Healthy lives
Early years
April 2016

This work is funded by the Health Foundation and produced by C3 Collaborating for Health. The Health Foundation is an independent charity committed to bringing about better health and health care for people in the United Kingdom.

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1. Executive summary

The aim of this paper (see section 2) is to provide background information and an overview of current evidence around factors affecting the health and wellbeing of children under five, set in the context of three themes from the Marmot Review *Fair Society, Healthy Lives*, namely: give every child the best start in life; enable all children, young people and adults to maximise their capacities and have control over their lives; and strengthen the role and impact of ill-health prevention. Like the other papers in this series (on Children and Young People, Workplace Health and Communities), it is a rapid review, not a full-scale systematic review of the literature.

Section 3 reviews the background and current position. While the health of UK children in many respects has improved over the last few years, progress does not compare favourably with similar countries in north and west Europe. There is increasing evidence that the most critical period in life is the first thousand days – from conception to age two. During this early period, development is very sensitive to disruption by environmental influences (such as maternal obesity, gestational diabetes, poor nutrition and exposure to environmental pollutants such as tobacco smoke, toxins, heavy metals and airborne microparticles). These can affect the growth and maturation of vital organs and the programming of key physiological and biochemical processes, and therefore impact on health later in life. This paper highlights the importance of addressing the deleterious impact of these environmental factors by intervening early, including before conception – exposure can impact on the offspring of potential fathers as well as mothers. Neonatal mortality is one example of a potentially preventable outcome, the main risk factors being preterm delivery and low birth weight. Other possible adverse outcomes, such as an increased risk of developing type 2 diabetes, cardiovascular disease or cancer, may not be evident for some years, and the risks can be decreased by appropriate interventions during childhood, adolescence and adulthood – but identification of those at high risk and early intervention aimed at prevention of adverse effects is the best approach.

There are some alarming statistics relating to health behaviours of UK children under five – for example, high levels of sugar intake and insufficient physical activity, which result in tooth decay and overweight/obesity. Rates of hospital admissions of children under five with rickets have been on the rise since the beginning of this century; so far, numbers of children affected are small, but it is unacceptable that this disease, which is entirely preventable, is found in the United Kingdom in the 21st century. It is significant that these cases occur mainly in children from disadvantaged families and this is just one example of the striking inequalities in health across the country - children living in the most deprived areas are significantly more likely to have poor health and lower academic achievement than their more affluent peers. One important mitigating factor is the quality of maternal and family relationships – according to the World Health Organization, ‘Warm and responsive caregiving is now known to extend some protection to children in otherwise adverse situations.’

There is a general consensus that early intervention to prevent/address an undesirable outcome is the most effective way to give children the opportunity to lead healthier lives into adulthood. In section 4 the evidence base around some relevant interventions is presented. They vary from legislation to counselling, motivational interviewing, use of internet/social media and educational/self-help materials. There is a variety of targets (individuals, families, teachers, health professionals) and locations (the home, school, health care settings, the community) – or combinations thereof. On the basis of the systematic reviews listed in section 4.2 the research-based evidence is mixed and at best reported modest positive outcomes, although it is argued that this may have a significant impact at the population level. Multicomponent interventions seemed to be more effective than those with single components. The methodology is difficult and several review authors commented on poor study design, small sample size and short duration.

In section 4.3 a number of cases are described that have been introduced in practice and evaluated (or have ongoing evaluation planned). They include Sure Start and the Family Nurse Partnership, which have involved significant investment on the part of government, on the basis of positive benefits for disadvantaged children that have been demonstrated in other countries; so far, the evaluations indicate less positive impact in the United Kingdom, suggesting that interventions may need to be specifically tailored to the national or local circumstances. Examples of more focused interventions implemented by local authorities are also described, with some initially positive results, but whether these are sustainable in the longer term is uncertain. These case studies illustrate the challenges/difficulties in knowing what has
worked and what hasn’t, and often suffer from the fact that they are funded for a specific time and are vulnerable to economic trends and that the continuously changing landscape makes evaluation difficult. In an attempt to unravel this, the Department for Education has set up SEED – Study of Early Education and Development – which is following thousands of English children from age two through to their early years at school. The findings can be followed over the next few years.

Therefore, addressing the first Marmot principle – give every child the best start in life – is challenging and the best place to start is preconception and the first thousand days of life, followed by the preschool years, as discussed in section 5. When, where and how to intervene is not clear, despite all the efforts from researchers and practitioners to ascertain a reliable evidence base. What is clear is that all young children need high-quality care and education, with support for their parents/carers that is sensitive to social and cultural differences, and that politicians and policymakers must be convinced of the resulting economic benefits.
2. Introduction

This aim of this briefing paper is to provide background information and an overview of current evidence around factors affecting the health and wellbeing of children from 0–5, together with examples of interventions designed to prevent or address health-deterring behaviours. A further, complementary report in this series explores the health and wellbeing of children and young people from ages 5–19. Both papers are presented as part of the wider Healthy Lives programme, which also looks at community and workplace health.

The paper particularly highlights issues to address three of the themes in the Marmot Review, Fair Society, Healthy Lives (Marmot 2010):

- give every child the best start in life;
- enable all children, young people and adults to maximise their capabilities and have control over their lives; and
- strengthen the role and impact of ill-health prevention.

3. The big issues – the current position

While there have been considerable improvements in child health worldwide, there are still a number of areas that are causing concern in the United Kingdom, one of which is how poorly the UK fares in health and wellbeing league tables when compared with other affluent countries, particularly in Europe. This section highlights the importance of the first thousand days of life (conception to age two), maternal and family relationships and other lifestyle and environmental factors that are of particular concern for the health of children under five. It also highlights the part that social disadvantage appears to play in health inequalities in the United Kingdom, and its impact on infants.

3.1 The first thousand days

NHS Choices (Pregnancy and Baby Care) (NHS Choices 2016b) provides extensive advice on health and lifestyle factors for pregnant women and mothers of infants and young children to help them give their child the best start in life – including healthy diets for pregnant women, the harm smoking and alcohol can cause the unborn baby, and breastfeeding. However, the importance of the first thousand days of life, starting with conception, is not widely recognised, despite the increasing body of research showing that early development (the period from conception – and therefore preconception – to age two) is very sensitive to disruption by environmental influences that affect the risk of developing non-communicable diseases (NCDs) in later life (Wadhwa et al. 2009; Hanson and Gluckman 2014). This relatively new area of research is known as DOHaD (Developmental Origins of Health and Disease) and there is evidence that the risk of developing NCDs in later life can be passed on to future generations through the process of epigenetics.

‘Barker’s hypothesis’ emerged in the early 1980s ‘from epidemiological studies of birth and death records that revealed a high geographic correlation between rates of infant mortality and certain classes of later adult deaths as well as an association between birth weight and rates of adult death from ischemic heart disease’ (Wadhwa et al. 2009). These observations led to the theory that under nutrition during pregnancy programmes the metabolism of the developing foetus and that this can lead to an increased risk of developing NCDs in later life. A number of other factors can disrupt early development, including maternal obesity, infant overfeeding with formula products, preterm birth, gestational diabetes and exposure to tobacco smoke, toxins and pollutants such as heavy metals and airborne microparticles (Hanson and Gluckman 2014). Exposure to harmful environmental factors can affect development of vital organs (including the heart and brain) and the programming of biochemical and physiological processes (for example, the immune system and the satiety response), which have impacts on health throughout later life.

