how the United Kingdom (UK) (or, where UK data are not available, England) compares with similar countries. Nationally, it may pinpoint areas for further investigation and concerted action. At a local level, particularly where an area compares relatively well with its peers in the UK, international comparisons can be an incentive to greater ambition. This report offers policymakers, commissioners, clinicians and others interested in the health of children an indication of where child outcomes could be even better.

Selection of comparative international indicators relating to early childhood

Data have been selected for presentation primarily based on relevance and inclusion in other indicator datasets. However, potentially useful indicators were then subjected to the following tests, and removed if they were deemed unsuitable:

- Are the data from different countries similar in quality and reliability?
- Have data from different countries been defined, collected and calculated in a similar enough way to make comparison meaningful?
- Is it possible to break down statistics to allow specific analysis of the 0 to 4 year age group and, where relevant, to identify the effects of other factors such as gender (Hjiern, 2012)?
- Are the data available over comparable time periods to enable identification of trends?

There are limitations to all the comparisons made in this report as very few countries collect exactly the same information in the same way. Instead, the comparisons offer an indication of how the UK performs relative to other countries. Detailed information about the limitations of the data used for comparison is given in the technical annex. In some instances, where those limitations are thought to be particularly noteworthy, information is included in the body of the report.

Comparisons are presented between the UK and 14 other countries, based on an approach outlined in a recent QualityWatch report that used an established set of indicators and compared how the UK performed relative to a pool of 14 similar countries (Kossarova and others, 2015). These 14 countries were considered to be relevant comparators for one or more of the following reasons (Kossarova and others, 2015):

- they are a similar western European country or have a similar level of economic development
- they have a minimum population of approximately 10 million people
- they have a similar type of health system to the UK
- they are historically relevant.

The 14 countries selected for that report, and which we have used here, are:

- Australia
- Belgium
- Canada
- France
- Germany
- Greece
- Ireland
- Italy
- The Netherlands
- New Zealand
- Portugal
- Spain
- Sweden
- United States of America (US)

Throughout this report, all comparisons are to these 14 countries unless it is explicitly stated otherwise.

The selection of comparator countries for international comparisons is contentious. The choice of comparators will inevitably influence the interpretation of the findings. For example, the exclusion of small countries in this report precludes comparison with some Scandinavian countries (such as Denmark, Finland and Norway) with traditionally excellent child health

outcomes. Other comparative studies of international child health have used different comparator country groups, using different selection criteria. While acknowledging that there is no perfect comparator group, our selection method is previously published, relevant to the topic, and provides robust criteria within which to make meaningful comparison and interpretation.

Further information about the data used in this report

A separate technical annex to this report includes further information about all the data which have been used to create the text and charts in this report. You will also find information about the technical methods used to analyse the data presented in the report. A list of sources is also included and should be read alongside the reference list.

4 Life expectancy at birth

Life expectancy at birth is the average number of years that would be lived by babies born in a given time period if mortality levels at each age remain constant. Since life expectancy was first measured in the mid-19th century, the trend in the UK has been of continued increase, interrupted only by the World Wars, although there are concerns that this trend has slowed or even stopped since 2014. Significant inequality persists, and this is closely associated with levels of deprivation (Public Health England, 2017a). Figures 1 and 2 show how male and female life expectancy in the UK compares to that in other European countries.

Figure 1: Male life expectancy at birth, 2015 (European comparators)

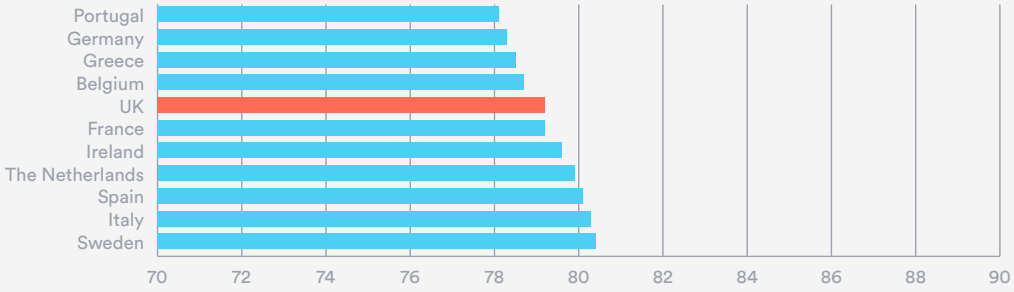
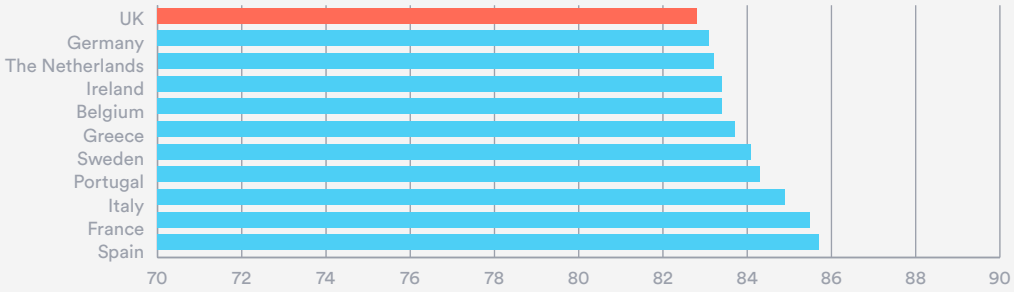


Figure 2: Female life expectancy at birth, 2015 (European comparators)



Source: European Commission, Eurostat.

Comparative data were only available for the European countries. Male life expectancy in the UK is broadly similar to European comparator countries; a

boy born in the UK in 2015 can expect to live 1.1 years more than one born in Portugal, but 1.2 years less than one born in Sweden. Female life expectancy in the UK, however, is the lowest for countries where comparable data are available; a girl born in the UK can expect to live 2.9 years less than one born in Spain.

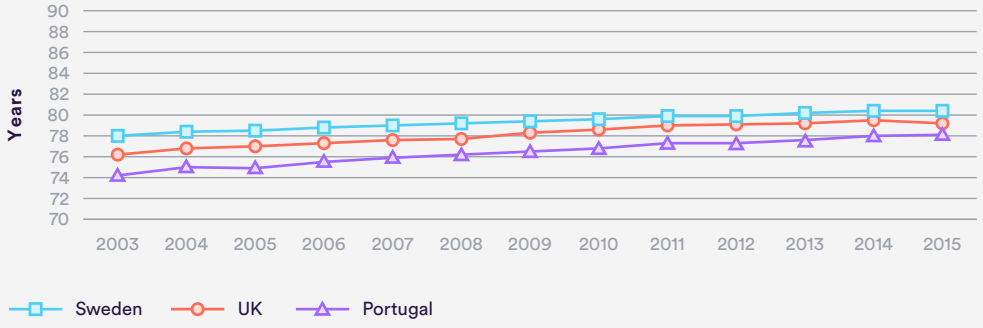
The quality of data underlying this indicator is considered to be good. The key variables in calculating life expectancy are the age and sex of the population, and death registration, all of which are reliable across countries. Aside from some classification issues over perinatal mortality, data quality does not explain the variation seen.

Trends over time in life expectancy at birth

In 2015, Spain had the highest life expectancy at birth for all children (83.0 years) and Germany the lowest (80.7 years). The trends over time for male and female life expectancy are shown in Figure 3 and Figure 4, with data presented for the UK alongside the countries with the highest and lowest life expectancy. Life expectancy should be considered over a number of years when looking at trends, to account for natural fluctuations in a population.

In recent decades in the UK, male life expectancy has increased faster than that for females, and the gap in life expectancy is now less than four years. Since 2011, the rate of increase in life expectancy has slowed for both males and females. Male life expectancy in the UK was 79.2 years in 2015; 3.0 years higher than it was in 2003.

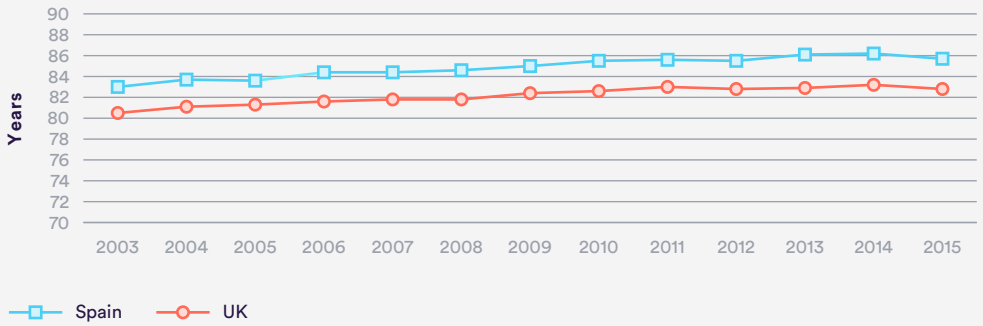
Figure 3: Changes in male life expectancy at birth



Source: European Commission, Eurostat.

Female life expectancy at birth has also been rising, but at a slower rate than for men. In 2015, it was 82.8 years; 2.3 years higher than it was in 2003.

Figure 4: Changes in female life expectancy at birth



Source: European Commission, Eurostat.
Note: In these charts, the UK is presented alongside the highest and lowest comparator countries. In this case, the UK is itself the lowest.

In countries where life expectancy is already high, there appears to be a slower improvement over time. In 2015, Sweden had some of the highest life expectancies for both men and women. However, increases in life expectancy in Sweden since 2003 for both sexes has been among the slowest, at 2.2 months per year for men and 1.5 months per year for women (Tables 2 and 3, technical annex).

Life expectancy trends are strongly linked to changes in population socioeconomic status, education and living environment. They also vary considerably between areas within each country. Efforts to improve life expectancy should target these broader determinants, with a particular focus on inequality (Public Health England, 2017a).

5 Factors contributing to health outcomes in children

Fertility rates

Fertility rates are an indicator of future population growth or decline. In 2013, the total fertility rate varied across countries from 1.3 to 2.1 per woman. The UK had a total fertility rate of 1.9, which is about average (Table 4, technical annex).

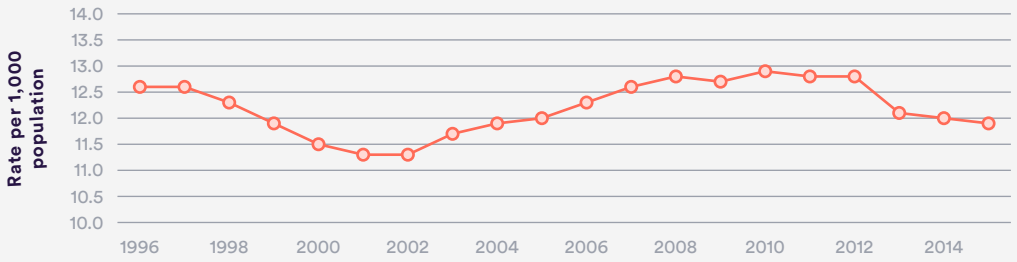
The number of teenagers giving birth (adolescent fertility rate) in the UK is relatively high at 19.3 for every 1,000 women aged 15 to 19 years; behind only the US (26.6 births for every 1,000 women). The Netherlands has the lowest rate at 4.5 (Table 5, technical annex).

There has been an increase in birth rates in the UK among mothers who were born outside the UK in the past 20 years. While the number of live births to mothers who were not born in the UK has increased over the past 10 years as a result of increased migration, the total fertility rate for such women has fallen since there are proportionately fewer women of childbearing age in the migrant population (Office for National Statistics, 2015a). The total fertility rate for mothers who were not born in the UK remains higher than for those who were (2.08 compared to 1.76 children per woman, respectively).

However, because migrants are more likely to be working age adults (Office for National Statistics, International migration), the proportion of births among women aged less than 20 years is much lower for mothers not born in the UK than those who were (1.4% compared with 4.2%; Table 6, technical annex) (Office for National Statistics, 2015a).

Figure 5 shows changes in the UK live birth rate between 1996 and 2015. Over the last 20 years, there has been a variation in the UK live birth rate; after a peak in 2010 the rate seems to be declining again, although not yet to the low of 2001 to 2002.

Figure 5: UK live birth rate per 1,000 population



Source: Office for National Statistics, Vital Statistics: Population and Health Reference Tables.

In 2014, the UK had 12.0 live births for every 1,000 people in the population – the fifth highest in the comparator group. Ireland had the highest rate at 14.6 births per 1,000 population and Portugal the lowest at 7.9 births per 1,000 population (Table 8, technical annex).

