Early Nutrition for Later Health: Time to Act Earlier

A report from the Infant and Toddler Forum

Supported by an unrestricted educational grant from Danone Nutricia Early Life Nutrition

Infant & Toddler Forum

Practical advice for healthy eating habits from pregnancy to preschool

Foreword

The UK is facing a health crisis related to poor diet. One third of our children, two thirds of adult men and just over half of adult women are overweight or obese[1].

Diabetes levels have doubled in the past two decades[2,3] and more than a quarter of five year-olds have tooth decay from eating sweets, sugary foods and drinks[4]. For around half of us, diets are too high in saturated fats and sugar, and for some, low in essential micronutrients such as iron, folate and iodine[5]. In addition, our lifestyles have changed, with less physical exercise and exposure to sunshine, which contribute to obesity and vitamin D deficiency.

The health consequences of this poor diet and lifestyle are both immediate and long-lasting. Type-2 diabetes, once considered a disease of middle age, is becoming increasingly prevalent[6], fuelled by an epidemic of obesity at ever younger ages. Overweight children are likely to become obese adults[7]. One in three adults is pre-diabetic[8] and by retirement age almost three quarters will be overweight or obese[9]. Over £5bn is spent by the NHS each year dealing with health problems associated with excess body weight[10], and despite a decline in recent years, cardiovascular disease remains the biggest cause of death in the UK[11].

Public health bodies have taken a number of measures to improve the national diet. Initiatives such as Healthy Start, the Change4Life programme, action on food labelling and the Public Health Responsibility Deal, have had limited impact[12,13,14]. The Infant and Toddler Forum (ITF) has contributed to these public health initiatives by producing a range of evidence-based resources to help healthcare professionals (HCPs) and parents to improve the diets of young children.

Previously, the ITF has focussed chiefly on the nutrition of children aged one to three: the forgotten years between weaning and school[15]. However by the time children start school, poor diet and sedentary lifestyle may have already laid the foundation for later ill health[16].

We know that what happens to children in their earliest years, and even before birth, is critical to health in adult life. Poorly nourished mothers are more likely to give birth to babies who are more likely to suffer ill health in later life[17]. Deficiencies (of folate for instance) or excesses (such as of alcohol) in the maternal diet can have harmful effects on fetal and infant neurodevelopment[18,19]. Clearly, if we are to halt this process we need to act earlier.

This report outlines the growing evidence that good early nutrition not only protects against deficiency diseases such as rickets, neural tube defects and anaemia, but also against a range of long-term adverse health outcomes such as obesity, cardiovascular disease, atopic disease and poor cognitive function. It shows that while healthcare policies generally support early intervention on issues such as folate, breastfeeding, weight management and vitamin and mineral supplementation, current nutritional, health and lifestyle advice often falls short of these aspirations.

There is an important 'window of opportunity' between preconception and the early postnatal years of life during which nutritional advice and dietary and behavioural change is best received and most likely to be effective[20].

Women are more likely to adopt healthier behaviours if they receive advice from HCPs, particularly before conception[20]. Unfortunately current provision of support during this critical period is insufficient, partly because frontline healthcare practitioners are struggling to cope with growing numbers of complex births[21], many of which are related to maternal obesity. While mothers are happy with the support they receive from their GPs and midwives, most (particularly young mothers) say they want more nutritional advice during pregnancy[22]. Many HCPs are unable to offer this owing to a lack of training in nutrition during pregnancy[22]. Over 70% of HCPs think nutrition advice is important prior to and during pregnancy[22], but they lack the resources and practical guidance to help them to deliver it.

This report makes the case for giving greater priority to nutrition guidance in preconception and pregnancy, during this critical 'window of opportunity' to improve the health of the next generation. The ITF has therefore widened its educational mission to include a mother's nutrition and health status before, during and after pregnancy. By taking a life-course approach to nutrition and health, its aim is to help HCPs and other early-years workers support and empower families to make healthy lifestyle choices that offer their children the best start in life.

Atul Singhal
Chairman of the
Infant and Toddler Forum

Early nutrition and later health

Optimal nutrition in early life not only gives a newborn baby the best start in life, but may also have lifelong positive effects in reducing the risk of a number of chronic diseases, such as diabetes, cardiovascular disease and some cancers[23].

A newborn baby depends on its mother for nutrition. Maternal health and nutritional status before conception, through pregnancy and during lactation, are critical determinants of the health and development of the unborn baby and growing infant. Some nutrients are especially important at particular stages of pregnancy.

Early life – the period between conception and weaning – may be seen as a 'critical period', when the way a fetus is nourished in the womb and how a baby is fed after birth, can determine his or her immediate health, growth and development, but also 'programme' later health and risk of disease. There is emerging evidence of an 'intergenerational effect' whereby a child born poorly nourished may carry adverse health consequences into adulthood and pass them on to the next generation[24].

The notion that early nutrition affects long-term health is not new. Animal studies in the 1930s showed a link between postnatal feeding and lifespan[25]. The meat industry alters the growth rate and weight of calves and lambs, and the dairy industry the volume and quality of milk through the manipulation of the diet of mothers and their offspring. Studies of smaller animals have shown that the quality and quantity of the nutrition that the young receive in the uterus and after birth in milk, can have profound long term effects on their body size, rate of growth and later health[26].

These studies have led to the concept of 'nutritional programming' – whereby the supply of nutrients in early life (in the womb and during milk feeding) can permanently affect the structure and function of organs and tissues of the body and thereby nutrition and metabolism, affecting health many years later. Support for the concept of programming comes from human studies linking low birth-weight and weight at one year with adult cardiovascular disease and diabetes[27,28], and animal studies showing direct relationships between maternal diet and cardiovascular disease and metabolic disorders[29]. While these diseases are usually considered to be diseases of adulthood due to poor diet and lifestyle, they have their beginning much earlier in life, in part as a result of poor maternal and infant health and nutrition.

Based on current evidence, there are four areas in which poor maternal diet and lifestyle can affect the health of offspring in early life and have long-term adverse health consequences.

1. Specific nutrients

There are a number of specific nutrients whose deficiency in pregnancy can have both immediate and long-term effects on the health of the young. For example:

Folate and folic acid – babies born of mothers who have low folate status at the time of conception and in the first weeks of fetal neurodevelopment are at risk of neural tube defects such as spina bifida. Low folate status in adolescents has also been found to increase the risk of having a baby that is small for gestational age (SGA)[30]

Vitamin D – maternal deficiency of this micronutrient increases the risk of rickets, hypocalcaemic seizures and cardiomyopathy in a baby[31], and lower bone density at nine years of age[32]

Iodine – maternal deficiency of iodine during pregnancy can damage a baby's brain development leading to permanent mental retardation[33]. Even minor levels of deficiency during pregnancy in the UK have been shown to reduce IQ levels in eight year-old children[34]

Iron – deficiency of this essential mineral can cause anaemia, tiredness and fatigue in the mother and increase the risk of low birth-weight in the baby[35]

Omega-3 fatty acids – these essential fatty acids are critical for brain development and vision[18], and the fetus is dependent on the mother to supply them in the womb and to the infant in milk[19]

2. Energy/calories

The rising rate of maternal obesity in the UK[36,37] is of particular concern because of the associated risk of pregnancy-related complications such as pre-eclampsia, gestational diabetes, thromboembolism, stillbirth, neonatal death, overweight babies and preterm birth that it presents[38]. Maternal obesity is linked to an increased risk of the child becoming obese later in life[39] and suffering from cardiovascular disease[40]. It has also been shown that underweight babies (with intrauterine growth restriction from poor maternal diet or placental function) whose 'catch-up' growth progresses too quickly are more likely to develop insulin resistance, dyslipidaemia, high blood pressure and obesity in later life[41].