The impact of air pollution is highlighted in a recent report from the Royal College of Physicians and the Royal College of Paediatrics and Child Health, Every Breath We Take: the Lifelong Impact of Air Pollution (RCP/RCPCH 2016). Damage can start from conception and particularly vulnerable times are gestation,
infancy and early childhood when the young body is growing and developing rapidly. The most vulnerable are those who live in deprived areas that have poor housing and indoor air quality with limited access to green space, and those who spend significant time near busy roads. There is also some evidence that these environmental factors can affect the epigenetic genome of the sperm of potential fathers, and hence the development of their offspring (Soubry 2015).

In 2004, the International Society for Developmental Origins of Health and Disease was set up to promote multidisciplinary research in this area. A white paper published in the journal *Environmental Health* (Barouki et al. 2012) concluded that the DOHaD evidence was robust enough to justify future investment in research and disease-prevention strategies that are targeted at the period of early life, including gestation. A recent supplement in *Reproductive Health* was devoted to preconception care and highlights the importance of nutritional advice for women of child-bearing age, particularly adolescents (Dean et al. 2014) and the need for better understanding of the possible adverse effects of substance abuse on future pregnancies (Lassi et al. 2014).

Following this, the UK’s National Childbirth Trust programme, The First Thousand Days (NCT 2016), was set up; it seeks to educate and support parents from pregnancy through to education of young children. NCT is also carrying out a major study to find out what life is like for today’s parents in the first thousand days.

The link between early development and health in later life has led to the argument that ‘if we act early we can prevent harm’ (Bertram and Pascal 2014). This report stressed that a mix of universal and targeted interventions is the best way forward. This is particularly important in the case of preterm infants, who are more susceptible than children born at term to abnormalities that affect their future health and wellbeing, such as motor development, behaviour and school performance (Moreira et al. 2014).

### 3.2 Infant mortality

A 2014 report for the Royal College of Paediatrics and Child Health (Wolfe et al. 2014) showed a steady and continuing decline in infant mortality rates over 30 years, yet in 2012 more than 3,000 babies died in the United Kingdom before their first birthday and 523 children died between the ages of one and four. The review highlights that the United Kingdom performs poorly on several measures of child health and wellbeing, including mortality, with stark differences in survival between rich and poor – and concludes that many children’s deaths are potentially preventable (estimates suggest that 21 per cent involve modifiable factors).

Infant mortality can be divided into neonatal mortality (deaths up to 27 days after live birth), and post-neonatal mortality (deaths from 28 days to 12 months). In the United Kingdom, the majority of infant deaths occur in the neonatal period, and the main influences are preterm delivery and low birth weight; risk factors include maternal age (mothers under 20 and over 35 being the most vulnerable), smoking and disadvantaged circumstances. Injuries are the most frequent cause of death after the first year of life (Wolfe et al. 2014).

International comparisons of infant mortality can be difficult because of differences in definitions and collection of data. However, latest figures show that the UK’s infant mortality rate of 3.8 per 1,000 live births in 2013 is falling, but is still behind many other European countries, with Finland and Iceland the lowest at 1.8 (OECD 2016). Data from the European Perinatal Health Report (cited in Wolfe et al. 2014), based on harmonised definitions and data, show that neonatal deaths for babies born at 24 weeks or more are 0.8 per 1000 live births in Iceland compared with 2.0 in England and Wales, 2.1 in Scotland and 3.0 in Northern Ireland. Romania has the highest rate at 4.3. The report argues that more children survive in countries where wealth is shared more equitably than those that have wide gaps between the very rich and the very poor and conclude that ‘social and economic inequalities are matters of life and death for children’.

Among its recommendations the Wolfe report calls for more robust action on smoking cessation in pregnancy, research to strengthen the evidence-base for child mortality, with a particular focus on better understanding the causes of prematurity and low birth weight, and enhanced promotion of breastfeeding.
3.3 Maternal and family relationships

The importance of maternal and family relationships was stressed in a World Health Organization review of theories and evidence on the role of caregiver–child relationships in the survival and healthy development of children (WHO 2004). It found that those ‘whose care is disturbed or distorted in some way, are at risk of not receiving sufficient nutrition, being subjected to stress, not growing well, not being psychologically stimulated and of developing malnutrition. Warm and responsive caregiving is now known to extend some protection to children in otherwise adverse situations.’ According to the report, this is true for children worldwide, although it recognises that most research in this area has been carried out in developed countries. It stresses the extent to which poverty – the most important exacerbating factor in child development – places stress on the relationship within families, including between mother and child. Other adverse childhood experiences (ACEs), such as the death of a parent, separation/divorce, and physical or sexual abuse can also have negative effects on health and wellbeing later in life (Sacks et al. 2014; Hughes et al. 2016) (see the Children and Young People paper in this series, section 3.7).

The quality of the parents’ relationship impacts on children’s behaviour problems at ages three and five, according to a paper based on the UK Millennium Cohort Study (Kiernan and Garriga 2014). These researchers found that a warm relationship with the mother did not reduce the detrimental effect of a poor relationship between parents, and that maternal conflict exacerbated it. The effect of the quality of the parents’ relationship was strongest amongst children from poorer families.

Using data from the same cohort, economic deprivation and/or maternal depression has been shown to reduce the cognitive and emotional wellbeing of children; this is attributable, at least in part, to less nurturing and engaged parenting (Kiernan and Huerta 2008). A review discussing the evidence for associations between parental mental disorders and offspring outcomes, from foetal development to adolescence, concluded that some of the factors underlying transmission of disturbance, such as quality of parenting, are potentially modifiable (Stein et al. 2014). Most of the interventions reviewed in that study are about maternal depression and provide support for the proposition that emphasis should be on both treating the parent’s disorder and helping with associated caregiving difficulties. The study underlines the need for early identification of parents at high risk and for more early interventions and prevention research, especially in socioeconomically disadvantaged populations and low-income countries.

3.4 Early years and lifestyle behaviour

3.4.1. Diet, exercise and obesity

The World Health Organization Global Strategy on Diet, Physical Activity and Health, which was adopted by the World Health Assembly in 2004, highlights childhood obesity as one of the most serious public-health challenges of the 21st century because overweight and obesity in childhood are likely to continue in adulthood and lead to an increased risk of developing non-communicable conditions such as cardiovascular disease and diabetes at a relatively young age (WHO 2004). The WHO’s Commission on Ending Childhood Obesity (ECHO) reported in 2016, emphasising that many children are growing up in an obesogenic environment that results in energy imbalance from a combination of a high-energy diet (encouraged by the accessibility and marketing of high-calorie foods) and a sedentary lifestyle. The report concluded that no single intervention can halt the rise of the growing obesity epidemic and that there need to be effective strategies to address the obesogenic environment, bearing in mind the effects at critical stages in the life course (i.e. preconception/pregnancy, infancy/early years and childhood/adolescence) (WHO 2016).