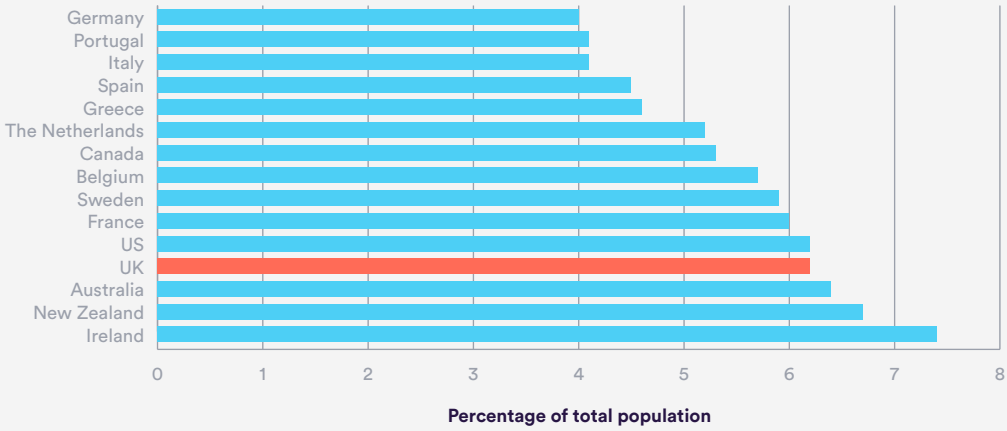
Changes in the fertility rate are related to the economic climate, family policy (such as maternity and paternity leave, and welfare benefits) and societal changes influencing individuals' decision and timing of having children. An increasing number of mothers born outside the UK, who have a higher fertility rate than mothers born in the UK, may have a role to play at a local level. However, this is unlikely to account for changes nationally, since the proportion of these mothers is relatively small.

Changes in the 0 to 4 years population

The UK child population has gradually increased over the past few years. In 2015 there were just over 4 million children aged 0 to 4 years in the UK. The percentage of the total population aged 0 to 4 years in each country is shown in Figure 6. In comparison, this represents a relatively high proportion of the overall population; the UK has relatively more children aged 0 to 4 years at 6.2% of the total population than Germany (4.0%), Italy (4.1%) or Portugal (4.1%). Only Ireland (7.4%), New Zealand (6.7%) and Australia (6.4%) have

more children than the UK in this age group when looked at as a percentage of their overall populations.

Figure 6: Percentage of total population aged 0 to 4 years



Source: Institute for Health Metrics and Evaluation (IHME), 2016.

Globally, childhood population changes are primarily driven by changes in fertility and child mortality rates (and by extension, socioeconomic and health care policy which affect these in turn). Across countries, the child mortality rate is relatively low and is unlikely to be a significant contributor. The high proportion of children aged 0 to 4 years in the UK means that child-friendly policymaking is of particular importance.

Low birth weight

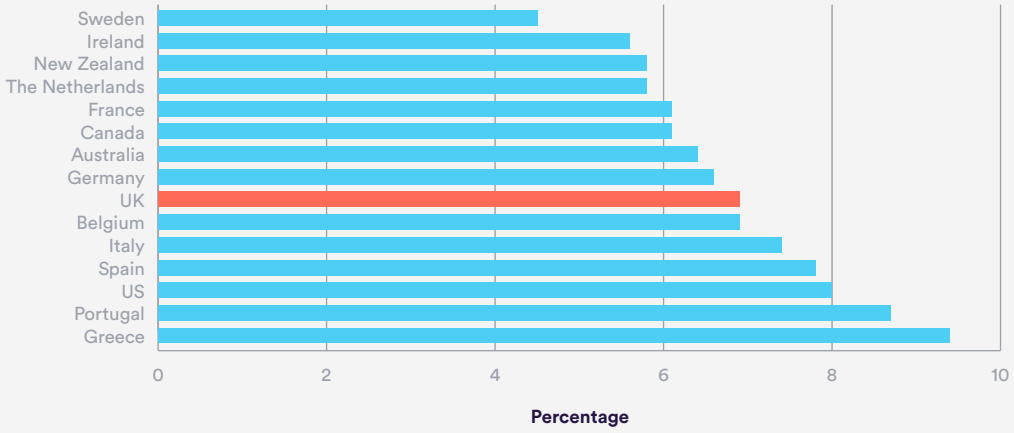
Low birth weight (under 2,500 grams) is associated with an increased risk of death in childhood, developmental problems in childhood and poorer health in later life (Risnes and others, 2011; Larroque and others, 2001; Watkins and others, 2016). A large proportion of babies will be born under 2,500 grams because they have been born before 37 weeks' gestation (a 'preterm birth'). Whether they were born prematurely or at full term, risk of a low birth weight birth is related to the following (Valero de Bernabé and others, 2004):

- preterm birth
- smoking while pregnant
- substance and alcohol misuse

- pregnancy health and nutrition
- pregnancy-related complications
- mother's young age.

The percentage of live births born weighing less than 2,500 grams is shown for each country in Figure 7. In 2014, 6.9% of live births in the UK weighed less than 2,500 grams. When compared with other countries, the UK lies around the middle of the range of values. Greece had the highest proportion of low birth weight babies with 9.4% and Sweden had the lowest with 4.5%.

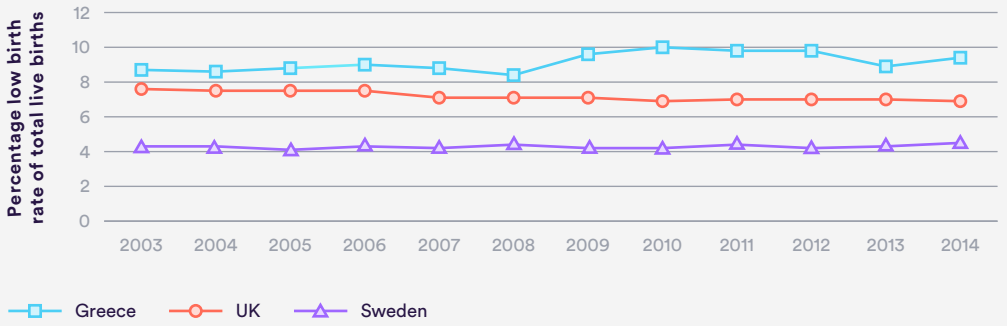
Figure 7: Percentage of live births weighing less than 2,500 grams in 2014



Source: OECD, Family database (indicator CO1.3).

There has been little change among all countries over the past 12 years. Figure 8 shows data presented for the UK alongside the countries with the highest and lowest proportion of low birth weight babies. In 2003, 7.6% of live births in the UK weighed less than 2,500 grams, falling to 6.9% by 2014. Greece has consistently had the highest proportion of low birth weight babies, and Sweden the lowest. If the UK increased the number of babies born who weigh more than 2,500 grams to the same percentage as Sweden, around 19,000 more babies would have a healthy weight at birth.

Figure 8: Low birth weight infants as a proportion of total live births, 2003 to 2014



Source: OECD, Family database (indicator CO1.3).

A high proportion of low birth weight babies at a population level is related primarily to poorer antenatal maternal health. Differences in rates of premature birth across different countries would account for only a small proportion of low birth weight babies and is, therefore, unlikely to explain the UK's relative position – notwithstanding the fact that premature births share many of the same risk factors as those for low birth weight. Of particular importance is reducing smoking during pregnancy, which will require population measures for tobacco control as well as targeted approaches at a local level for pregnant women. More broadly, the prioritisation of policies targeting maternal health, both socioeconomic and those which relate to antenatal health care quality and access, will contribute to a reduction in the number of low birth weight babies.

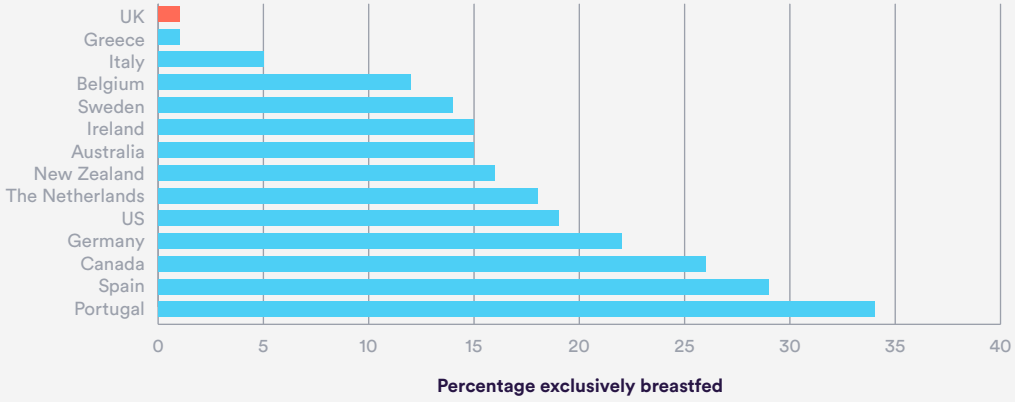
Breastfeeding

There is overwhelming evidence that breastfeeding provides substantial health benefits for mothers and babies which extend well beyond the period of breastfeeding itself. Not breastfeeding can increase the risk of death from gut infections in sick and premature babies (necrotising enterocolitis); chest infections (lower respiratory infections); ear infections (otitis media); diarrhoea and vomiting (gastroenteritis); and tooth decay and dental malocclusion. There is also growing evidence that breastfeeding protects against the risk of a child becoming overweight or obese later in life. There is some evidence of an association between not being breastfed and risk of Sudden Infant Death Syndrome (SIDS). Breastfeeding also benefits the mother

in many ways, including lowering risk of breast cancer and potentially the risk of ovarian cancer (NHS Choices, Benefits of breastfeeding; Public Health England, 2016a).

The UK has some of the lowest breastfeeding rates in the world: 34.0% of babies are receiving any breastmilk at six months compared with 62.5% in Sweden (Table 10, technical annex) (World Health Organization [WHO], European Health for All family of databases). The percentage of infants aged 0 to 5 months who are fed exclusively with breastmilk is shown in Figure 9. Only 1% of UK babies aged under 6 months are being breastfed exclusively, compared with 34% in Portugal (WHO, Global Health Observatory data repository).

Figure 9: Percentage of infants aged 0 to 5 months (inclusive) who are fed exclusively with breastmilk (latest available data from each country)



Source: WHO, Global Health Observatory data repository; Australian Institute of Health and Welfare, 2011; Royal New Zealand Plunket Society, 2012.
Note on source data years: UK, 2010; Greece, 2009; Italy, 1999, Belgium, 2012; Sweden, 2011; Ireland, 2006; Australia, 2010; New Zealand, 2012; Netherlands, 2010; US, 2011; Germany 2003-6; Canada, 2009-10; Spain, 2011-12; Portugal, 2003.

In 2015/16, the percentage of infants in England who were receiving breastmilk at their 6–8-week check was 43.15% (Public Health England, 2016b).

A small proportion of women cannot breastfeed for a variety of reasons, often as a result of their own health. However, this cannot explain the UK's relative position in this data.

Breastfeeding promotion is an important means to change social norms around the initiation and duration of breastfeeding (Balogun and others, 2016), and national strategies must address both the initiation and continuation of breastfeeding, supporting mothers to breastfeed their healthy term infants exclusively for up to 6 months. Information about breastfeeding should also be included as part of statutory personal, health and social education in schools.

The provision and quality of postnatal and health care visiting play an important role in encouraging mothers to breastfeed (Bhutta and others, 2013). An important step is in ensuring all maternity units across the UK achieve and maintain Unicef UK Baby Friendly Initiative accreditation.[1] Health visiting services, which are so vital in providing breastfeeding support after discharge from hospital, must be preserved.

More broadly, policies that reduce socioeconomic inequality and create working environments which support mothers who are returning to work and wish to continue breastfeeding, are likely to bring about improvements in breastfeeding rates (Shealy and others, 2005). The four UK governments should introduce supportive legislation for breastfeeding breaks and facilities suitable in all workplaces for breastfeeding or expressing breast milk, and employers must ensure career or life-time salaries are not adversely affected by a woman's choice to breastfeed.

High quality data is required for the design and implementation of programmes and policies to improve breastfeeding. Reinstatement of the Infant Feeding Survey in the UK is therefore vital for ensuring that we have accurate data captured at regular intervals up until an infant reaches 12 months of age.

1 https://www.unicef.org.uk/babyfriendly

Childhood obesity

The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. Globally, there has been an increased intake of energy-dense foods that are high in fat and sugar; and a decrease in physical activity due to the increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanisation.

Without intervention, the majority of obese infants and young children will likely continue to be obese during childhood, adolescence and adulthood (Mead and others, 2016; Public Health England, 2017b).

There is evidence that being breastfed (relative to being formula fed) and a longer duration of breastfeeding, is associated with a decreased risk of being overweight or obese in later life (Monasta and others, 2010; Scientific Advisory Committee on Nutrition, 2011).

Obesity in childhood is associated with a wide range of serious health complications throughout the life course, and an increased risk of premature onset of illnesses, including diabetes and heart disease.

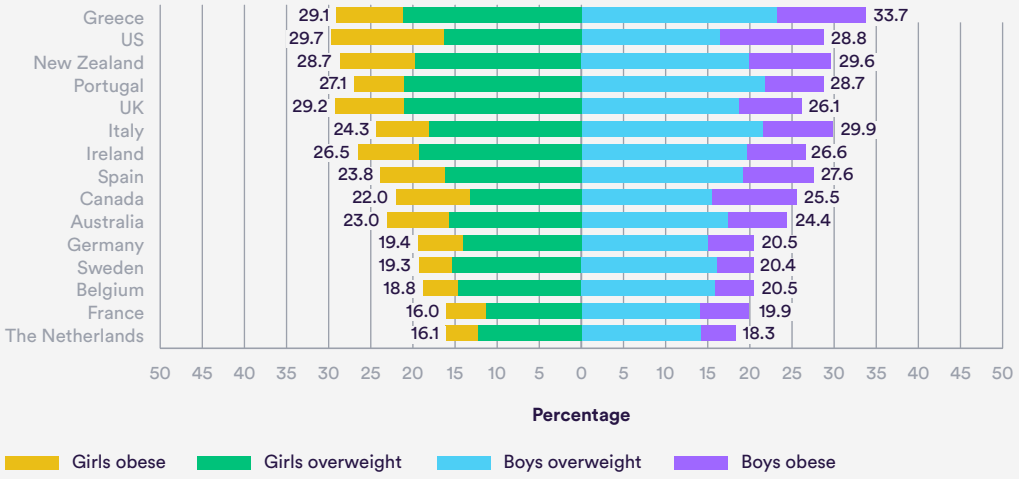
Body mass index (BMI) is a measure of weight status that adjusts for height. BMI is a person's weight in kilograms divided by the square of their height in metres. In children and adolescents, BMI varies with age and gender, so a growth reference must be used. Many countries have their own population-specific growth references for assessing BMI in children and adolescents. In the UK, public health surveillance commonly defines obesity in children as BMI over the 95th centile of the UK 1990 growth reference. However, the International Obesity Task Force (IOTF) BMI cut-offs are most commonly used for international comparisons of overweight and obesity in children under 18 years (Public Health England, 2016c).