3. Alcohol, smoking and drugs

Two units of alcohol per week during the first trimester of pregnancy increases the risk of premature birth, and pregnant women drinking two or more units also have an increased risk of a lower birth weight infant[42]. Excess alcohol consumption during pregnancy (>10 units per day) leads to diminished fetal growth, with intrauterine growth restriction and low birth-weight babies who are often born with morphological abnormalities and impairment of the central nervous system leading to delayed neurodevelopment[42]. Maternal smoking during pregnancy increases the risk of miscarriage, stillbirth, premature birth, and sudden infant death syndrome[43,44,45]. Drug-taking in pregnancy is associated with damage to the fetus and neonatal abstinence syndrome (NAS)[46].

4. Mode and quality of infant feeding

Some of the strongest evidence for a link between early nutrition and long-term health derives from research into the benefits of breastfeeding. Human milk feeding has been shown to improve cognitive function[47], reduce the risk of some infections and atopic disease in children with a family history of allergy. The growth rates of breast-fed babies, which differ from those that are formula-fed, appear likely to protect them against respiratory disease, diabetes and obesity in childhood and its later consequences including cardiovascular disease in adult life[48].

Early life – a window of opportunity

Early life is therefore an important 'window of opportunity', when the potential health and life chances of infants and children can be maximised, and the risks of poor health, growth and development can be minimised.

The first 1,000 days of life, the period between conception and second birthday, are the focus of this report, which aims to present a life-course approach to optimising health[49]. It focuses particularly on maternal health and nutrition during pregnancy, in-line with the UK cross-party 1001 Critical Days Manifesto, which calls for a holistic approach to antenatal and postnatal health services from conception to the toddler years[50].

A large and growing body of clinical, epidemiological and experimental research has informed and underpinned many maternal and child health services, programmes, interventions and initiatives. However there are inconsistencies and gaps, made all the more worrying because of the inexorable rise in obesity and its serious medical consequences and associations, of diabetes and cardiovascular disease and some cancers, which have their genesis, in part, in early life.

There is insufficient emphasis on the importance of early health interventions, ideally starting before mothers conceive, during pregnancy, and through childbirth and infancy, which requires a continuity of healthcare provision to mothers, babies, toddlers and children. Such a life-course approach is vital. The gaps between health policy and implementation are addressed next in this report, followed by a review of the obstacles to achieving effective pre-, peri- and postnatal nutritional recommendations, concluding with a life-course approach to delivering comprehensive joined-up health care during this early years 'window of opportunity'.

Health policy versus effective implementation

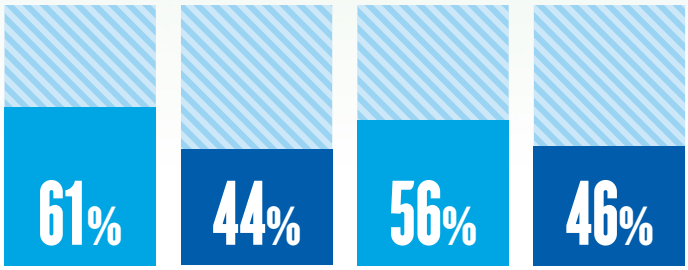
There are gaps between health policy and effective implementation of nutritional advice and nutritional supplementation; compliance with guidance is fragmented, often inconsistent and ineffective.
For example:

	Policy	Implementation
Folic Acid	The Department of Health recommends a daily supplement of 400µg of folic acid to women pre-conceptually and until the 12th week of pregnancy[51]. A higher dose (5mg) is prescribed for women at higher risk[52]. Healthy Start supplements are recommended throughout pregnancy[53].	Although folic acid supplements have been promoted since the mid-1990s, only around one third of women take them before conception and only 46% during pregnancy[22].
Breastfeeding	Exclusive breastfeeding is recommended from birth until around six months of infant life, with continued breastfeeding alongside complementary feeding thereafter for as long as the mother and child wish[23].	Over three-quarters of mothers breastfeed their babies at birth, but only 46%, 23% and 1% are still exclusively doing so at one week, six weeks and six months respectively[54].
Vitamin D	The Department of Health recommends all pregnant and breastfeeding women take a 10µg supplement of vitamin D every day. Infants and young children aged six months to five years should also take daily vitamin D drops[51].	Many women begin pregnancy with low vitamin D status and use of supplements is low[32]. Of 39% of women who were not taking supplements, 46% did not see the need for extra supplementation when pregnant[22]. Non-caucasian pregnant women with darker skin are particularly likely to have low levels of vitamin D[55]. 77% of parents are unaware of their child's daily dietary requirement of vitamin D and over 30% have never had information about the need for vitamin D[56].
Iodine	The WHO recommends pregnant women have 250µg of iodine per day[57]. The UK RNI for pregnant women of 140µg/day of iodine has not been reviewed for many years and is now considered to be too low.	10 – 22% of girls and young women in the UK have daily iodine intakes below both these figures and many meet the WHO definition of 'mild iodine deficiency'[58,59]. Over 30% of mothers and mothers-to-be lack information on iodine[22].
Iron	NICE recommends iron supplements for women with haemoglobins <110g/l in the first trimester of pregnancy and <105g/l at 28 weeks gestation[60]. Pregnant women should be offered screening for anaemia. Screening should take place early in pregnancy (at the booking appointment) and at 28 weeks when other blood screening tests are performed. This allows enough time for treatment if anaemia is detected[60].	10% of women of childbearing age have low haemoglobin levels, indicating iron deficiency[5].
Maternal obesity	There are currently no UK guidelines on appropriate weight gain during pregnancy. NICE recommends that maternal obesity is best tackled before women become pregnant[61].	Many UK health professionals use guidelines compiled by the US Institute of Medicine[62] (table 1). Maternal obesity in the UK is rising[36,37]; around 16% of women are obese and 50% of women are overweight at the start of pregnancy[61]. 65% of pregnant mothers lack advice on weight management during pregnancy and only 10% of HCPs always offer this[22].
Childhood obesity	NICE has issued guidelines on managing overweight and obesity among childhood and young people[63].	Public Health England estimates that >30% of 10-11 year olds and >20% of 4-5 year olds are overweight or obese[64] and these rates are not decreasing. Many interventions to tackle childhood obesity exist but there remains a lack of high-quality evidence with effective outcomes. Programmes are still not widely available for all families[65].

