



# Prioritising early childhood to promote the nation's health, wellbeing and prosperity

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Contributions by the Steering Group were made purely in an advisory capacity. The members of the Steering Group participated in an individual capacity and not as representatives of their organisations. Steering Group members are detailed below. A biography and summary of the Steering Group members' interests, as well as further details about the development of this report, can be found on our website at the following address: [www.acmedsci.ac.uk/child-health/report-preparation](http://www.acmedsci.ac.uk/child-health/report-preparation).

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## **Contents**

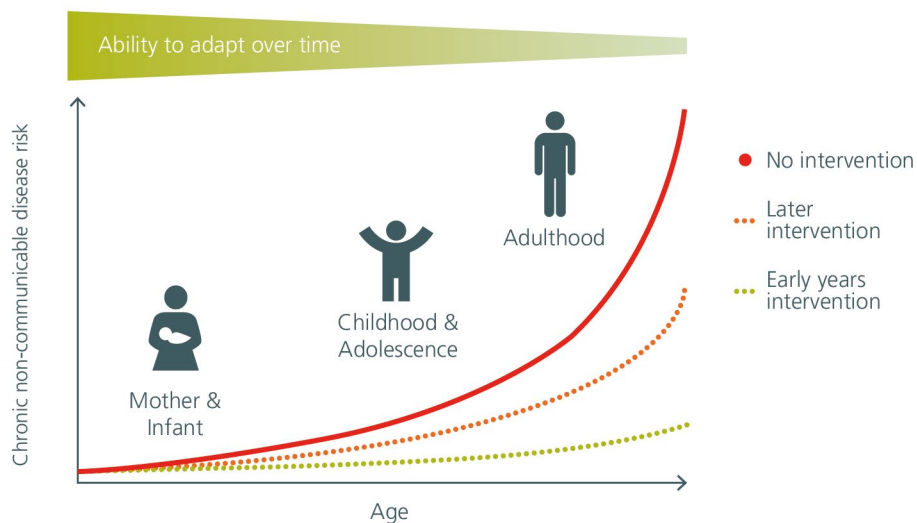
Executive summary.....	4
Background.....	10
Why prioritise the early years?.....	14
Opportunities to intervene in the early years.....	18
Priorities to address.....	32
Conclusion .....	40

# Executive summary

**To transform the health and prosperity of the nation we recommend that current and future Governments prioritise improving health and wellbeing and reducing inequalities in early childhood.**

The health of the UK population is deteriorating, with inequalities between the health of the most and least deprived widening, leading to detrimental impacts on both the economy and society.<sup>1,2,3,4</sup> Health in the early years (which we define in this report as encompassing preconception, through pregnancy, to the first five years of childhood) forms the basis for mental and physical health and wellbeing through the rest of the life course with consequent benefits to population health, national productivity, innovation and the prosperity of the nation.<sup>5,6</sup> However, the importance of the early years to health and wellbeing through childhood into adult life, and to our nation's economic prosperity, is not always recognised in policy development across Government. While there is a clear and urgent need to improve the current health of the UK population, our ambition is to also transform future population health through innovative changes to the circumstances in the early years to improve the health and wellbeing of children now and as they progress to adulthood. The scientific evidence from studies examining the development of health and disease shows that the impact of various factors during the early years is profound and long-lasting, since this is a major period of brain and organ development.<sup>5,7</sup> The early years provide a crucial window of opportunity to improve children's health in the short and long term, providing cumulative benefits, and avoiding the greater challenge and expense of intervening later in life (see figure below).

**A visual representation based on the theory of the developmental origins of health and disease indicating that interventions in childhood are likely to be more effective at reducing the risk of developing a chronic disease across the life course compared with interventions in adulthood.**<sup>8,9</sup>



The messages of our report are urgent, because, despite its importance, health in the early years is under serious threat. The infant survival rate in the UK has stalled in recent years,<sup>10</sup> and is worse than in 60% of other Organization for Economic Cooperation and Development (OECD) nations.<sup>11</sup> Other metrics of child health and wellbeing point in a similar direction. The prevalence of obesity is increasing,<sup>12</sup> demands on all childhood mental health services are growing,<sup>13</sup> breastfeeding rates are amongst the lowest of comparable high-income countries, ranking 15th out of 19 countries,<sup>14</sup> the majority of childhood vaccination rates have fallen below the World Health Organization (WHO) recommended levels,<sup>15-18</sup> and dental extractions due to preventable tooth decay remain a top reason for hospital admission of children.<sup>19</sup> The decline in child health and wellbeing is being further compounded by recent crises related to climate change, global conflicts, increases in the cost of living, and the COVID-19 pandemic. Those living in the most disadvantaged circumstances are impacted most strongly, widening health inequalities which persist throughout life and are often transmitted to subsequent generations.<sup>20-22</sup> Child health and wellbeing are the result of overlapping influences (known as the wider determinants of health), such as poverty, family and carer health, and the physical environment including air quality, food and housing. A suite of interventions is therefore needed across the system, including health, education, nutrition, income, housing and the environment.

In this report, we set out the rationale and scientific basis for a strong, sustained policy focus on improving health in the early years. We focus on the evidence of the value of intervening during the period from preconception up to the age of 5, highlighting areas where the evidence points to effective and impactful interventions, and setting out priorities to address in order to transform the health of our population.

**We recommend that UK Government departments prioritise improving health and wellbeing and reducing inequalities in the first 5 years of life in order to enhance the health and economic prosperity of the UK now and in the future, by urgently addressing the following priorities:**

### Priority 1: Implement effective interventions and policies to improve child health and wellbeing and promote research to identify further approaches



There is substantial evidence identifying where interventions need to be made to improve child health and wellbeing, such as reducing child poverty, supporting emotional and cognitive development, tackling obesity, improving vaccinations and immunity, supporting breastfeeding, enhancing air quality and respiratory health, and promoting oral health, among others. Evaluated interventions in some of these areas already exist. **We recommend that in all UK nations, Government, the NHS and local authorities, work together to implement proven interventions and policies to improve child health and wellbeing at scale and to a high quality.**

We consistently heard through our evidence gathering that funding for research into child health exists but is limited in the early years. For example, the Royal College of Paediatrics and Child Health (RCPCH) informed us that their analysis of UK health research figures estimated that just 5% of the UK's health research spend focuses on the health of children and young people. **We recommend that, in all UK nations, the Government, NHS, local authorities and research funders work together to support further collation of evidenced, cost-effective interventions and policies, and evaluate new interventions and policies. We also recommend further investment in research into improving health in the early years. In particular, ongoing research is necessary to understand causal pathways leading from exposures in early development to later health risks and to identify effective interventions and policies, including for emerging threats to child health.** This would also inform existing areas of research interest (ARIs) related to child health across Government departments.<sup>23</sup>

## Priority 2: Establish a unifying vision across Government for the early years to overcome policy silos



Despite the opportunities to intervene across multiple areas, child policy in the UK is developed and implemented in silos. Enhanced working across departments would help to coordinate the policies, programmes and resources needed to improve child health and wellbeing. Ongoing commitments from consecutive Governments in all UK nations are needed to make child health a priority and improve outcomes for children. **In all UK nations, we recommend the development of a unifying vision across Government that prioritises early years health and wellbeing. This vision should promote the use of evidence related to child health in all policies and coordinate resources across departments. For example, in England, the Office for Health Improvement and Disparities (OHID), supported by the Cabinet Office and working with the Chief Medical Officer (CMO), as well as the networks of Chief Scientific Advisors and Permanent Secretaries across Government, should initiate this joined-up approach to improving child health.**

## Priority 3: Address the decline in the child and family health workforce and fragmentation across sectors to deliver effective services for children



The NHS, local authorities and community care all have a significant role to play in supporting families. However, the system is fragmented and overwhelmed, and not structured in a way that provides parents and carers with easy access to early childhood services.<sup>24</sup> Services need to be appropriately resourced, delivered at scale and to a high quality, and joined up to provide safe and effective care. **We recommend that in all UK nations, Government, the NHS and local authorities work together to address the decline in the child and family health workforce.** There is a critical opportunity in the development of Integrated Care Systems (ICSs) to overcome fragmentation of services for the early years by coordinating across the NHS, community care and local authorities.

#### Priority 4: Collect, improve access to and link a broader range of data to facilitate research into interventions and policies that improve child health and wellbeing and their effective implementation



Continuous development, implementation, monitoring and evaluation of proven and potential interventions and policies are required to improve child health and wellbeing. To do this, better collection of and access to a broader range of quantitative and qualitative data on the wider determinants of health and wellbeing across the life course (e.g. education, social care income, criminal justice and the environment) is necessary.

**We call upon departments of health and public health bodies in all UK nations to review the existing mechanisms for collecting, accessing and linking data on the wider determinants of child health and wellbeing. Governments in all UK nations should ensure that interventions and policies are formally evaluated in accordance with the Government's Magenta Book to ensure they are impactful and cost effective.**<sup>25</sup>

#### Priority 5: Ensure diverse child, parent and carer perspectives are represented in the development and implementation of new policies and interventions to facilitate their uptake and improve the likelihood of their success



Involving children, parents and carers in developing child health policies and interventions is vital to ensuring their success. **We recommend that diverse voices and perspectives of children, through or in addition to their parents and carers, should be included in the development of policies and interventions to ensure they address their needs and that implementation is effective. This could enhance success by raising awareness and increasing uptake.**

Not only does each child have a right to a safe and healthy childhood, but their health and wellbeing is also the foundation for their health in adult life. Action taken now to improve health in the early years offers a powerful opportunity to benefit the nation, and secure a more prosperous economic future.

## Child health issues in numbers



**30th**  
out of 49  
OECD countries

The UK ranks 30th out of 49 OECD countries for infant mortality.<sup>11</sup>



**Rise** in infant  
mortality

Between 2014 and 2017, there was a sustained **rise in infant mortality in England**, with this rise disproportionately affecting the poorest areas of the country, widening inequalities in infant mortality.<sup>26</sup>



**1 in 5**  
children falling  
short of early  
learning goals

Around **one in five children** (21%) aged 2–2.5 years were found to have **fallen short of their expected level of development** in 2022/23.<sup>27,28</sup>



**1/5**  
of children aged  
5 are overweight  
or obese

Over a fifth of children aged 5 are **overweight or obese**. Children living in the most deprived areas are twice as likely to be obese than those in the least deprived areas.<sup>29</sup>



**Childhood  
vaccination  
targets not met**

Data from 2021–2022 show that across the UK, the majority of routine vaccination programmes **do not meet the 95% coverage target** set by the WHO,<sup>15–18</sup> and this has led to preventable infectious diseases and death.