Risk factors for overweight/obesity are poor diet and lack of exercise, and NHS Choices provides extensive advice and recommendations for a healthy diet (NHS Choices 2016b) and physical activity levels (NHS Choices 2016a) for pregnant women and children under five. The importance of a healthy diet in pregnancy – with plenty of fruit and vegetables and avoiding an excess of sugary and high-fat foods – is highlighted, and there is advice on taking supplements such as vitamin D and folic acid. There is also information on breastfeeding, expressing breast milk and bottle feeding.
The NHS recommends that infants are exclusively breastfed for at least six months and then breastfeeding is continued for another six months while other foods are introduced. However, the results of an international survey of breastfeeding reported in *The Lancet* found that **only 34 per cent of UK women breastfeed for six months**, and only 0.5 per cent continue to breastfeed for 12 months (Victoria et al. 2016). This compares badly with other high-income countries – for example, in Norway 35 per cent of women continue to breastfeed for 12 months, while in low-income countries such as India the figure is over 90 per cent. The authors also described evidence for the health benefits of breastfeeding both to the mother (it protects against breast cancer, and possibly also ovarian cancer) and child (it protects against infection and may also decrease the risk of obesity and developing diabetes). They concluded by pointing out that protection, promotion and support of breastfeeding is directly relevant to Goals 2 (improve nutrition) and 3 (ensure healthy lives and promote wellbeing for all at all ages) of the Sustainable Development Goals (UN 2015).

Recognising the importance of nutrition for the under-fives, since 2015 the government has provided 189ml of free milk a day for children attending approved day-care facilities for two hours or more (Nursery Milk Scheme 2015).

Latest figures (PHE 2016a) show that 9 per cent of children entering reception classes at age 4–5 are **overweight or obese** and, although there are signs that childhood-obesity levels are levelling off (van Jaarsveld and Gulliford 2014), Public Health England has warned that there is no room for complacency because obesity rates continue to rise among the most deprived children. The consequences of obesity are not just a concern in later life – obesity is damaging for young children, with diagnosis of type 2 diabetes in children as young as seven, and increased risks of asthma, sleep disturbance, mental-health disorders and musculoskeletal problems (PHE 2016b). Risk factors for overweight/obesity are poor diet and lack of exercise, and NHS Choices provides extensive advice and recommendations for a healthy diet (NHS Choices 2016b) and physical-activity levels (NHS Choices 2016a) for children under five.

**Excess sugar intake** is a particular issue that was recently reviewed by the Scientific Advisory Committee on Nutrition (SACN 2015a). In light of the available evidence, the Committee recommended new, lower levels of sugar intake; free sugars should make up no more than 5 per cent of daily energy intake for everyone over two years old, and children aged 4–6 should not consume more than 19g (or five sugar cubes) a day, which would rule out many popular fizzy drinks and juices. The ‘obesogenic’ environment that promotes high levels of sugar intake is discussed further in section 3.2.3 of the briefing paper on Children and Young People in this series.

**Lack of physical activity** is also an issue of concern (BHF 2015); only 9 per cent of children aged 2–4 in England meet the recommendations of three hours of physical activity a day, and 84 per cent are active for less than one hour per day. Negative effects on weight, cognitive development and psychosocial health are associated with high levels of screen time, and this is influenced by the time families as a whole spend watching screens. Screen use in children under three is also linked to negative health outcomes, including increased BMI, decreased cognitive and language development and reduced academic success according to a systematic review (Duch et al. 2013). 68 per cent of these under-threes use screen media (such as television, DVDs and video games) on a daily basis and there is evidence that high levels of sedentary behaviour in early life tend to continue throughout childhood.

A study involving 87 teachers of four- to six-year-old preschool children from six European countries (de Decker et al. 2013) found that teachers perceive shortage of space as one of the main reasons for lack of physical activity, and report that children in this age group spend more time on computers than watching television. The authors recommend interventions that raise teachers’ awareness and support them in finding ways of enabling children to be more physically active.

### 3.4.2 Tooth decay

The first national survey of the oral health of three-year-old children in England was published in September 2014 (PHE 2014). It found that 12 per cent of the children surveyed had dental decay and, while this meant that a large majority had entirely healthy teeth, the wide variations across the country was cause for concern – **from 2 per cent in some areas to 34 per cent in others**. On average, children affected had three decayed teeth. Public Health England is encouraging parents and carers of young children to take
steps that will help prevent tooth decay in this age group, stressing that without lifestyle changes there is a much higher chance of decay in permanent adult teeth. And the SACN report (SACN 2015a) on carbohydrates and health included a review of studies showing a link between intake of sugar in children’s diets and dental caries – hence the recommendation that children aged 4–6 should not consume more than 19g of sugar a day (see section 3.4.1).

3.4.3 Rickets

Rickets – a condition that affects bone development in infants and children because of inadequate vitamin D or calcium intake – is preventable and virtually disappeared from the western world during the 20th century. It is therefore alarming that in England hospital admission rates for rickets are now on the increase, with children under five the most likely to be affected (Goldacre et al. 2014). Rates were low in the 1960s and 1970s, falling further in the 1980s and 1990s. Prevalence started to rise again in 2000 – a rise seen in the white population but more common in the non-white population; it is argued that there is a case for a national confidential audit of rickets.

Vitamin D can be made by our bodies if there is sufficient sunlight; however, in the United Kingdom, particularly in winter, adequate levels can only be achieved in most people by ensuring that the diet has sufficient natural vitamin or by taking supplements. There is increasing evidence that vitamin D may play a role in many biological processes, including brain development and functioning of the immune and cardiovascular systems, but a draft report on vitamin D and health by SACN (2015b) concluded that its effect on musculoskeletal outcomes should be a basis for setting new recommendations for vitamin D intake. This draft has been out for consultation and the responses are currently being analysed. Current recommendations for vitamin D intake for pregnant women and their babies can be found on NHS Choices (NHS Choices 2016c).

3.4.4 Health inequalities

There are striking variations across the country in health, cognitive behaviour and wellbeing of children under five. The National Children’s Bureau observes that ‘simply by growing up in a certain part of England a child is more likely to have poor health that will impact the rest of their lives’ (NCB 2015). It uses the latest published data for England to analyse variation in four key outcomes for children’s health and development in the early years: obesity in four- to five-year-olds; tooth decay in five-year-olds; hospital admission due to injury in the under-fives; and children achieving a good level of development by the end of reception. Comparisons are made across English local authorities and regions using the Indices of Multiple Deprivation to assess the link between the extent of deprivation in a local authority area and early-years health and development outcomes.

Comparing the 30 most deprived local authorities with the 30 most affluent, the report finds that children under five in poor areas are significantly more prone to obesity, tooth decay, accidental injuries and lower educational development. For example:

- reception-age children in Barking and Dagenham are over two and a half times more likely to be obese than a child of the same age in Richmond upon Thames, only 18 miles away;
- a five-year-old in Leicester is over five times more likely to have tooth decay than a child of the same age in West Sussex; and
- young children on the Isle of Wight are over four times more likely to be admitted to hospital with an injury than their counterparts in Westminster.

A literature review of early years (Bertram and Pascal 2014) revealed the growing extent of child poverty, inequality and social immobility and the widening extent and nature of early childhood inequality, both in the United Kingdom and internationally. The authors say their findings chime well with Marmot’s early-years recommendations, namely the need to:

- reduce inequalities in the early development of physical and emotional health, and cognitive, linguistic and social skills;
• ensure high-quality maternity services, parenting programmes, childcare and early-years education to meet need across the social gradient; and

• build the resilience and wellbeing of young children across the social gradient.