A UK picture of pregnancy health

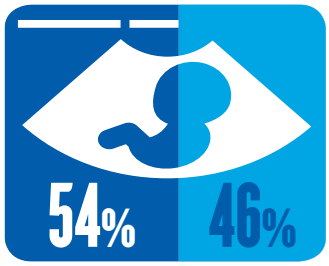
Data from a survey of 1,000 mothers or mothers-to-be, and 150 healthcare professionals, including midwives, health visitors, GPs, lactation consultants and nursery nurses[22].

Taking dietary supplements



- **61 per cent** of pregnant mums are currently taking supplements
- **44 per cent** started taking supplements before they got pregnant, however, **more than half (56%)** didn't start taking any until after they discovered they were pregnant
- Of the mums not taking supplements, **46 per cent** say it's because they don't see the need for extra supplementation during pregnancy, while **more than a third (36%)** said supplements have made them ill in the past

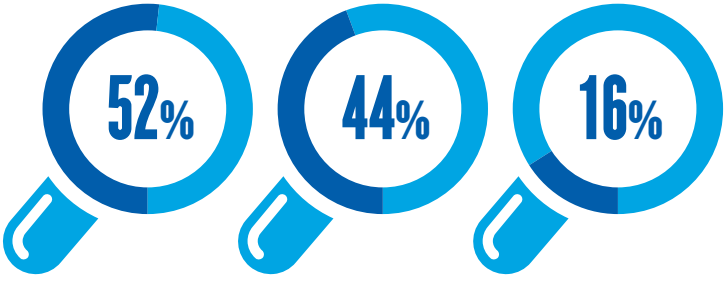
Lifestyle changes



- While **more than half of mums (54%)** said they have made other dietary changes relating to their pregnancy, **just under half** made no dietary changes **(46%)**

Seeking advice

- **More than half of the respondents (52%)** said that apart from healthcare professionals, they go to family for advice on nutrition and lifestyle in pregnancy
- **44 per cent** said they get their advice on nutrition and lifestyle from books, while just **16 per cent** get their advice on nutrition and lifestyle from antenatal classes



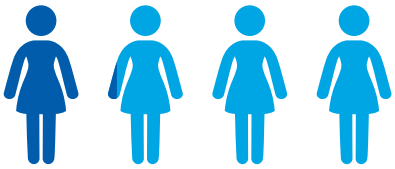
Physical activity and weight gain

68 per cent of mums

- Said their midwife or GP did not give them any advice about weight gain before, during or after their pregnancy

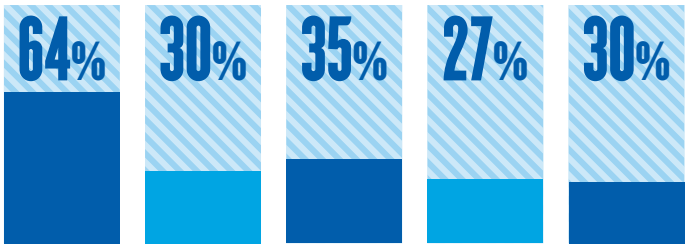
Almost half (46%)

- Said their midwife or GP didn't weigh or measure them to calculate their body mass index (BMI)
- **More than a quarter of mums (27%)** admitted they had nutritional/ weight concerns throughout their pregnancy



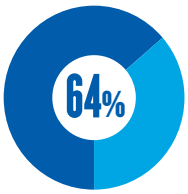
More advice and support

- **64 per cent of mums** said they would welcome more advice or support relating to their pregnancy
- **Three in ten mums (30%)** felt that they did NOT receive enough dietary information to make informed decisions about calcium in their diet or from supplements, while **35 per cent** felt they didn't know enough about iodine in their diet or from supplements
- **One in four (27%)** felt they could have been given more information on the effects of alcohol on their pregnancy, while another **three in ten (30%)** felt they had little information on caffeine



Lifestyle and its influence on long term health

- **64 per cent** believe the nutritional status of a woman before and during pregnancy influences conception, growth and development of a baby and forms the foundations of her child's later health at birth



- **More than half (59%)** of mums believe being physically active throughout their pregnancy will benefit their baby and child later in life

Biggest misconception

- **41 per cent of mums** think it is true that 'pregnant women should eat for two'

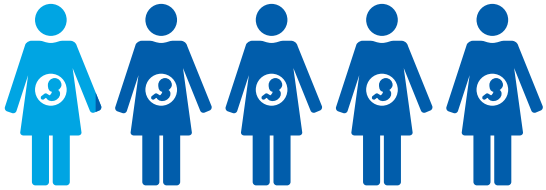
A healthy conversation

Advice on nutrition and exercise is not routine

- Although **72 per cent of healthcare professionals (HCPs)** consider nutrition important in preconception and pregnancy, **only four in ten** always give advice on nutrition and exercise to pregnant women

Advice on supplementation

- **Almost one in five (19%) HCPs** never give advice to pregnant women about vitamin and nutrient supplementation

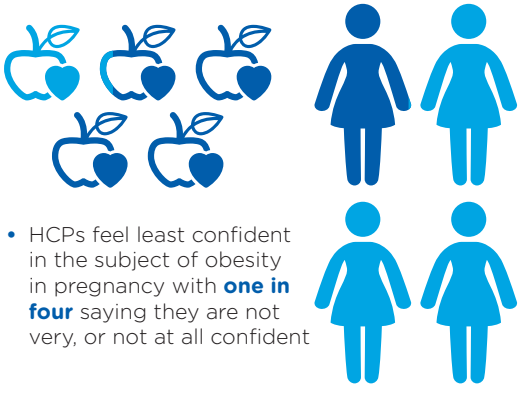


Advice on weight management

- **Just one in ten (11%) HCPs** always offer advice on weight management during pregnancy, with **more than one in four (27%)** never doing this

Confidence in knowledge

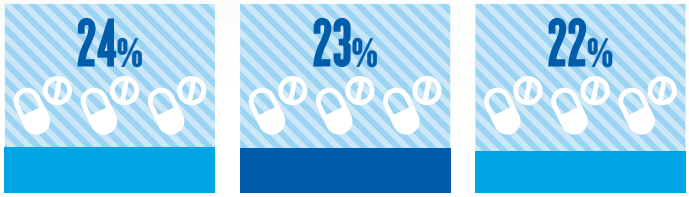
- While **73 per cent of HCPs** said they feel either very or quite confident in their knowledge of nutrition for preconception, more than **one in five (23%)** admitted they have little or no confidence in the subject



- HCPs feel least confident in the subject of obesity in pregnancy with **one in four** saying they are not very, or not at all confident