**1/4**  
of all 5 year olds  
affected by  
tooth decay

In 2019, **tooth decay, a preventable condition, affected nearly a quarter of all 5 year olds in England**. It is the most common reason that children aged between 6 and 10 years old are admitted to hospital.<sup>30,31</sup>



**Air pollution  
linked to  
asthma**

In Bradford, it was found that **air pollution is linked to 33% of childhood asthma cases**,<sup>32</sup> whilst in London, 7% of all childhood hospital admissions for asthma between 2017 and 2019 were attributable to air pollution.<sup>33</sup>



**1 in 5**  
experience mental  
health problems  
around pregnancy

Around **1 in 5 women will experience mental health problems during or after pregnancy**, 70% will hide or underplay the severity of their illness, and suicide is the leading cause of direct maternal death within a year of having a baby.<sup>34</sup> **Poor maternal mental health has been linked with poorer cognitive and emotional development in their children.**<sup>35,36</sup>



**Behavioural  
problems risk  
6x higher with  
persistent  
adversity**

Children who are **exposed to persistent poor parental mental health and poverty are at six times more risk of experiencing socio-emotional behavioural problems compared to their peers.**<sup>37</sup>



**Limited** mental health  
referrals for aged 2  
& under

Services for infants and their parents are limited. Prior to recent NHS reforms and the scale up of ICSs, children and young people's mental health services **in 42% of Clinical Commissioning Group areas in England would not accept referrals for children aged 2 and under, despite the services nominally covering ages 0–18.**<sup>38</sup>



**£16.13 billion**  
the cost to society of not  
addressing issues early

Data from the Royal Foundation and the London School of Economics reveal that **the cost to society of addressing the issues that might have been avoided through action in early childhood has been estimated to be £16.13 billion each year (estimates from 2018/19).**<sup>39</sup> The figure of £16.13 billion is likely to be an underestimate, as it neither includes the later costs of failing to provide the right support early on, nor the losses to the productivity and earnings of individuals over their lifetime.<sup>39</sup>



## Child health opportunities in numbers



### **13% return** on investment from early years programmes

Evidence from the United States (US) shows that **quality birth-to-five programmes can provide a 13% return on investment for every year of a person's life.**<sup>40</sup>



### **2,860** fewer hospitalisations at age 5

Increased access to services through exposure to an additional Sure Start centre per thousand children at ages 0–4 is estimated to avert around 7% of hospital admissions at age 5, 8% by age 11, and 8.5% by age 15. Each year this represents **2,860 fewer hospitalisations at age 5, and over 13,150 prevented hospitalisations of 11–15 year olds.**<sup>41</sup>



### **60% less tooth** decay with water fluoridation

In areas of high deprivation, water fluoridation is calculated to offer a return on investment of £35 for every £1 spent.<sup>42</sup> According to the Government's 2022 report, **5 year olds in areas of England with higher water fluoride concentrations are around 60% less likely to have dental caries and be admitted to hospital to have teeth removed due to decay than those in areas with low fluoride concentration.**<sup>43</sup>



### **3/4** parents better supported by mental health services

Funds provided to support charities in Scotland to deliver mental health services from the Scottish Government's Perinatal and Infant Mental Health Fund have resulted in **77% of people feeling better able to meet the needs of their infants and children, and 75% of parents showing improvement in supporting infants at higher risk of mental health problems.**<sup>44</sup>



### **388,000** fewer days with asthma symptoms

Meeting climate change targets by achieving the WHO interim target on air pollution for fine particulate matter could lead to children across the UK suffering **388,000 fewer days with asthma symptoms.** Total health and economic benefits across children and adults of reducing air pollution in the UK are valued at £383 billion between 2018 and 2134, with 11.5 million life years gained across the UK population in this time.<sup>45</sup>



### **20 million** measles cases averted

Since a measles vaccine was introduced in the UK in 1968, it is estimated that **20 million measles cases and 4,500 deaths have been averted.**<sup>46</sup> Effective interventions exist to increase vaccination rates and reduce avoidable disease and deaths.



### Pre-term birth **reduced by 24%** with continuity of midwife care

Premature babies are more likely to have problems that affect their vision, hearing, movement, learning and behaviour.<sup>47</sup> Continuity of midwife care, however, can **reduce the likelihood of pre-term birth by 24%.**<sup>48</sup>



### **20%** neural tube defects prevented

The UK does not fortify its flour with folic acid. Current plans propose fortification to levels which would **prevent around 20% of the current UK total cases of neural tube defects.**<sup>49</sup>

# Background

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**The health of the UK population is deteriorating. Between 1960 and 2020, the UK rank among Organization for Economic Cooperation and Development (OECD) countries for life expectancy at birth fell from 7th to 23rd.<sup>2</sup>**

In addition, inequalities in life expectancy have increased in recent years. In the most deprived areas, male life expectancy is 9.7 years lower than in the least deprived areas, with female life expectancy 7.9 years lower. Furthermore, healthy life expectancy (the number of years spent in 'very good' or 'good' health) for women decreased across all UK nations between 2017 and 2019 relative to 2014–2016, with healthy life expectancy for men following the same pattern except in Northern Ireland.<sup>3</sup> From 2017–2019 to 2018–2020, Scotland saw an additional significant decrease of 1.4 years in male healthy life expectancy at birth, with other UK nations showing no significant change in either direction.<sup>50</sup> Inequality in healthy life expectancy between the most and least deprived areas is 19.3 years for females and 18.6 years for males.<sup>51</sup> Analysis by the Health Foundation has found that poor health is increasingly driving a rise in economic inactivity, with inactivity due to ill health rising since before the COVID-19 pandemic.<sup>4</sup>

Health in the early years, which we define in this report as encompassing preconception, through pregnancy, to the first five years of childhood, presents a key opportunity to address this decline in population health. Exposures and experiences in the early years have an important influence on the trajectory of mental and physical health across the whole life course (see Figure 1 and section on why prioritise the early years),<sup>52–55</sup> presenting opportunities for short- and long-term benefits and policy impact. However, in recent years, progress on infant mortality has stalled.<sup>10</sup> Between 2014 and 2017, there was a sustained rise in infant mortality in England, with about a third of the increase suggested to be attributable to rising child poverty.<sup>26</sup> The latest data show that infant mortality in the UK, a key indicator of a nation's health, is worse than in around 60% of other OECD nations,<sup>11</sup> and 2021 saw the first rise in perinatal mortality across the UK following 7 years of year-on-year reduction.<sup>56</sup> Other metrics of child health and wellbeing point in a similar direction: the prevalence of obesity is increasing,<sup>12</sup> demands on all childhood mental health services are growing,<sup>13</sup> breastfeeding rates are amongst the lowest of comparable high-income countries, ranking 15th out of 19 countries,<sup>14</sup> the majority of childhood vaccination rates have fallen below the World Health Organization (WHO) recommended levels,<sup>15–18</sup> and dental extractions due to preventable tooth decay remain a top reason for hospital admission of children.<sup>19</sup>

The effects of these downward trajectories are felt most strongly in areas of greater socioeconomic deprivation. The impact of the wider determinants of health means that in these areas, higher rates of poverty (see Box 1),<sup>57</sup> poorer-quality housing,<sup>58</sup> more limited access to green space,<sup>59,60</sup> and increased exposure to air pollution<sup>61,62</sup> underpin substantially poorer health in the early years, and are a driving force of health inequalities.<sup>1</sup> The wider determinants of health also intersect with other factors such as ethnicity and geography to further drive inequalities.<sup>57</sup> The English Health Inequalities Strategy, which included increased investment in healthcare, the early years, education and neighbourhood renewal, was associated with a reduction in geographical inequalities in both life expectancy and infant mortality.<sup>63,64</sup>

## Box 1: Poverty underpins adverse health outcomes

Poverty adversely affects health outcomes from the beginning of life. The adverse impacts of poverty in early years health are felt in adulthood, and ultimately lead to declining national health, wellbeing and prosperity.<sup>1,21</sup> The total societal cost of child poverty in 2023 is estimated to be £39 billion,<sup>65</sup> with the number of children living in extreme poverty having tripled between 2019 and 2022.<sup>66</sup> Greater exposure of those living in poverty to health-damaging environments are driving stark differences in health and life outcomes:<sup>21</sup>

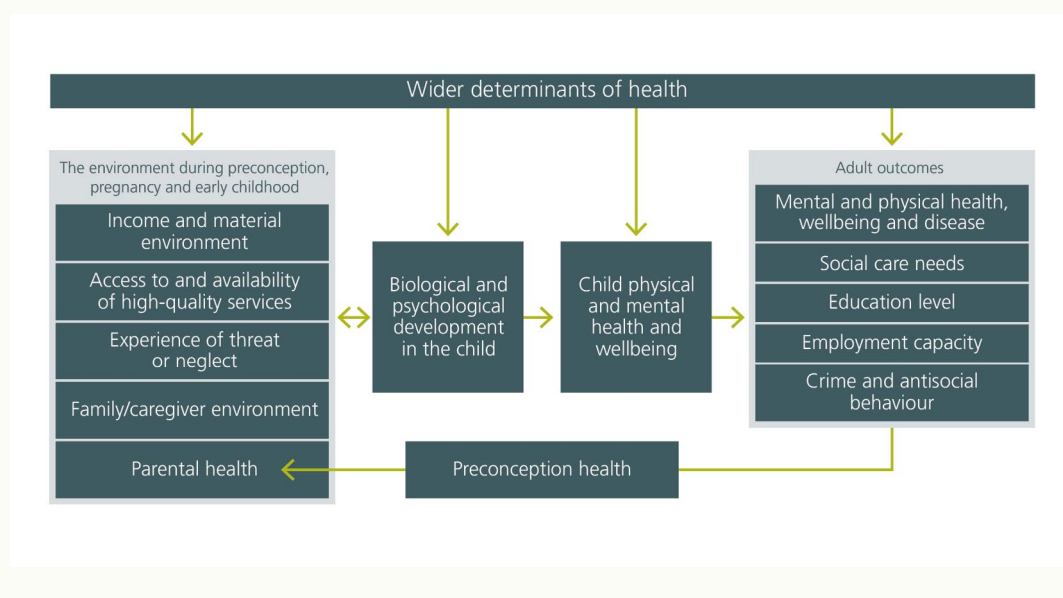
- For each increase in deprivation level, relative infant mortality risk increases by 10%.<sup>67</sup>
- Children born into the poorest fifth of families in the UK are 12 times more likely to experience a series of poor health and educational outcomes by the age of 17, compared with more affluent peers.<sup>68</sup>
- Early years material deprivation puts children at a higher risk of premature mortality.<sup>69</sup>
- Deprivation maps to school readiness, with the percentage of children achieving a good level of development by the end of reception decreasing in line with increased deprivation.<sup>70</sup>
- Children who live in the most deprived areas are twice as likely to be obese than those in the least deprived areas.<sup>29</sup>
- Lower household income is significantly associated with low uptake of the measles, mumps and rubella vaccine.<sup>71</sup>
- Communities with higher levels of socioeconomic deprivation are more likely to be exposed to higher levels of air pollution, and associated poor health outcomes.<sup>72,73</sup>
- The prevalence of dental caries in 5 year olds is 2.5 times higher in the most deprived areas compared with the least deprived.<sup>30</sup>

Recent global and national events, including the climate crisis, international conflict, the COVID-19 pandemic and the related cost of living crisis, alongside cuts to funding across the public health and research landscape, are driving a further decline in children's health and a widening of existing inequalities.<sup>74-77</sup> For example, during the pandemic, children in the north of England were exposed to increased rates of parental depression and stress compared with before the pandemic, and lost more learning than the countrywide average.<sup>21</sup> The loss of learning experienced is estimated to cost £24.6 billion in lifetime lost wages, and a further £13.2 billion as a result of the mental health conditions developed by children during the pandemic.<sup>21</sup>

Without enhanced focus on the new generation, there is a risk that health and productivity across the country will continue to decline, resulting in an accumulation of further challenges for the future. In this report, we set out the rationale and scientific basis for a strong, sustained policy focus on improving health in the early years, highlighting areas where the evidence points to effective and impactful interventions, to transform the future of our population. **Not only does each child have a right to a safe and healthy childhood, but their health and wellbeing is also the foundation for their health in adult life. Action taken now to improve health in the early years offers a powerful opportunity to benefit the nation, and secure a more prosperous economic future.**

## Figure 1: The environment experienced during a child's early years has an impact on their biological and psychological development, in turn affecting their physical and mental health and wellbeing.