As well as highlighting the deprivation attributed to poverty, the review examined the ethnicity and gender gaps in early educational achievement, concluding that working-class boys, regardless of ethnicity, are likely to be one of the most deprived groups.

4. What works and what doesn’t

4.1 Introduction

There is a general consensus among researchers that early intervention to prevent/address an undesirable outcome is the most effective way to give children the opportunity to lead healthier lives into adulthood (Bertram and Pascal 2014; Early Intervention Foundation 2015; Hanson and Gluckman 2014; Stein et al. 2014; Wadhwa et al. 2009; Wolfe et al. 2014). **Targets for intervention** include the child, the mother’s health during pregnancy, the family setting, the local environment including preschool, and the national context/government policies. Outcome measures include various aspects of child development, parenting as assessed through interaction between the parent and child, and the development of knowledge and skills of parents, carers and teachers. The *Early Years Literature Review* (Bertram and Pascal 2014) points out that, while there is little doubt that early intervention can contribute to combating educational and health disadvantages, the design of interventions and the approach to service delivery is crucial to success. They report that the most effective are early, intensive, multisystem approaches that include education and the involvement of trained professionals as a core activity.

A review of six major European studies (Inskip et al. 2014) proposed that **early intervention should start before conception**. The authors considered that a woman’s education has a strong influence on her own and her children’s health behaviours and that psychological barriers are important contributors to a poor diet and lack of exercise. They suggest that a good way to start improving the education of women of child-bearing age is school-based interventions aimed at adolescents.

4.2 Research-based evidence

There is an enormous research literature reporting on evidence of the effectiveness of a whole range of interventions designed to improve the prospects of a healthy life for infants and young children. Documents published by Public Health England (PHE 2015), the Early Intervention Foundation (Early Intervention Foundation 2015), and the Local Government Association and National Foundation for Educational Research (Easton and Gee 2012) provide information about the evidence base underpinning a variety of programmes available in the UK (Annex 2: Table 1).

Annex 2: Table 2 gives some examples of recent systematic reviews that present analyses of the research-based evidence for a variety of interventions targeted at pregnancy/early childhood. These are just a small fraction, not necessarily representative, of the available literature, but they do give some idea of the issues associated with this type of research. The interventions range from legislation (the smoking ban) to counselling, motivational interviewing, use of internet and social media, and educational/self-help materials. Some interventions are targeted at individuals, others at families, teachers or health professionals, and locations can be in the home, school, health-care settings or the community, or a combination thereof. Outcome measures also vary widely, including measurements of child development, diet, physical activity and parenting skills.

The **methodology is difficult** and the study designs vary from randomised controlled trials (RCTs), through quasi-experimental designs, to qualitative research and assessment. Several authors questioned the quality of the studies they reviewed; particular issues highlighted were small sample size, short duration and general poor study design. Although RCTs are considered to be the ‘gold standard’ in drug trials, their
application to lifestyle interventions is difficult because there is a multitude of confounding factors and to allow for these adequately requires very large numbers of participants.

Across these examples there were relatively few instances of anything more than modest positive outcomes, though several authors commented that multicomponent interventions were more effective than single components. Furthermore, it is not even clear to what extent smoke-free legislation has played a part in reductions in preterm births (see Annex 2: Table 2).

4.3 What is happening in practice? Practice-based evidence

The evidence base for public-health interventions has traditionally relied on findings from empirical studies/research-based evidence such as those listed in section 4.2. However, a recent systematic review (Ng and de Colombani 2015) highlighted the importance of considering ‘practice-based evidence’ and proposed that successful interventions should meet most of the following criteria: relevance, community participation, stakeholder collaboration, ethical soundness, replicability, effectiveness, efficiency and sustainability. In addition, even if there is very good evidence that a particular intervention is effective, policymakers and local commissioners increasingly want evidence of the extent of potential cost savings on implementation (Easton and Gee 2012).

This section highlights some case studies of interventions that have been/are being implemented and evaluated.

4.3.1 Examples of national, multicomponent programmes

The UK government has recognised the need to provide children under five with the best start in life and has set up a number of studies and programmes to achieve this. As long ago as 1998 the Blair Government set up the Sure Start programme, mainly across England but with slightly different versions in Scotland, Wales and Northern Ireland. The aim was to establish local centres in disadvantaged areas where help and advice would be available to parents of young children and, in some cases, provide early learning and day care for pre-school children. Originally the network of local projects was funded centrally, but control of children’s centres moved to local authorities in 2005. Evaluation is ongoing, carried out by the National Evaluation of Sure Start (NESS) team at Birkbeck College, London.

The effectiveness of Sure Start has been controversial with little in the way of positive outcomes reported initially, but the NESS evaluation (NESS 2010) demonstrated significant positive effects for eight of 21 outcomes when over 7,000 disadvantaged families and their five-year-olds who had been involved in Sure Start Local Programmes were compared with similar families in areas where Sure Start was not available. Among the Sure Start children there was evidence of lower BMI and better physical health; mothers/families reported more stimulating and less chaotic home environments, less harsh discipline, and greater life satisfaction. However, significantly more mothers in Sure Start areas reported depressive symptoms and parents in these areas were less likely to visit schools for planned meetings. A further evaluation when children reached seven years old (NESS 2012) compared 15 outcomes relevant to child and family functioning in over 5,000 families recruited from 150 Sure Start areas with similar families outside a Sure Start area. There was a significant effect on mothers, who reported that as a result of Sure Start they were providing a more stimulating home learning environment and engaging in less harsh discipline; significantly more reported a less chaotic home environment for boys (for girls this was not significant) and single parents and workless households reported better life satisfaction.

The NESS team points out that on most outcomes no difference was found and that most of the improvements affected parents and families rather than children, and that there are methodological challenges associated with longer-term follow-up. However, they suggest that the value of Sure Start children’s centres is improving, although greater emphasis needs to be given to focusing services on improving child outcomes, particularly language development, if school readiness is to be enhanced for the children served.

The Education Committee of the House of Commons considered evidence for the effectiveness of Sure Start centres. Its report concluded that these centres are popular and well used, but there is a lack of clarity in their purpose. The report (House of Commons Education Committee 2013) recommended a review of
the core purpose of Sure Start centres and consideration of a tripartite model with three types of centre, offering different levels of service: full centres, based around nursery schools; centres that are part of schools; and family centres. Local authorities must be more accountable for the performance of these centres. However, the coalition government did not agree that the core purpose was in need of review (House of Commons Education Committee 2014).

The future/evolution of Sure Start has been a matter of debate by successive governments since its launch in 1998. A briefing paper (Bate and Foster 2015) that summarises the history of Sure Start centres in England concluded by noting the recommendations in a pre-election report from the All Parliamentary Group on Sure Start Children’s Centres that, whichever government took office after the election, Children’s Centres should be at the heart of local service provision, and that in June 2015 the parliamentary under-secretary of state for schools stated that there would be a consultation to consider the role of Sure Start.

The 150 local authorities in England have received funding to deliver the Parenting Early Intervention Programme (discussed in detail in the briefing paper on Children and Young People, section 4.2.1.3). This is weighted towards disadvantaged families and is made up of evidence-based programmes that have been implemented successfully outside the United Kingdom. Three of the programmes (Families and Schools Together (FAST) and Strengthening Families, Strengthening Communities, which both originated in the United States, and Positive Parenting Program (Triple P), which originated in Australia) include children under five and were shown to be effective in improving outcomes for parents and children, with these outcomes maintained one year on from the end of the programme. There was a positive effect on parents’ mental wellbeing and style of parenting, as well as on their children’s behaviour (Lindsay et al. 2011).