The most comprehensive analysis of international comparisons of overweight and obesity among children and young people comes from a 2014 systematic analysis of international surveys, reports and published studies for countries around the world. The IOTF thresholds were used to determine overweight

and obesity for children under the age of 18 years (Ng and others, 2014). Statistical modelling techniques were used to enable direct comparisons to be made between countries which otherwise would not be possible. These findings are summarised below.

Worldwide, the proportion of children and young people classified as overweight or obese has increased since 1980. In developed countries, prevalence rose during this period from 16.9% of boys and 16.2% of girls in 1980, to 23.8% of boys and 22.6% of girls in 2013. Figure 10 shows the percentage of girls and boys who are estimated to be classified as obese or overweight in each country in 2013.

Figure 10: Percentage of children classified as overweight and obese in 2013 using IOTF thresholds



Source: Ng and others, 2014.

In this international comparison, in the UK it was estimated that 26.1% of boys and 29.2% of girls aged 2 to 19 years were overweight or obese in 2013. This means the UK has considerably more overweight or obese children and young people than the average proportion among developed countries, for both boys and girls.

For girls in the UK, there has been a 39% rise in prevalence of overweight (including obesity) since 1980, a similar trend to Canada. For boys the rise has been 48%, similar to the US (Public Health England, 2016c).

Within England, using data collected about children through the National Child Measurement Programme in 2016/17, nearly a quarter (23.6%) of children in reception (aged 4 to 5 years) were overweight or obese. Obesity prevalence (using the 95th centile obesity threshold) varied by local authority from 4.8% to 13.5%, with an average of 9.6% of reception children being obese in England as a whole (NHS Digital, 2017). This has risen since 2015/16 but remains lower than a decade ago in 2006/7.

The causes of childhood obesity are multifactorial. There are clear associations with factors such as socioeconomic deprivation, and tackling inequality and the broader determinants of overall health is crucial to the success of any policy to tackle childhood obesity. Dietary habits and activity levels, not only of the child but the whole family, contribute to the development and persistence of obesity and overweight among children (Patrick and Nicklas, 2005). To address this, policies should focus on access to physical activity and food of high nutritional quality, and the societal and economic conditions which affect this.

The introduction of the sugar levy in the UK is an important step in tackling the obesogenic environment, although robust monitoring of the impact of the levy will be essential. Reformulation of high fat, salt and sugar products is also required – and if the existing voluntary measures do not result in meaningful change, then a more robust regulatory framework will be required, including the regulation of broadcast advertising before 9pm of high fat, sugar and salt products.

The provision and evaluation of services to support overweight children and young people are vital. Health professionals have individual responsibility too, and must ensure they make every contact count through raising issues of weight management with their patients, regardless of age.

Vaccination and immunisations

Immunisation prevents illness, disability and death from vaccine-preventable diseases. In the UK, children up to 5 years of age are immunised against diphtheria, tetanus, whooping cough (pertussis), polio, haemophilus

influenzae type B, rotavirus, meningococcal B and C disease, measles, mumps, rubella, pneumococcal disease, influenza, and, from October 2017, hepatitis B. In addition, children most at risk of tuberculosis and hepatitis B are vaccinated against those diseases through selective programmes (Public Health England, 2016d).

The World Health Organization (WHO) has set vaccination coverage targets at global and WHO regional levels for specific diseases such as measles and rubella. The 95% target for vaccination coverage is required nationally to ensure control of some vaccine-preventable diseases within the UK routine childhood vaccination programmes, with at least 90% coverage in each geo-political unit such as England regions. These targets have been adopted for most childhood vaccine-preventable diseases by the Department of Health at national and local levels.

Diphtheria, tetanus, pertussis and haemophilus influenzae type b (Hib)

Pertussis (whooping cough) is an important cause of morbidity and mortality in infants worldwide, and continues to be a public health concern despite high vaccination coverage. Epidemic cycles have been occurring every two to five years (typically three to four years), even after the introduction of effective vaccination programmes and the achievement of high vaccination coverage (Edwards and Decker, 2013).

In the UK, a national pertussis outbreak was declared in April 2012 and is still ongoing. In response, the Department of Health announced that pertussis immunisation would be offered to pregnant women from 1 October 2012 to protect infants from birth while disease levels remain high. This programme aims to passively protect infants from birth, through intra-uterine transfer of maternal antibodies, until they can be actively protected by the routine infant programme with the first dose of pertussis vaccine scheduled at 8 weeks of age.

Vaccination remains the only effective means of preventing haemophilus influenzae type b (HiB) disease and is becoming increasingly important as Hib antibiotic resistance grows. Serious Hib disease occurs most commonly in children aged between 4 and 18 months.

WHO's Expanded Programme on Immunisation (EPI) has been recommending vaccination against diphtheria, tetanus and pertussis since its inception in 1974. WHO recommends that three doses of vaccination against diphtheria, tetanus and pertussis are given to all children to ensure full vaccination. For Hib, WHO recommends that immunisation should start from six weeks of age, or as early as possible thereafter, and that three doses of vaccine against HiB are scheduled (WHO, 2013). In most countries, including the UK, vaccination against these diseases is delivered as part of a three-dose combined vaccine that includes vaccination against diphtheria, tetanus, pertussis, Hib and polio (5-in-1 vaccine; from autumn 2017 in the UK the vaccination used will also offer protection against hepatitis B) (Public Health England, 2016d). In the UK, children are offered the primary vaccine course at 8, 12 and 16 weeks old, as well as boosters at 1 year (Hib) and 3 years 4 months (diphtheria, tetanus, pertussis) (Public Health England, 2016d).

Pneumococcal disease

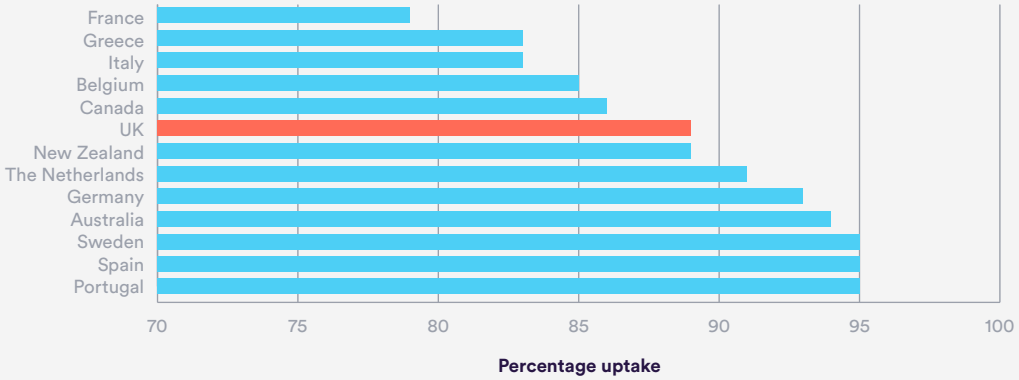
Pneumococcal infections result in serious diseases such as meningitis, bacteraemia and pneumonia, as well as less severe conditions such as sinusitis and otitis media. In line with WHO recommendations, in England, the administration of three primary doses (or two primary doses plus a booster) of vaccine against pneumococcal is recommended. The first vaccination can take place as early as 6 weeks of age (Public Health England, 2016d).

Measles

Reaching all children with two doses of measles vaccine is the standard for all national immunisation programmes. In addition to the first routine dose of measles-containing vaccine, all countries should include a second routine dose of measles-containing vaccine in their national vaccination schedules, regardless of the level of the first vaccine coverage. In England, vaccination against measles is included alongside mumps and rubella. It is recommended that this takes place when a child is 1 year old and again at 3 years 4 months, or shortly thereafter. WHO has set up a measles and rubella elimination objective for Europe, which the UK has signed up to. This requires achieving at least 95% coverage with both doses, delivered equitably to all children in every geopolitical unit (Public Health England, 2016d; WHO, 2017).

The estimated uptake of two doses of vaccine which gives protection against measles, in 2016 for each country, is given in Figure 11. It is based on the age at which each country recommends children should receive a second dose in its national immunisation schedule.

Figure 11: Uptake for two doses of measles vaccine according to the administration recommended in national immunisation schedule, 2016



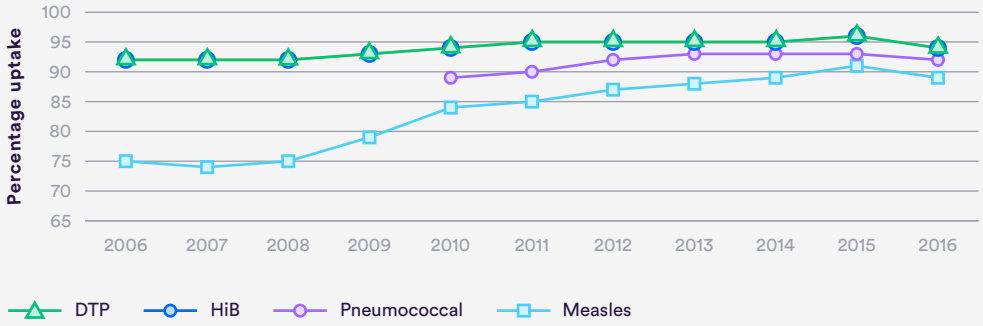
Source: WHO-UNICEF, 2016.

Trends over time in vaccination

For immunisations against diphtheria, tetanus and pertussis, France, Belgium and Greece have consistently had uptake rates between 97% and 99% over the last 10 years. Canada's rate has fluctuated over that time, falling from 95% (in 2006 and 2012) to 91% in 2016. The UK has shown a gradual increase in the percentage of children who have had three doses of vaccine by their second birthday – although there has been a slight decrease over recent years, at 94% in the most recent data (for 2016).

Pneumococcal vaccines were introduced more recently and at different times in different countries. For the last four years, the uptake for the vaccine in Sweden has been around 97%, while the UK has shown a gradual increase over that time, going from 90% to 93%. Canada's uptake seems to have fluctuated dramatically over that time; ranging from 42% to 79% in the last five years. The uptake of vaccines over time in the UK is shown in Figure 12.

Figure 12: Uptake of diphtheria, tetanus and pertussis, and pneumococcal vaccines within the UK since 2006



Source: WHO-UNICEF, 2016.
Note: In this chart DTP and HiB values are identical.

Vaccination against measles, mumps and rubella (MMR vaccine) has shown a gradual rise in all countries over the last 10 years. UK vaccination uptake rates were dramatically affected following a well-publicised 1998 study implicating the vaccine in the development of autism in children (Godlee and others, 2011). This study has since been conclusively and widely discredited, and UK vaccine coverage has returned to pre-1998 levels. However, MMR vaccine coverage is still below 95% for children receiving two doses by their fifth birthday. Around 50,000 children in England each year are at risk of measles, mumps and rubella because they have not been immunised against the diseases.

MMR vaccination rates have been slowly rising again in all countries. Over the last 10 years, the uptake for the second dose of the measles vaccine in Portugal and Sweden by the age recommended within the respective country has consistently been around 95%. The uptake rate in France is consistently lower than other countries and, at 79% in 2016, is well below the recommended uptake levels. This may reflect the different ways in which data about vaccination uptake are collected, as well as the actual percentage of children who have been vaccinated, and reinforces the complexities of comparing data from different countries. The UK has shown a gradual increase in the uptake of the second dose of the measles vaccine from 75% in 2006 to 89% in 2016. This is having a positive impact on the incidence of measles within England and Wales, particularly among under 5-year-olds. However, most recent data suggest a small reduction in vaccine uptake in 2016 once again, which may be concerning.

Increasing vaccination rates requires national leadership with a relentless local focus across all health professional groups. Particular focus should be placed upon specific groups which have lower vaccination rates, such as those from deprived areas, or those families who make a conscious decision not to vaccinate their child.

