

Appendix A: Summary of evidence from surveillance

2017 surveillance of [Maternal and child nutrition](#) (2008) NICE guideline PH11

Summary of evidence from surveillance

After considering topic expert feedback, related policy and guidance issued by the UK government, and the 2014 surveillance decision, it was clear that the guideline on [maternal and child nutrition](#) should be updated and replaced. Public consultation was considered not to be necessary for this decision because stakeholders should have opportunities to comment during development of the update.

Literature searches were considered not to be necessary because work is needed to identify the scope of the updated guideline, and enough information had been assessed to justify the need to update the guideline. Part of this was a search of the Cochrane Library for relevant studies, which are summarised below based on the information presented in their abstracts. Full texts were consulted in specific circumstances, for example if checking the full text was necessary to make a definitive statement about the impact of the study on current recommendations.

Preamble to the recommendations

When writing the recommendations, the Programme Development Group (see [appendix A](#)) considered the [evidence of effectiveness](#) (including cost effectiveness), fieldwork data and comments from stakeholders.

The recommendations support local implementation of national policy on maternal and child nutrition.

As set out in the [scope for the guidance](#), they do not cover the following areas:

- population-based screening programmes
- complementary therapy approaches
- national maternal and child nutrition policies that are the responsibility of the Department of Health (DH) and the Food Standards Agency (FSA), as advised by the Scientific Advisory Committee on Nutrition. These include policies on population-based dietary recommendations, food safety, the nutritional content of infant formula and the fortification of foods.

The recommendations are relevant for all women who are pregnant (or who may become pregnant), mothers of children aged under 5 and others who care for children aged under 5. They are particularly relevant for pregnant women, mothers and children from low-income and other disadvantaged backgrounds.

The evidence statements that underpin the recommendations are listed in [appendix C](#).

The evidence reviews, supporting evidence statements and economic appraisal are [available](#).

The PDG also considered whether a recommendation should only be implemented as part of a research programme, where evidence was lacking.

For the research recommendations and other gaps in the research, see [section 6](#) and [appendix D](#) respectively.

Training

Recommendations in this section of the guideline

Recommendation 1

Who is the target population?

Health professionals and support workers who care for children under 5 years and women who may become – or who are – pregnant.

Who should take action?

Professional bodies, skills councils and others responsible for setting competencies and developing continuing professional development programmes for health professionals, nursery nurses and support workers.

What action should they take?

- Professional bodies should ensure health professionals have the appropriate knowledge and skills to give advice on the following:
 - the nutritional needs of women and the importance of a balanced diet before, during and after pregnancy (including the need for suitable folic acid supplements)
 - the rationale for recommending certain dietary supplements (for example, vitamin D) to pregnant and breastfeeding women
 - the nutritional needs of infants and young children
 - breastfeeding management, using the [Baby Friendly Initiative](#) (BFI) training as a minimum standard (www.babyfriendly.org.uk)
 - strategies for changing people's eating behaviour, particularly by offering practical, food-based advice.
- As part of their continuing professional development, train midwives, health visitors and support workers in breastfeeding management, using BFI training as a minimum standard.
- As part of their continuing professional development, train health professionals, including doctors, dietitians and pharmacists, to promote and support breastfeeding, using BFI training as a minimum standard.

Surveillance decision

Although no new information about this section of the guideline was identified, the decision to do a full guideline update means that this question may be updated.

Folic acid

Recommendations in this section of the guideline

Recommendation 2

Who is the target population?

Women who may become pregnant and women in early pregnancy.

Who should take action?

- Primary care trusts (PCTs) and NHS trusts.
- Directors of public health, planners and organisers of public health campaigns.
- Pharmacists, GPs, hospital doctors and nurses, particularly those working in gynaecology, sexual health, contraceptive and family planning services, fertility clinics and school health services.
- Public health nutritionists and dietitians.
- Manufacturers of goods for women of childbearing age.

What action should they take?

- Health professionals should:
 - use any appropriate opportunity to advise women who may become pregnant that they can most easily reduce the risk of having a baby with a neural tube defect (for example, anencephaly and spina bifida) by taking folic acid supplements. Advise them to take 400 micrograms (μg) daily before pregnancy and throughout the first 12 weeks, even if they are already eating foods fortified with folic acid or rich in folate
 - advise all women who may become pregnant about a suitable folic acid supplement, such as the maternal Healthy Start vitamin supplements
- encourage women to take folic acid supplements and to eat foods rich in folic acid (for example, fortified breakfast cereals and yeast extract) and to consume foods and drinks rich in folate (for example, peas and beans and orange juice).
- PCTs should ensure local education initiatives aimed at health professionals include information on the importance of folic acid supplements. They should provide the maternal Healthy Start vitamin supplements (folic acid, vitamins C and D) for eligible women. They should also ensure women who are not eligible for Healthy Start can obtain the supplements from their local pharmacy.
- GPs should prescribe 5 milligrams of folic acid a day for women who are planning a pregnancy, or are in the early stages of pregnancy, if they:
 - (or their partner) have a neural tube defect
 - have had a previous baby with a neural tube defect
 - (or their partner) have a family history of neural tube defects
 - have diabetes.

- Manufacturers should include information with their products on the importance of folic acid supplements before and during pregnancy. Relevant products may include pregnancy tests, sanitary products, contraceptives and ovulation predictor kits.

(See also [diabetes in pregnancy](#) NICE guideline CG63 and [antenatal care](#) NICE guideline CG62)

Surveillance decision

The update of this guideline should investigate effective interventions to increase the uptake of folic acid supplementation, with consideration of the Scientific Advisory Committee on Nutrition's (SACN) work in this area.