The Family Nurse Partnership (FNP) is based on another programme that has been successfully implemented in the United States. It is a home-visiting programme aimed at helping first-time mothers aged 19 or under to have a healthy pregnancy, improve their child’s health and development, plan their own futures and achieve their aspirations. A specially trained family nurse visits the young woman regularly, from the early stages of pregnancy until her child is two. Using a psycho-educational approach and a focus on positive behaviour change, FNP provides intensive support for mothers and babies, as well as fathers and other family members if mothers would like them to take part.

FNP was introduced in England in 2007 and is delivered nationally (135 local authorities signed up) through the FNP National Unit. A randomised controlled trial commissioned by the Department of Health (Robling et al. 2015) found some improvements, for example in early language development at 24 months, and possible protection of children from serious injury, abuse and neglect, with some small improvement in mothers’ social support, relationship quality and self-efficacy. The women were positive about the programme and felt it had helped them to be good parents. They especially valued the close and trusting relationship with their family nurse. However, the authors concluded that FNP did not have an impact across the study’s four main short-term outcomes – prenatal tobacco use, birth weight, subsequent pregnancy by 24 months and A&E attendances and hospital admissions in the first two years of life. Results were less positive than trials of the US scheme, which the authors suggest may be explained by the young mothers not being as disadvantaged as those in the US trials, as well as the higher levels of universal and specialist services available in the United Kingdom.

Two programmes designed to improve outcomes for children under five have been implemented and evaluated in the Republic of Ireland. The Early Years Programme of Childhood Development is a high-quality, two-year early-childhood care and education programme run by the Childhood Development Initiative in Tallaght West, an area with a high proportion of families described as living in poverty and supported by the Irish Department of Children and Youth Affairs and Atlantic Philanthropies. An evaluation of the programme (Hayes et al. 2013) examines its effects on children’s cognitive, language and social development, on parental stress and the home-learning environment, and on programme quality. The two-year curriculum-based intervention involved a practitioner-to-child ratio of 1:5, which is more favourable than the national comparison of 1:6 or higher for a similar service. Observation of children’s learning enabled practitioners to develop child-centred follow-up work plans in collaboration with parents during home visits. Nutritious food, physical play and recreation opportunities were provided, as well as specialist
primary health-care support in the areas of dental hygiene and psychological assessment, with access to a dedicated speech and language therapist to support children in their language development.

Modest benefits compared to a control group were observed in a number of areas across different elements of the intervention. The strongest was in the quality of the curriculum and activities provided in intervention services. In terms of outcomes for children, gains were indicated in areas such as improved behaviour and social skills, child attendance, and better speech and language prognosis on entry to school. An ‘indirect’ effect on parenting was discovered, with the quality of the home-learning environment being positively associated with the number of parent sessions attended, but further follow-up is needed to determine if children and their siblings are likely to benefit in the long term from a more positive home-learning environment.

The **National Early Years Access Initiative (NEYAI)** is a three-year programme aimed at improving quality and outcomes in Ireland’s early-years sector. NEYAI comprises 11 projects mainly located in disadvantaged areas of Dublin, Cork and Limerick and two rural locations. It was officially launched by the Irish government in June 2011 when it was described as being made up of local demonstration projects with ‘a focus on evidence-based practice and ongoing project evaluation for the purpose of advising future policy and the mainstream provision’.

NEYAI projects involved children aged 0–6 and their parents; they were multidimensional, operating across many sites, and could include staff training and mentoring, parenting courses, family support services and interagency collaborations, across many sites. This diversity of activity and lack of common themes created challenges for the national evaluation (McKeown et al. 2014). To overcome this, the evaluation focused on one age-group of children, namely those attending the 2012/13 Free Pre-School Year, and compared child outcomes in NEYAI with those in the Síolta Quality Assurance Programme (Síolta QAP), which is a 12-step quality improvement process for early-years centres. The report found that children taking part in both NEYAI and Síolta QAP improved during the course of the intervention in all areas covered by the internationally used Early Development Instrument, which covers physical health, social competence, emotional maturity, language and cognitive development, communication skills and general knowledge. However, because there was no control group the contribution made by NEYAI or Síolta QAP to these improvements was unclear.

### 4.3.2 Examples of more focused interventions implemented by local authorities

In addition to national, multicomponent initiatives, there is a whole host of interventions being delivered by local authorities. Some examples are described in the boxes. Healthy Early Years (HEY), Healthy Exercise Nutrition for the Really Young (Henry) and TrimTots involve courses for children and their parents aimed at addressing diet and health behaviours. Positive results have been demonstrated for all, but much longer-term follow-up is needed to see if these changes are sustained.

In partnership with local stakeholders, Lambeth Council has introduced a multicomponent programme for pregnant women – LEAP (Lambeth Early Action Partnerships). One component, aimed at pregnant women with a BMI of more than 25, has had positive effects on health behaviours.

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**Case study 1: Healthy Early Years (HEY) course**

HEY is delivered by the Community Health and Learning Foundation, funded by Danone Nutricia. It takes the form of a health-literacy intervention lasting seven weeks, targeting parents of children aged 1–3 who live in deprived communities, and covering healthy eating, shopping on a budget and cooking from scratch. Providers around the country include 61 children’s centres and two local authorities – Leicestershire County Council and Buckinghamshire County Council.

External evaluation findings (Shared Intelligence 2015) indicate improvement in knowledge about healthy behaviours, which has led to changes such as increased fruit and vegetable intake and involvement of toddlers in cooking.
Case study 2: The Henry Programme (Healthy Exercise Nutrition for the Really Young)

This is an educational intervention that aims to protect pre-school children from the physical and emotional consequences of obesity, working with families and practitioners across 32 local authorities. It takes the form either of an eight-week course for parents/carers or, in the case of families with young children at high risk of becoming obese, one-to-one sessions.

An evaluation (Willis et al. 2013) found significant positive benefits, including better working relationships between families and professionals, increased consumption of fruit and vegetables and lower intake of sugar, positive changes in mealtime behaviour and reduced screen time.

Case study 3: TrimTots

A multicomponent programme with an emphasis on family involvement and learning through art and play, TrimTots aims to prevent obesity in children aged 1–5. The 24-week intervention is delivered as one two-hour session per week. It includes nutrition education, physical activity and behaviour-change components offered at children’s centres throughout the country. It has been assessed in two randomised control trials with the findings published in The Lancet (Lanigan et al. 2013). The trials indicated favourable results in terms of BMI and waist circumference.

Case study 4: Lambeth Early Action Partnerships (LEAP)

Funded over 10 years by the Big Lottery, as part of its A Better Start programme, LEAP supports families from pregnancy until the child reaches the age of four, working with a range of stakeholders to improve services. The programme addresses the social, emotional, communication and language development of babies and children, and their diet and nutrition, as well as parents’ wellbeing, their social networks and the strength of their communities and wider environment. It includes peer support through the creation of Parent Champions.