This lays down the foundations for health, wellbeing and other outcomes in adult life, which underpins the economic productivity of the nation.<sup>78</sup> Adult outcomes also contribute to the health of parents in the preconception period, which is crucial for the health of the next generation. This sets up a cycle of transmission across generations, which can be influenced through childhood health and wellbeing. Figure adapted from papers by Pickett *et al.*<sup>21</sup> and Nelson *et al.*<sup>5</sup> For a more detailed overview of the links between preconception health exposures and child and adult health, see figure 4 in Stephenson, J. *et al.* (2019).<sup>79</sup>



## Box 2: Lived experience perspectives

As part of this work, we sought the perspectives of those with lived experience. The time frames and resources of the project did not allow for consultation with children directly, and we sought their perspectives through parents and carers. We acknowledge this means that the direct perspectives of children are missing from this report.

We engaged with a small number of public contributors through interviews with eight individuals with varied lived experience as parents and carers, as well as two workshops – one with parents of children aged 0–5 years old and one with parents and grandparents of children over 5. Two experts by experience were part of the project Steering Group and the report was independently reviewed by two further experts by experience (for more detail, see the report preparation document). Several of the contributors we spoke to had professional experience within the early years sector, for example through charities and early years education. The following key themes emerged from the interviews and workshops:

- Support for families, parents and carers was felt to be inadequate. Those we spoke to found it unclear what support is available, where this can be accessed, and who best to turn to if support is needed. Support to build a nurturing environment in the early years is needed by mothers, fathers and other carers.
- Geographic variation in services and reductions in health visitor and Children’s Centre services were felt to be adding to the difficulties in accessing them.
- Parents are not always equipped with knowledge of how different aspects of development (socio-emotional, cognitive, physical) contribute to their child’s health during the first 5 years.
- There was a recognition that although early years experiences and circumstances are critical for long-term health, support and services for under-5s and their parents/carers are dwindling. Early years education was regularly highlighted as crucial for a child’s development, even if attending a setting such as a nursery is not suitable for all children.
- Other areas frequently raised were: oral health, vaccinations, nutrition, exercise, play, the importance of parental support groups, maintaining good mental and physical health in children and their parents/carers, better signposting of services, and empowering the voices of children. The impact of experiences *in utero*, such as poor maternal mental health, alcohol and substance abuse, and domestic violence, was also highlighted.
- Areas highlighted by those that we spoke to overlap with issues raised with us by policymakers. This shows that there is an awareness among policymakers of the problems facing the early years, but work remains to be done to address them. Some felt that the early years are not seen as a priority for Government.

# Why prioritise the early years?



If we get it right at an early age, it is so important. You can see the impact of it on long term health.

Public contributor

The early years, from preconception and pregnancy through to the first years of childhood, present a unique opportunity to impact the health of an individual across their whole life, as demonstrated by the science of the developmental origins of health and disease. Longitudinal cohorts show that at a population level, poor health in the early years is an important predictor of poor health in adulthood,<sup>80-83</sup> setting up a cycle of health decline that flows across generations. Many diseases have their origins during pregnancy and even before conception (see Box 3).

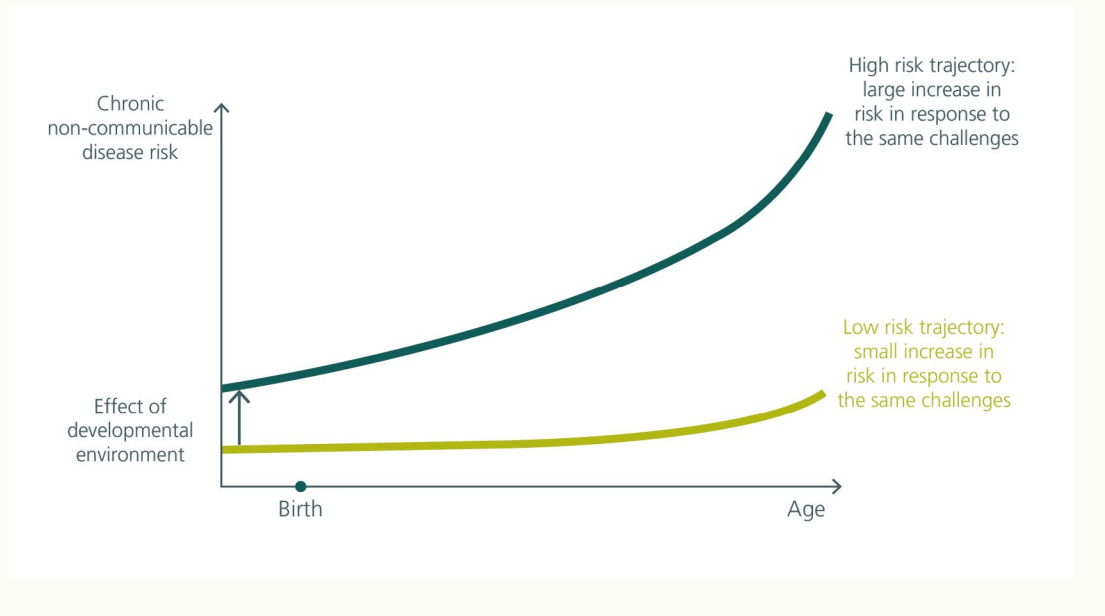
## Box 3: The impact of preconception and pregnancy health

Interventions during preconception and pregnancy provide an important opportunity to improve a child's health during the early years, with impacts into adult life. Factors experienced during this window also relate to an individual's experience of the wider determinants of health, which are often outside their control. Parental diet, environmental exposures, and health behaviours during these periods can impact the development of diseases across the life course of the child, including cardiovascular and lung disease, diabetes, some cancers and mental disorders.<sup>84,85</sup> Analysis from the Royal College of General Practitioners suggests that more than 9 in 10 women experience potentially modifiable preconception behavioural or medical risk factors for pregnancy.<sup>86</sup> The report suggests that attention should be given to equipping primary care teams to help people receive the preconception care they need at the right time.<sup>86</sup> Paternal health during this period also has important consequences for offspring development and long-term outcomes, although research in this area remains more limited.<sup>87</sup> The link between health in pregnancy and lifelong health of pregnant women and their children was also highlighted in an Academy workshop on developing drugs for pregnancy-specific conditions.<sup>88</sup>

The impact of factors that drive an increase or decrease in health is particularly profound during the early years, since it is during this period that development of brain architecture and other organ systems occurs.<sup>5,7</sup> For example, the first two years of life in particular see a substantial increase in brain size,<sup>89,90</sup> as well as an exponential increase in the number of air sacs within a child's lungs.<sup>91</sup> The way in which these systems develop is highly dependent on their environment as well as experiences of adversity in childhood, and can lead to disease development through mechanisms such as hormonal dysregulation, alterations in brain maturation, immune system malfunctioning and changes in metabolic health.<sup>5,7</sup> In turn, this can have an impact on adult health outcomes. Overall, children growing up in a more challenging developmental environment are at increased risk of poor health during the rest of their life, compared with children who do not (see Figure 2).

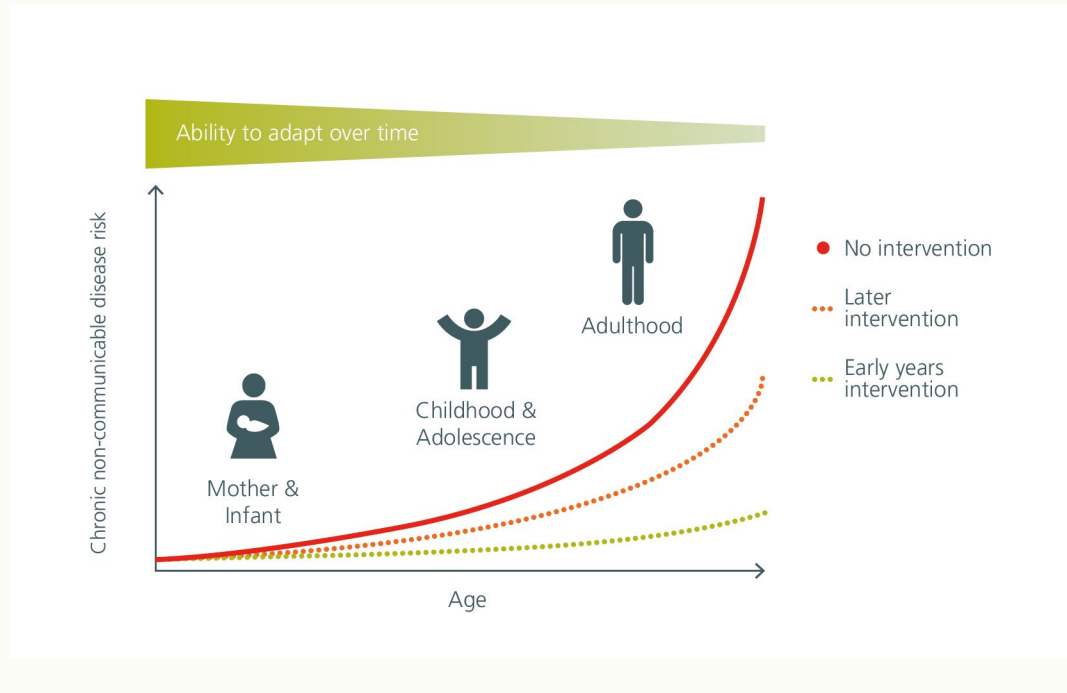
**Figure 2: Visual representation of the effect of developmental environment on the risk of mental and physical disease across the life course, based on the theory of the developmental origins of health and disease.**

Negative experiences during the early years lead to a higher-risk disease trajectory. This is established from before birth, with the environment during preconception and pregnancy making the first contributions towards disease risk across mental and physical health. These baseline inequalities are compounded throughout life. Figure adapted from Hanson (2019).<sup>6</sup>



The ability of a system to respond to factors in an individual’s environment (known as developmental plasticity)<sup>7</sup> reduces with time, meaning that the process of making changes also becomes more difficult over time (Figure 3). Conversely, this means that the early years provide a window where it is less challenging to influence the development of good health and avoid the greater challenge and expense of intervening later. All development builds on earlier development, and getting the early years right offers a fundamental opportunity to provide the foundation for future health, but it is crucial to continue acting beyond the early years to build on healthy trajectories, and to continue to improve the health of those who may not have experienced the best start in life. It is important to note that outcomes for children with chronic genetic conditions can also be positively influenced by early intervention in childhood.