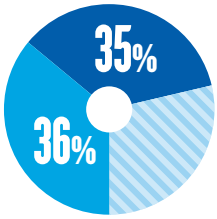
Confidence in ability to give advice

- **24 per cent of HCPs** have little or no confidence in giving out advice on vitamin supplements for babies and toddlers, **23 per cent** about vitamin supplements for pregnant women and **22 per cent** about vitamin supplements for women trying to conceive



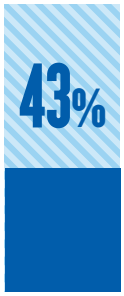
Biggest challenges

- **36 per cent of HCPs** said the biggest challenge they face is lack of time to talk to mums, while **35 per cent** feel it's encouraging mums to adopt healthy behaviours
- Other challenges include explaining the associated risks of obesity **(33%)** and clinical priority **(21%)**



Training and education

- **One in three HCPs** have had no training on nutrition in pregnancy or infant breastfeeding and **43%** have had no training on obesity in pregnancy



- **Half of respondents** would welcome more training on nutrition in pregnancy
- **45 per cent** of respondents said they would welcome training in behavioural change specific to nutrition and lifestyle in pregnancy

Lifestyle and its influence on long-term health

- **Only half of the respondents (51%)** agreed that a pregnant woman's diet and lifestyle can impact the health of the unborn child positively or negatively and, in fact, the health of generations to come

Common misconception

- **43 per cent of HCPs** said the most common misconception women have about pregnancy is that pregnant women should eat for two

"Dietary changes should be individualised, tailored to food preference and allow for flexible approaches to reducing calorie intake"

Table 1: US Institute of Medicine: Recommendations for total and rate of weight gain during pregnancy, by pre-pregnancy BMI[62]

Pre-pregnancy BMI	Total weight gain		Rates of weight gain* 2nd and 3rd trimester	
	Range in kg	Range in lbs	Mean (range) in kg/week	Mean (range) in lbs/week
Underweight (<18.5 kg/m²)	12.5-18	28-40	0.51 (0.44-0.58)	1 (1-1.3)
Normal weight (18.5-24.9 kg/m²)	11.5-16	25-35	0.42 (0.35-0.50)	1 (0.8-1)
Overweight (25.0-29.9 kg/m²)	7-11.5	15-25	0.28 (0.23-0.33)	0.6 (0.5-0.7)
Obese (≥30.0 kg/m²)	5-9	11-20	0.22 (0.17-0.27)	0.5 (0.4-0.6)

* Calculations assume a 0.5-2 kg (1.1-4.4 lbs) weight gain in the first trimester (based on Siega-Riz *et al.*, 1994; Abrams et al., 1995; Carmichael *et al.*, 1997).

NICE – Guidelines on the identification, assessment, prevention, and management of overweight and obesity in children and adults[66]

A supportive environment should be created that helps overweight or obese children and their families to make lifestyle changes.

Decisions on the approach to management of a child's overweight or obesity should be made in partnership with the child and family and be tailored to the needs and preferences of both.

Weight management interventions should include behaviour change strategies to increase physical activity levels or decrease inactivity, improve eating behaviour and the quality of the diet and reduce energy intake.

Dietary changes should be individualised, tailored to food preference and allow for flexible approaches to reducing calorie intake.

Obstacles to effective implementation of pre, peri and postnatal nutritional recommendations

The peri-conceptual period presents a useful window for nutrition education and policy implementation when women come into greater contact with health professionals.

New mothers are generally open and more readily motivated to make lifestyle changes that could benefit the health of themselves and their baby[67,68]. However, there is a gap between healthcare policy and effective implementation which may be due to many obstacles in the path of healthcare practitioners seeking to offer dietary and lifestyle advice and nutritional support to parents and parents-to-be and the public. These barriers include:

Overstretched frontline staff – despite the success of recent recruitment drives there remains a shortfall of 2,300 midwives in England and Wales[21,69]. Only around one-third of the extra 4,200 health visitors recommended between 2010 and 2015 have so far been recruited[70]. At a time when the proportion of complex births is rising[21] and the rate of maternal obesity is increasing[71]; over a third of HCPs say they have insufficient time to offer effective nutritional support to pregnant women[22].

Insufficient and/or inadequate resources – while parents-to-be are seen as a receptive audience to dietary and lifestyle advice, HCPs feel they need better information and resources to help advise them. Factsheets, apps, quick reference cards and videos are regarded as helpful ways of delivering dietary advice[22].

Lack of continuity and consistency – in dialogues between midwives and pregnant women about nutrition and healthy eating there can be insufficient repetition of this advice. Whilst a conversation about nutrition takes place in the first meeting with a midwife, it is not reinforced in the subsequent eight to nine meetings.

Too late conversations – between midwives and parents – 39% of mothers had their first doctor or midwife visit when they were already five to ten weeks pregnant[22] and 50% were not aware of the appropriate diet and supplementation to support breastfeeding[22]. In addition, Healthy Start vitamins are not widely used because of poor access issues[72]. Services to support mothers who are breastfeeding in hospital and seek advice after discharge are patchy[73].

Inadequate training of healthcare practitioners – on nutritional advice in pregnancy. More than one third of HCPs do not receive training on lifestyle advice during pregnancy, over half are unaware of NICE guidelines on nutrition in pregnancy[22], and many lack confidence in giving specific nutritional advice to parents – 69% do not discuss supplements with pregnant women[22].

Weight management can be particularly troublesome as some midwives and health visitors do not want to 'get off on the wrong foot' with parents they have only just met. Routine weighing is not mandatory, and only 18% of HCPs feel very confident in raising the topic of weight management during pregnancy[22].

Frontline maternity staff would also benefit from a better understanding of the Healthy Start scheme, knowledge of updates about it, and information on the best use of vouchers to improve diet[74].

Reactive, negative advice – too often dietary advice from HCPs takes the form of "don't do this, avoid that", rather than a proactive evidence-based approach to the promotion of the benefits of healthy eating.

Inconsistent guidelines – UK guidelines on iodine intake differ from those of the World Health Organisation. The UK currently has no guidelines on weight gain during pregnancy; so many HCPs use US guidelines[62].

Fragmented preconception care – Quality and Outcomes Framework indicators (QOF) currently offer GPs financial incentives for carrying out preconception counselling for women with pre-existing medical conditions such as epilepsy and diabetes. No such incentives are offered for general preconception dietary advice or for advice targeted at obese women of childbearing age.

Difficulty engaging with those most in need of dietary advice – people from low income households tend to eat less healthily and be less physically active than those with higher incomes[75]. Health inequalities result from social inequalities, and require action directed at all the social determinants of health[76]. There are a number of reasons for this, including less disposable income for healthy food and leisure activities, lower educational attainment and cultural dietary preferences of different ethnic groups. There are also gender divides – in women, the risk of obesity rises steadily with falling household income. The trend is less straightforward in men[77]. These social factors pose a significant challenge for HCPs as people most in need of dietary guidance and support may be the most disenfranchised and difficult to reach.