Serving one of the most diverse communities in Britain, the South London initiative has two current projects – Community Activity and Nutrition (CAN) and Family Foundations – both of which are evidence-based according to the LEAP website (LEAP 2016). Aimed at pregnant women with a BMI of more than 25, CAN offers eight weekly group sessions with a health trainer as well as supporting materials to encourage healthy lifestyles. CAN was evaluated as part of a wider national study, UPBEAT (UK Pregnancies Better Eating and Activity Trial). Results published in The Lancet investigated whether the programme could reduce the incidence of gestational diabetes and large-for-gestational-age infants (Poston et al. 2015). While there was no evidence of any impact on this primary element of the study, the programme was found to be effective across a number of outcomes, including improved diet, increasing physical activity, reducing gestational weight gain, and decreasing surrogate measures of maternal body fatness. Overall, the authors conclude that the intervention does provide a means to improve healthy behaviours in obese pregnant women.

The second live project, Family Foundations, is a course for couples expecting their first baby together, currently being piloted. Intervention begins between weeks 20 and 30 of the pregnancy and is aimed at couples expecting their first baby, including same sex-couples and surrogate pregnancies, as well as those with additional needs or mild-to-moderate depression and anxiety. Seven 90-minute sessions are spread over the course of seven weeks, delivered by two family support practitioners to small groups of couples. A midwife attends one of the pre-birth sessions and a health visitor is present at one of the post-birth sessions for questions and answers. There is a break of about 10 weeks for all the women to give birth, during which there will be social opportunities for members of the group to meet up.
4.4 Do we know what works and what doesn’t?

This section has given a small insight into the number of different interventions that are being implemented in parallel across the country to address some of the key issues around the health and wellbeing of children under five. They all have an ‘evidence base’ but, as demonstrated by the Family Nurse Partnership, interventions that are effective in one situation do not necessarily give such positive results in a different context. Evaluation is difficult, particularly if a project evolves over time and against a continually changing environment; therefore, even with longer term follow it will be difficult to assess the contribution of investments such as Sure Start. Furthermore, a major problem identified in the Early Years Literature Review is that many targeted programmes do not meet the criteria for quality and efficiency, and projects are often temporary and vulnerable to economic trends. It concludes that: ‘The policy challenge is to rebuild the current systems so that they meet the crucial design features; provide high-quality early education and care for all children, and outstanding health and social care support for parents and families; are integrated, attractive and affordable to all families regardless of social class or minority status; yet, are sensitive to differing needs, working in a child and family-centred way and able to compensate for early disadvantages’ (Bertram and Pascal 2014).

In an attempt to unravel what works and what doesn’t, the Department for Education has set up SEED – Study of Early Education and Development – to help provide evidence on the effectiveness of early-years education and short- and longer-term benefits from its investment in this area. Undertaken by NatCen Social Research, the University of Oxford, 4Children and Frontier Economics, it follows thousands of children across England from the age of two through to their early years at school. The latest report (Speight et al. 2015) provides descriptive findings from the first wave of the longitudinal survey of parents. More than 5,600 families took part in the baseline survey over the period from October 2013 to November 2014. Most children were two years old at the time and the aim of the study is to set the scene for the impact reports that will be available later in the evaluation. As one of the aims of the evaluation is to explore the extent to which high-quality early years provision can improve outcomes for children, especially for those from disadvantaged backgrounds, families were looked at in three groups: disadvantaged; moderately disadvantaged and not disadvantaged.

The findings generally highlight clear differences between these groups across a number of factors. Children from birth to age two from the most disadvantaged families are the least likely to receive formal childcare or early education. However, after turning two, when the government support became available, over half the children in all three groups were receiving formal childcare.

Children from the most disadvantaged families (and therefore less likely to receive childcare) had substantially less developed language skills compared with the children from families that were moderately disadvantaged or were not disadvantaged. Within these two groups there was evidence that those who received childcare before age two had better language skills than their peers who did not experience nursery/preschool.

Disadvantaged children were reported by their parents to be showing less positive behaviour on the ASBI scale and more negative behaviour. However, while early formal childcare was not linked to less negative behaviour, it was associated with more positive behaviour in all groups.

The next stage in the SEED process is an impact analysis that will be able to draw on data from follow up surveys when the children are aged three and four. It will also aim to unpick the complexity of factors contributing to outcomes for children in different economic circumstances.

5. Challenges and gaps

5.1 Introduction

Some aspects of the health of UK children (such as infant mortality and childhood obesity) have improved over the last few years, although the levelling-off of obesity masks serious inequalities. However, the rate of progress has not compared favourably with similar countries in north and west Europe, and the increases...
(albeit relatively small) in children under five with tooth decay and rickets, which are both easy to prevent, are unacceptable in the 21st century. It is also clear that the biggest burden of childhood disease falls on those living in deprived areas. Politicians and policymakers are well aware of the importance of the importance of the health of mothers and their children in the very early years, as demonstrated by various inquiries and reports from parliamentary Select Committees and government departments (such as Childhood Obesity – Brave and Bold Action (House of Commons Health Committee 2015) and Public Health England reports (PHE 2014 and 2015). The challenge is that they also need to consider political issues and be convinced that proposed interventions have cost–benefits or are cost-effective.

5.2 The first thousand days
As discussed in section 3.1, there is increasing evidence that the first thousand days of life (conception to age two – and therefore preconception) are the most critical because development during pregnancy and early life is very susceptible to a range of environmental factors – for example, diet, exposure to microorganisms, tobacco smoke, drugs and air pollution. The challenge is how to communicate the importance of the preconception period and first thousand days and how the lifestyle of potential parents can influence the health of their children. This must be conveyed in a sensitive way – while parents bear a big responsibility over this time, it would not be constructive if they end up bearing a burden of blame. Who, therefore, should be the primary target? Adults of childbearing age, families, health and social practitioners, community organisations, policymakers?

5.3 Children aged two to five years
It is important that preschool children learn healthy behaviours from the start, thus setting down a healthy lifestyle for the future. Particular areas of concern are poor diet and sedentary behaviour (often linked to the time spent on screens). Maternal and family relationships play a critical role during this period, and children brought up in a household beset with family conflict have an increased risk of developing health problems. The challenge is how to engage with families at risk (which are often ‘hard to reach’) and support them in developing parenting skills and understanding how lifestyle factors contribute to the health of their children.

5.4 Interventions

5.4.1 Introduction
All the environmental health-deterring factors highlighted in section 3 are, in theory at least, potentially modifiable. There is general consensus that early intervention is important and there is an enormous amount of information available on healthy lifestyles for pregnant women and parents of young children, but it is not clear how much this advice is taken up and the importance of the preconception period tends to be overlooked.

The findings from research into interventions is confusing and at best there seem to be modest benefits, although it has been argued even small positive effects can have an impact at population level. The government has invested significant amounts in interventions such as Sure Start and the Family Nurse Partnership, which are aimed at preschool children from disadvantaged families. Both are being evaluated and so far the outcomes have been disappointing, despite the fact that they were evidence-based and that the Family Nurse Partnership had been successfully implemented in the United States. The Parenting Early Intervention Programme seems initially to be more promising. On a smaller scale many local authorities offer relatively short-term interventions such as the HENRY programme and the Healthy Early Years Course, which seem to have positive benefits in the short term. What is uncertain is whether they have a long-term impact and how sustainable they are.