**Figure 3: A visual representation based on the theory of the developmental origins of health and disease, indicating that interventions in childhood are likely to be more effective at reducing the risk of developing a chronic disease across the life course compared with interventions in adulthood.<sup>8,9</sup>**



Data from the Royal Foundation and the London School of Economics show that the cost to society of addressing the issues that might have been avoided through action in early childhood is £16.13 billion each year (estimates from 2018/19). This includes the cost of school absences and exclusions, youth economic activity, children's social care, child injuries and mental health problems, crime and antisocial behaviour, and the long-term mental and physical health and social consequences of adverse childhood experiences.<sup>39</sup> The figure of £16.13 billion is likely to be an underestimate, as it does not include the later costs of failing to provide the right support early on, and also does not include the losses to the productivity and earnings of individuals over their lifetime. Nevertheless, this is equivalent to nearly five times the total annual spend in England on early education and childcare entitlements, and around 44 times the annual expenditure on specialist perinatal programmes.<sup>39</sup> The percentage of public expenditure on 0–5 year olds in the UK also lags behind the OECD average.<sup>92</sup>

A number of programmes provide examples of the high rate of return on early years investment. In the United States (US), high-quality birth-to-five programmes for disadvantaged children, offering comprehensive developmental resources including nutrition, access to healthcare and early learning, can deliver a 13% per year return on investment through better outcomes in education, health, social behaviours and employment.<sup>40</sup> The return on investment in Chicago Child-Parent Centres, which provide education and family support to economically disadvantaged children through to third grade (age 8 or 9), has been estimated to be between \$1.35 and \$3.66 per dollar spent and could be higher if crime reduction, welfare and earnings are taken into account.<sup>93</sup> In the UK, evaluation of the Sure Start programme, which brought together in one place education, employment and health services for children under five and their families, in England between 1999 and 2010 found an increased prevalence of immunisations, a reduced probability of accidental injuries at age 3, lower body mass index (BMI), and better parent-reported health status by age 5.<sup>94–96</sup> The programme was also associated with a reduction in hospitalisations in 11–15 year olds, equivalent to around 18,500 averted hospitalisations per year.<sup>41</sup> This alone offset approximately 31% of the cost of programme provision.<sup>41</sup> Sure Start spending was cut by over 60% between 2011 and 2019.<sup>97</sup> The current model of Family Hubs has followed but its impact has not yet been evaluated.



There is a wealth of evidence that supports the benefits of intervening in the early years (see Box 4 for some examples of reviews, programmes and policy reports that bring together this evidence). In the next section, we highlight some possible opportunities for intervention.

## Box 4: Sources of evidence to support interventions in the early years

[Child of the North – building a fairer future after COVID-19](#)<sup>21</sup>

[Securing our healthy future – prevention is better than cure](#)<sup>98</sup>

[Early moments matter – guaranteeing the best start in life for every baby and toddler in England](#)<sup>24</sup>

[A preconception care strategy](#)<sup>99</sup>

[The best start for life – a vision for the 1,001 critical days](#)<sup>100</sup>

[Big change starts small](#)<sup>39</sup>

[Best beginnings in the early years – a proposal for a new early years guarantee to give all children in England the best start in life](#)<sup>101</sup>

[Rare Jewels – specialised parent-infant relationship teams in the UK](#)<sup>38</sup>

[Nurturing care for early childhood development – a framework for helping children survive and thrive to transform health and human potential](#)<sup>102</sup>

[Understanding and supporting mental health in infancy and early childhood – a toolkit to support local action in the UK](#)<sup>103</sup>

[Evidence Briefs series on first 1001 days from The First 1001 Days Movement](#)<sup>104</sup>

[Infant and early childhood mental health: the case for action](#)<sup>105</sup>

[Best Start in Life – the first 1,001 days](#)<sup>106</sup>

[Reducing inequities in health across the life-course – early years, childhood and adolescence](#)<sup>107</sup>

[Developmental origins of health and inequality](#)<sup>108</sup>

[The Childhood Policy Programme](#)<sup>109</sup>

# Opportunities to intervene in the early years

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In this section, we highlight drivers and opportunities for improving health in the early years, and provide case studies of impactful interventions across the following areas: brain development and childhood mental health; obesity and nutrition; infection and immunity; respiratory health; and oral health. These case studies are intended to give some examples of effective interventions that have been identified through our project. We provide these to illustrate some of the current evidence on how improvements to child health could be achieved. The topic areas we discuss were consistently raised in our research interviews with experts across a diversity of fields, and were also common themes from the targeted review of the economic impact of interventions in the early years that we commissioned (see Box 5).<sup>110</sup> These health challenges also align closely with the core components of the WHO Nurturing Care Framework,<sup>102</sup> as well as the NHS Core20PLUS5 approach for reducing health inequalities among children and young people.<sup>111</sup>

The highlighted topics are not an exhaustive list of targets or interventions, and there are other areas that we do not cover in detail, such as hearing and visual impairment, allergies, cardiovascular health, genetic disorders, epilepsy, and injury prevention. The evidence we provide is intended to highlight the many opportunities where interventions can be made, to achieve improvements in key areas of child health. These areas, as well as upstream drivers and wider determinants of health, should be considered holistically to optimise a system-wide, interconnected approach to improving child health.

Indeed, to improve health in the early years, interventions are required both within and outside the health context. Interventions outside the health context include those related to income, housing, social care, education and the natural environment. There are likely to be synergies between individual policies, with the potential to impact more than one health area. This is particularly the case across interlinked disease areas where interactions between each condition negatively influence the other(s).<sup>112</sup> Likewise, benefits from health improvements can also be felt across multiple other sectors, including but not limited to employment, criminal justice and education.

Through our engagement, we heard about 'invisible groups'. In particular, we heard that many groups with additional needs and experiences do not have a voice and can be invisible to the system as a whole. This includes children in care and those without a family unit, children with one or more long-term conditions or disability, and those from ethnic minorities. The needs of different groups must be considered when developing policies in the early years. All children, no matter their background, should be able to access high-quality, supportive services in order to experience an environment that is conducive to the development of good health.

## Box 5: Targeted review of the economic impact of interventions that aim to improve child mental and physical health

We commissioned York Health Economics Consortium (YHEC) to undertake a targeted review of economic evaluations of interventions during pregnancy and in children up to age 5 that aim to improve the mental and physical health of the child in the short and long term. The review highlighted that there are interventions that can be, or are being, implemented, often at a national level, that potentially give significant returns on investment. Interventions were identified across a range of settings, including the benefits of increasing breastfeeding, improving antenatal and child mental health, reducing dental caries, lowering parental smoking and decreasing obesity prevalence. While there were limitations to the scope of the review, the search provides a useful source of information on some of the effective interventions that can be applied to improve child health with consequent benefits to the health of the population and the economy. We highlight some examples throughout the sections below, and direct readers to the full report for a complete reference list of the studies captured by the search.<sup>110</sup>

## Box 6: Evidence presented in this report

The evidence presented in this report encompasses a range of study types, including randomised controlled trials, observational studies and systematic reviews. Whilst the strength of the evidence may be usefully considered in a hierarchy that crudely ranks study designs by their ability to produce robust and reliable results, good judgement and critical appraisal of the evidence are still necessary.<sup>113</sup> This includes ensuring that studies are designed appropriately to consider the challenges of understanding potential confounding factors and biases in associational data.<sup>114</sup> In public health research in particular, there are often practical and ethical constraints which mean that observational studies are possible where randomised controlled trials are not. In these cases, data from well-designed, high-quality observational studies, where the risk of biases and confounding has been assessed and adjusted for, may be a valuable evidence base. In other cases, such data may highlight a research gap where further studies could be undertaken to shed more light on the causal or mechanistic underpinnings.

## Brain development and childhood mental health

The early years are a crucial time for the development of the brain and mind. Beginning before birth, billions of connections are formed between different areas of the brain, building the foundations for the later connections that occur during lifelong cognitive development.<sup>115</sup> The first two years of life in particular see substantial growth of grey and white matter as the brain increases towards its adult size.<sup>89,90</sup> It is within this window that the brain is at its most adaptable, making it easier and more cost effective to intervene in earlier rather than later years.<sup>116</sup>

The types of environments and the quality of parental or carer care that young children experience have profound implications for their development. Although children's physiology is designed to withstand stress,<sup>117</sup> extreme stress during early childhood can disrupt neurological, metabolic and immunologic systems, leading to poor developmental outcomes.<sup>5,7</sup> The presence of consistent, responsive caregiving relationships supports the healthy development of a child's brain,<sup>118</sup> enabling optimal cognitive, emotional and social development. Ensuring parents are appropriately supported in this area is therefore crucial, as reflected by the public contributors we spoke to. The development of the brain in the early years can influence executive functions which are important for school readiness.<sup>119</sup> In England, data from 2021/22 show that nearly 35% of children at the end of reception year at school do not achieve at least the expected level of development in the early learning goals in the prime areas of learning (personal, social and emotional development; physical development; and communication and language) and in the specific areas of mathematics and literacy.<sup>28</sup>

Children who are exposed to adversity in their early environments, including abuse, domestic violence, neglect and reductions in carer interactions are more likely to have alterations in brain and behavioural development.<sup>120,121</sup> In 2010, it was estimated that childhood adversity contributes to nearly one-third of adult mental disorder.<sup>122</sup> Experiences are not limited to the postnatal period, and prenatal development is also important. It is widely known that certain substances can have teratogenic effects (causing abnormalities or birth defects) on the developing foetus. For example, brain development is affected through exposure to alcohol, with foetal alcohol spectrum disorders estimated to affect around 3% of the UK population, although studies measuring prevalence are lacking.<sup>123,124</sup> Prenatal alcohol exposure is linked to learning difficulties and behavioural problems, mental ill health, increased risk of physical health conditions,<sup>125</sup> increased likelihood of entering the criminal justice system<sup>126</sup> and challenges with employment.<sup>127</sup>

Many of the stresses that impact early brain development and childhood mental health are linked to a child's experience of deprivation during their early years. Poverty is linked to structural differences in several areas of the brain associated with school readiness,<sup>128</sup> whilst household income is a robust predictor of antenatal maternal mental health and all child outcomes.<sup>129</sup> Deprivation also maps to school readiness, with the percentage of children achieving the expected level of development in the early learning goals by the end of reception decreasing in line with increased deprivation.<sup>70</sup> Childhood mental health conditions are also associated with a variety of future physical diseases, including liver and renal diseases, ischaemic heart disease, cerebral infarction, chronic obstructive bronchitis, lung cancer and dementia.<sup>130</sup> This increased risk is associated with socioeconomic status.

### Supporting parental mental health



Parental stress and how that impacts from *in utero* and right through those early years, I think that's something we don't recognise, appreciate, understand or choose to ignore.

Public contributor

Poor maternal mental health during pregnancy is linked to impairments in child cognitive and emotional development, with regions of the brain important for stress regulation and mood disorders found to be compromised in children exposed to maternal anxiety or depression during pregnancy.<sup>35,36,119</sup> Although most parents with mental health problems provide good care for their children, poor mental health in either parent can, in certain circumstances, impact on their ability to provide the environment that a child requires for healthy brain development. This has been linked to impaired caregiving and language development,<sup>131</sup> and childhood psychiatric disorders.<sup>132</sup> There have been indications that treatment of maternal depression can positively affect the mental health outcomes of offspring, though the authors highlight the need for further high-quality research in this area to understand these effects.<sup>133</sup> It has also been shown that childhood adversity can be reduced through parent training programmes, home-based visiting programmes, school-based interventions and adult trusted support.<sup>134</sup> Higher levels of sensitive caregiving from mothers and fathers were found to be associated with markers of brain development (relating mainly to brain volume) in children.<sup>135</sup> Methods of working to promote attachment and attachment-related outcomes through parenting and home visiting programmes have been incorporated into the Government's Healthy Child Programme.<sup>136</sup> Better support for parental mental health, including during pregnancy, was raised in our engagement with public contributors. Some noted the negative perceptions associated with having poor mental health during this period, which deterred parents from speaking about it and seeking help.