2017 surveillance summary

An [update on folic acid](#) was published by SACN in July 2017. This document recommends mandatory fortification of flour with folic acid in the UK, although recommendations on folic acid supplementation before and during pregnancy were unchanged.

A Cochrane review(4) of 5 studies (n=7,391) assessed folic acid supplementation in women who were pregnant or planning pregnancy. Randomised and quasi-randomised studies were included. Four comparisons were assessed:

- supplementation with any folic acid versus no intervention, placebo or other micronutrients without folic acid (5 trials)
- supplementation with folic acid alone versus no treatment or placebo (1 trial)
- supplementation with folic acid plus other micronutrients versus other micronutrients without folic acid (4 trials)
- supplementation with folic acid plus other micronutrients versus the same other micronutrients without folic acid (2 trials).

Any folic acid supplementation showed a protective effect of on risk of neural tube defects. The authors noted this finding to be based on high quality evidence.

Folic acid supplementation additionally showed a protective effect on recurrence of neural tube defects. The effects were not affected by dose (400 µg or higher) or by administration (alone or with other vitamins and minerals). The remaining comparisons were noted by the authors to have consistent results, although no statistical data were reported in the abstract.

The authors additionally noted that there was no evidence of an effect of folic acid supplementation on cleft lip, cleft palate, congenital cardiovascular defects, miscarriage, or any other birth defects.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

Findings that folic acid supplementation before and during pregnancy reduces neural tube defects are consistent with current recommendations. However, the update of this guideline should investigate effective interventions to increase the uptake of folic acid supplementation, with consideration of SACN's work in this area.

New evidence identified that may change current recommendations.

Vitamin D

Recommendations in this section of the guideline

Recommendation 3

Recommendation 3 in this guideline has been replaced by [vitamin D: supplement use in specific population groups](#) NICE guideline PH56 (2014).

Surveillance decision

For 2017 surveillance, this section of the guideline was not considered because it is now covered by NICE PH56.

Healthy Start

Recommendations in this section of the guideline

Recommendation 4

Who is the target population?

Pregnant women and parents of infants and children under 4 years who may be eligible for the Healthy Start benefit.

Who should take action?

- PCT commissioners and managers.
- GPs, midwives, health visitors, obstetricians, paediatricians, and community pharmacists.

What action should they take?

- PCTs should promote the Healthy Start scheme.
- PCTs should ensure an adequate supply of both types of Healthy Start vitamin supplements (for women and for children from 6 months to 4 years) is available for distribution by health professionals when they see pregnant women and parents of children under 4 years.
- PCTs should ensure an adequate supply of Healthy Start application forms is available and that the uptake of Healthy Start benefits is regularly audited.
- Health professionals should advise pregnant women and parents of children under 4 years about the Healthy Start scheme. They should ensure all women who may be eligible receive an application form as early as possible in pregnancy.
- Health professionals should use every opportunity they have to offer those parents who are eligible for the Healthy Start scheme practical, tailored information, support and advice on:
 - how to use Healthy Start vouchers to increase their fruit and vegetable intake
 - how to initiate and maintain breastfeeding

- how to introduce foods in addition to milk as part of a progressively varied diet when infants are 6 months old.
- Health professionals should offer the maternal Healthy Start vitamin supplement (folic acid, vitamins C and D) to pregnant women who are (or who may be) eligible.
- GPs and health visitors should offer children's Healthy Start vitamin supplements (vitamins A, C and D) to all children aged from 6 months to 4 years in families receiving the Healthy Start benefit.
- Commissioners should consider distributing the maternal Healthy Start vitamin supplement (folic acid, vitamins C and D) to all women who receive Healthy Start benefit for children aged 1–4 years, particularly those who may become pregnant.
- Community pharmacists should ensure the Healthy Start maternal vitamin supplements are available for purchase by women who are not eligible to receive them free of charge.

Surveillance decision

The update to the guideline on maternal and child nutrition should investigate effective interventions to increase the uptake of Healthy Start supplementation, and appropriate vitamin A supplementation in children, with consideration of SACN's report on feeding in the first year of life (in development, publication expected in mid-2018).

Vitamin A supplementation

2017 surveillance summary

A Cochrane review(5) of 12 studies (n=24,846) assessed vitamin A supplementation in infants aged 1–6 months. There was no evidence of any effect of vitamin A supplementation on all-cause mortality, mortality or morbidity due to diarrhoea and respiratory tract infection. Vitamin A supplementation increased the risk of bulging fontanelle, but this mostly resolved within 72 hours and was not associated with increased risk of death, convulsions, or irritability. No increased risk of vomiting, diarrhoea, fever or convulsions was seen with vitamin A supplementation. Additionally, vitamin A supplementation showed no significant effects on vitamin A deficiency. The authors noted that the quality of evidence was high or moderate, however the dose of vitamin A was not reported in the abstract.

A Cochrane review (6) of 19 studies (n>310,000) assessed vitamin A supplementation during pregnancy. Comparators were placebo, no

treatment, other supplementation, or multi-supplementation (with versus without vitamin A). Vitamin A supplementation reduced maternal night blindness. However, Vitamin A supplementation showed no evidence of an effect on maternal mortality, perinatal mortality, neonatal mortality, stillbirth, neonatal anaemia, preterm birth, or low birth weight (the authors classed evidence for most of these outcomes as high quality). Evidence for an effect on maternal infection and maternal anaemia varied depending on the comparator and whether other micronutrients were included in the supplement (all evidence for this outcome was low quality).