"As a nation we consume too much energy from refined carbohydrates and saturated fats and eat too few vegetables, fruit and oily fish"

Myths surrounding diet in pregnancy – there are a number of unhelpful myths surrounding the role of diet and lifestyle in pregnancy (table 2). Many indicate a poor understanding of the nutritional inter-connection between and mother and baby.

Poor National Diet – particularly among young women – many adults and children in the UK eat a poor quality diet. As a nation we consume too much energy from refined carbohydrates and saturated fats and eat too few vegetables, fruit and oily fish. Women aged between 19 and 24 are particularly likely to be eating diets that are high in energy and low in micronutrients[5,23]. Mandatory fortification of food with folic acid has been debated, but not yet implemented in the UK.

Table 2: Some common myths about nutrition, diet and lifestyle in pregnancy

Myth	Fact
Pregnant women should eat for two.	No extra calories are needed until the third trimester of pregnancy when the Department of Health recommends that energy intake should increase by only 200kcal per day[78].
Avoid salt. It will make pregnant mothers swell up.	Salt does not cause swelling or oedema, although excess consumption should be avoided because it can increase blood pressure[79]. Healthy eating advice is to consume less than 6g per day.
Peanuts will cause allergy in the unborn child.	There is no need for pregnant mothers to avoid peanuts unless they are allergic to them[80].
Avoid coffee and tea during pregnancy.	Excess caffeine can cause low birth weight, but moderate consumption (200mg/day, the amount in two cups of instant coffee) is safe[81].
Avoid eating fish during pregnancy.	Two servings of cooked fish a week (one of which should be oily) is a healthy way of consuming vital omega-3 fatty acids. Fish to avoid are swordfish, shark, and marlin due to high mercury levels, and raw fish due to the risk of food poisoning[80].
A big baby is a healthy baby.	The average newborn baby weighs around 3.5kg (7.5 lb). Very heavy babies (those over 4kg[82]) and those that cross upwards on weight-for-age centiles during infancy are more likely to suffer from birth difficulties and longer-term conditions such as diabetes and obesity in later life[83].
A small baby means an easier birth.	The birth of a small baby will not necessarily be easier, as the pelvis expands to allow the delivery of babies of all sizes. Underweight infants (those weighing less than 2.5kg) are more prone to infection and poor growth during early infancy[84].
Eating spicy food can induce labour.	There is no evidence for this common pregnancy myth.
Avoid exercise while pregnant.	Moderate exercise helps keep pregnant women fit, reduces complications of pregnancy and labour, and helps restore body shape after birth[85]. Women are advised to be active for at least four 30-minute sessions per week[85].
Smoking and drinking during pregnancy will not harm the baby.	Smoking can reduce placental function and cause intrauterine growth restriction. It is the biggest risk-factor for sudden infant death[45], and increases the risk of stillbirth, premature birth, miscarriage and low birth weight babies[86]. Even small amounts of alcohol consumption (1-2 units/week) during the first trimester increases risk of premature birth. Larger amounts can lead to preterm delivery and low birth weight. Excess intake (>10 units per day) is associated with 'fetal alcohol syndrome' – a child with stunted growth and mental retardation.

Life-course approach

The longstanding and widespread impact of poor nutrition on the health of the UK population can best be addressed by a life-course approach which, ideally, begins before conception, carries on through pregnancy and is maintained throughout the early years.

The period of preconception and pregnancy is a window of opportunity to reach mothers and their immediate family, to help ensure a commitment to positive eating habits and healthy lifestyles throughout the course of life.

There is a clear demand for more nutritional guidance during pregnancy – three quarters of young pregnant women (aged 18 to 24) feel they need more support and there is widespread confusion about how much weight to gain during pregnancy, what to eat and what supplements to take[22]. Healthcare practitioners are well placed to guide women through their pregnancies. GPs and midwives are currently the biggest providers of advice during pregnancy, and their guidance is well respected[22].

Nutritional recommendations can be divided into the four phases of early life:

Preconception

Advice for women who are planning a baby should include:

- **Healthy eating** – eat a varied diet based on the five food groups in the Eatwell Plate limiting intake of foods high in sugar and saturated fats, and including 1 – 2 servings of oily fish per week
- **Folic acid supplements** – 400µg per day or: 5mg per day on prescription for those women with spina bifida, a history of a previous child with a neural tube defect, pre-existing diabetes, epilepsy and obesity
- **Improve vitamin D status** – safe exposure to the sunlight and 1 – 2 servings of oily fish per week, and a daily vitamin D supplement see **ITF Factsheet 4.7**. Eat eggs and choose foods fortified with vitamin D such as certain breakfast cereals and yogurts
- **Optimise iron status** – dietary sources during pregnancy include meat, oily fish, eggs, beans and nuts. The vitamin C in vegetables and fruit increases iron absorption from eggs, beans and nuts
- **Ensure adequate iodine intake** – dietary sources include dairy produce and fish
- **Lose excess body weight** – try to achieve a healthy body mass index (BMI) of between 18.5 – 24.9kg/m^2
- **Take regular exercise** – 30 minutes at least five days a week of moderate intensity exercise[87]
- **Moderate alcohol and caffeine consumption**
- **Stop smoking**
- **Discuss current treatments** and medications for existing long-term conditions such as diabetes, mental illness etc.

A woman's wider family can be involved in lifestyle change, as well as midwives and other HCPs.

Pregnancy

Pregnant women should be advised and encouraged to:

- **Eat a balanced nutritious diet** and receive advice on weight gain
- **Maintain a healthy body weight** – there is no need to eat for two
- **Eat iodine-rich foods** such as milk, yogurt, cheese and fish
- **Eat foods rich in omega-3 fatty acids**, especially docosahexaenoic acid (DHA) and eicosopentanoic acid (EPA), found particularly in oily fish, or take a supplement
- **Avoid raw eggs** (unpasteurised dairy products, raw or undercooked meat, paté, soft cheeses and liver) and **take care in preparing food** to avoid the risk of a number of food-borne enteric infections
- **Avoid supplements that may contain vitamin A in the retinol form**
- **Take folic acid supplements** – 400µg per day or: 5mg per day on prescription for those women with spina bifida, a history of a previous child with a neural tube defect, pre-existing diabetes, epilepsy and obesity
- **Take vitamin D supplements** providing 10µg per day throughout pregnancy
- **Plan to continue healthy eating habits and vitamin D supplements during breastfeeding**
- **Avoid alcohol**[89]
- **Stop smoking and avoid drug misuse**
- **Maintain activity as long as comfortable** and if not active before pregnancy gradually increase to 30 minutes of moderate intensity exercise per day at least four days a week[85]
- **Discuss any concerns** about feelings or persistent symptoms such as low mood, extreme tiredness or excessive energy, irritability, changes in sleep, changes in appetite

For more information on healthy eating in pregnancy, please see **ITF Factsheet 5.1**.