Some parents feel they are ashamed to talk about [mental health] or it's a cultural thing and they're not allowed.

Public contributor

Children who are most disadvantaged, including those in care, often do not have a traditional family unit, therefore support through improved parental mental health may not be an intervention that reaches such children. This should be considered to ensure that all children, no matter their background, are prioritised for high-quality, supportive services, in order to experience an environment that is conducive to the development of good health in the early years.

### **Case study: Addressing postnatal depression – the POstNatal Depression Economic evaluation and Randomised (PoNDER) trial**

The PoNDER trial of training health visitors to assess and deliver psychologically informed interventions showed reduced incidence of women with postnatal depressive symptoms.<sup>137</sup> As discussed above, poor parental mental health can have a negative impact on a child's brain development, therefore an improvement to maternal mental health would be beneficial to a child's health. Further evaluation showed that there was also an enduring preventative effect in women who screened negative for depression postnatally, showing that benefits were derived from the intervention across multiple groups.<sup>138</sup> The low-cost training for health visitors in this context was found to be cost saving, with the health and social care costs per individual receiving the treatment £72 lower than for those that did not receive the intervention.<sup>139</sup>

## Early childhood education and care settings



The positive side to the early years [childcare] is the personal, social and emotional aspect, like interactions, which is so important for our under 5s.

Public contributor

Early childhood education and care (ECEC) presents another critical setting for impacting a child's healthy brain development. Embedding support for self-regulation in the education of children in kindergarten (age 5–6) has been shown to positively impact executive functions (working memory, inhibitory control and cognitive flexibility), reading, vocabulary and mathematics skills.<sup>140</sup> Support for self-regulation that was integrated across pre-school (age 4) and home environments was also found to increase academic achievement, decrease obesity and improve behaviour problems through to age 8 among ethnically diverse families from underserved, urban communities.<sup>110,141–145</sup> Economic modelling of this intervention suggested the potential for high return on investment if the early impacts on outcomes such as obesity were sustained to adulthood.<sup>146</sup>

In the longer term, expansion of early childcare provision has been shown to have positive effects on educational attainment and income (except for highest earners) at age 26–30 in Norway,<sup>147</sup> with high-quality ECEC provision linked with a reduction in wage inequalities in children from low-income families in the US.<sup>148</sup> Programme quality was also found to be particularly important.<sup>149</sup> In the UK, children were found to have better educational outcomes at age 5 if they spent more time in a setting with the highest inspection ratings.<sup>150</sup> In Greater Manchester, targets set to improve the quality of all early years settings have been linked to closing the gap in school readiness between the regional and national average.<sup>1</sup> The House of Commons Education Committee reported in its inquiry on support for childcare and the early years that whilst the majority of ECEC provision in England is good or outstanding, high staff turnover rates in formal settings affects young children, who benefit from consistent relationships with adult carers.<sup>151</sup>

Across the UK, net childcare costs for couples ranked between 4th and 7th highest out of 30 OECD countries between 2018 and 2022, depending on the earnings of the couple.<sup>152</sup> For lone parents, the UK ranked 16th. Whilst it has subsequently been announced that the entitlement to 30 hours free childcare per week will be expanded to all children under the age of five by 2025, there are concerns that this will not benefit those on the lowest incomes. One report estimates that 70% of high-income parents would be able to benefit, but only 2% of parents in the lowest income decile would be able to access the expanded offer.<sup>153</sup> In addition, parents contributing evidence to the House of Commons Education Committee outlined the increasing challenges for parents to find ECEC places for their children as a result of the high rate of closures currently seen across the sector.<sup>151</sup> The public contributors we spoke to as part of our work agreed that quality childcare and early childhood education was important, and highlighted the difficulties in accessing it.



You can see a difference [...] in other children who haven't had that exposure to good early childcare.

Public contributor

## Breastfeeding

The Millennium Cohort study, following outcomes of children born across the UK between 2000 and 2002, found that at all ages, longer breastfeeding durations were associated with higher cognitive scores after accounting for the child's own characteristics.<sup>154</sup> Although the size of the effect on cognitive scores was smaller once adjusting for socioeconomic position and maternal cognitive scores, associations between cognitive scores and breastfeeding duration remained at ages 7, 11 and 14.<sup>154</sup> UNICEF's baby-friendly initiative provides a list of further research on the links between breastfeeding and cognitive development.<sup>155</sup> We highlight some of the barriers to breastfeeding in the section below on infection and immunity.

## Obesity and nutrition

Obesity is becoming increasingly prevalent in children,<sup>29,156</sup> with nearly a quarter of children in England aged 5 years overweight or obese.<sup>29</sup> Substantial inequalities exist, whereby children who live in the most deprived areas are twice as likely to be living with obesity as those in the least deprived areas.<sup>29</sup> The 2019 Chief Medical Officer's (CMO's) report on solving childhood obesity highlights how the wider determinants of health contribute to the shaping of people's health, including obesity.<sup>157</sup> Obese children are five times more likely to be obese in adulthood than those who are not obese,<sup>158</sup> and therefore experience increased risk of cardiovascular disease, diabetes, musculoskeletal disorders and some cancers.<sup>159</sup> In addition to this future risk, children with obesity are at increased risk in childhood of asthma, fractures, hypertension, early markers of cardiovascular disease, insulin resistance and psychological effects.<sup>159,160</sup> The strong correlation between socioeconomic status and childhood obesity persists with age and across generations,<sup>161</sup> with children of overweight or obese mothers much more likely to themselves have a high BMI and poor cardiometabolic health.<sup>162,163</sup> The cost of treating obesity-related ill health in England is projected to reach £9.7 billion per year by 2050.<sup>164</sup>

## Improving physical activity



Our children's centre has given us a really solid foundation in terms of physical health, like understanding importance of physical activity and good nutrition – things like that I probably wouldn't kind of think as priorities or necessarily need to consider, are all delivered in a really age-appropriate way.

Public contributor

Lack of physical activity during the early years is a contributing factor in the development of childhood obesity.<sup>165</sup> During the early years, active play is a key pathway to physical activity, which also contributes to mental and social aspects of growth and development.<sup>166,167</sup> The importance of exercise was frequently highlighted by the public contributors that we spoke to.

## Case study: Interventions promoting healthy eating and active play

The Romp & Chomp intervention took place in a large regional city in Australia and involved 12,000 children between 0 and 5 years old. It was designed to increase the capacity of the area to promote healthy eating and active play in early childhood care and educational settings in order to achieve healthy weight in children under 5 years of age. The project's objectives were to promote: 1. Daily active play; 2. Daily water and fewer sweet drinks; 3. Daily fruit and vegetables; 4. Less screen time (TV or DVD time).<sup>168</sup> The intervention led to a reduction in obesity and an improvement in young children's diets.<sup>168</sup>

Analysis of the potential to deliver the intervention across the country suggested that it could be cost effective when delivered at scale.<sup>169</sup> It should be noted that the costs are high and the quality-adjusted life year (QALY) gains are relatively small. However, the economic analysis undertaken looked only at the mid-term quality of life impacts (within the first 15 years of life), and evidence suggests that the detrimental health impacts of an unhealthy BMI in childhood are likely to manifest into adulthood.<sup>169</sup> Modelling capturing the potential longer-term health benefits and healthcare cost savings of obesity prevention in early childhood suggests that healthcare cost-savings peak around the time children reach their late 60s to early 70s,<sup>170</sup> age ranges not covered in the analysis of the Romp & Chomp intervention.<sup>169</sup>

Evaluation has also been undertaken of the Carolina Abecedarian Project, which was an integrated intervention conducted on four cohorts of disadvantaged children born between 1972 and 1977, and included a period of social and cognitive stimulation interspersed with caregiving and supervised play throughout a full eight-hour day between birth and age 5. Findings saw improved trends in body mass measurements, which persisted into adulthood,<sup>171</sup> with longer-term economic forecasting on the life-cycle benefits and costs of the programme estimating a 13.7% rate of return on investment.<sup>172</sup>

### Improving nutrition



Food and all of that, really does go back to the main crucial part that is the brain development for these children.

Public contributor



Once they've eaten, they can learn and play.

Public contributor

Nutrition plays a crucial role in the development of obesity. Poor diet quality in early childhood is associated with increased obesity risk in later childhood.<sup>173</sup> Increased food insecurity is linked to poorer quality dietary intakes in mothers and children,<sup>174</sup> with better diet quality in young children also associated with their greater exposure and access to healthy food outlets,<sup>175</sup> which are less common in the most deprived areas.<sup>176</sup> Consumption of sugar-sweetened beverages is also highest in deprived areas,<sup>177,178</sup> and is associated with weight gain and obesity in children.<sup>179</sup>



The Government's Soft Drinks Industry Levy saw a 46% decrease in average sugar content of those drinks subject to the levy,<sup>180</sup> and has been estimated to have prevented around 5,000 cases of obesity in Year 6 girls (aged 10–11) across all socioeconomic groups.<sup>181</sup> The importance of nutrition was repeatedly highlighted in our engagement with public contributors.

Maternal nutrition also impacts on childhood diet quality. Poor maternal diet quality in pregnancy is associated with poor diet quality during the early years of their child's life, increased child adiposity (body fat) and increased child BMI.<sup>182</sup> Maternal nutrition preconception and during pregnancy has also been shown more widely to affect a child's mental and physical health.<sup>183,184,185,186</sup> A recent trial found that improving diet quality in mothers through preconception and antenatal nutritional supplementation reduced the risk of rapid weight gain in their children in the first year of life, as well as the risk for high body mass index at two years.<sup>185</sup> Emerging evidence also suggests that paternal BMI affects offspring risk of obesity, with both maternal and paternal BMI found to be independently associated with offspring weight.<sup>187</sup> The intergenerational aspects of obesity were also raised in discussions with public contributors.



If they start eating good healthy food [...] eventually there's a good eating habit, it's not just being healthy, it's learning a good habit of understanding that eating good food is important.

Public contributor

More widely, the quality of early years nutrition has additional impacts on health. For example, folic acid supplementation during pregnancy has a preventative effect on neural tube defects in the child, which cause lifelong disabilities, miscarriages, stillbirths and neonatal deaths.<sup>188</sup> Full fortification of flour with folic acid in the UK to levels beyond those currently implemented in other countries could safely prevent 80% of neural tube defects in babies.<sup>189</sup> Breastfeeding also has many additional benefits on health, which are discussed below in the section on infection and immunity.