5.4.2 The early stages of research into interventions
As indicated in section 4.2, there are some major scientific challenges in demonstrating the effectiveness of interventions to address lifestyle and health behaviours. These include:
• study design – the ‘gold standard’ randomised controlled trial is difficult to set up in a lifestyle situation and other designs often suffer from lack of adequate control groups;

• difficulties in recruitment and retention of participants, leading to small sample sizes that are prone to bias;

• short duration of the studies;

• choice of outcome measures, which are often proxies for health outcomes; and

• the effect of confounding factors (which may be known or unknown) on the results.

The challenge for researchers (and funders and publishers of scientific journals) is to ensure that preliminary intervention research is robust. The challenge for those who are looking for research-based evidence to support implementation of an intervention is to know what to make of all the confusing and conflicting findings! These challenges hold true for all the areas covered in these briefing papers.

5.4.3 Implementing and evaluating interventions in practice

As indicated in section 4.3 there are major challenges in evaluating interventions that have been implemented in practice, and the benefits from some major investments such as Sure Start and the Family Nurse Partnership, which had positive effects in other countries, seem to be less evident in the United Kingdom. This suggests that, for each intervention, the local context (social, cultural and economic) needs to be taken into account. The challenge for policymakers and practitioners is to know how to adapt evidence-based interventions to their local situation and how to evaluate impact in the face of a continually changing environment, which includes parallel relevant interventions.

There are, therefore, some major challenges in fulfilling the three Marmot themes – to give every child the best start in life, to enable all children, young people and adults to maximise their capacities and have control over their lives, and to strengthen the role and impact of ill-health prevention. In particular:

• identifying and engaging with children and families at risk, many of whom are likely to be ‘hard to reach’;

• finding the best way to communicate the message of the importance of the first thousand days of life;

• identifying the most appropriate way to intervene – this may vary, depending on the individual context;

• assessing the evidence base from economic and practical as well as scientific standpoints.

6. Talking points

• Preconception and/or the first thousand days – are these the most important points to intervene?

• How do we make sense of the confusing and conflicting ‘evidence’ around interventions?

• Are interventions where there is evidence for small positive outcomes worth pursuing because, assuming these outcomes are the same at the population level, there will be positive effects on relatively large numbers of participants?

• What is the best strategy to reach the ‘hard-to-reach’ families?
Annex 1: Key players

There is a host of organisations who commission and/or fund research and evaluation into the health of young children. The resources listed below are selected from the large number available, and a short description, URL and (where appropriate) important publications of the organisations appear in the DebateGraph mapping that accompanies this scoping project. (Contact letcher.rice@c3health.org for more information.)

****

- American Academy of Child and Adolescent Psychiatry
- ASH – Action on Smoking and Health
- Barnado’s
- Big Lottery Fund
- Bill and Melinda Gates Foundation
- British Association for Early Childhood Education
- British Heart Foundation
- British Nutrition Foundation
- Bromley-by-Bow Centre
- CEDAR – Centre for Diet and Activity Research
- Centre for Longitudinal Studies
- Childhood Development Initiative
- Children and Young People Scrutiny Committee
- Children and Young People’s Health Outcomes Forum
- Children and Young People’s Services Committees
- Children’s Society
- Community Health and Learning Foundation
- Danone Nutricia Early Life Nutrition
- Department for Communities and Local Government
- Department for Education
- Department of Health
- Early Intervention Foundation
- Economic and Social Research Council
- EPODE
- Faculty of Public Health
- Family Nurse Partnership
- Health and Social Care Information Centre
- Health Complexity Group
- Healthy Child Programme (Department of Health)
- HENRY – Health Exercise and Nutrition for the Really Young
- HEY – Healthy Early Years
- Inclusive Change
- Inclusive Neighbourhoods
- Institute of Alcohol Studies
- Institute of Child Health (UCL)
- International Diabetes Federation
- International Society for Developmental Origins of Health and Disease
- Joseph Rowntree Foundation
- LEAP – Lambeth Early Action Partnerships
- LGA Knowledge Hub
- Local Government Improvement and Development
- Medical Research Council
- Mental Health Foundation
- MIND
- MyTime Active UK
- National Centre for Health and Clinical Excellence
- National Child Measurement Programme (Health and Social Care Information Centre)
- National Childbirth Trust
- National Children’s Bureau
- National Foundation for Educational Research
- National Institute of Mental Health
- Nesta
- NHS Alliance
- Nuffield Trust
- Nutrition Society
- Prevention and Early Intervention Network
- PROMISE – Paediatric Research in Obesity Multi-modal Intervention and Service Evaluation programme
- Public Health England
- RAND Europe
- Robert Woods Johnson Foundation
- Royal College of Midwives
- Royal College of Nursing
- Royal College of Obstetricians and Gynaecologists
- Royal College of Paediatrics and Child Health
- Royal College of Physicians
- Royal College of Psychiatrists
- Royal Society for Public Health
- Save the Children
- SEED – Study of Early Education and Development
- SHINE HIT – Supporting Healthy Inclusive Neighbourhood Environments
- Sure Start
- TrimTots
- Trussell Trust
- UK Health Forum
- Understanding Society
- UNICEF
- Wellcome Trust
- World Health Organization
- World Obesity Federation
## Annex 2: Evidence tables

### Table 1: Summaries of the evidence base for early-years interventions

<table>
<thead>
<tr>
<th>Title</th>
<th>Reference</th>
<th>Interventions</th>
<th>Findings</th>
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<tbody>
<tr>
<td>Rapid review to update evidence for the Healthy Child Programme 0 to 5</td>
<td>PHE 2015</td>
<td>Rapid review updating the evidence base that underpins the current Healthy Child Programme for 0–5s (the previous update was in 2009). It focuses on interventions that work across key areas: parental health (smoking, alcohol/drug misuse, intimate partner violence); preparation and support for childbirth and transition to parenthood; attachment; parenting support; unintentional injury in the home; safety from abuse and neglect; nutrition and obesity prevention; speech, language and communication.</td>
<td>Some of the new evidence identified comes from the 18 pieces of guidance published by NICE since the previous review. For example, new recommendations on helping pregnant women to stop smoking based on evidence that some health-care professionals have negative perceptions about intervention efficacy.</td>
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<tr>
<td>The best start at home</td>
<td>Early Intervention Foundation 2015</td>
<td>This is the first What Works review commissioned by the Early Intervention Foundation on UK-based early interventions for children from conception to the start of primary school. It considers interventions that enhance parent–child interaction with a view to improving three important outcomes: attachment and parental sensitivity; social and emotional development; and language and communication.</td>
<td>The review found 100 programmes around the UK that met its criteria, all included in an annex to the report. These projects are to be reviewed in greater detail so that recommendations about efficacy and cost effectiveness can be made. 32 of the programmes are looked at in more detail in the report.</td>
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<tr>
<td>Early Intervention: Informing Local Practice</td>
<td>Easton and Gee 2012</td>
<td>Review of early intervention approaches to inform the practice of local authorities. Examines the impact of the Healthy Child Programme, Family Nurse Partnerships, and Parenting Early Intervention Programme.</td>
<td>Overall, the evidence reviewed shows that the case for investing in early intervention approaches to improve outcomes for children, young people and families and to bring about cost savings in the longer term is widely accepted and supported. Investing early in the life of a problem, or when children are younger, can have greater benefits in the long term and is therefore likely to be most cost effective. It is the extent of potential cost savings that increasingly needs to be identified and evidenced to enable policymakers and local commissioners to make informed decisions.</td>
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### Table 2: Smoking – systematic reviews