Infancy (birth to one year)

HCPs can offer guidance and support that includes:

- **Continuing advice** to the mother on eating healthily
- **Advice and support** on best practice for breastfeeding, and for those choosing not to breastfeed, preparing formula milk feeds safely
- **Advice on responsive feeding** allowing the baby to finish milk feeds and meals when s/he signals s/he has had enough

- Advice on the introduction of complementary food (weaning). Parents should begin when their infant is ready, by six months, but not before four months, using a variety of energy-dense, iron-rich foods that provide a wide range of tastes and textures[89,90,91]
- The growth of the newborn infant should be monitored using UK-WHO growth charts see **ITF Factsheet 3.1**
- Advice to ensure a mother's mental health needs are addressed and advice about how a routine of eating well can promote positive mental health

Pre-school Years (1 – 4 years)

Throughout the toddler years parents often seek guidance from HCPs. The ITF has produced a range of materials to equip HCPs when guiding parents on how to feed their young children[92], which include:

- How to combine food for a balanced diet see **ITF Factsheet 1.2**
- How to maintain a positive relationship with food and encourage healthy eating habits, such as avoiding comfort eating see **ITF Factsheet 1.1**
- Guidance on portion sizes see **ITF Factsheet 1.3**
- Understanding food labels see **ITF Factsheet 1.9i**
- Managing childhood obesity see **ITF Factsheet 3.3**
- Dealing with faddy and fussy eating see **ITF Factsheet 2.2**
- Advice on dental health see **ITF Factsheet 4.5**
- Preventing deficiency disorders see **ITF Factsheet 4.1**

Conclusions and recommendations

Preconception and pregnancy offer a window of opportunity to deliver dietary and lifestyle advice that will be well received and likely to have a lasting impact. There is a strong case that advice on 'early' nutrition should be given earlier than in pregnancy, ideally before conception. This early life focus should be the beginning of a life-course approach to optimising nutrition and lifestyle.

There are a number of ways in which this approach could be improved, which include:

Nutrition guidance in preconception and pregnancy should be a public health priority

This could be achieved by:

- Public health awareness campaigns communicating the importance of diet and lifestyle in early life as key to improving the health of the next generation
- Production and dissemination of evidence-based guidelines on weight management during pregnancy
- Redoubling of efforts to improve both numbers of midwives and health visitors and their knowledge of the importance of early life to lifelong health
- Training in nutrition for HCPs working with women throughout pregnancy
- All stakeholders working in partnership

Healthcare professionals: Every contact should be made to count

The Department of Health states: "Every healthcare professional should *'make every contact count'*, with every individual, to maintain or improve their mental and physical health and wellbeing wherever possible, whatever the specialty of the HCP or the purpose of their contact."

- Dietary assessment, advice and body weight measurement should be integral parts of the first midwifery visit with regular follow-up reviews throughout the planned visits
- Greater emphasis within primary care of preconception clinics to guide all parents-to-be on nutrition and lifestyle
- Action to increase uptake of recommended vitamins and nutritional supplements during preconception, pregnancy and breastfeeding, including improving access to Healthy Start vitamins and vouchers by those eligible[93]

Education and training

- Provision of better education, training and resources to achieve these ends, including instruction on how to effectively communicate messages about healthy nutrition and lifestyle to women planning to conceive or who are pregnant, and training on active listening and how best to inspire behavioural change in parents and parents-to-be
- Greater use of the internet-based resources, including apps, designed to promote the messages outlined above

The report is based on a review of existing guidance and interviews with specialists in nutrition, obstetrics and child health. It has undergone consultation with key experts and professional bodies, and is supported by a survey of 1,000 mothers and mothers-to-be, and 150 frontline healthcare professionals.