## Case study: Improving children's diet – the Healthy Start scheme

Inequality remains a key driver of nutrition quality, which the Healthy Start scheme aims to tackle. Healthy Start is an NHS scheme that helps pregnant women, new parents and their children in England and Wales to eat healthily. For those receiving a qualifying benefit and who are pregnant (from 10 weeks) or have parental responsibility for at least one child under the age of 4, the scheme offers a prepaid card towards the cost of foods such as milk, fruit and vegetables. The card can also be used to collect Healthy Start vitamins to support pregnancy and breastfeeding, as well as vitamin drops for babies and young children up to 4 years old. Healthy Start was introduced to provide a nutritional safety-net and improve access to a healthy diet for low-income families. However, there are concerns around uptake of the scheme amongst eligible parents, and the value of vouchers given increasing food prices.<sup>190,191</sup> Although initial analyses showed positive impacts of the scheme in increasing spending on fruit and vegetables,<sup>192</sup> analysis in 2021 did not find evidence of increased fruit and vegetable purchasing with scheme participation.<sup>193</sup> However, an intervention piloted in England which topped-up Healthy Start vouchers with an additional £2 that was redeemable only against fruit and vegetables led to increased fruit and vegetables purchased.<sup>194</sup> Notably the redemption of top-up vouchers was positively correlated with deprivation status.<sup>194</sup>

## Infection and immunity

Children are born with an immature immune system which develops as they grow to protect against infection. The early years are a key window for immune system development,<sup>195</sup> which was recognised by the public contributors we spoke to.

### Improving vaccination rates

Vaccination plays a key role in ensuring children are protected against a range of serious infections. The importance of vaccinations in early childhood was frequently raised in our engagement with public contributors. Since a measles vaccine was introduced in the UK in 1968, it is estimated that 20 million measles cases and 4,500 deaths have been averted.<sup>46</sup> Childhood vaccination coverage in the UK has been decreasing in recent years, with 2021–2022 data reporting that the majority of routine vaccination programmes do not meet the 95% coverage target set by the WHO.<sup>15–18</sup> Regional variations in uptake were also present. In 2019, the UK lost its measles-free status from the WHO, just 2 years after originally eliminating the disease, although this was regained in 2021 based on a significant decline in measles circulation globally due to the COVID-19 pandemic.<sup>196</sup> MMR vaccination coverage in England has fallen to the lowest level in a decade, leading to increased risk of a measles outbreak, particularly in London where coverage is lowest, and the need for costly catch-up vaccination campaigns.<sup>197,198</sup> The threat of outbreaks without improvement in access in London was highlighted by the UK Health Security Agency (UKHSA) in 2023.<sup>197</sup>

More needs to be done to ensure that routine childhood vaccinations are administered. A survey of parents by the Royal Society for Public Health found the greatest barriers to vaccination were the timing and availability of appointments, and childcare duties (although the respondents were not representative of a diverse population).<sup>199</sup> Healthcare workers raised similar concerns.<sup>199</sup> Several interventions to improve vaccination rates have been evaluated, with call/recall strategies seemingly the most effective, and this approach was recommended in 2019 vaccine uptake guidelines.<sup>200,201</sup> There is also a focus on increasing maternal vaccination before and during pregnancy, which provides important protection during the first months of a baby's life before they are able to receive their own vaccinations.

### Case study: Maternal vaccination for Group B Streptococcus (GBS)

GBS is a common bacterial pathogen that can infect pregnant women and their babies. GBS infection causes a considerable burden of sepsis and meningitis and is also associated with stillbirth and pre-term birth.<sup>202</sup> Several vaccines against GBS for use during pregnancy are being developed and initial studies suggest that maternal immunisation is expected to avert a substantial burden of death and disability in children. This is also expected to be cost effective, even with a relatively high vaccine price.<sup>203</sup>

## Breastfeeding

Breastfeeding plays a key role in developing the immune system in the early years by providing a plethora of biological molecules that directly contribute to the immune system, such as antibodies, and factors that modulate development, such as establishment of the microbiome.<sup>204</sup> Breastfeeding helps protect against acute childhood conditions.<sup>205</sup> Quantitative models have found that, assuming a moderate increase in breastfeeding rates (45% of women exclusively breastfeeding for four months, and 75% of babies in neonatal units breastfed at discharge), every year there could be substantial reductions in gastrointestinal disease, respiratory disease, otitis media and necrotising enterocolitis, with combined savings across hospital admissions, GP consultations and treatment costs conservatively estimated to be over £17 million per year (analysis published in 2012).<sup>205</sup> There is also some evidence of breastfeeding being associated with improved cognitive outcomes, reduced early years obesity and reduced sudden infant death syndrome.<sup>205</sup> Benefits to mothers are also observed, with breastfeeding associated with reduced rates of breast cancer, as well as likely indications of protection against ovarian cancer and type 2 diabetes.<sup>206</sup> Quantitative modelling of savings due to reduced breast cancer rates suggests that if half of those mothers who currently do not breastfeed were to do so for up to 18 months in their lifetime, there could be an incremental benefit of more than £31 million over the lifetime of each annual cohort of first-time mothers.<sup>205</sup>

The UK breastfeeding rate remains one of the lowest amongst comparable high-income countries, ranking 15th out of 19 countries,<sup>14</sup> and currently around 40% of infants in England are not breastfed at all (data from 2022–2023 quarterly breastfeeding rates).<sup>207</sup> The Lancet’s breastfeeding series emphasises that breastfeeding is not the sole responsibility of women and that overcoming the cultural and practical barriers to breastfeeding is an important societal responsibility.<sup>208</sup> It also highlights that action is needed to tackle the structural barriers to breastfeeding resulting from gender inequities, the lack of consistent quality care in the healthcare environment, adverse sociocultural infant feeding norms and embedded inequalities, and poor accommodation of women’s reproductive rights in the labour market. Integrated interventions targeting all levels of the breastfeeding environment from economic and social, across healthcare services, family, community and workplaces, to individual mother-infant relationships, are discussed in the series.<sup>208</sup> The public contributors that we spoke to recognised the benefits of breastfeeding and the need for support to establish and continue breastfeeding, which isn’t always straightforward.



Found breastfeeding harder than I could have imagined, it really hurt, but I had a really good health visitor, she only came round once but I had a community to draw on so I asked other women and so I was able to do it and I was really pleased I could do it. I think breastfeeding is really important, but I think that women have to be supported through it.

Public contributor

## Case study: Increasing breastfeeding rates

Data from mothers in Scotland have shown that the length of time taken for maternity leave corresponds with the duration of breastfeeding, suggesting that more flexible working conditions and more generous employment leave could help increase and prolong breastfeeding among working mothers.<sup>209</sup> In separate analysis, a cluster randomised clinical trial in England found that financial incentives were linked to a modest but statistically significant increase in breastfeeding prevalence at 6 to 8 weeks in areas where breastfeeding rates were below 40%.<sup>210</sup>

In 2019, a lack of breastfeeding was estimated to result in global economic losses of about US \$341.3 billion annually, or 0.70% of global gross national income, through lost earnings due to child and women's mortality, as well as through cognitive losses.<sup>211</sup> In a UK setting, at 2009–2010 values, increasing the duration of breastfeeding would be expected to save at least £42 million annually through reductions in gastrointestinal and lower respiratory tract infections, acute otitis media in infants, necrotising enterocolitis in pre-term babies and breast cancer in women.<sup>212</sup>

## Respiratory health

The early years encompass a crucial period of lung development. Disruption during this time has been shown to reduce lung function in later life.<sup>213</sup> A recent study spanning over seven decades has found that those who contracted a lower respiratory tract infection during early childhood had a greater risk of dying from respiratory disease by age 73 years than those who did not, accounting for one-fifth of such deaths.<sup>214</sup> Prenatal factors also affect respiratory health in later life, with nicotine exposure, maternal malnutrition and vitamin deficiencies, alcohol exposure, and air pollution exposure all shown to impact structural lung growth.<sup>213</sup>

The example of chronic respiratory diseases shows how earlier treatments during childhood can avoid greater cumulative damage than if chronic conditions are left untreated for longer. In the case of cystic fibrosis, earlier interventions have resulted in better physical and mental health outcomes,<sup>215,216</sup> as well as reduced health resource usage.<sup>217</sup>

### Reducing tobacco smoke exposure

Exposure to tobacco smoke in infancy is linked to an increase in lower respiratory diseases, asthma and impaired lung function.<sup>218</sup> In addition, it is estimated that each year in England and Wales, 17,000 young people take up smoking by the age of 15 as a result of exposure to household smoking in early childhood.<sup>219</sup> Given that in England 14% of women are smokers at conception, interventions to support smoking cessation in pregnancy offer a valuable opportunity to reduce smoking exposure in children.<sup>220</sup> Schemes such as MiQuit (a 12-week programme of tailored text messages in addition to normal NHS smoking cessation support) and offering financial incentives for pregnant women to stop smoking were both found to increase rates of quitting. Economic modelling also suggests that both interventions could be cost effective through lifetime improvements to mother and child health outcomes.<sup>110,221,222</sup> The Government's proposals to create a smoke free generation through legislation that restricts the sale of tobacco could also positively impact on child respiratory health.<sup>223,224</sup>

## Reducing air pollution

There are clear links between air pollution exposure in the early years and childhood asthma cases,<sup>32</sup> with childhood asthma linked to reduced adult lung function, and higher risk of chronic obstructive pulmonary disease (COPD).<sup>225</sup> Communities with higher socioeconomic deprivation, or communities with a higher proportion of people from a non-white ethnic background, are more likely to be exposed to higher air pollution.<sup>72</sup> Initiatives to improve air quality will help to improve respiratory health in both the immediate and longer term.

### Case study: Improving air quality – clean air zones

In Bradford, pollution has been shown to be linked to 33% of childhood asthma cases,<sup>32</sup> lower birth weight,<sup>226</sup> higher blood pressure in children aged 4–5,<sup>227</sup> childhood obesity aged 6–11,<sup>228</sup> poorer cognitive ability at age 5,<sup>229</sup> and biological ageing in children aged 8,<sup>230</sup> illustrating how an intervention to address pollution benefits multiple health areas. To reduce air pollution in Bradford, a daily fee is operated for entry to a clean air zone by more polluting commercial vehicles such as buses, vans and taxis.<sup>73</sup> To mitigate the impact of this charge on the taxi trade for families already on a low income, £30 million of funding has been provided to support vehicles upgrading to compliant standards.<sup>73</sup> Evaluation of the impact of this scheme is ongoing. In London, exacerbation of asthma by air pollution is estimated to lead to 7% of asthma hospital admissions in children,<sup>231</sup> whilst long-term exposure to air pollutants during pregnancy is associated with an increased risk of low birth weight.<sup>232</sup> Evaluation of the London Low Emission Zone (LEZ) found that it reduced respiratory problems such as asthma and bronchitis by 8% in the second stage of its introduction.<sup>233</sup> Cost benefit analysis of LEZ-type policies suggests that they offer good value for money, with savings of more than £963 million indicated in Greater London.<sup>233</sup> Separate analysis has shown that meeting climate change targets through achieving the WHO interim target on air pollution for fine particulate matter could lead to children across the UK suffering 388,000 fewer asthma symptom days. Total health and economic benefits across children and adults of reducing air pollution in the UK are valued at £383 billion between 2018 and 2134, with 11.5 million life years gained across the UK population in this time.<sup>45</sup>

## Oral health

Nearly a quarter of all 5 year olds in England have tooth decay,<sup>30</sup> and almost 9 out of 10 hospital tooth extractions among children aged 0 to 5 years are due to preventable tooth decay.<sup>19</sup> Tooth decay is also the most common reason for hospital admission in children aged 6–10 years old.<sup>31</sup> The prevalence of dental caries is strongly correlated with socioeconomic status, with 13.7% of 5 year olds living in the least deprived areas having cavities, compared with 34.4% of those living in the most deprived areas.<sup>30</sup> Early childhood caries can lead to pain, infections and difficulties with eating, sleeping and socialising, impacting across other areas of early development.<sup>234</sup> Furthermore, observational data suggest that children with dental caries are three times more likely to have caries in their adult teeth, highlighting the potential longer-term benefits of good oral health habits in childhood.<sup>235</sup> The cost to the NHS of treating oral conditions is about £3.4 billion per year.<sup>19</sup> Poor dental hygiene in early childhood was raised as an issue in our interviews with public contributors.