A Cochrane review(7) of 14 studies (25,758 pairs of women and infants) assessed vitamin A supplementation in postpartum women. Included studies were randomised or quasi-randomised trials, which used high single or double doses of vitamin A (200,000 to 400,000 IU) or 7.8 mg beta-carotene daily. Comparators included placebo, other supplements or high (400,000 IU) versus low (200,000 IU) dose. Most infants were at least partially breastfed until 6 months.

There was no evidence of effects on:

- maternal mortality at 6 or 12 months
- maternal morbidity (diarrhoea, fever, respiratory infections)
- maternal abdominal pain
- infant mortality at 2–12 months
- infant gastroenteritis at 3 months.

However, maternal vitamin A supplementation was associated with increased breast milk retinol concentrations and increased bulging fontanelle in infants. The authors noted that the evidence quality for the outcomes ranged from very low to moderate.

A Cochrane review(8) assessed vitamin A supplementation in very low birth weight infants. In 10 studies (n=1,460), compared with control, vitamin A supplementation showed a small significant effect in reducing the risk of death or needing oxygen at 1 month. The risk of chronic lung disease was also significantly lower with vitamin A supplementation. The author noted the quality of evidence for outcomes, which ranged from low to moderate.

Topic expert feedback

Topic experts highlighted NICE's report on the [cost-effectiveness of Healthy Start vitamins](#), which concluded: 'The model suggests that making

Healthy Start vitamin supplements universally available is cost effective, as long as women who are planning a pregnancy and those in the first 10 weeks of pregnancy are included. This is based on the assumptions made in the model... However, a lack of data for some of the model inputs meant that many assumptions had to be made. Some of these were fundamental and could have a crucial impact on cost effectiveness.' The findings were driven by benefits of folic acid.

Impact statement

Vitamin A supplementation during or after pregnancy or in infants appears to provide little benefit to mothers or infants, although major adverse effects were not apparent. Vitamin A is currently included in the Healthy Start children's vitamin drops. The SACN Subgroup on Maternal and Child Nutrition (SMCN) is developing a report on feeding in the first year of life, which is expected to cover vitamin A supplementation (publication expected mid-2018).

The update to the guideline on maternal and child nutrition should investigate effective interventions to increase the uptake of Healthy Start supplementation, and appropriate vitamin A supplementation in children, with consideration of SACN's report on feeding in the first year of life.

New evidence identified that may change current recommendations.

Supplementation (other than vitamin A) in women before, during and after pregnancy

2017 surveillance summary

Multiple micronutrient supplementation

A Cochrane review(9) of 17 randomised controlled trials (RCTs; n=137,791) assessed multiple micronutrient supplementation including iron and folic acid during pregnancy. In 15 studies, multiple

micronutrient supplementation including iron and folic acid was compared with iron (with or without folic acid). Compared with iron (with or without folic acid), multiple micronutrient supplementation reduced the number of low birth weight infants (high quality evidence) and small for gestational age infants (moderate quality evidence). There was no evidence of an effect on preterm birth, stillbirth, maternal anaemia in the third trimester, miscarriage, maternal mortality, perinatal mortality, neonatal mortality, or caesarean section

(the authors noted that evidence for these outcomes was high quality).

A Cochrane review(10) assessed multiple micronutrient supplementation in breastfeeding mothers. The authors found no studies comparing multiple micronutrient supplementation with 3 or more micronutrients versus supplementation with 2 or fewer micronutrients. In 2 studies (n=52), multiple micronutrients were compared with placebo or no supplementation. However, the reports did not report any of the Cochrane review authors' primary or secondary outcomes of interest except for maternal anaemia. One study reporting on maternal anaemia reported qualitative data indicating that multiple micronutrient supplementation was effective for recuperating from anaemia.

A Cochrane review(11) of 2 studies (n=478) assessed multiple micronutrient powder supplementation, added to foods during pregnancy. Randomised and quasi-randomised studies were included. One study assessed powder containing iron, folic acid, vitamin C and zinc compared with iron and folic acid. Adherence to multiple micronutrient powder was lower than to iron and folic acid. One study assessed micronutrient powder containing iron, folic acid, vitamin C, zinc, iodine, vitamin E and vitamin B12 compared with a tablet formulation containing the same micronutrients. In one study, no significant effects were seen on maternal anaemia at 37 weeks. Neither trial reported on any of the primary outcomes of interest defined by the reviewers.

Vitamin B6 supplementation

A Cochrane review(12) of 4 RCTs (n=1,646) assessed vitamin B6 supplementation during pregnancy. Eligible studies were RCTs comparing vitamin B6 supplementation with placebo, no supplement or supplements not containing vitamin B6. However, it was not clear in the abstract what comparators were used in the studies analysed. Oral vitamin B6 supplementation reduced dental decay in pregnant women. No significant differences were

seen in pre-eclampsia, low Apgar scores, Apgar scores at 5 minutes, or breastmilk production. The authors reported that the evidence was low quality.

Vitamin C supplementation

A Cochrane review(13) of 29 studies (n=24,300) assessed vitamin C supplementation during pregnancy. Randomised and quasi-randomised studies were included. Studies assessing vitamin C alone or in combination with other separate supplements were included, but studies of multivitamins including vitamin C were excluded. In studies comparing vitamin C with placebo or control, no significant effects were seen on stillbirth, neonatal death, perinatal death, birth weight, intrauterine growth restriction, preterm birth, preterm pre-labour rupture of membranes, or pre-eclampsia. However vitamin C supplementation reduced the risk of placental abruption, increased the gestational age at birth by a small amount, but increased self-reported abdominal pain. The authors reported the quality of evidence across outcomes, which ranged from low to high quality.