6 Social determinants of health in early childhood

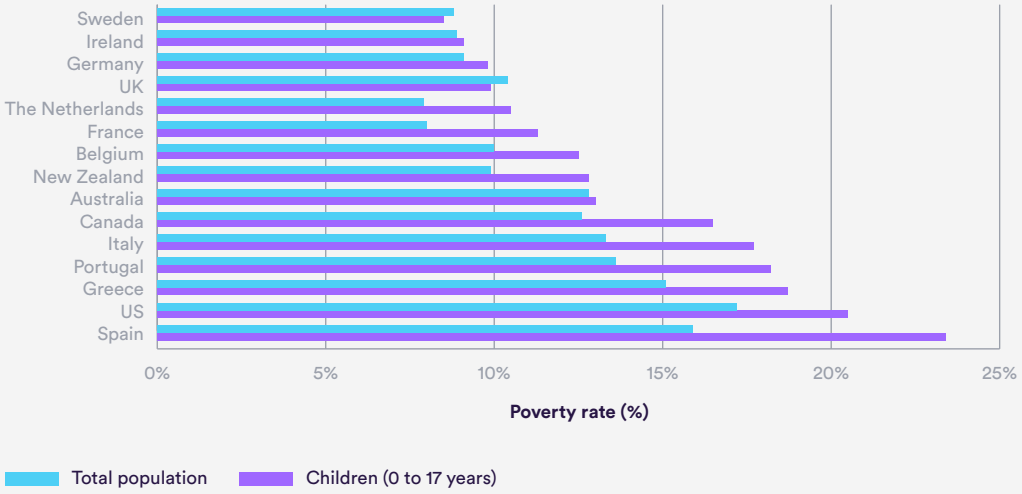
Poverty

There are many different ways to measure poverty – based on total income, disposable income (taking into account taxation and state benefits), material deprivation (the ability to afford certain essential goods), among others. Many of these can also be described in absolute or relative (compared to the total population) terms.

Each has its merits and disadvantages, and countries vary in the measures they select as a basis for monitoring and policymaking. The most robustly comparable international data are published by the Organisation for Economic Co-operation and Development (OECD), which compares relative income poverty, based on the proportion (percentage) of the total population, and also of children (aged 0 to 17 years), with an income of less than 50% of the national annual median. These data are depicted in Figure 13, which shows child income poverty rates compared with income poverty rates for the general population in each country.

This method is different from that routinely used in the UK to look at children living in low-income families. The UK low-income indicator is slightly less stringent and records the percentage of children (aged 0 to 15 years) in low-income households (children living in households where their reported income is less than 60% median income, i.e. £288 per week or lower in 2015/16) (Her Majesty's Revenue and Customs, 2016).

Figure 13: Child income poverty rates (proportion of population – child and total – with a household income of less than 50% national annual median), 2013 or nearest available year



Source: OECD, Family database.

When compared to other countries, using the more stringent OECD criteria of less than 50% of annual median income as the threshold for poverty, in 2013 the UK had a comparatively low rate of child income poverty (9.9%). Spain had the highest rate at 23.4% and Sweden had the lowest rate at 8.5%. Using this measure, the proportion of children living in poverty is less than that of the total population (of all ages) in the UK. This is a pattern the UK shares only with Sweden – in most other countries, the pattern is reversed, with child poverty rate being higher than the all-age poverty rate.

Trends over time, however, paint a much less rosy picture. Using the UK definition of less than 60% of annual median income as the child poverty threshold, the proportion of children in low-income households in 2015/16 was 20%, the highest level seen since 2009/10 and reversing the steady improvement seen since the late 1990s (Department for Work and Pensions, 2017b).

Deprivation is a well-established risk factor for many health outcomes, including those listed within this report (Wickham and others, 2016). Approaches to improve health outcomes must therefore remain focused on addressing the quality of care, and in particular access to care, of the proportion of children living in poverty in order to reduce health inequality.

Inequality blights a child's life. Children living in the UK's wealthiest areas have health outcomes that match the best in the world, while outcomes among our deprived groups are amongst the worst in the developed world. (Royal College of Paediatrics and Child Health, 2017). In order to mitigate the adverse health effects of poverty, universal public health services should be prioritised and supported, alongside targeted help for children and families experiencing poverty.

Tackling child poverty has wider societal benefits including sustainable socioeconomic growth and social cohesion. Recent analysis of child poverty policy and performance across the European Union suggests that to have the greatest impact on child poverty, policies should address three key areas: prioritising education and childcare in early childhood; reducing the risk of poverty (such as increasing wages and employment opportunities) among those families in employment; and effective income support benefits for those on very low incomes (Gábos, 2013). Policy priorities would usefully focus on these areas within the framework of national economic and social policy.

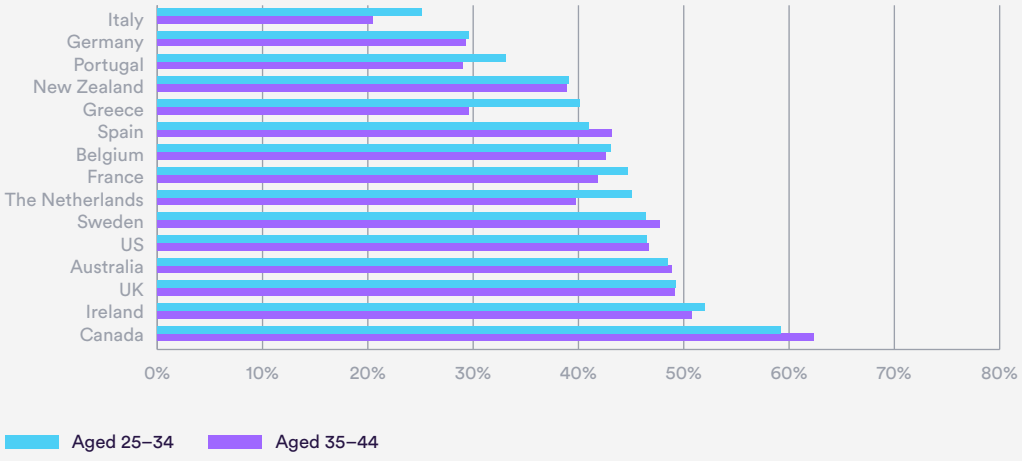
The sustained reduction in child poverty in the UK since 1999 stemmed from a government commitment to eliminate child poverty by 2020. This placed political emphasis and capital on this long-term goal, resulting in cross-party support for the Child Poverty Act 2010, which enshrined this commitment in law. However, this target has subsequently been reversed by the Welfare Reform and Work Act 2016. There is a risk that this leads to a loss of political focus and undermines recent progress that resulted in the decade-long improvement in reducing the number of children living in poverty. Child poverty in the UK is expected to increase significantly over the next few years so strategies are urgently needed to reduce poverty and to mitigate its impact on child health outcomes. For instance, the Westminster government should disclose the information about the impact of the Chancellor's annual budget statement on child poverty and inequality, with specific considerations given to the impact on devolved nations.

Education

The educational attainment and employment status of parents is an important factor for child health and wellbeing outcomes. There is debate over whether this relationship is causal or due to unobserved genetic or environmental factors, but it is clear that higher parental education and economic status is associated with improved child outcomes, including health (Black and Devereux, 2010).

OECD adult education data show the percentage of the population who were educated to the highest level of education (tertiary level) (OECD, 2017). These data are depicted in Figure 14 for both the population aged 25 to 34 years and 35 to 44 years in each country.

Figure 14: Percentage of the population with tertiary-level education



Source: OECD, 2017.

In 2015, nearly half of the UK population aged 25 to 34 years and 35 to 44 years were educated to the highest level of education (tertiary level). This includes both theoretical programmes leading to advanced research or high skill professions, such as medicine, and more vocational programmes leading to the labour market.

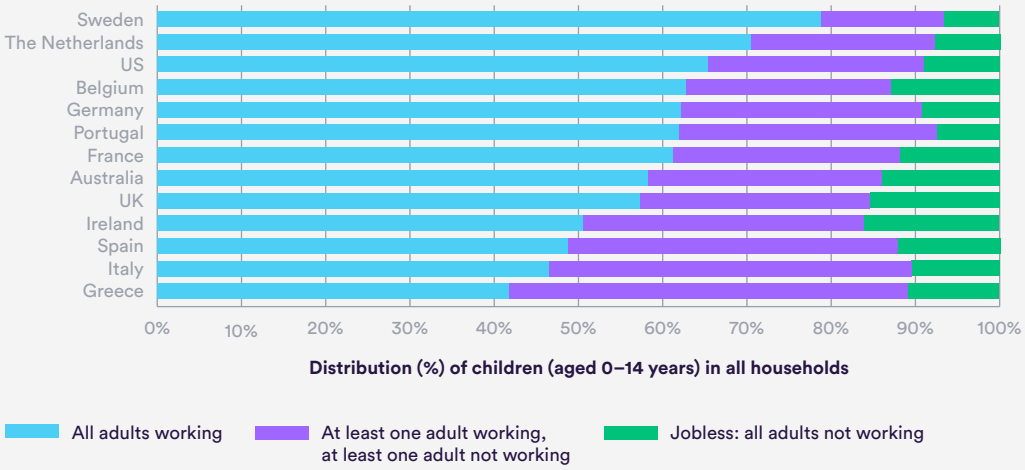
Only Canada (59.2% of those aged 25 to 34 years and 62.3% of those aged 35 to 44 years) and Ireland (52.0% of those aged 25 to 34 years and 50.8% of those

aged 35 to 44 years) have more young people educated to the highest level of education. The country with the lowest percentage of adults achieving this level of education was Italy with 25.1% of those aged 25 to 34 years and 20.5% aged 35 to 44 years being educated to tertiary level.

Parental employment

Children who grow up in workless families (households where no adult is working) have poorer developmental, educational and employment outcomes themselves (Gregg and others, 2017; Schoon and others, 2012). Figure 15 shows the percentage of children (aged 0 to 14) who were in households where all adults worked, at least one adult worked and at least one adult didn't work, or where no adults worked.

Figure 15: Percentage of children (aged 0 to 14) in all households by the employment status of adults in the household, 2014 or latest available year



Source: OECD Family database.

When compared with other countries, the UK has the second highest proportion of children in households where no adult is working (15.4%), behind only Ireland (16.0%). Data were not available for Canada or New Zealand.

Employment and education are both associated with poverty and socioeconomic deprivation, which in turn affect child health outcomes in the short and long-term. They may also reflect the scale of a country's overall economic challenges. This may, in part, explain the relative position of the UK and other countries in this comparison.

7 Stillbirths and deaths in early childhood

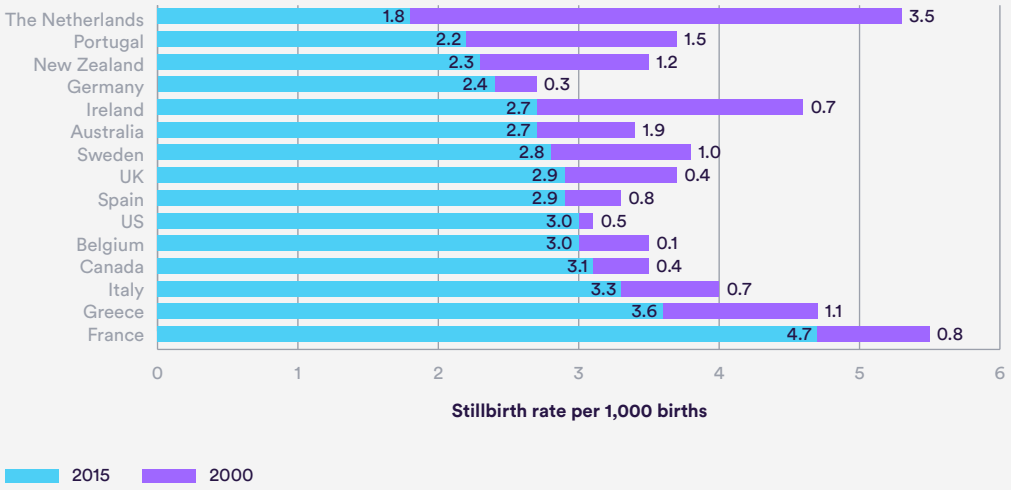
Infant and child death rates in the UK have declined substantially over the last 30 years, and continue to fall. Despite this, over 3,500 children died before their fifth birthday in 2015 in the UK (over 3,000 infants and over 500 children between their first and fifth birthdays).

Stillbirths

The UK stillbirth rate fell to 4.4 per 1,000 total births in 2015; the lowest rate seen since the early 1990s when the definition for this indicator was amended (the gestational age for stillbirth was reduced from 28 weeks to 24 weeks in 1992 by the Still-Birth (Definition) Act 1992; this was to reflect improvements in neonatal viability).

Figure 16 shows the stillbirth rate across countries in 2000 and 2015. It indicates the variation between countries in terms of their starting position and in the speed and extent of improvement, which has been seen in each country since the beginning of the millennium. While the stillbirth rate has been improving, the UK continues to have a relatively high stillbirth rate and has not seen the same level of improvement as that seen in some other countries.

Figure 16: Stillbirth rates in 2000 and 2015

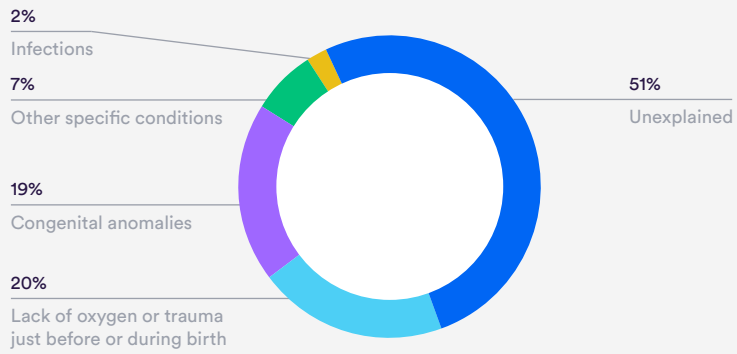


Source: Blencowe and others, 2016.