At the nursery [there are] quite a few children with poor dental hygiene.

Public contributor

### Regular toothbrushing

Regular and effective toothbrushing is a key factor in children's oral health. However, children in more deprived areas are less likely to brush their teeth at least twice per day,<sup>236</sup> and Public Health England (the functions of which have now been assumed by the Office for Health Improvement and Disparities (OHID) and UKHSA) recommended supervised tooth brushing in targeted childhood settings.<sup>237,238</sup>

### Case study: Improving oral health – the ChildSmile programme

ChildSmile, a community-based child oral health improvement programme, was designed to improve the oral health of children in Scotland and reduce inequalities in both dental health and in access to dental services by shifting the balance of care towards more preventative and anticipatory care and promoting health from infancy.<sup>239</sup> The multicomponent intervention included a daily toothbrushing programme for 3 and 4 year olds attending nursery, and for those in the first and second years of primary school in disadvantaged areas, support registering with a dentist provided in a nursery or school setting, sessions for families including dietary advice and toothbrushing demonstrations tailored to the needs of the child, and family support on good oral health via a Dental Health Support Worker.<sup>239</sup> The implementation of the nursery supervised toothbrushing programme was associated with a reduction in dental caries.<sup>240</sup> Estimations of the costs of the programme and the costs of dental treatments found that the NHS costs associated with dental treatments for 5-year-old children decreased over time. In the eighth year of the toothbrushing programme, the expected savings were more than two and a half times the costs of implementation.<sup>241</sup>

### Breastfeeding and diet

Breastfeeding is associated with reduced risk of dental caries in children breastfed up to the age of 12 months, likely due to breastmilk increasing enamel calcium content.<sup>242,243</sup> Notably, infant formula reduced both calcium and phosphorous enamel content and may contribute to enamel damage.<sup>243</sup> Improving breastfeeding rates, as discussed above in the infection and immunity section, would have an additional benefit on oral health. Early introduction of dietary sugars, including through sugar-sweetened beverages, has been shown to be associated with increased incidence of dental caries.<sup>244</sup> Recent evidence indicates that sugar consumption may explain a possible effect of prolonged breastfeeding on the increased risk of dental caries, indicating the importance of interventions to reduce sugar consumption in the early years, alongside interventions to support improving breastfeeding rates.<sup>245</sup>

## Water fluoridation

Water fluoridation is a well-evidenced intervention to improve oral health.<sup>43</sup> According to the Government's 2022 report, 5 year olds in areas of England with higher water fluoride concentrations are around 60% less likely to have dental caries and be admitted to hospital to have teeth removed due to decay than those in areas with low fluoride concentration.<sup>43</sup> Around 1 in 10 people in England currently have fluoride added to their drinking water, and children aged 5 in areas with a fluoridation scheme are also less likely to experience cavities and undergo hospital admission for tooth extraction.<sup>43</sup> In areas of high deprivation, water fluoridation is calculated to offer a return on investment of £35 for every £1 spent.<sup>42</sup>

# Priorities to address

## Priority 1: Implement effective interventions and policies to improve child health and wellbeing and promote research to identify further approaches



There is substantial evidence identifying the areas for intervention to improve child health and wellbeing. In our report we have focused on the following areas where we believe action can be taken quickly, though these are not exhaustive: supporting emotional and cognitive development, tackling obesity, improving vaccination take-up and immunity, supporting breastfeeding, enhancing air quality and promoting oral health. Evaluated interventions in some of these areas already exist, as discussed above. Other reports have highlighted the importance of addressing the wider determinants of health, including child poverty, which should also be considered as they could impact on a range of outcomes, across physical and mental health and beyond.<sup>21</sup> **We recommend that in all UK nations, Government, the NHS and local authorities, work together to implement proven interventions to improve child health and wellbeing at scale and to a high quality.**

The National Institute for Health and Care Research (NIHR) recently announced funding to further develop the economic case for early intervention.<sup>246</sup> This is a welcome step to further identify the potential economic benefits of intervention in the early years. We have anecdotally, but consistently, heard that funding for research into child health exists but is limited in the early years. For example, in 2018 just 2.1% of all public and charitable health research spend in the UK was on reproductive health and childbirth, and this had decreased as a proportion of total spend since 2009/10.<sup>247</sup> In Australia, 27% of research funding from the National Health and Medical Research Council between 2013 and 2022 was allocated to child health research.<sup>248</sup> We have been unable to source a comparable figure, but the Royal College of Paediatrics and Child Health's (RCPCH's) analysis of UK health research figures estimates that just 5% of the UK's health research spend focuses on the health of children and young people (personal communication). There has also been a decline of 13% in the already small number of clinical academics working in paediatrics and child health (positions at Professor, Reader/Senior Lecturer and Lecturer levels), currently at 210, compared to 241 in 2004.<sup>249</sup> This reflects the wider trend in declining numbers of clinical academics, a theme explored by the Academy in its 'Future-proofing UK health research' report.<sup>249,250</sup>

Further research into specific interventions and policies to improve health in the early years is vital, and input from policymakers would prove beneficial in guiding research questions to ensure that the most pressing issues are addressed as a priority. Such research would also inform existing areas of research interest (ARIs) related to child health across Government departments, such as the Department of Health and Social Care (DHSC) on early action to prevent poor health and reducing pressures on the NHS and social care, the Department for Transport (DfT) on the health benefits of active travel, the Ministry of Justice (MoJ) on offending risk and child developmental outcomes, and the Department for Work and Pensions (DWP) on child maintenance arrangements and the wider welfare system, to name a few.<sup>23</sup> **We recommend that, in all UK nations, the Government, NHS, local authorities and research funders work together to support further collation of evidenced, cost-effective interventions and policies, and evaluate new interventions and policies. We also recommend further investment in research into improving health in the early years. In particular, ongoing research to understand causal pathways leading from exposures in early development to later health risks and to identify effective interventions and policies is necessary, including for emerging threats to child health.**



## Priority 2: Establish a unifying vision across Government for the early years to overcome policy silos



Health is not determined by a single factor but is the result of overlapping influences such as the food we eat, the air we breathe and where we live. Because of this, major child health challenges cannot be tackled through individual interventions or by individual sectors. Instead, a suite of cross-sectoral interventions and policies is needed that includes health (which we have focused on in this report), education, housing, income protection and the environment. Despite opportunities to intervene across multiple areas, we have heard from stakeholders that policy in the UK is often siloed. Cross-department working in child policy is necessary and would be particularly beneficial where the underlying determinants of health are the responsibility of other departments, such as housing, welfare, transport and education. **In all UK nations, we recommend the development of a unifying vision across Government that prioritises early years health and wellbeing. OHID, supported by the Cabinet Office and working with the CMO, as well as the networks of Chief Scientific Advisors and Permanent Secretaries across Government, could initiate this joined-up approach to improving child health.**

The Academy has previously called for the use of broader health evidence in the development of policies across Government departments to maximise the benefits to health and the economy.<sup>251</sup> **A unifying vision would promote the use of evidence related to child health in all policies. It would also support the coordination of resources across departments.** This is especially important in instances where spending in one Government department might be beneficial to a different department. The Sure Start programme described above was introduced in 1998 as a multi-departmental programme, and the current model of Family Hubs is a joint programme between DHSC and the Department for Education (DfE).<sup>252,253</sup> We are also aware of examples of resource coordination outside the sphere of child health. For example, the implementation of Employment Advisers in NHS Talking Therapies led to improved employment outcomes, leading to expansion of the programme with resource from DHSC, NHS England and DWP.<sup>254,255</sup> The Work and Health Unit, sponsored by DHSC and DWP, and led by OHID, is another example of a joint working and resourcing mechanism and aims to improve the health and employment outcomes for working age people who have, or may acquire, a disability or health condition. Such cross-working and cross-subsidy of programmes would ensure that departments are recognised for implementing child health policies that have a broader set of health and associated benefits. Crucially, any policy or interventions should be iterative, embedding learning and evaluation to ensure interventions are impactful and cost-effective (see Priority 4, below).

Ongoing commitments from consecutive Governments in all UK nations is needed to make child health a priority and improve outcomes for children. The concept of unifying children's policy development across Government has been outlined by many organisations. For example, UNICEF, the Royal College of Psychiatrists (RCPsych) and RCPCH are all calling for a cross-government strategy for early childhood.<sup>24,98,105</sup> Other mechanisms to coordinate cross-government working in child health exist and are outlined in Box 7. Despite differences in health systems and populations across the UK nations and internationally, these examples demonstrate that there are opportunities to share learnings to improve child health both in the UK and globally. We note that although this document focuses on the UK, many of the principles are also applicable in international contexts and the Academy encourages the Foreign Commonwealth and Development Office to engage with this as part of a cross-government discussion.

## Box 7: Examples of initiatives to prioritise and coordinate cross-government working in children

- **The Welsh Well-being of Future Generations Act:** the Act gives a legally-binding common purpose with seven wellbeing goals for national Government, local Government, local health boards and other specified public bodies in Wales. It details the ways in which they should think about the long-term impact of their decisions, to work better with people, communities and each other, and to prevent persistent problems such as poverty, health inequalities and climate change.<sup>256</sup>
- **Scotland's Minister for Children, Young People and Keeping the Promise:** this junior ministerial role has responsibility for the early years, child protection, creating positive futures, and for keeping 'The Promise' to ensure children grow up loved, safe and respected. The role supports the Cabinet Secretary for Education and Skills and directly reports to the First Minister on The Promise.<sup>257</sup>
- **The Chile Crece Contigo (Chile Grows with You) initiative:** this initiative was enshrined into law in 2009 to provide a universal platform to support early child development and has continued to progress despite changes in the Chilean Government.<sup>258</sup>
- **Abu Dhabi's Early Childhood Authority:** a Government body aiming to promote child development across health, child protection, family support and education in the early years.<sup>259</sup>
- **Singapore's task force on Child and Maternal Health:** this task force has been established in Singapore to drive improvements in child health and is responsible for addressing challenges related to children's policy.<sup>260,261</sup>
- **A proposed 'Health and Prosperity Act':** although not enacted, the Institute for Public Policy Research (IPPR) Commission on Health and Prosperity has recently proposed that the UK Government introduces a new Health and Prosperity Act to ensure health is considered across all Government policy development.<sup>78</sup> This would include introducing a 'healthy lives mission' for the UK; a new legislative body – the Committee on Health and Prosperity – modelled on the Climate Change Committee and designed to independently advise on the mission and hold Government accountable to it; a 'what works' centre focusing on interventions that support the health of the public; and dedicated funds to translate evidence into practice and provide a reliable source of long-term capital for health-creating innovations. With a focus on children, this type of mechanism could seek to ensure a long-term cross-government commitment to improving child (and adult) health.

### Priority 3: Address the decline in the child and family health workforce and fragmentation across sectors to deliver effective services for children



Our local children's hospital [...] was really backed up, so he had to have surgery [in another city two hours away] to get it done quicker. It was really hard on him.