Vitamin E supplementation

A Cochrane review(14) of 17 studies (n=22,129) assessed vitamin E supplementation during pregnancy. Randomised and quasi-randomised studies were included. Studies of multivitamin supplementation including vitamin E were excluded. All identified trials assessed vitamin E plus vitamin C with or without other micronutrients. In studies comparing supplementation with vitamin E with placebo, no significant effects were seen on stillbirth, neonatal death, pre-eclampsia, preterm birth, or intrauterine growth restriction. However, vitamin E supplementation was associated with reduced risk of placental abruption, but increased self-reported abdominal pain and pre-labour rupture of membranes at term.

Iodine supplementation

A Cochrane review(15) of 14 studies assessed iodine supplementation before, during and after

pregnancy. Randomised and quasi-randomised studies were included, but the abstract did not include details of the comparator for the studies assessed. Iodine supplementation reduced postpartum hyperthyroidism, but also increased digestive intolerance. No clear effects were seen on post-partum hyperthyroidism, hypothyroidism in pregnancy or postpartum, or on the adverse effects of elevated thyroid peroxidase antibodies.

Perinatal deaths were significantly lower in infants whose mothers had iodine supplementation compared with no iodine supplementation; however, all deaths occurred in a setting with severe iodine deficiency. No significant effects on low birth weight, neonatal hypothyroidism, or elevated neonatal thyroid peroxidase antibodies. All trials were conducted in settings with mild-to-moderate iodine deficiency. The authors noted that the evidence across maternal and infant outcomes was of low or very low quality.

Iron supplementation

A Cochrane review(16) of 44 studies (n=43,274) assessed daily iron supplementation during pregnancy. Randomised and quasi-randomised studies assessing iron supplementation compared with supplementation without iron or placebo were included. Iron supplementation reduced maternal anaemia at term, iron-deficiency anaemia at term, and iron deficiency at term. No significant differences were seen for severe anaemia in the second or third trimester, maternal infection during pregnancy, maternal mortality or reporting of adverse effects. No significant effects on low birth weight, preterm delivery, neonatal death, or congenital anomalies were seen. The authors reported the quality of evidence for outcomes, which ranged from low to moderate quality.

A Cochrane review(17) of 21 studies (n=5,490) assessed intermittent oral iron supplementation during pregnancy. Randomised or quasi-randomised studies were included. Intermittent iron plus folic acid was assessed in 14 studies, 3 assessed intermittent iron alone, and 4 assessed intermittent iron plus multiple vitamins. Overall,

any intermittent iron regimen compared with daily use showed no significant effects on the infant outcomes of low birth weight, birth weight, preterm birth or neonatal death. Additionally, no significant effects on maternal anaemia at term were seen. However, women on intermittent supplementation were at lower risk of having high haemoglobin in the second or third trimester. The authors rated the evidence as low or very low quality.

Calcium supplementation

A Cochrane review(18) of 23 RCTs (n=17,842) assessed calcium supplementation (other than for preventing or treating hypertension) during pregnancy. RCTs comparing calcium supplementation with placebo or no treatment were eligible for inclusion. No significant differences in preterm births or low birth weight infants were seen. However, a small significant increase in birth weight was noted. The authors rated the quality of evidence as moderate.

Zinc supplementation

A Cochrane review(19) of 21 RCTs assessed zinc supplementation during pregnancy. The abstract had no information on the comparator interventions of included studies. Zinc supplementation was associated with a small reduction in preterm births. No significant difference was seen for low birth weight. The authors reported the quality of evidence as low or moderate.

Magnesium supplementation

A Cochrane review(20) of 10 RCTs assessed magnesium supplementation during pregnancy. The comparator was placebo in 8 studies and no intervention in 2 studies. The dosage and timing of magnesium supplementation varied across studies. Magnesium supplementation showed no significant effects on perinatal mortality, small for gestational age babies, or pre-eclampsia. A small significant increase was seen in neonatal death before discharge from hospital; however, this finding was driven by deaths of children with severe congenital anomalies (not attributed to

magnesium supplementation) in one study. Women receiving magnesium were significantly less likely to be admitted to hospital during pregnancy. Magnesium supplementation was additionally associated with lower risk of: Apgar scores of less than 7 at 5 minutes; meconium-stained amniotic fluid; late fetal heart decelerations; and mild hypoxic-ischaemic encephalopathy. The authors noted that only 2 of the included studies were of high quality.

Omega-3 long chain polyunsaturated fatty acids (PUFA) supplementation

A Cochrane review(21) of 8 RCTs (n=3,366 women and n=3,175 children) assessed omega-3 long chain PUFA supplementation during pregnancy or breastfeeding. Compared with control, omega-3 long chain PUFA reduced any medically diagnosed IgE-mediated allergy in children aged 12 to 36 months, but not after 36 months. No differences were seen in allergies defined as medically diagnosed IgE-mediated allergy or parental report.

A further Cochrane review(22) of 8 RCTs (n=1,567) assessed long chain PUFA supplementation during breastfeeding. The abstract had no information on the comparator interventions of included studies. No significant differences were seen in children's neurodevelopment (intelligence or problem-solving ability, language, psychomotor, or motor development, or general movements, working memory or inhibitory control). No significant differences were seen in length, head circumference, fat mass or fat mass distribution. Children whose mother's received supplementation had greater attention scores at 5 years. The authors reported the quality of evidence for outcomes, which ranged from low to moderate.