International comparisons of stillbirth rates are complicated by differences in definitions. For instance, some countries do not register deaths as stillbirths until later in pregnancy. By including only babies stillborn from 28 weeks, researchers found that the UK has a higher stillbirth rate (2.9 per 1,000 births) than Germany (2.4), New Zealand (2.3), Portugal (2.2) and The Netherlands (1.8). The stillbirth rate in the UK is falling more slowly than elsewhere in Europe. However, the starting position was better than many. Stillbirth rates declined by 1.4% per year between 2000 and 2015 in the UK, compared with The Netherlands (6.8% per year), Ireland and Portugal (3.5% per year), and New Zealand (2.8% per year). Since 1992, in the UK, stillbirths have been defined as those born with no signs of life after 24 completed weeks of gestation.

In England and Wales, half (51%) of stillbirths are unexplained, with the remainder resulting from lack of oxygen or trauma just before or during birth (20%), congenital anomalies (19%), other specific conditions (7%) or infections (2%) (Office for National Statistics, 2015b).

Figure 17: Causes of stillbirths in England and Wales, 2015



Source: Office for National Statistics, 2015b.

In November 2015, the Westminster government announced its ambition to reduce the rate of stillbirths, neonatal and maternal deaths in England by 50% by 2030. *Saving Babies' Lives: a care bundle for reducing stillbirth is designed to tackle stillbirth* and early neonatal death, by improving care for babies in the period before and immediately after birth (NHS England, 2016). Its four elements target interventions on:

- smoking in pregnancy
- foetal growth restriction
- reduced foetal movement
- foetal monitoring during labour.

The Royal College of Obstetricians and Gynaecologists (RCOG) is running a quality improvement programme called 'Each Baby Counts' (RCOG, 2015). This programme collects data on all intrapartum term stillbirths in order to identify lessons learned to improve future care.

Infant mortality

Deaths in infancy are subject to different causal and risk factors, dependent on age. For example, the effect of prematurity and low birth weight is greatest on deaths in the neonatal period (first 28 days of life). Other independent risk factors for infant mortality include births outside marriage, to mothers under 20 years old and deprivation (Office for National Statistics, 2015c). Many of these causes are strongly inter-related.

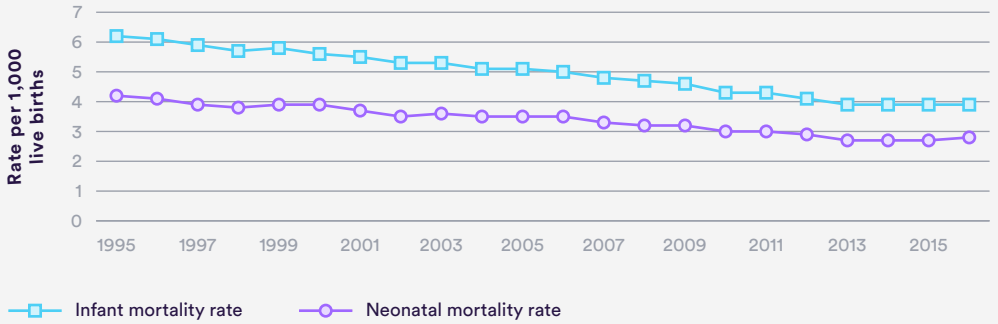
Conditions related to immaturity, such as respiratory and cardiovascular disorders, remain the most common cause of infant deaths in 2015 for England and Wales. Congenital anomalies followed as the second most common cause of infants dying and continues to account for the largest percentage of post-neonatal deaths (Office for National Statistics, 2015b).

Data on gestation and infant deaths are being recorded by the Euro-Peristat project. Based on data from 2010, the project concluded that preterm babies born before 28 weeks of gestational age constitute over a third of all deaths within Europe, but data are not comparable between countries. About a third of all foetal deaths and 40% of all neonatal deaths occurred in babies born before 28 weeks of gestational age. Unfortunately, differences between countries in legislation governing registration of births and deaths, and misclassification of stillbirths and neonatal deaths due to differences in the limits on neonatal viability, make it difficult to compare mortality at these very early gestations (EURO-PERISTAT, 2010).

Infant mortality rates are comparatively higher for low-income families, with the mortality rate among those infants born to the mothers in the lowest socio-economic classifications (manual and routine occupations) being twice as high as those in the highest classifications (professional and managerial occupations) (Office for National Statistics, 2015b). There is evidence that mothers from routine and manual occupations have poorer health themselves, and are more likely to engage in risky health behaviours such as smoking before or during pregnancy, and are less likely to breastfeed. In turn, these lead to poorer nutritional status, immunity and digestive health for the baby, and may be part of the reason for this association (Office for National Statistics, 2015d).

The changes in infant and neonatal mortality rates in the UK between 1995 and 2016 are shown in Figure 18.

Figure 18: Trends in infant and neonatal mortality rates per 1,000 live births in UK



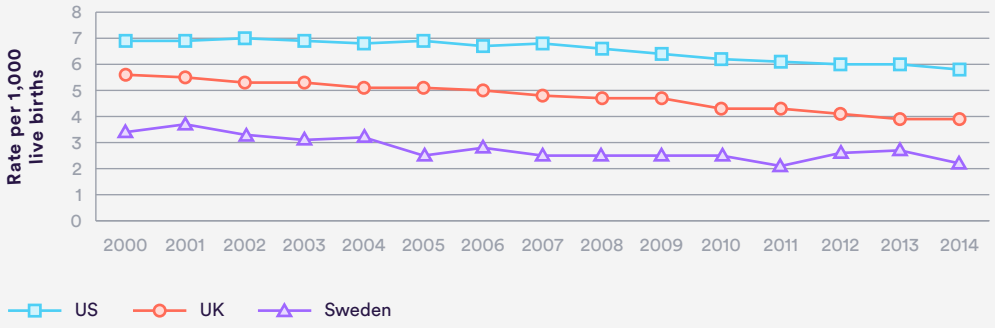
Source: Office for National Statistics, Vital Statistics: Population and Health Reference Tables.

Infant mortality rates are showing a gradual decrease over the years. In 2016, there were 3,004 infant deaths in the UK (3.9 per 1,000 live births). A large proportion of infant deaths occur in the neonatal period (first 28 days of life); in 2016, there were 2,136 neonatal deaths in the UK (2.7 per 1,000 live births). 2015 saw the first rise in infant mortality in England and Wales since 2006.

The WHO definition of live birth is any infant born demonstrating independent signs of life, including breathing, heartbeat, umbilical cord pulsation or definite movement of voluntary muscles, irrespective of gestation (The Partnership for Maternal, Newborn and Child Health, 2011). Despite this standard definition, not all countries calculate their infant mortality rates based on all live births. This makes comparison between countries challenging.

International trends in infant mortality rates between 2000 and 2014 (the latest year in which international data are available) are depicted in Figure 19. Data for the UK are presented alongside the countries with the lowest (Sweden) and highest (US) rates of infant mortality.

Figure 19: Trends in infant mortality rates



Sources: Sweden and the UK – WHO, European Health for All family of databases (indicator E070100.T); US – Kochanek and others, 2016.

When comparing data with other countries, there is a gradual decline in infant mortality across developed nations. From 2003 onwards, the US has consistently had the highest rate, with 5.8 infant deaths per 1,000 live births in 2014; compared with Sweden with the lowest rate at 2.2. In 2014, the UK had the fourth highest infant mortality rate (3.9) among all comparable countries, but one of the highest among comparable European countries. If the UK had the same infant mortality rate as Sweden, there would have been nearly 1,000 fewer infant deaths in 2015.

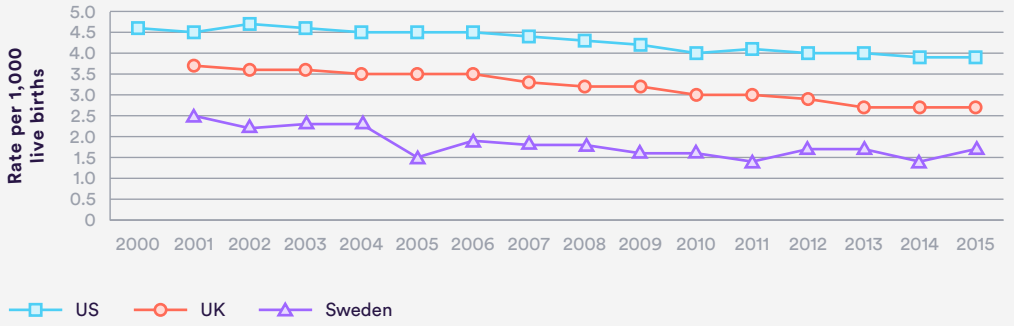
Neonatal mortality

A child's risk of death in the first four weeks of life is nearly 15 times greater than any other time before his or her first birthday, and three quarters of all newborn deaths occur in the first week of life. The three major causes of neonatal deaths worldwide are infections (36%), premature birth (28%) and suffocation (birth asphyxia; 23%) (The Partnership for Maternal, Newborn and Child Health, 2011). From 1990 to 2016, neonatal deaths in the UK have dropped from 3,616 (4.5 deaths for every 1,000 live births) to 2,136 (2.7 deaths for every 1,000 live births). For England specifically, there has been a fall from 3,052 neonatal deaths in 1990 (a rate of 4.6 for every 1,000 live births) to 1,855 in 2016 (a rate of 2.8 deaths for every 1,000 live births).

However, over the last decade, the rate of decline in neonatal mortality within the UK has slowed. Indeed, from 2013 to 2015 the neonatal mortality rate in the UK remained static at 2.7 neonatal deaths for every 1,000 live births, and rose slightly in 2016 to 2.8 neonatal deaths per 1,000 live births.

The latest year in which international data are available for all comparators is 2012. At that time, Sweden had the lowest neonatal mortality rate (with 1.7 deaths aged under 28 days for every 1,000 live births) and the US the highest (with 4.0 deaths for every 1,000 live births). Based on those figures, the UK had the fourth highest neonatal mortality rate among the comparator countries, with 2.9 deaths for every 1,000 live births). Figure 20 depicts the trends for these three countries, up to 2015.

Figure 20: Trends in neonatal mortality rates



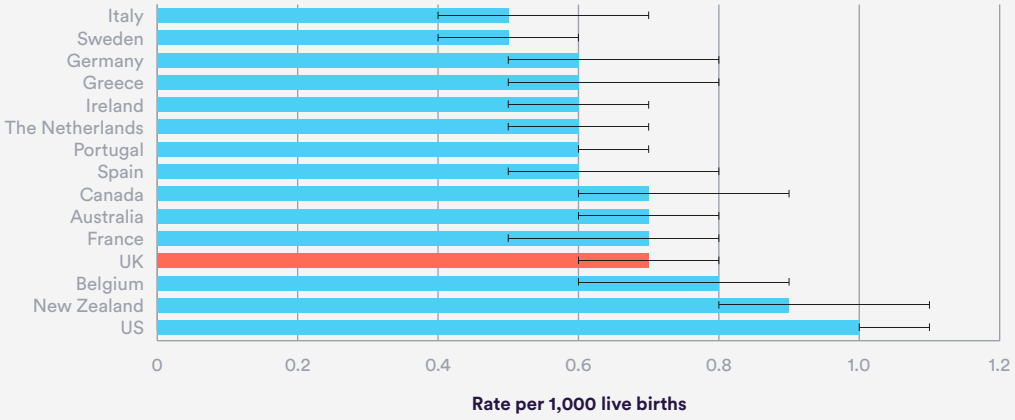
Sources: Sweden – WHO, European Health for All family of databases; US – Kochanek and others, 2016; UK – WHO, European Health for All family of databases, except 2013–2015 data which uses ONS, Vital Statistics: Population and Health Reference tables.
Note: Please note that neonatal mortality rates are a subset (and are included) within the infant mortality rate shown in the previous figure.

Measures to reduce poverty and mitigate the impact of poverty on the health of women before and during pregnancy will have a significant impact on the risk of stillbirth and death during infancy. Policy should be directed at improving the health of pregnant women (such as helping them to stop smoking or to promote healthy weight in women of childbearing age) as well as supporting health promotion and early intervention services such as health visiting and midwifery. Improving the mechanisms to collect data on maternal health and infant mortality across the UK is a necessary prerequisite to developing and monitoring any interventions.

Childhood mortality among children aged over 1 year and under 5 years

The Global Burden of Disease 2015 Study provides an analytical framework to comprehensively assess trends for under-5 mortality, age-specific and cause-specific mortality among children under 5 years, and stillbirths by geography over time (Institute for Health Metrics and Evaluation, 2017). The following analyses have been derived from this report. Figure 21 shows the death rate in 1 to 4-year-olds in each country in 2015. While it may appear that there is quite a large difference in the values between countries, the confidence intervals[2] (shown as black lines in the chart) largely overlap. This suggests that there is less significant variation than there might otherwise appear and that any difference might lie in the uncertainties of the estimates.

Figure 21: Child (aged 1 to 4) mortality rates per 1,000 live births, 2016



Source: Institute for Health Metrics and Evaluation, 2017.