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References

1. Department of Health HSCIC. Statistics on Obesity, Physical Activity and Diet. http://www.hscic.gov.uk/catalogue/PUB13648/Obes-phys-acti-diet-eng-2014-rep.pdf (Accessed October 2014)
2. Diabetes UK. Key statistics on diabetes. http://www.diabetes.org.uk/About_us/What-we-say/Statistics/Diabetes-in-the-UK-2012/ (Accessed October 2014)
3. Selvin E, Parrinello CM, et al. Trends in prevalence and control of diabetes in the United States, 1988-1994 and 1999-2010. Ann Intern Med. 2014:160(8):517–25
4. Public Health England. National Dental Epidemiology Programme for England: Oral health survey of five-year-old children. 2012
5. Bates B, Lennox A et al. National Diet and Nutrition Survey Headline results from Years 1-4 (combined) of the Rolling Programme (2008/2009 – 2011/12) . https://www.gov.uk/government/uploads/syste m/uploads/attachment_data/file/310997/NDNS_Y1_to_4_UK_report_Executive_summary.pdf (Accessed October 2014)
6. Daniels SR. Complications of obesity in children and adolescents. Int J Obes. 2009 Apr;33:S60–S65
7. Serdula MK, Ivery D et al. Do obese children become obese adults? A review of the literature. Prev Med. 1993:(2):167–77
8. Mainous AG, Tanner RG et al. Prevalence of prediabetes in England from 2003 to 2011: population-based, crossectional study. BMJ Open. 2014:4 (6):e005002
9. Health & Social Care Information Centre (HSCIC). Focus on the health and care of older people. June 2014. http://www.hscic.gov.uk/catalogue/PUB14369/focu-on-hac-op-main-pub-doc%201.1.pdf (Accessed October 2014)
10. Department of Health and Jane Ellison MP. Reducing obesity and improving diet. https://www.gov.uk/government/policies/reducing-obesity-and-improving-diet/ (Accessed October 2014)
11. British Heart Foundation. Heart statistics. http://www.bhf.org.uk/research/heart-statistics.aspx (Accessed October 2014)
12. The Lancet UK Policy Matters. Maternal Vitamin D supplementation via the Healthy Start programme. http://ukpolicymatters.thelancet.com/maternal-vitamin-d-supplementation-via-the-healthy-start-programme/ (Accessed October 2014)
13. Department of Health. Change4Life one year on. http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_112529 (Accessed October 2014)
14. Petticrew M, Eastmure E et al. The Public Health Responsibility Deal: how should such a complex public health policy be evaluated? J Public Health. 2013:35(4):495-501
15. Infant and Toddler Forum. Food and Nutrition for the Under Threes. A discussion document from the Infant & Toddler Forum. https://www.infantandtoddlerforum.org/documents/11528/5ab8bcdf-69b2-4f2c-8767-e7881a4eee9f (Accessed October 2014)
16. Rudolf M. Tackling Obesity Through the Healthy Child Programme: A Framework for Action. 2009. http://www.noo.org.uk/uploads/doc/vid_4865_rudolf_TacklingObesity1_210110.pdf (Accessed October 2014)
17. Berti C, Cetin I et al. Pregnancy and infants' outcome: nutritional and metabolic implications. Crit Rev Food Sci Nutr. 2014
18. Greenberg JA, Bell SJ et al. Omega-3 Fatty Acid supplementation during pregnancy. Rev Obstet Gynecol. 2008;1(4):162–9
19. Ingrid B. Helland, MD, Lars Smith et al. Maternal Supplementation With Very-Long-Chain n-3 Fatty Acids During Pregnancy and Lactation Augments Childrens' IQ at 4 Years of Age. Paediatrics. 2003:39-44
20. Stephenson J, Patel D et al. How do women prepare for pregnancy? Preconception experiences of women attending antenatal services and views of health professionals. PloS One. 2014:9(7)
21. Parliament UK. NHS midwives shortage remains despite increasing numbers. http://www.parliament.uk/business/committees/committees-a-z/commons-select/public-accounts-committee/news/maternity-services-report/(Accessed October 2014)
22. OnePoll. Early nutrition surveys of mothers/mothers-to-be and healthcare professionals. August 2014. Data on file
23. SACN. The influence of maternal, fetal and child nutrition on the development of chronic disease in later life [Internet]. 2011. http://www.sacn.gov.uk/reports_position_statements/reports/the_influence_of_maternal_fetal_and_child_nutrition_on_the_development_of_chronic_disease_in_later_life.html (Accessed October 2014)
24. Horta B, Gigante D et al. Intergenerational effect of weight gain in childhood on offspring birthweight. Int J Epidemiol. 2009: 38(3):724-32
25. McCay CM. Is longevity compatible with optimum growth? Science.1933: 28;77(2000):410–1
26. Wu G, Bazer FW et al. Maternal Nutrition and Fetal Development. The Journal of Nutrition. 2004:9:2169-2172
27. Barker DJ. Fetal origins of coronary heart disease. BMJ. 1995:15;311(6998):171–4
28. Singhal A, Lucas A. Early origins of cardiovascular disease: is there a unifying hypothesis? Lancet, 2004 May 15;363(9421): 1642-5
29. McMullen S, Mostyn. Proc Nutr Soc. 2009:68(3):306-20
30. Baker PN, Wheeler SJ et al. A prospective study of micronutrient status in adolescent pregnancy. Am J Clin Nutr. 2009;89:1114-24
31. Ahmed SF, Franey C et al. Recent trends and clinical features of childhood vitamin D deficiency presenting to a children's hospital in Glasgow. Arch Dis Child. 2011:96 (7):694-694
32. Javaid MK, Crozier SR et al. Maternal vitamin D status during pregnancy and childhood bone mass at age 9 years: a longitudinal study. Lancet. 2006: 367 (9504):36-43
33. Skeaff S.A. Iodine Deficiency in Pregnancy: The Effect on Neurodevelopment in the Child Nutrients. Nutrients. 2011: 3(2): 265–273
34. Bath SC, Steer CD et al. Effect of inadequate iodine status in UK pregnant women on cognitive outcomes in their children: results from the Avon Longitudinal Study of Parents and Children (ALSPAC). Lancet. 2013 Jul 27;382(9889):331–7
35. Breymann C. Iron deficiency and anaemia in pregnancy: modern aspects of diagnosis and Therapy. Blood Cells Mol Dis.2002: 29(3):506-16
36. Public Health England. Prevalence of obesity in females aged 16-44 years during the period 1993-2010. http://www.noo.org.uk/NOO_about_obesity/maternal_obesity/uk_trends (Accessed October 2014)
37. Heslehurst, N. et al. (2007) Trends in maternal obesity incidence rates, demographic predictors, and health inequalities in 36 821 women over a 15-year period, BJOG An International Journal of Obstetrics & Gynaecology, 114 (2), pp.187-194
38. Confidential Enquiry into Maternal and Child Health. Saving Mothers' Lives: Reviewing maternal deaths to make motherhood safer - 2003-2005. http://www.publichealth.hscni.net/sites/default/files/Saving%20Mothers'%20Lives%202003-05%20.pdf (Accessed October 2014)
39. Parsons, T.J. et al. Childhood predictors of adult obesity: a systematic review. [Review] [283 refs]. International Journal of Obesity & Related Metabolic Disorders: Journal of the International Association for the Study of Obesity 1999; 23 Suppl 12: pp.S1-S107
40. Drake AJ, Reynolds RM. Impact of maternal obesity on offspring obesity and cardiometabolic disease risk. Reprod Camb Engl. 2010: 140(3):387–98
41. Singhal, A. et al. Promotion of faster weight gain in infants born small for gestational age: is there an adverse effect on later blood pressure? Circulation. 2007. 115(2):213-220
42. Royal College of Obstetricians and Gynaecologists. Alcohol Consumption and the Outcomes of Pregnancy. 2006. http://www.alcoholpolicy.net/files/RCOG_Alcohol_pregnancy_March_06.pdf (Accessed October 2014)
43. Stocks, J, Dezateux C. 2003. The Effect of Parental smoking on Lung Function and Development During Infancy. Respirology, 8, 266-285
44. ASH 2013, A Call to Action, http://ash.org.uk/files/documents/ASH_893.pdf (Accessed October 2014)
45. Fleming P, Blair PS. Sudden Infant Death Syndrome and parental smoking. Early Human Development. 2007;83:721-725
46. Jansson LM, Velez M. Neonatal abstinence syndrome. Curr Opin Pediatr. 2012: 24(2):252-8
47. Kramer MS, Aboud F et al. Breastfeeding and child cognitive development: new evidence from a large randomized trial. Arch Gen Psychiatry. 2008:65(5):578–8