Public contributor

The NHS, local authorities and community care all have a significant role to play in supporting families – including mothers, fathers, carers and siblings. However, the system is siloed, fragmented and overstretched, as reflected on by key stakeholders we spoke to, including public contributors, making it difficult for parents to access services in early childhood and for service professionals to act on family health and care issues in a timely manner.<sup>24</sup> For example, prior to the recent NHS reforms and the scale up of Integrated Care Systems (ICSs), in 42% of Clinical Commissioning Group areas in England children and young people's mental health services would not accept referrals for children aged 2 and under, despite the services nominally covering ages 0–18.<sup>38</sup> UNICEF is calling for a Baby and Toddler Guarantee to ensure all families with young children can access support services, such as maternity, health visiting and mental health services.<sup>24</sup> The Family Hubs and Start for Life programme aims to provide a physical space for those seeking advice on child and family health, parenting, finances, training and employment.<sup>253</sup> However, as mentioned above, this has not yet been evaluated.



If you look back 20 years ago [...] [and] even leading up to COVID [...] [services] started to get really reduced in the healthcare sector [...] parents are coming through to me now saying that they're on their own [...] and it is a really scary place for parents.

Public contributor

**There is a critical opportunity in the development of ICSs to coordinate work around the early years across the NHS, community care and local authorities in England.** We are pleased that leads for children have been assigned in each Integrated Care Board (ICB), and they have a duty to set out steps to address the needs of children and young people in their joint forward plans. We understand there is ongoing work within NHS England investigating how best to implement early years policy in these plans, which should address the acute pressures faced by existing child health and care services and consider preventative approaches to improve the health of future generations. We are aware of the Barnardo's Health Equity Collaborative which aims to gather insights into the challenges facing children's health at a local level and shape the way ICSs can address them.<sup>262</sup>

The paediatric and family health workforce is made up of many professions, including paediatricians, children's nurses, primary care workers, midwives and allied health professionals. The demand for child health services is higher than its capacity, with estimates from the RCPCH stating that a minimum of 856 extra paediatric consultants are needed in the UK.<sup>263</sup> The Nursing and Midwifery Council has reported that between 2022 and 2023 the number of children's nurses in the UK has grown by 3.5% (from 55,062 to 57,014).<sup>264</sup> It should be noted that the RCPCH has previously reported that there is significant geographical variation between the four nations (as well as within nations) and found that overall, between 2009 and 2019, child health nursing numbers have largely declined in England but increased in Wales and Northern Ireland (with no comparable data available for Scotland). Over that period, England saw a decline in all nursing numbers, with the exception of children's nurses in hospital, whereas Wales and Northern Ireland both, by and large, saw slight increases in child health nursing professionals between 2013–2019 and 2009–2019 respectively.<sup>263</sup>

Midwives are critical providers of care for pregnant women and continuity of midwifery care has been shown to reduce pre-term birth by 24%.<sup>48</sup> The number of midwives on the UK's Nursing and Midwifery Council register increased by 3.9% between 2022 and 2023 (from 40,163 to 41,716).<sup>264</sup> However, the Royal College of Midwives has found that between 2019 and 2023, the number of midwives rose just 1.1% in England, with only 247 additional midwives.<sup>265</sup> This increase has not kept pace with demand and the Royal College of Midwives reports a shortage of 2,500 full-time midwives in England.<sup>265</sup>

Health visitors are key to supporting families in the early years of a child's life, including through the Government's Healthy Child Programme.<sup>266</sup> However, the health visitor workforce in England has decreased by over a third (37%) since 2015 due to decreases in the Public Health Grant and a reduction in health visitor training places.<sup>266</sup> Analysis has been conducted to show that the average caseload for a health visitor working full time was 409 children per health visitor, compared to the recommended maximum of 250.<sup>267</sup> Organisations such as the Institute of Health Visiting are calling for investment in the sector to increase the numbers of health visitors. Others we spoke to have suggested that health visitors should closely integrate with primary care to better inform health referrals and prescriptions when necessary.

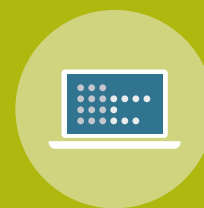
**We recommend that, in all UK nations, Government, the NHS and local authorities work together to address the decline in child and family health workforce.**



[We are] not always sure we can go to the health visitor, [...] assume we should try the doctor. We phone the doctor who says you need to speak to your health visitor.

Public contributor

## Priority 4: Collect, improve access to and link a broader range of data to facilitate research into interventions and policies that improve child health and wellbeing and their effective implementation



The UK has excellent national data assets but these are not often utilised to their full potential. Improved collection of and access to a broader range of qualitative and quantitative data across the life course on health, education, household income, social care, criminal justice and the environment offers enormous opportunity to further understand the drivers of child health, model long-term trends and identify opportunities for improvement. Governance and infrastructure issues cause delays in accessing data to monitor and evaluate interventions and support decision-making. The Academy has called for improved data collection and management on the wider determinants of health and health metrics at local, regional and national levels. **We call upon departments of health and public health bodies in all UK nations to review the existing mechanisms for collecting, accessing and linking data on the wider determinants of child health and wellbeing.**

There are several UK initiatives seeking to improve access to and use of data to improve health, including in the early years (see examples in Box 8). Coordination and expansion of these initiatives could support the development of a wide range of interventions to improve child health.

Linking data across sectors (health, education, income, social care) throughout the life course is challenging and some have suggested that a consistent, unique 'child identifier' assigned at birth could help to track and provide better data for monitoring of health, education and other outcomes in adulthood.<sup>24</sup> Others have suggested using the existing NHS number (or Community Health Index number in Scotland) as a unique identifier.<sup>276</sup> However, there are challenges around the establishment and use of unique identifiers which must be explored to protect the privacy and security of children. We heard that there has been some success in using Unique Property Reference Numbers to bring together pseudonymised data for households to identify those in need of intervention and inform service delivery – for example, those eligible for Healthy Start vouchers that may not have claimed them.<sup>277</sup> Unique Pupil Numbers could also be used to link to school data.<sup>277</sup>

When implementing interventions to improve child health, it is also vital that data are collected to enable their evaluation. **We recommend that Governments in all UK nations ensure that interventions and policies to improve child health and wellbeing are formally evaluated in accordance with the Government's Magenta Book to ensure they are impactful and cost effective.**<sup>25</sup> As outlined under Priority 2 above, identifying appropriate measures for outcomes could be useful in terms of recognising how they are interlinked and in turn could inform Government departmental budgets.

## Box 8: Examples of UK initiatives to improve access to and use of data to improve health, including in the early years

- The Education and Child Health Insights from Linked Data (ECHILD) project links data to better understand how education affects children's health, and how health affects children's education.<sup>268</sup>
- The Early Life Cohort Feasibility Study aims to collect data on the new generation of UK-born babies in their first year of life, including on economic and social environments and their health, wellbeing and development.<sup>269</sup>
- The UK National Neonatal Research Database holds a standard set of detailed clinical information on all admissions to NHS neonatal units and is used by a wide range of researchers across the public sector and industry, the NHS and policy-makers.<sup>270</sup>
- Health Data Research UK's (HDRUK) ongoing review 'Unifying Health Data in the UK' seeks to map and assess the flows of health-related data across the UK.<sup>271</sup>
- HDRUK is also establishing a Research Driver Programme looking to link localised social and environmental health-related data to existing, longitudinal administrative records from healthcare services, surveys and recruited cohorts.<sup>272</sup>
- The Office for National Statistics Health Index provides a systematic, independent view of health in England, enabling comparison of health over time and across geographies.<sup>273</sup>
- The Connected Bradford programme links routine data in an anonymised database across primary care, secondary care, community care and social care for over 700,000 individuals at Bradford Teaching Hospitals NHS Foundation Trust to improve patient pathways of care across the region and re-design models of care, research and evaluation.<sup>274</sup>
- The Secure Anonymised Information Linkage (SAIL) Databank in Wales holds de-identified datasets in linkable form and, following further safeguards, makes selected data available for analysis in anonymised form to approved researchers.<sup>275</sup>

**Priority 5: Ensure diverse child, parent and carer perspectives are represented in the development and implementation of new policies and interventions to facilitate their uptake and improve the likelihood of their success**



Listening to children, what they say, what they want, their needs [...] honouring every family, just talking and listening with them, that's what they need.

Public contributor

The United Nations Convention on the Rights of the Child articulates that every child has the right to enjoy quality healthcare and to be both physically and mentally fulfilled.<sup>278</sup> It also states that children have rights to express their opinions and be heard.<sup>278</sup> Gaining insights directly from young children is challenging for many reasons, including communication barriers and safeguarding requirements. However, young children's perspectives can be represented and should be if their rights are to be recognised and protected.<sup>279</sup> As was raised in our engagement with public contributors, involving children, parents and carers will assist in the development of successful interventions and policies that meet their needs. This must be done with a clear purpose, and should be inclusive of all groups impacted. Those that we engaged also felt that empowering children to have a voice could support their role in future decision-making. **We recommend that diverse voices and perspectives of children, through or in addition to their parents and carers, should be included in the development of policies and interventions to ensure they address their needs and that implementation is effective. This could enhance success by raising awareness and increasing uptake.**



At what point do we then start listening to that voice a little bit more as we're teaching them to be strong, independent, and express themselves?

Public contributor

Challenges exist in the evaluation of healthcare interventions for young children as there are limitations with both the methods and data to measure the health-related quality of life in pre-school children. The National Institute for Health and Care Excellence (NICE) has recognised that data from parents or guardians collected as part of a clinical trial could help inform interventions aimed at young children.<sup>280</sup> It identified several research priorities that would allow it to achieve this, including the psychometric properties of existing measures and the feasibility and validity of valuation studies.<sup>280</sup> Progress in these areas could help to ensure that the aspects of health-related quality of life which matter to children and their families are captured in NICE evaluations.

# Conclusion

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The health of the UK population is deteriorating, driving a rise in economic inactivity that threatens to continue unless the health and wellbeing of new generations is prioritised.<sup>1,4</sup> Addressing this requires an approach that focuses on improving health in the early years.

The scientific evidence from studies examining the development of health and disease shows that the early years provide a crucial window to improve child health, bringing short- and long-term benefits to individuals, population health and the economy, and avoiding the greater challenge and expense of intervening later in life.

Effective interventions exist and this document highlights examples from across cognitive development and physical health. There are other areas for intervention within and outside the medical context, including in sectors such as employment, crime and education, with potential synergies between policies that will benefit health.

We have identified five priorities that need to be urgently addressed, to secure benefits to the health and prosperity of the nation:

1. Implement effective interventions to improve child health and wellbeing and promote research to identify further approaches.
2. Establish a unifying vision across Government for the early years to overcome policy silos.
3. Address the decline in the child and family health workforce and fragmentation across sectors to deliver effective services for children.
4. Collect, improve access to and link a broader range of data to facilitate research into interventions and policies that improve child health and wellbeing and their effective implementation.
5. Ensure diverse child, parent and carer perspectives are represented in the development and implementation of new policies and interventions to facilitate their uptake and improve the likelihood of their success.

**We call on the current and future UK Governments to improve the health of our children and transform the wellbeing of the future adult population by prioritising improvements in health and wellbeing and reducing inequalities in the first 5 years of life. This will build a healthier, more prosperous society for all.**



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