Myo-inositol supplementation

A Cochrane review(23) of 4 RCTs (n=567) assessed supplementation with the sugar myo-inositol during pregnancy. Myo-inositol reduced the incidence of gestational diabetes compared with control; however, the authors noted that the quality of evidence was low. No effects on hypertensive disorders in pregnancy, caesarean

section, or maternal adverse events were seen (low or very low quality evidence). Additionally, no evidence of any effect on macrosomia, neonatal hypoglycaemia, or shoulder dystocia was seen.

Energy and protein supplementation

A Cochrane review(3) of 17 RCTs (n=9,030) assessed education about and supplementation of energy and protein intake during pregnancy. Women who received nutritional education had lower risk of preterm birth and low birth weight. Birth weight was significantly increased among undernourished women but not in adequately nourished women. Protein intake increased significantly. However, no significant effects were seen on head circumference at birth, stillbirth, small for gestational age babies, and total gestational weight gain.

In women receiving balanced energy and protein supplementation, significant reductions were seen in stillbirth, small for gestational age, and mean birth weight was increased. No significant effects were seen for preterm birth, neonatal death, or weekly gestational weight gain.

High protein supplementation significantly increased the risk of small for gestational age babies. No significant effects were seen for stillbirth, neonatal death, preterm birth, birth weight or weekly gestational weight gain. Isocaloric protein supplementation had no significant effect on birth weight or weekly gestational weight gain. The authors reported the quality of evidence for outcomes, which ranged from very low to moderate quality.

Probiotics

A Cochrane review(24) of 1 RCT assessed probiotic supplementation during pregnancy. The included trial had 3 arms: probiotic plus dietary intervention, placebo plus dietary intervention and dietary intervention alone. The probiotic group had significantly lower rates of gestational diabetes mellitus. Miscarriage, intrauterine fetal death, stillbirth and neonatal death showed no significant difference. Infant birth weight was lower in the probiotic group, but there was no

significant effect on preterm delivery or caesarean section.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

Generally, the impact of micronutrient supplementation for women during or after pregnancy showed no significant effects on maternal or infant outcomes. In some studies

showing significant effects on some outcomes, for example with magnesium supplementation, both positive and negative effects were seen. Where authors noted the quality of the evidence informing their reviews in the abstract, much was of low or very low quality. Overall, the evidence does not indicate a need to update guidance on micronutrient supplementation for women during or after pregnancy.

New evidence is unlikely to change guideline recommendations.

Supplementation in infants

2017 surveillance summary

Zinc supplementation

A Cochrane review(25) of 80 RCTs (n=205,401) assessed zinc supplementation compared with no intervention placebo, or waiting list control in children aged 6 months to 12 years. No significant effects were seen on mortality, mortality due to diarrhoea, lower respiratory tract infection, or malaria. Zinc supplementation reduced diarrhoea morbidity, but was associated with increased risk of having at least one episode of vomiting. Zinc supplementation increased height by a small degree (but the authors noted that this may not be clinically important). The abstract did not report results for different age groups of children, so it is unclear how relevant the data to NICE PH11, which is concerned with children up to the age of 5 years.

Polyunsaturated fatty acids (PUFA)

A Cochrane review(26) of 9 studies (n=2,704) assessed PUFA supplementation in infants. Randomised or quasi-randomised trials were included. The authors noted that there was no evidence of an effect of PUFA supplementation on:

- all allergy
- asthma

- dermatitis or eczema
- food allergy.

Allergic rhinitis was lowered with PUFA supplementation in children aged under 2 years, but no effect was seen in children aged 2–5 years. The authors noted that 8 of the 9 studies had methodological issues.

Food supplementation in socio-economically disadvantaged children

A Cochrane review(27) of 32 studies assessed supplementary feeding interventions in disadvantaged children aged 3 months to 5 years. All included studies were RCTs or controlled before-and-after studies. Supplementary feeding had positive effects on growth in low and middle-income countries. However, in high income countries, no significant effect was seen.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

Generally, the impact of micronutrient supplementation in infants showed no significant effects on maternal or infant outcomes. In studies showing significant effects on some outcomes, for example with zinc supplementation, both positive and negative effects were seen. Overall, the

evidence does not indicate a need to update guidance on micronutrient supplementation in infants.

New evidence is unlikely to change guideline recommendations.

Diet in pregnancy

Recommendations in this section of the guideline

Recommendation 5

Who is the target population?

Pregnant women and those who may become pregnant.

Who should take action?

Midwives, obstetricians, GPs, health visitors and dietitians.

What action should they take?

- Early in pregnancy, discuss the woman's diet and eating habits and find out and address any concerns she may have about her diet.
- Provide information on the benefits of a healthy diet and practical advice on how to eat healthily throughout pregnancy. This should be tailored to the woman's circumstances. The advice should include: eat five portions of fruit and vegetables a day and one portion of oily fish (for example, mackerel, sardines, pilchards, herring, trout or salmon) a week.

Surveillance decision

NICE also has guidance on [weight management before, during and after pregnancy](#) (NICE PH27), which is currently being updated. The guideline on weight management before, during and after pregnancy has detailed recommendations on dietary advice during pregnancy. The update to the guideline on maternal and child nutrition should consider removing dietary advice for pregnant women from the scope of this guideline, and instead cross-refer to the guideline on weight management before, during and after pregnancy.

2017 surveillance summary

A Cochrane review(1) of 11 studies (n=2,786) assessed dietary advice interventions during pregnancy. Compared with standard care, dietary advice did not significantly reduce gestational diabetes or pre-eclampsia. No significant effects on caesarean section were seen. Pregnancy-induced hypertension and weight gain in pregnancy were significantly lower with dietary advice. In studies assessing advice on a low

glycaemic index diet compared with advice on a moderate to high glycaemic index diet, gestational diabetes did not differ significantly between groups. No significant effects on caesarean section or gestational weight gain were seen. The authors rated the evidence for outcomes as low or very low quality.