48. Health Service Executive. The Evidence for Breastfeeding. Information for GPs and Pharmacists
49. Horton R, Lo S. Nutrition: a quintessential sustainable development goal. The Lancet. 2013:382(9890):371–2
50. Leadsom A, Field F et al. The 1001 Critical Days: The Importance of the Conception to Age Two. http://www.andrealeadsom.com/downloads/1001cdmanifesto.pdf (Accessed October 2014).
51. NHS Choices. Vitamins and nutrition in pregnancy. http://www.nhs.uk/conditions/pregnancy-and-baby/pages/vitamins-minerals-supplements-pregnant.aspx (Accessed October 2014)
52. NHS Choices. Why do I need folic acid in pregnancy? http://www.nhs.uk/chq/Pages/913.aspx#close (Accessed October 2014)
53. Healthy Start. Vitamins. http://www.healthystart.nhs.uk/for-health-professionals/vitamins/ (Accessed October 2014)
54. NHS Information Centre for health and social care. Infant Feeding Survey 2010: Summary. 2012. http://www.hscic.gov.uk/article/2021/Website-Search?productid=9569&q=infant+feeding+survey&sort=Relevance&size=10&page=1&area=both#top (Accessed October 2014)
55. Datta S, Alfaham M et al. Vitamin D deficiency in pregnant women from a non-European ethnic minority population--an interventional study. BJOG. 2002:109:905-08
56. Vitamin D mission. Vitamin D mission research. 2014. Available at http://www.vitamindmission.co.uk/who-we-are (Accessed October 2014)
57. World Health Organization. Assessment of Iodine Deficiency Disorders and Monitoring Their Elimination, 2nd edn. Geneva, 2007
58. Vanderpump MPJ, Lazarus JH et al. Iodine status of UK schoolgirls: a cross-sectional survey. Lancet. 2011:377(9782):2007–12
59. World Health Organization. Iodine deficiency in Europe. A continuing public health problem. 2007
60. NICE. Antenatal care. http://www.nice.org.uk/guidance/cg62/resources/guidance-antenatal-care-pdf (Accessed October 2014)
61. NICE. Weight management before, during and after pregnancy. http://www.nice.org.uk/ (Accessed October 2014)
62. Institute of Medicine. Weight Gain During Pregnancy. http://iom.edu/-/media/Files/Report%20Files/2009/Weight-Gain-During-Pregnancy-Reexamining-the-Guidelines/Resource%20Page%20-%20Weight%20Gain%20During%20Pregnancy.pdf (Accessed October 2014)
63. NICE. Managing overweight and obesity among children and young people https://www.nice.org.uk/guidance/ph47/chapter/1-recommendations#lifestyle-weight-management-programmes (Accessed October 2014) http://www.nice.org.uk/guidance/CG43/chapter/1-Guidance (Accessed October 2014)
64. HSCIC & Public Health England. National Child Measurement Programme: England, 2012/13 school year. 2013. http://www.hscic.gov.uk/catalogue/PUB13115/nati-chil-meas-prog-eng-2012-2013-rep.pdf (Accessed October 2014)
65. Oude Luttikhuis H, Baur L et al. Interventions for treating obesity in children. Cochrane Database Syst Rev 2009;1:CD001872. http://dx.doi.org/10.1002/14651858.CD001872.pub2
66. NICE. Guidelines on the identification, assessment, prevention, and management of overweight and obesity in children and adults. http://www.nice.org.uk/guidance/cg43/chapter/guidance (Accessed October 2014)
67. Wilkinson, S.A, McIntyre, H.D. Evaluation of the 'healthy start to pregnancy' early antenatal health promotion workshop: a randomized controlled trial. BMC Pregnancy Childbirth. 2012: (12)131
68. Wilkinson, S.A., van der Pligt, P et al. Trial for Reducing Weight Retention in New Mums: a randomised controlled trial evaluating a low intensity, postpartum weight management programme. J Hum Nutr Diet. 2014
69. National Audit Office. Maternity services in England. http://www.nao.org.uk/report/maternity-services-england-2/ (Accessed October 2014)
70. Department Of Health. Health Visitor Implementation Plan: Quarterly Progress Report: July – September 2013. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/309591/Health_visitor_implementation_plan_-_quarterly_progress_report.pdf (Accessed October 2014)
71. British Nutrition Foundation. Nutrition and Development: Short and long-term consequences for health. Oxford: Wiley-Blackwell; 2013
72. Jessiman T, Cameron A et al. A qualitative study of uptake of free vitamins in England. Arch Dis Child 2013;98;587-591. http://adc.bmj.com/content/98/8/587.full.pdf (Accessed October 2014)
73. UNICEF Baby Friendly Initiative. The evidence and rationale for the UNICEF UK Baby Friendly Initiative Standards. 2003. Available at http://www.unicef.org.uk/Documents/Baby_Friendly/Research/baby_friendly_evidence_rationale.pdf (Accessed October 2014).
74. Lucas P, Jessiman T et al. Healthy Start Vouchers Study: The Views and Experiences of Parents, Professionals and Small Retailers in England. University of Bristol. March 2013. http://www.bristol.ac.uk/sps/research/projects/completed/2013/finalreport.pdf (accessed October 2014)
75. Public Health England. Social and economic inequalities in diet and physical activity. http://www.noo.org.uk/uploads/doc/vid_19253_Social_and_economic_inequalities_in_diet_and_physical_activity_04.11.13.pdf (Accessed October 2014)
76. Marmot M, Bell R. Fair society, healthy lives. The Marmot Review. February 2010
77. National Obesity Observatory. Adult obesity and socioeconomic status. http://www.noo.org.uk/uploads/doc/vid_16966_AdultSocioeconSep2012.pdf (Accessed October 2014)
78. Start4Life. Pregnancy myth #1: "you're eating for two now!" http://www.nhs.uk/start4life/Pages/pregnancy-myth-one.aspx (Accessed October 2014)
79. British Heart Foundation. Salt. http://www.bhf.org.uk/heart-health/prevention/healthy-eating/salt.aspx (Accessed October 2014)
80. NHS Choices. Foods to avoid in pregnancy. http://www.nhs.uk/conditions/pregnancy-and-baby/pages/foods-to-avoid-pregnant.aspx#close (Accessed October 2014)
81. NHS Choices. Limit caffeine during pregnancy - Health questions. http://www.nhs.uk/chq/Pages/limit-caffeine-during-pregnancy.aspx (Accessed October 2014)
82. Catalano P, Ehrenberg H. The short- and long-term implications of maternal obesity on the mother and her offspring. BJOG 2006; DOI: 10.1111/j.1471-0528.2006.00989.x.
83. Frongillo EA, Lampl M. Early identification of children at risk of developing obesity. Arch Pediatr Adolesc Med. 2011:165(11):1043–4
84. Centres for Disease Control and Prevention. Low Birth weight and the Environment. http://ephtracking.cdc.gov/showRbLBWGrowthRetardationEnv.action (Accessed October 2014)
85. NHS Choices. Exercise in pregnancy - Pregnancy and baby guide. http://www.nhs.uk/conditions/pregnancy-and-baby/pages/pregnancy-exercise.aspx (Accessed October 2014)
86. Passive smoking and children. A report by the Tobacco Advisory Group of the Royal College of Physicians. March 2010. https://www.rcplondon.ac.uk/sites/default/files/documents/passive-smoking-and-children.pdf (Accessed October 2014)
87. Department of Health. Physical activity guidelines for adults (19-64 years). 2011. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213740/dh_128145.pdf (Accessed October 2014)
88. NHS Choices. Alcohol in pregnancy. http://www.nhs.uk/conditions/pregnancy-and-baby/pages/alcohol-medicines-drugs-pregnant.aspx#close (Accessed October 2014)
89. European Food Safety Authority (EFSA). Scientific Opinion on the appropriate age for introduction of complementary feeding of infants. EFSA Journal. 2009:7(12) 1423
90. Agostoni C, Decsi T et al. Complementary Feeding: A Commentary by the ESPGHAN Committee on Nutrition J Pediatr Gastroenterol Nut., 2008: (46) 99-110
91. NICE. Guidance: Maternal and child nutrition. March 2008. http://www.nice.org.uk/guidance/PH11 (Accessed October 2014)
92. Infant and Toddler Forum. Factsheets for healthcare professionals [Internet]. https://www.infantandtoddlerforum.org/factsheets (Accessed October 2014)
93. NICE (2014) Public Health Guidance 56: Vitamin D: increasing supplement use among at-risk groups. Available at: http://www.nice.org.uk/guidance/PH56 (Accessed November 2014)

INFANT & TODDLER FORUM

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from pregnancy to preschool

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