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<td>Effect of smoke-free legislation on perinatal and child health: a</td>
<td>Been et al. 2014; Frazer et al.</td>
<td>The first review (2014) analyses the impact of smoke-free legislation locally (five studies in North America) or nationally (six European countries). Together they cover 2.5 million births and 247,168 asthma exacerbations. Risk of bias was high for one study, moderate for six and low for four. The second review (2016) covers 21 countries.</td>
<td>The analysis in the Been et al. review suggests that smoke-free legislation is associated with substantial reductions in preterm births and hospital attendances for asthma. There was no significant effect on low birth weight. However, the Frazer et al. review, which covers 21 countries, concluded that the results on premature births were inconclusive, although it did find a positive effect on cardiovascular health outcomes at the population level.</td>
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<td>systematic review and meta-analysis</td>
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<td>Legislative smoking bans for reducing harms from second-hand</td>
<td>Miyazaki et al. 2015</td>
<td>Smokers may have psychosocial as well as health problems. This review investigated the evidence that psychosocial interventions for smoking cessation are effective during pregnancy. 35 articles, covering studies in high-, middle- and low-income countries met the search criteria. Intervention programmes included health education, face-to-face counselling, telephone counselling, websites, text messaging, other self-help materials, and multi-component intervention programmes.</td>
<td>There were considerable variations in the prevalence of smoking during pregnancy across the countries studied, reflecting differences in social, cultural and ethnic backgrounds. However, as a general rule, women who experienced socioeconomic disadvantages, problems with interpersonal relationships, higher stress, depression, less social support, and who engaged in health-risk behaviours were more prone to smoking during pregnancy. The authors concluded that psychosocial interventions, such as counselling, can be effective methods for increasing smoking cessation and should be focused on the needs and characteristics of the individual.</td>
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<td>smoke exposure, smoking prevalence and tobacco consumption</td>
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<td>Smoking cessation in pregnancy: psychosocial interventions and</td>
<td>Brown et al. 2015</td>
<td>Reviews interventions designed to promote smoke-free home environments for infants and young children. Most focused on reduction/cessation of parental smoking and reducing environmental tobacco smoke in the home. The approaches included motivational interviewing and counselling. Primary outcome measures were based on self-reporting of smoking status.</td>
<td>Most of the studies were rated as fair quality and only four reported statistically significant positive effects. However, the report suggests that interventions to reduce second-hand smoke exposure may be more successful in families with young children than interventions aimed at stopping family members smoking or relapsing. It also suggests that there is a need for a range of interventions (including targeting the social and psychodynamics of the family) to support families in creating a smoke-free home environment, and that they should be tailored and targeted to specific populations. They also highlighted issues around stigmatisation of family members who smoke.</td>
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<td>patient-focused perspectives.</td>
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<td>Title</td>
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<td>Impact of interventions to prevent obesity or improve obesity-related behaviours in children (0–5 years) from socioeconomically disadvantaged and/or indigenous families: a systematic review</td>
<td>Laws et al. 2014</td>
<td>Reviews evidence for interventions targeting prevention of unhealthy weight gain and/or obesity-related behaviours in disadvantaged children. Most studies used a (cluster) RCT design. Delivery was in the home, primary healthcare settings, at preschool or in the community, mainly by trained volunteers or health professionals. Primary outcomes included anthropometric measures, child/family diet and physical activity.</td>
<td>The interventions initiated in infancy (under two years) had a positive impact on obesity related behaviours (e.g. diet quality) but their longer-term impact on weight is unknown. For children aged 3–5, the findings were mixed, but the more successful interventions required high levels of parental engagement, use of behaviour-change techniques, or a focus on skill building rather than just knowledge acquisition and links to community resources. Less than 10 per cent of studies were high quality.</td>
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<td>A systematic review of types of healthy-eating interventions in preschools</td>
<td>Mikkelsen et al. 2014</td>
<td>Reviews interventions to promote healthy eating in preschools. 26 studies, mainly from North America, were included. Eight involved single interventions (e.g. promoting fruit or vegetable intake; generally low quality, with small numbers), 11 were educational (i.e. designed to increase the children’s knowledge of healthy eating; generally better quality but some had serious limitations such as lack of a control group or high drop-out) and seven were multicomponent (i.e. used more than one strategy to influence eating behaviour; these were the best designed but some had high drop-out rates).</td>
<td>There was evidence suggesting that healthy-eating interventions increased fruit and vegetable consumption and nutrition-related knowledge among the target groups, indicating that preschools are potentially a useful setting for influencing children’s food choices. However, this review highlights the scarcity of properly designed healthy-eating interventions using clear indicators and verifiable outcomes.</td>
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<td>Obesity prevention in the preschool years</td>
<td>de Silva-Sanigorski and Campbell 2012</td>
<td>Analyses eight studies that involved obesity-prevention interventions targeted at children under five years old. They were delivered in different ways – at home, or in health-care or education settings. Five incorporated both diet and physical activity strategies, three just physical activity. The primary outcome was BMI.</td>
<td>Overall the impacts were positive but modest, with larger effects in the home-based or health-care settings than in education settings. However, numbers were small and the quality of the study designs was low.</td>
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Table 4: Parenting – systematic reviews

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<td>Systematic review of parenting interventions in European countries aiming to reduce social inequalities in children’s health and development</td>
<td>Morrison et al. 2014</td>
<td>Reviews 23 studies, mostly from the United Kingdom and Republic of Ireland, designed to improve parenting skills. Study designs varied – RCTs, experimental and quasi-experimental studies, before-and-after evaluations, and qualitative research assessments. They involved offering intensive support, information/home visits, psycho-educational approaches, and some had additional components such as day-care provision, improving housing conditions and speech or psychological therapies. Outcomes were parenting behaviours, children’s health and cognitive functioning.</td>
<td>Interventions with the best outcomes combined activities such as workshops and educational programmes for both parents and children, beginning early in pregnancy, and including home visits by trained staff. The authors noted that some studies had small sample sizes, which make the study vulnerable to chance variation.</td>
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<tr>
<td>Review of relationship-based interventions for low income families with infants and toddlers: facilitating supportive parent-child interactions</td>
<td>Mortensen and Mastergeorge 2014</td>
<td>Meta-analytic review examining the effectiveness of 19 studies aimed to improve relationships in socioeconomically disadvantaged families with infants and toddlers. It focuses on the effectiveness of interventions in improving supportive parenting behaviours, as measured by observational assessments of dyadic parent–child interactions. Randomised and non-randomised study designs were included.</td>
<td>Intervention characteristics such as participant randomisation, breadth of intervention services offered, duration, child age at the start of the intervention, professional qualifications of the intervener, and type of play task used during assessment were tested as possible moderators of effectiveness. Significant differences in effectiveness were found between randomized and non-randomised interventions. Within the subsample of randomised interventions, programmes that were shorter in duration, that provided direct services to the parent–child dyad, used interveners with professional qualifications, and assessed parent–child interactions with free-play tasks were the most effective. The review suggests that these factors should be considered when designing intervention protocols to meet the needs of this high-risk population.</td>
</tr>
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All URLs correct as of 31 March 2016


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