A Cochrane review(2) assessing nutritional advice in women with multiple pregnancies identified no trials meeting the inclusion criteria.

A Cochrane review(3) of 17 RCTs (n=9,030) assessed education about and supplementation of energy and protein intake during pregnancy. Women who received nutritional education had lower risk of preterm birth and low birth weight. Birth weight was significantly increased among undernourished women but not in adequately nourished women. Protein intake increased significantly. However, no significant effects were seen on head circumference at birth, stillbirth, small for gestational age babies, and total gestational weight gain.

Topic expert feedback

Topic experts highlighted the Cochrane review that assessed the effect of dietary interventions on gestational diabetes.

Impact statement

Evidence suggests that dietary advice may have beneficial effects on pregnancy-induced hypertension and weight gain in pregnancy, which supports current recommendations. However, NICE also has guidance on [weight management before, during and after pregnancy](#) (NICE PH27), which is currently being updated. NICE PH27 has detailed recommendations on dietary advice during pregnancy. The update to PH11 should consider removing dietary advice for pregnant women from the scope this guideline, and instead cross-refer to NICE PH27.

New evidence identified that may change current recommendations.

Obesity

Recommendations in this section of the guideline

Recommendation 6

Who is the target audience?

Pregnant women who have a pre-pregnancy body mass index (BMI) over 30, and those with a BMI over 30 who have a baby or who may become pregnant.

Who should take action?

Obstetricians, gynaecologists, GPs, midwives, health visitors, nurses, dietitians, those working in contraceptive services or on weight management programmes (commercial or voluntary).

What action should they take?

- Inform women who have a BMI over 30 about the increased risks this poses to themselves and their babies and encourage them to lose weight before becoming pregnant or after pregnancy. Provide a structured programme that:
 - addresses the reasons why women may find it difficult to lose weight, particularly after pregnancy
 - is tailored to the needs of an individual or group
 - combines advice on healthy eating and physical exercise (advising them to take a brisk walk or other moderate exercise for at least 30 minutes on at least 5 days of the week)
 - identifies and addresses individual barriers to change

- provides ongoing support over a sufficient period of time to allow for sustained lifestyle changes.
- Health professionals should refer pregnant women with a BMI over 30 to a dietitian for assessment and advice on healthy eating and exercise. Do not recommend weight-loss during pregnancy.
- Advise breastfeeding women that losing weight by eating healthily and taking regular exercise will not affect the quantity or quality of their milk.

(See also [diabetes in pregnancy](#) NICE guideline CG63 and [antenatal care](#) NICE guideline CG62)

Surveillance decision

This section of the guideline should be updated.

NICE also has guidance on [weight management before, during and after pregnancy](#) (NICE PH27), which is currently being updated. The guideline on weight management before, during and after pregnancy has detailed recommendations on dietary advice during pregnancy. The update to the guideline on maternal and child nutrition should consider removing obesity from the scope this guideline, and instead cross-refer to the guideline on weight management before, during and after pregnancy.

Breastfeeding

Recommendations in this section of the guideline

Recommendation 7

Who is the target population?

Pregnant women and breastfeeding mothers.

Who should take action?

Commissioners and managers of maternity and children's services.

What action should they take?

- Adopt a multifaceted approach or a coordinated programme of interventions across different settings to increase breastfeeding rates. It should include:
 - activities to raise awareness of the benefits of – and how to overcome the barriers to – breastfeeding
 - training for health professionals
 - breastfeeding peer-support programmes
 - joint working between health professionals and peer supporters
 - education and information for pregnant women on how to breastfeed, followed by proactive support during the postnatal period (the support may be provided by a volunteer).
- Implement a structured programme that encourages breastfeeding, using [BFI](#) as a minimum standard. The programme should be subject to external evaluation.

- Ensure there is a written, audited and well-publicised breastfeeding policy that includes training for staff and support for those staff who may be breastfeeding. Identify a health professional responsible for implementing this policy.

(See also [postnatal care](#) NICE guideline CG37)

Recommendation 8

Who is the target population?

Pregnant women and breastfeeding mothers.

Who should take action?

- Commissioners and managers of maternity and children's services.
- PCTs.

What action should they take?

- Ensure health professionals who provide information and advice to breastfeeding mothers have the required knowledge and skills.
- Ensure support workers receive training in breastfeeding management from someone with the relevant skills and experience before they start working with breastfeeding mothers.
- Ensure all those who work in maternity and children's services, including receptionists, volunteers and ancillary staff, are made fully aware of the importance of breastfeeding and help to promote a supportive environment.

Recommendation 9

Who is the target population?

Pregnant women and their partners.

Who should take action?

Midwives, obstetricians, GPs and health visitors.

What action should they take?

- Midwives and health visitors should ensure pregnant women and their partners are offered breastfeeding information, education and support on an individual or group basis. This should be provided by someone trained in breastfeeding management and should be delivered in a setting and style that best meets the woman's needs.
- During individual antenatal consultations GPs, obstetricians and midwives should encourage breastfeeding. They should pay particular attention to the needs of women who are least likely to breastfeed (for example, young women, those who have low educational achievement and those from disadvantaged groups).
- A midwife or health visitor trained in breastfeeding management should provide an informal group session in the last trimester of pregnancy. This should focus on how to breastfeed effectively by covering feeding position and how to attach the baby correctly.