When compared with similar countries, particularly those in the European Union, the UK has a relatively high child death rate among children aged 1 to 4 years. It is higher than Sweden, Ireland, Italy, the Netherlands and Portugal, but not significantly different to the rates in Germany, Greece, France, Belgium, Australia, Spain and Canada. Only New Zealand and the US have statistically higher child death rates than the UK.

2 All confidence intervals shown in charts in this report are at the 95% level.

In England and Wales, the most common cause of death in the 1 to 4-year-old age group is cancer. In 2015, 14.5% of all deaths aged 1 to 4 years had their underlying cause of death coded as neoplasms (tumours), followed by diseases of the nervous system (13.8%), diseases of the respiratory system (12.6%), external causes of morbidity and mortality (11.6%), and congenital malformations, deformations and chromosomal abnormalities (11.1%) (Office for National Statistics, 2015b).

Cancer

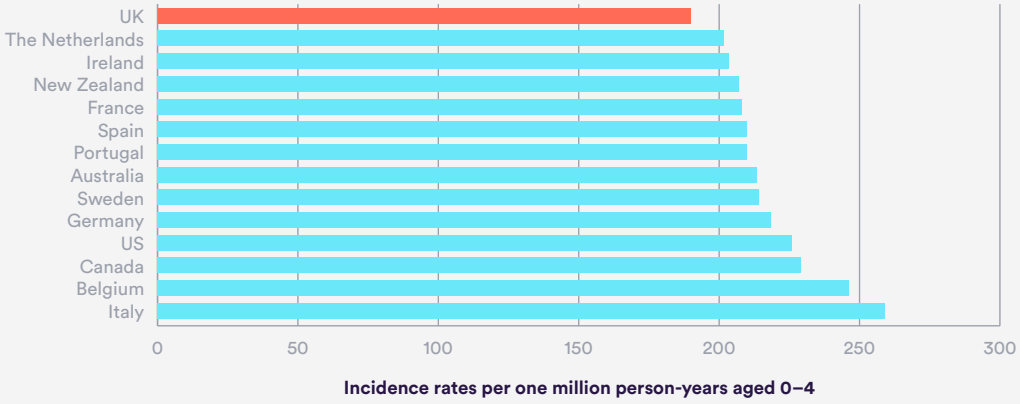
Incidence of cancer

In 2015, there were 699 registrations of newly diagnosed cases of cancer in children aged 0 to 4 years in England; a rate of 20.4 for every 100,000 children aged 0 to 4 years (Office for National Statistics, 2015e).

The third volume of the International Incidence of Childhood Cancer (IICC) project provides a compendium of international childhood cancer data based on a unique collaboration with more than 300 population-based cancer registries in 82 countries, departments and territories (International Agency for Research on Cancer, 2017). Diagnostic data are available on more than 770,000 children aged 0–19 years. Although all datasets from IICC are of high quality within the global region in which the data were collected, variations in cancer registration techniques and the wider socioeconomic context may have affected the reported incidence rates. The data summarised are presented per million person-years, to account for the different time periods of data submitted by the respective countries.

The rate at which cancer occurred (incidence) in 0 to 4-year-olds is shown in Figure 22. The data available come from 1990 onwards. The exact years available are indicated on the chart, as they differ from one country to another.

Figure 22: Incidence of cancer in 0 to 4-year-olds



Source: International Agency for Research on Cancer, 2017.

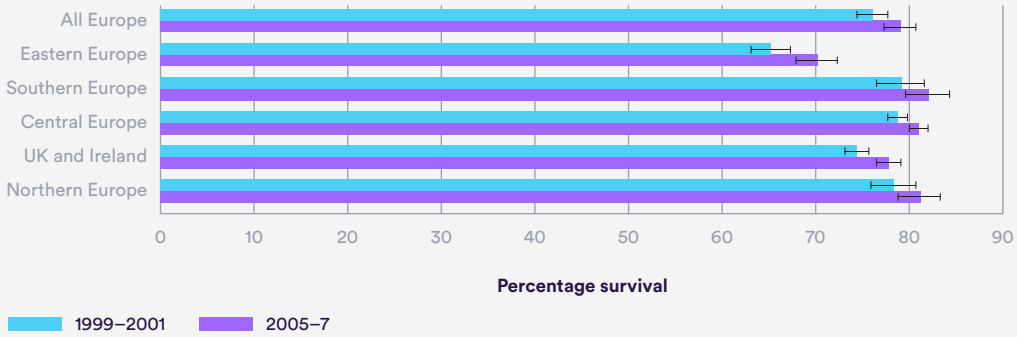
When comparing the UK to the 14 other countries for children aged 0 to 4 years, Italy had the highest incidence of cancer with 259.2 cases per million person-years. The UK had the lowest incidence rate of 189.8. This may be related to differences in reporting, but is also likely to be related to the differences in the multitude of genetic and environmental factors implicated in the development of cancers, many as yet unknown.

The most common type of cancer in this age group in England was leukaemia. Italy had the highest incidence of leukaemia (86.9 per million person-years) and Portugal the lowest (59.6 per million person-years). The UK had a rate of 71.0 cases per million person-years. England had a slightly lower rate of 70.2. By gender, the incidence rate was significantly higher for young boys (75.2) than for girls (65.0) in England, which is in keeping with most comparable countries (Table 29, technical annex).

Cancer survival rates

Survival after childhood cancers has shown a steady improvement over several decades, and is better than that for adults. The EUROCARE-5 survival study estimates survival of children diagnosed with cancer between 2000 and 2007 (Gatta and others, 2014). Data from this study are depicted in Figure 23 and compare estimated five-year survival for children aged 0 to 14 years in different parts of Europe in two time periods (1999 to 2001 and 2005 to 2007)

Figure 23: Five-year age-standardised survival from childhood cancers diagnosed in Europe from 1999 to 2007



Source: Gatta and others, 2014. Northern Europe – Denmark, Finland, Iceland, Norway and Sweden; Central Europe – Austria, Belgium, France, Germany, Switzerland and The Netherlands; Southern Europe – Croatia, Italy, Malta, Portugal, Slovenia and Spain; and Eastern Europe – Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia.

Combined five-year survival for all childhood cancers in Europe rose from 76.1% in 1999–2001 to 79.1% in 2005–2007. For the UK and Ireland, the survival percentage increased from 74.4% in 1999–2001 to 77.8% in 2005–2007. All areas show an increase in survival rates over time. Aside from Eastern Europe, which shows significantly lower survival rates when compared with other parts of Europe, most other areas have similar rates over the most recent time period (2005–2007).

For children diagnosed in 2000–2007, the combined survival rate for all cancers was 90.6% at one year, 81.0% at three years and 77.9% at five years (Gatta and others, 2014).

Children aged 1 to 4 years have a higher percentage of survival at five years after diagnosis compared with those aged 5 years and over. When looking at all ages of children, a slightly higher percentage of girls survive beyond five years compared with boys (78.3% for girls compared with 77.5% for boys) (Gatta and others, 2014).

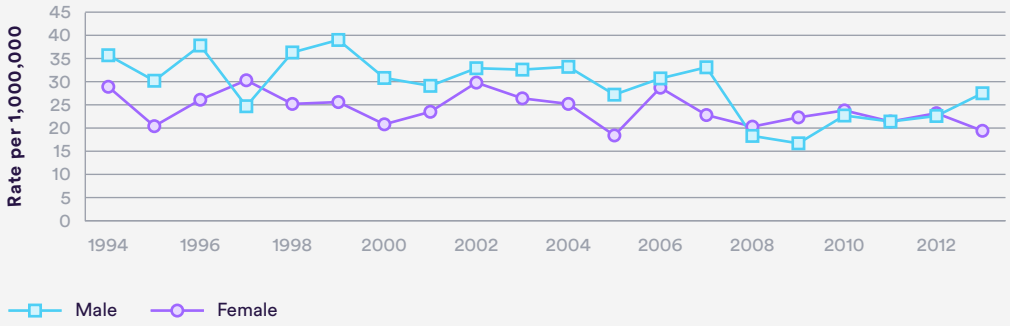
The improvement in childhood cancer survival is a cause for celebration and learning. Much of this has been driven by scientific research, as well as the systematic focus on the delivery of research into clinical care. However, international comparisons of overall cancer survival can mask differences

between the care of individual cancers, and UK performance on some of these varies significantly (Gatta and others, 2014). Future focus should include ongoing support for scientific research, and training for health care professionals to improve the recognition and time from first presentation with symptoms to diagnosis (Pritchard-Jones and others, 2016). The progress that has been made as a result of scientific research should continue to be supported, including promoting the widening of access to clinical trials.

Cancer mortality rates

Childhood cancer is rare and survival is relatively high. For this reason, population mortality rates are generally low. Rates have been steadily declining over time. Figure 24 shows the UK trend in cancer mortality rates over the last 20 years.

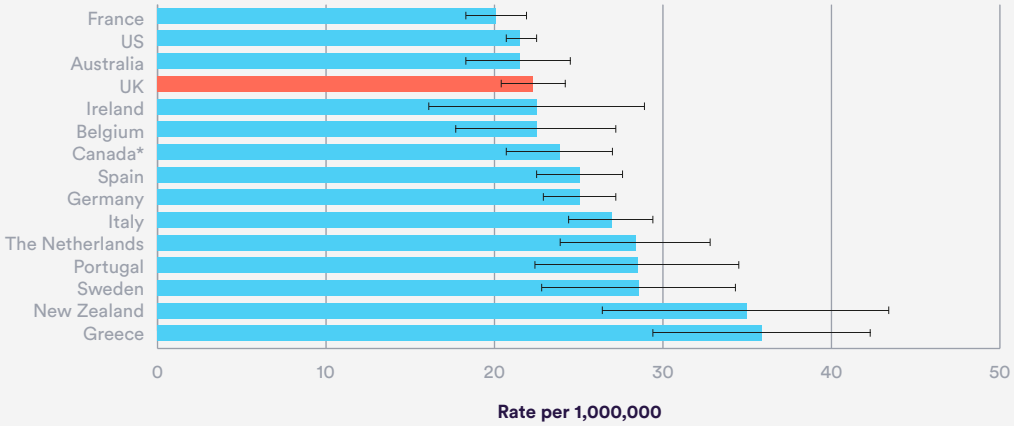
Figure 24: UK trends in cancer mortality for children aged 0 to 4 years



Source: WHO Department of Information, Evidence and Research, Cancer Mortality Database.

When compared with the other countries, for all cancers, the UK has a slightly better mortality rate than average (22.3 per million population) and is significantly better than New Zealand and Greece. The mortality rate for all cancers in children aged 0–4 years can be seen in Figure 25.

Figure 25: Mortality rate for all cancers in children aged 0 to 4 years for 2007 to 2012



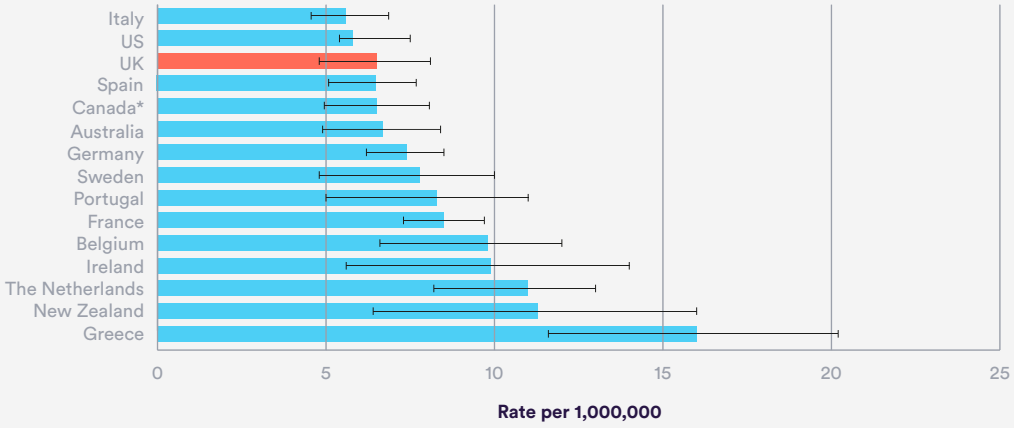
Source: WHO Department of Information, Evidence and Research, Cancer Mortality Database.

*Data for Canada relate to 2007–2011.

In the UK from 2007 to 2012, childhood mortality rates for children aged 0 to 4 years were 22.4 per million population for all cancers combined, 6.2 per million for leukaemia, and 6.5 per million for brain and central nervous system tumours. Brain and central nervous system tumours accounted for 29.1% of childhood cancer deaths and leukaemia accounted for 27.7% of childhood cancer deaths in 2007 to 2012.

The mortality rate for cancer of the brain and central nervous system for the UK is around average when compared with the other countries, with a mortality rate of 6.5 per million. Greece has the highest rate (16.0 per million) and Italy has the lowest rate (5.6 per million), and is significantly lower than The Netherlands and Greece. Figure 26 shows the mortality rates for each country.