Recommendation 10

Who is the target population?

Breastfeeding mothers.

Who should take action?

Midwives, health visitors, midwifery and health visitor support workers.

What action should they take?

- Ensure a mother can demonstrate how to position and attach the baby to the breast and can identify signs that the baby is feeding well. This should be achieved (and be documented) before she leaves hospital or the birth centre (or before the midwife leaves the mother after a home birth).
- Provide continuing and proactive breastfeeding support at home, recording all advice in the mother's hand-held records.
- Provide contact details for local voluntary organisations that can offer ongoing support to complement NHS breastfeeding services.
- Advise mothers that a healthy diet is important for everyone and that they do not need to modify their diet to breastfeed.
- Do not provide written materials in isolation but use them to reinforce face-to-face advice about breastfeeding.

Recommendation 11

Who is the target population?

Pregnant women and new mothers, particularly those who are least likely to start and continue to breastfeed. For example, young women, those who have low educational achievement and those from disadvantaged groups.

Who should take action?

Commissioners and managers of maternity and children's services.

What action should they take?

- Provide local, easily accessible breastfeeding peer support programmes and ensure peer supporters are part of a multidisciplinary team.
- Ensure peer supporters:
 - attend a recognised, externally accredited training course in breastfeeding peer support
 - contact new mothers directly within 48 hours of their transfer home (or within 48 hours of a home birth)
 - offer mothers ongoing support according to their individual needs. This could be delivered face-to-face, via telephone or through local groups
 - can consult a health professional and are provided with ongoing support
 - gain appropriate child protection clearance.

- Consider training peer supporters and link workers to help mothers, parents and carers follow professional advice on feeding infants aged 6 months and over. The advice should promote an increasingly varied diet using food of different textures in appropriate amounts (in addition to milk), in response to the baby's needs.

Recommendation 12

Who is the target population?

Breastfeeding mothers.

Who should take action?

Midwives, health visitors, paediatric nurses, nurses working in special-care baby and neonatal units, and nursery nurses.

What action should they take?

- Show all breastfeeding mothers how to hand-express breast milk.
- Advise mothers that expressed milk can be stored for:
 - up to 5 days in the main part of a fridge, at 4°C or lower
 - up to 2 weeks in the freezer compartment of a fridge
 - up to 6 months in a domestic freezer, at minus 18°C or lower.
- Advise mothers who wish to store expressed breast milk for less than 5 days that the fridge preserves its properties more effectively than freezing.
- Advise mothers who freeze their expressed breast milk to defrost it in the fridge and not to re-freeze it once thawed. Advise them never to use a microwave oven to warm or defrost breast milk.

Surveillance decision

Public Health England has published comprehensive [information to support commissioning of local infant feeding services](#). The commissioning guide was, in part, informed by the guideline on maternal and child nutrition. Additionally, several of NICE's maternity-related guidelines are currently being updated.

Therefore, an update of the section of the guideline on maternal and child nutrition that covers breastfeeding will complement the updated maternity guidelines. NICE's guidelines on antenatal care, intrapartum care, and postnatal care cover distinct periods, ending at 8 weeks after birth. However, the guideline on maternal and child nutrition covers these periods and beyond, and extends to settings other than health services. The update should investigate effective interventions to increase the uptake and continuation of breastfeeding, with consideration of related recommendations in NICE's in-development guidelines and Public Health England's information to support commissioning of local infant feeding services.

Breastfeeding interventions

2017 surveillance summary

Breastfeeding education and support

A Cochrane review(28) of 28 RCTs (n=107,362) assessed interventions for promoting initiation of breastfeeding. Breastfeeding education and support was associated with increased rates of breastfeeding initiation, when led by healthcare professionals and when led by non-healthcare professionals. The authors rated the evidence as low or very low quality.

A Cochrane review(29) of 24 RCTs assessed antenatal breastfeeding support. Overall, compared with standard care, there was no evidence that breastfeeding education improved initiation of breastfeeding or continued breastfeeding at 3 or 6 months. The authors rated the evidence across outcomes, which varied from low to high quality.

A Cochrane review(30) of 73 studies (n=74,656 mother-infant pairs) assessed breastfeeding support compared with standard maternity care. Randomised and quasi randomised studies were included. Breastfeeding support reduced the rates of stopping breastfeeding before 6 months (partial or exclusive breastfeeding). Breastfeeding support also reduced the rates of stopping breastfeeding before 4–6 weeks. Evidence was downgraded to moderate quality because of high heterogeneity.

A Cochrane review(31) of 10 studies (n=5,787) assessed breastfeeding support women with multiple pregnancies. Randomised and quasi-randomised studies were included. However, the authors were unable to conduct analyses or rate the quality of the evidence because of scarcity of evidence and the format of reporting.

Mothers drinking extra fluids

A Cochrane review(32) of 1 quasi-randomised study (n=210) assessed the effect of extra fluid for breastfeeding mothers. The trial's authors reported that advising mothers to drink extra fluid did not improve breast milk production. However, the Cochrane review's authors noted that the data

from this study were not available in a form that allowed further analysis.

Breastfeeding scheduling strategies

A Cochrane review(33) assessing baby-led breastfeeding compared with scheduled breastfeeding identified no eligible RCTs or quasi-randomised studies.

Additional food or fluids for infants

A Cochrane review(34) of 11 studies (n=2,542 mother-infant pairs) assessed the addition of food or fluid to breastfeeding before the age of 6 months. Randomised and quasi-randomised studies were included. The addition of 'artificial milk' had no significant effect on rates of breastfeeding at hospital discharge. At 3 months any breastfeeding was significantly higher in infants provided with 'artificial milk' compared with exclusive breastfeeding. However, rates of breastfeeding were lower with artificial milk than with exclusive breastfeeding at 4, 8, 12, 16, and 20 weeks. The authors rated the evidence for these outcomes as low quality.