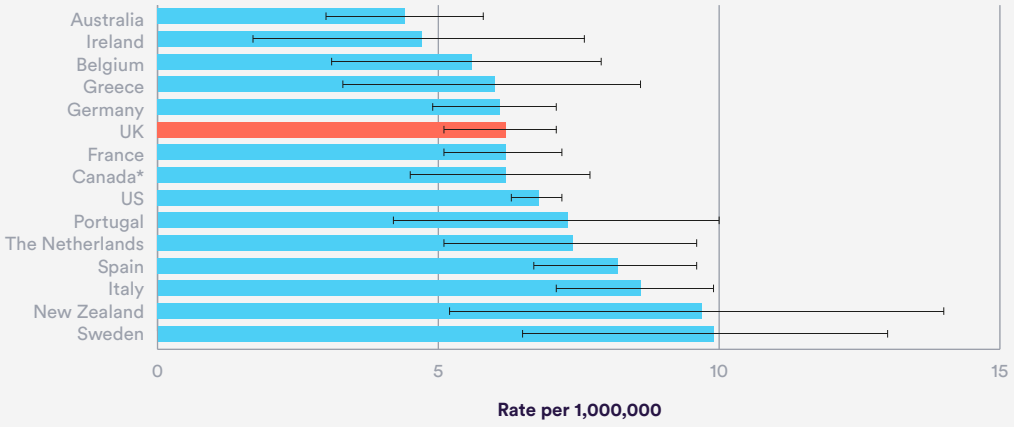
Figure 26: Mortality rate for cancer of the brain and central nervous system in children aged 0 to 4 years for 2007 to 2012



Source: WHO Department of Information, Evidence and Research, Cancer Mortality Database.
*Data for Canada relate to 2007–2011.

For leukaemia, the UK is slightly better than average when compared with the other countries, with a mortality rate of 6.2 per million. Sweden has the highest rate (9.9 per million) and Australia has the lowest rate (4.4 per million). However, it must be noted that there are wide confidence intervals due to the small number of deaths and these differences may not be significant. The mortality rate for leukaemia in children aged 0 to 4 years can be seen in Figure 27.

Figure 27: Mortality rate for leukaemia in children aged 0 to 4 years for 2007 to 2012



Source: WHO Department of Information, Evidence and Research, Cancer Mortality Database.
*Data for Canada relate to 2007–2011.

Congenital anomalies

Congenital malformations or anomalies are abnormalities that are recognised at, or are present since, birth. These include conditions which are genetic in origin, those caused by environmental factors in the antenatal period, and those in whom the underlying cause is unclear. They can contribute to long-term disability, and may have significant impacts on individuals, families, health care systems, and societies.

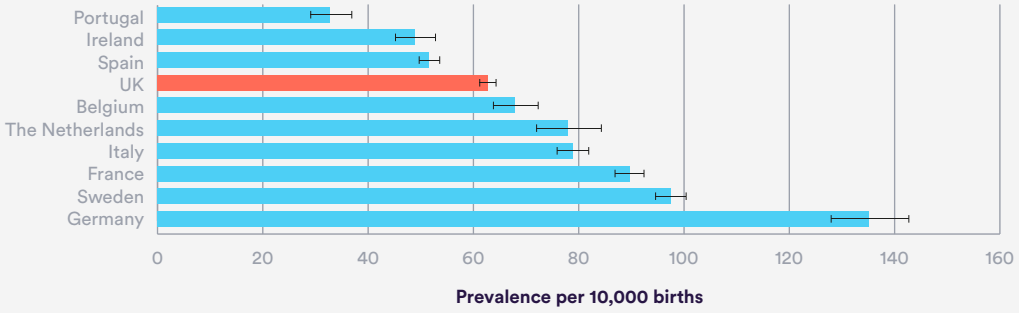
The new National Congenital Anomaly and Rare Disease Registration Service (NCARDRS) in Public Health England now covers the whole of England and records data on people with congenital abnormalities. The service is also expanding to collect information about people with other rare diseases, whether diagnosed at birth or later on in life. NCARDRS shares data with the European Surveillance of Congenital Anomalies (EUROCAT), which pools data across a wider geographical area, in order to make comparisons across Europe and share expertise (EUROCAT, prevalence tables 2011–2015). EUROCAT is a European network of population-based registries for the epidemiologic surveillance of congenital anomalies.

The most common severe congenital anomalies are heart defects, neural tube defects (defects related to the development of the central nervous system) and Down syndrome. Screening during pregnancy may detect some congenital anomalies, while some are only recognised at birth. Other conditions only become obvious as a baby grows older.

Differences between countries in these data may reflect not just the frequency with which these anomalies occur, but also the access and quality of antenatal diagnosis (including routine screening), as well as the societal and legal approach to terminations of pregnancy in each country. Thus higher apparent rates in some countries may reflect higher rates or detection and/or lower rates of terminations for anomalies.

Figure 28 shows the prevalence of congenital heart defects. It is based on data from 2011 to 2015, and shows how many babies had congenital heart defects for every 10,000 who were born.

Figure 28: Prevalence of congenital heart defects per 10,000 births, 2011 to 2015

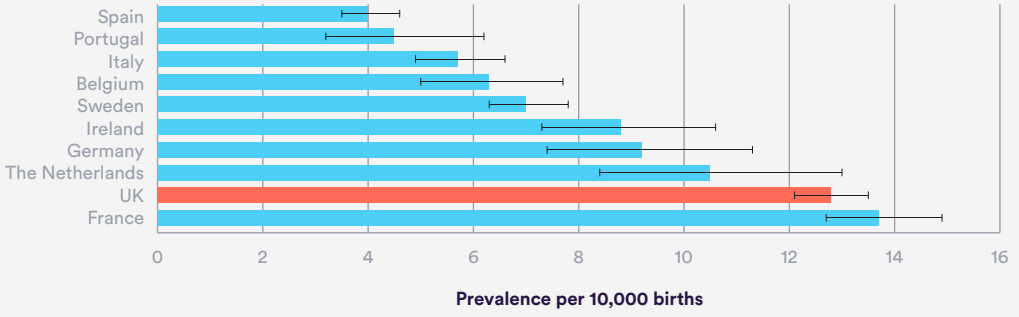


Source: EUROCAT, prevalence tables 2011–2015.

Based on data from full member registries from 2011 to 2015, the prevalence of congenital heart defects for EUROCAT countries is 76.5 for every 10,000 births. Of these, 87.6% were live births, 1.7% late foetal deaths or stillbirths, and 10.7% termination of pregnancy for foetal anomaly. Germany has the highest prevalence of congenital heart defects, with 135.2 for every 10,000 births, which is significantly higher than all the other comparable countries. The area with the lowest prevalence was Portugal with 32.8. The UK's prevalence was 62.7 per 10,000 births (Table 32, technical annex).

Similar information is available for the number of babies born with neural tube defects. Figure 29 shows how many babies had neural tube defects for every 10,000 who were born, based on data from 2011 to 2015.

Figure 29: Prevalence per 10,000 births of neural tube defects, 2011 to 2015

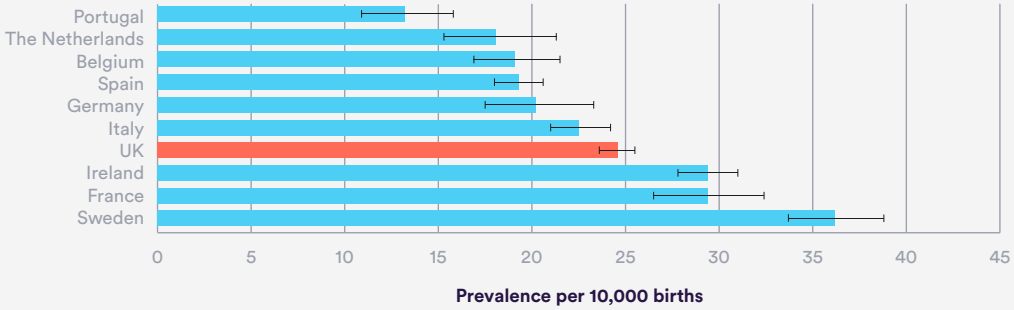


Source: EUROCAT, prevalence tables 2011–2015.

The prevalence of neural tube defects for EUROCAT countries from 2011–2015 is 10.3 per 10,000 births, of which a fifth are live births. The highest total prevalence of neural tube defects within the reference countries available is in France with 13.7 per 10,000 births, closely followed by the UK with 12.8. Supplementation with folic acid can prevent neural tube defects and ideally should start before conception and continue throughout early pregnancy. However, levels of supplementation in the European population remain low and prevalence of neural tube defects has not changed in Europe over the last few years. There is a clear need for policies which support the implementation of evidence-based preventive strategies (EUROCAT, 2014).

Figure 30 is also based on data from EUROCAT and shows how many babies were born with Down syndrome for every 10,000 born, based on data from 2011 to 2015.

Figure 30: Prevalence per 10,000 births of Down syndrome, 2011 to 2015



Source: EUROCAT, prevalence tables 2011–2015.

The prevalence of Down syndrome in EUROCAT from 2011 to 2015 is 23.9 per 10,000 births, of which 41.0% were live births, 2.3% late foetal deaths or stillbirths, and 56.7% termination of pregnancy for foetal anomaly. Sweden has a significantly higher prevalence, at 36.2 per 10,000 births for Down syndrome, but it should be born in mind that this is based on data for only two years (2011 and 2012), compared with the other countries for which five years' worth of data are available. The UK had a prevalence of 24.6 per 10,000 births. Variation in prevalence between countries may be due primarily to variation in maternal age at delivery.

The EUROCAT prenatal detection rates for all anomalies (excluding genetic conditions) for registries with complete data from 2011 to 2015 is 39.1%, of which approximately one fifth are chromosomal for reasons such as Down syndrome.

Injury and poisoning

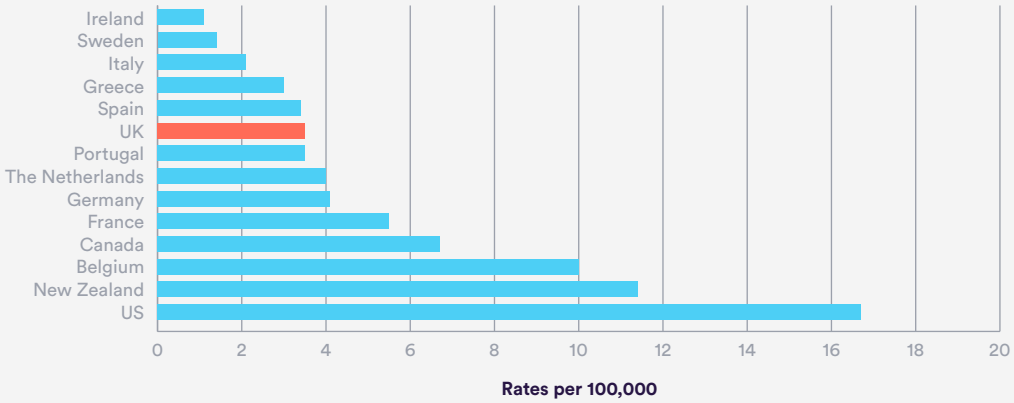
Unintentional injuries are a leading cause of death for children under 5 years, as well as a major cause of ill health and serious disability. The majority of these injuries are preventable. Reducing the number of young children who are injured not only has obvious benefits for children and their families, but will also reduce pressure on the NHS by reducing hospital attendances and admissions (Public Health England, 2014).

Between 2008 and 2015, 469 children aged under 5 years died in England from unintentional injuries (2.00 deaths per 100,000 children aged under 5 years), compared with 298 aged 5 to 14 years (0.69 per 100,000).

Unintentional injuries in and around the home are a leading preventable cause of death for children under 5 years and accounted for 8% of all deaths of all children in England aged 1 to 4 years between 2008 and 2015 (Public Health England, 2014).

Figure 31 shows how the UK compares with other similar countries for under-5 death rates due to external causes of injury and poisoning, for every 100,000 children of this age in the population in 2012. The UK falls in the middle range when compared with the other countries.

Figure 31: Under-5 death rates due to external causes of injury and poisoning per 100,000 population, 2012



Source: WHO European Health for All family of databases (indicator E110104.T); Statistics Canada, 2012; New Zealand Ministry of Health, 2012; Centers for Disease Control and Prevention, Fatal injury data.

Significant progress has been made in reducing mortality and serious morbidity from injuries in the UK over the past decades, in particular among adolescents and young people. Public health campaigns, ranging from home safety to road safety measures, have been credited with this improvement. Further collaboration with local health visiting services, education and charitable organisations should focus on the reduction of largely preventable injuries in the home for children of all ages, with particular emphasis on those most vulnerable groups such as those living in more deprived areas.

Injury prevention should combine technological and engineering innovations with education and health promotion approaches. This requires a multifaceted collaboration between public health, environmental planning and commercial partners, underpinned by a governmental and societal acceptance of the need for prevention. The differences in societal acceptance of injuries as a largely preventable rather than accidental phenomenon, and the extent to which government actively pursues policies and legislation to tackle these, may explain why this international variation persists (Sethi and others, 2008).

8 Discussion of findings

The scientific and economic case for investing in the health, education and wellbeing of young children, and indeed even from the time of conception, has been clear for some time (Allen, 2011). And in fact, the UK has made significant progress for its young children over the past decades. Death and disability from serious injuries or infections have continued to fall, and more and more children survive cancers which, until recently, would have been routinely fatal. But many of these eye-catching improvements relate to the progress of modern medicine and the march of science. To understand how well we are fulfilling our broader aims of promoting the health of young children in order to improve their life chances, we must compare against other countries which have similar levels of wealth, economic development, scientific progress and health care infrastructure.

International comparisons of child health are vital for monitoring and accountability. They show where the health and wider outcomes of children and families in England are similar to those in other countries. Where outcomes are better or improving, it is possible to consider how this might be sustained. Where outcomes are worse, this presents the opportunity to prioritise activity at a local and national level to achieve improvement. However, there are many challenges involved, reflected in the relatively limited number of indicators which it was possible to include in this report. There is a pressing need to develop international academic and government collaborations to define, collect and report standard measures in child health across international boundaries, to enable meaningful comparison of child health indicators at greater detail and wider scope than is currently possible.

Regardless, it is important to understand that other contextual factors will remain which will affect the ability to directly compare outcomes globally. Social and cultural factors, as well as differences in health care systems, mean that even well-defined indicators may be collected and interpreted differently. Kossarova and others (2015) have outlined a series of helpful tips when considering how to interpret international comparison data (Figure 32).

Figure 32: Handle with care – making the most of international comparative indicators

Be wary of individual observations that are extreme – experience suggests that this is often the result of data artefacts. Focus on patterns that look broadly similar.
Try to look at change over time – even if the baselines are different, there may be more value in looking at trends.
Look for similar patterns in related indicators – 'triangulation'. No single data item or indicator is perfect.
Consider the likely explanation for observed variances. Do they fit with your perceptions of how things work in different countries?
Remember that some of the indicators prompt as many questions as they provide answers. Understanding what really lies behind observed differences would require an in-depth analysis of additional data in the specific areas of care.

Source: Adapted from Kossarova and others, 2015.

This report has highlighted some of the contextual factors and the findings have been interpreted in light of these. In particular, the comparison countries chosen will influence findings. Here we chose a set of countries previously used for UK comparators. Our list excludes some high performing Scandinavian countries, while including the US as a comparator, despite its very large size in comparison to other countries, its extremes of inequality and its differently funded health system, and its infamously poor early years outcomes. One would expect therefore that the relative UK performance might be artificially elevated as a result. Sadly, it does not appear to have been enough to hide the UK's blushes.

While the UK has been improving in many areas relating to the health of children in early childhood, in very few fields is there a convincing argument that the UK is among the best performing of any comparable developed country. The findings are summarised in Figure 33, which outlines for these indicators how the UK has changed over time, and its relative performance against comparable countries. In fact, while the UK is doing relatively well in two measured social determinants (education and income poverty), it cannot claim to be top of the pack in any of the health outcomes measured here.

Figure 33: Summary of findings

Indicator	Trend over past decade	UK relative to others
Life expectancy	Stable	Worse
Children aged 0–4 years as proportion of population	Increasing	Larger
Low birth weight (born at <2500 grams)	Stable	Similar
Breastfeeding rates – exclusive breastfeeding up to 6 months	Stable	Worse
Obesity	Deteriorating	Worse
Vaccine uptake	Improving	Similar
Income poverty (OECD definition)	Stable	Better
Education to tertiary level	Improving	Better
Employment – children living in workless family	Improving	Worse
Stillbirth	Improving	Similar
Infant mortality	Improving	Worse
Neonatal mortality	Improving	Similar
Early childhood mortality (aged 1–4 years)	Improving	Worse
Childhood cancer 5-year age-standardised survival	Improving	Similar
Congenital heart disease incidence		Better
Neural tube defects incidence		Worse
Death due to unintentional injury	Improving	Similar

By and large, the perception that health outcomes for young children in this country have got better over recent decades holds true. There are a slew of indicators which show improvement over time, which is a cause for celebration. But this should be couched in the knowledge that there are many indicators where we lag behind other countries. Among these, there are some, such as breastfeeding rates, which stubbornly remain poor; and others where our pace of improvement has been relatively sluggish by comparison, and we have been overtaken by most others – such as for infant mortality.

For childhood obesity and breastfeeding rates, this report confirms what is widely acknowledged – that the UK is amongst the very worst performers in comparable countries. Breastfeeding rates continue to be shockingly low. Only 1% of all UK babies aged under 6 months are exclusive breastfed; the worst of all the comparator countries – with Portugal's 34% some way over the horizon. Even using the most forgiving indicator (proportion of babies receiving any breastmilk at 6–8 weeks of age in 2015/16), the figure does not get any higher than 43.15% in England, which is the best performing of the four UK countries. And this figure has decreased year on year since 2013/14 in England.

The prevalence of low birth weight babies, virtually unchanged for the past decade, and the UK's high incidence of neural tube defects (which are amenable to dietary intervention, in particular folic acid supplementation) suggest that much still needs to be done on antenatal maternal health promotion.

The benefits of early targeted investment in maternal and perinatal health to improve health and developmental outcomes for children, well into adulthood, are well recognised. This was clearly enough understood by policymakers to ensure the introduction of progressive policies such as the Healthy Start and the Healthy Child Programmes (Public Health England, 2016e) and the much vaunted increase in recruitment of health visitors through the Health Visitor Implementation Plan (Department of Health, 2011). However, these have been put at risk by the considerable pressures that public health budgets have come under in the last few years, potentially undermining or even reversing some of the progress previously made. The economic case for prevention and early intervention in maternal health is well rehearsed, but there is a serious risk that, for local authorities on diminishing budgets, these are seen as a luxury for times of feast rather than famine.

Data on deaths in children also warrant further exploration. While mortality in young children has been steadily decreasing over the past decades in the UK, it has done so at a slower rate than in many comparable countries, and has moved from its position as one of the leading countries to one that is now squarely ensconced in the lower echelons of the chasing pack (Viner and others, 2014). Indeed, for infant and neonatal mortality since 2012, that decade-long reduction has ground to a halt.

For some other indicators which have shown improvement over the past decade, this report's focus on recent trends and comparisons means that any celebration is quickly tempered by caution. Immunisation rates for MMR and combined diphtheria/tetanus/pertussis vaccines, which had shown such a robust year-on-year recovery from the 2007 nadir related to the discredited MMR-autism link, have started to fall once again over the past two years. Improvement in life expectancy, which had shown steady progress for several decades, has slowed dramatically since 2012, and has been essentially unchanged for the past two years.

The recent change in the UK's trajectory for this critical triumvirate of mortality, life expectancy and immunisation uptake is potentially concerning, and should serve to alert policymakers to the risks that reductions in public health investment pose, particularly for early years preventive services – both universal and targeted at families in need.

Key indicators of the determinants of health have also been included to emphasise the importance of wider social factors in the health of young children, and to highlight the need for ongoing policy focus on these wider determinants.

The UK has done well to promote higher education opportunities, an indicator which has both improved over time and compares favourably with other countries. However, the outlook for economic wellbeing among young children is less rosy. While the proportion of children living in workless families is declining, the UK fares poorly in comparison with other countries. Similarly, at first glance on a cross-sectional comparison the UK seems better than average in terms of child income poverty (as defined by the OECD). However, using the current government's own preferred poverty measure (60% threshold relative low income), since 2013/14 relative income poverty

for children has deteriorated to levels not seen since 2009/10 (Department for Work and Pensions, 2017b). This decline, combined with the knowledge that poverty profoundly influences outcomes across a wide range of health indicators, means that tackling poverty and inequality, and improving social mobility for young children and their families, must remain the highest priority (Royal College of Paediatrics and Child Health, 2017; Kossarova and others, 2017).

The UK has a relatively high proportion of young children aged 0 to 4 years. This should strengthen the case for policymakers to design and implement child-friendly policy across all areas, be that health, social, economic or judicial.

All the UK nations would do well to follow the example of Scotland's 'Getting it right for every child' framework, an overarching child health strategy which unifies and coordinates policies, services and programmes for children and young people.

This report may lend some weight to the suggestion that the UK should follow the example of other high-performing countries such as Sweden, by moving from a voluntary system to one that mandates the assessment of impact of any legislation on children's rights before its passage. Scotland and particularly Wales have made significant progress in this regard, but there is a pressing need for action in England and Northern Ireland, neither of which has delivered a full Child Right Impact Assessment for any piece of legislation thus far (Payne, 2017).

9 Conclusion

International comparisons provide an opportunity to identify and learn from high-performing countries. Country-level comparisons should be interpreted with caution, since there are significant societal, population and economic differences which may be impacting individual health outcome indicators far in excess of specific health or policy interventions. However, they can highlight broad areas of policy or specific innovations which are associated with excellence in outcomes, and from which we can learn valuable lessons. This approach should be fundamental to our ambition to improve the lifelong trajectory for children in the critical early years of life.

The health of children, particularly very young children, strikes a universally emotive chord. International comparison, too, can be a popular and powerful heuristic, and the findings in this report suggest that, despite some impressive progress over the past decades, the UK remains a long way short of its stated ambition to be an international leader in fostering a healthy start for children.

Publication and analysis of between-country comparisons such as this should be seen primarily as an opportunity to learn from other countries about how policymakers can best deliver on this, albeit within the context of the caveats about over-simplification and over-interpretation. But, provided they are carefully and sensitively interpreted, international comparisons can – and should – be a powerful tool to provide ongoing scrutiny of the government's pledge to prioritise early years investment, and to hold their commitment to account.

Glossary

Complications in pregnancy can result in poor placental growth, which may result in poor foetal growth throughout pregnancy (intrauterine growth restriction; IUGR). Women who have pre-existing chronic conditions such as diabetes, heart defects or kidney disease are also at higher risk of giving birth to preterm babies, and having babies born with low birth weight at term (Larroque and others, 2001).

Congenital anomalies can be defined as structural or functional abnormalities, including metabolic disorders, which are present from birth (EURO-PERISTAT, 2010).

Diphtheria is a potentially acute disease caused by exotoxin-producing Corynebacterium diphtheriae. Morbidity and mortality result from the bacterial toxin that may cause obstructive pseudo-membranes in the upper respiratory tract or damage to the heart and other tissues.

Down syndrome is a genetic condition that typically causes some level of learning disability and certain physical characteristics. It is usually caused by an extra chromosome in a baby's cells. The likelihood of having a child with Down syndrome increases with the age of the mother (NHS Choices, Down's syndrome).

Gestational age is the term used during pregnancy to describe how far along the pregnancy is. It is measured in weeks, from the first day of the woman's last menstrual cycle to the current date. A normal pregnancy can range from 38 to 42 weeks. Infants born before 37 weeks are considered premature.

Haemophilus influenzae type b (HiB) is a cause of death and serious disease, including meningitis and pneumonia, in infants and young children which can be prevented by vaccination.

Infants are children aged under 1 year.

Intrapartum is the time period occurring during childbirth or during delivery.

Mother's age is calculated at the point that the woman gives birth. Teenage mothers (especially those younger than 15) have a much higher risk of having a baby with a low birth weight (Watkins and others, 2016).

Neoplasm is an abnormal growth of tissue in the body, sometimes described as a tumour. Neoplasms may be benign (not cancer) or malignant (cancer).

Neural tube defects are those which relate to the development of the central nervous system and affect the brain, spine or spinal cord in the early period of pregnancy. The neural tube is the structure that eventually develops into the baby's brain and spinal cord. One of the most common conditions is spina bifida when part of the neural tube does not develop or close properly, leading to defects in the spinal cord and bones of the spine (vertebrae). A lack of folic acid before and in the early stages of pregnancy is a significant risk factor for such conditions (NHS Choices, Spina bifida).

Nutrition in pregnancy, when it is poor, is strongly associated with low birth weight babies. This disproportionately affects mothers of lower socioeconomic status, who as well as being at highest risk of poorer nutrition during pregnancy, are also more likely to have inadequate prenatal care and suffer complications during pregnancy, all of which are factors that can contribute to low birth weight (Larroque and others, 2001).

Pertussis is commonly known as whooping cough. It is a highly contagious disease of the respiratory tract caused by Bordetella pertussis, a bacterium that lives in the mouth, nose and throat. Many children who contract pertussis have coughing spells that last four to eight weeks. The disease is most dangerous in infants and spreads easily from person to person, mainly through droplets produced by coughing or sneezing. The first symptoms generally appear 7–10 days after infection, and include mild fever, runny nose and cough, which in typical cases gradually develops into a paroxysmal cough followed by whooping (hence the common name of whooping cough).

Preterm births are when babies are born earlier than 37 weeks of pregnancy. Babies born at this stage have an increased risk of problems, particularly with breathing, feeding and infection. Twins and other multiple birth babies are at increased risk of low birth weight because they often are premature. Preterm birth itself is associated with many of the other factors for low birth weight.

Smoking in pregnancy risks harmful chemicals (tar, nicotine and carbon monoxide) passing from the mother to the foetus. This can reduce the baby's oxygen supply, slowing its growth and development. It has been identified as a major risk factor contributing to low birth weight. Babies born to women who smoke weigh, on average, 200g less than babies born to non-smokers, and the effect on low birth weight is directly related to how heavily a woman smokes (Larroque and others, 2001).

Substance misuse in pregnancy can lead to serious health complications for both the mother and baby. Alcohol misuse can have a wide range of differing impacts for both mother and child. For children these include a range of lifelong conditions, grouped under the umbrella term of Foetal Alcohol Spectrum Disorders (FASD). The amount of alcohol taken during pregnancy, and the developmental stage of the foetus at the time, are directly related to the nature and severity of FASD symptoms the baby will develop (Patra and others, 2011).

Tetanus is an acute infectious disease caused by toxigenic strains of the bacterium Clostridium tetani (C. tetani). The spores of C. tetani are present in the environment irrespective of geographical location; they enter the body through contaminated skin wounds or tissue injuries, including puncture wounds.

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