Addition of glucose water reduced episodes of hypoglycaemia at 12 hours, but there was no significant difference at 24 hours. Weight loss was significantly lower with glucose water at 6–48 hours but not at 72 hours. The authors rated the evidence for these outcomes as low or very low quality.

The early introduction of potentially allergenic foods was not associated with reduced allergy levels at 1–3 years or with visible eczema at 12 months, food protein-induced enterocolitis reactions. No significant difference in infant weight gain was seen with addition of foods from 4 months compared with exclusive breastfeeding until 6 months.

Pacifier use

A Cochrane review(35) of 2 studies (n=1,302) assessed restricted compared with unrestricted pacifier use in infants. No significant differences were seen in exclusive or partial breastfeeding at 3 or 4 months. The authors rated the quality of

evidence as moderate. None of the studies reported data on duration of partial or exclusive breastfeeding, breastfeeding difficulties (mastitis, cracked nipples, breast engorgement); infant's health (dental malocclusion, otitis media, oral candidiasis; sudden infant death syndrome [SIDS]); maternal satisfaction and level of confidence in parenting. One study reported that restricting pacifiers had no effect on crying behavior at ages 4–9 weeks or weaning before age 3 months; however, the authors noted that the data were incomplete and could not be further analysed.

[Location of infants after birth](#)

A Cochrane review(36) of 1 study (n=176) assessed the effect of location of infants after birth (in the same room or a separate room as their mother). The included study additionally assessed type of clothing for the infant, however the Cochrane review's authors combined the groups into an overall comparison of same room versus separate room. No significant difference was seen in rates of any breastfeeding at 6 months. However, rates of exclusive breastfeeding at day 4 was significantly higher in infants kept in the same room compared with a separate room. The authors rated the evidence as low quality.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

Studies of breastfeeding suggest that forms of support for breastfeeding mothers help to increase breastfeeding rates are consistent with current guidance in NICE PH11 and with Public Health England's [local infant feeding services](#) commissioning strategy.

Keeping the baby in the same room as the mother after birth may increase breastfeeding; which is consistent with practice in the UK. Public Health England's [local infant feeding services](#) commissioning strategy additionally promotes skin-to-skin contact at birth and throughout the first feed.

However, evidence on other interventions generally showed no significant effects, and authors sometimes struggled to find results on key outcomes for analyses.

The update should investigate effective interventions to increase the uptake and continuation of breastfeeding, with consideration of related recommendations in NICE's in-development guidelines addressing pregnancy and Public Health England's information to support commissioning of local infant feeding services.

New evidence is unlikely to change guideline recommendations.

[Link workers](#)

Recommendations in this section of the guideline

Recommendation 13

[Who is the target population?](#)

Pregnant women and mothers whose first language is not English, their partners and extended family.

[Who should take action?](#)

NHS trusts responsible for maternity care and GP surgeries and community health centres.

What action should they take?

- NHS trusts should train link workers who speak the mother's first language to provide information and support on breastfeeding, use of infant formula, weaning and healthy eating.
- Where link workers are not available, ensure women whose first language is not English have access to interpreting services and information in a format and language they can understand.
- NHS trusts should encourage women from minority ethnic communities whose first language is not English to train as breastfeeding peer supporters.

Surveillance decision

The update to the guideline on maternal and child nutrition should consider whether recommendations in this area should be stood down and replaced with a cross-reference to [patient experience in adult NHS services](#) (NICE CG138).

Infant formula

Recommendations in this section of the guideline

Recommendation 14

Who is the target population?

Pregnant women and mothers.

Who should take action?

- Commissioners and managers responsible for maternity, children's and primary care services.
- GPs, midwives, health visitors and pharmacists.

What action should they take?

- Commissioners and managers should ensure mothers have access to independent advice from a qualified health professional on the use of infant formula. This should include information on the potential risks associated with formula-feeding and how to obtain ongoing advice at home.
- Midwives should ensure mothers who choose to use infant formula are shown how to make up a feed before leaving hospital or the birth centre (or before the mother is left after a home birth). This advice should follow the most recent guidance from the DH ('Guide to bottle feeding' 2011).*
- Avoid promoting or advertising infant or follow-on formula. Do not display, distribute or use product samples, leaflets, posters, charts, educational or other materials and equipment produced or donated by infant formula, bottle and teat manufacturers.

(See also [postnatal care](#) NICE guideline CG37)

* This recommendation has been amended to include the latest Department of Health guidance on bottle feeding. The original wording was as follows: ('Bottle feeding' 2006).

Surveillance decision

Public Health England has published comprehensive [information to support commissioning of local infant feeding services](#). Therefore, the update should investigate effective interventions to provide advice and education for mothers using infant formula, with consideration of related recommendations in NICE's in-development maternity guidelines and Public Health England's information to support commissioning of local infant feeding services.

Long chain PUFA supplementation of infant formula

2017 surveillance summary

A Cochrane review(37) of 15 RCTs (n=1,889) assessed infant formula supplemented with long chain PUFAs compared with non-supplemented infant formula. Sweep visual evoked potentials at 12 months were significantly lower with PUFA supplementation, but no significant effects were seen on visual acuity measured by Teller cards at 12 months. No significant differences in Bayley Scales of Infant Development (BSID) mental development index or psychomotor function scores were seen at 18 months. PUFA supplementation was associated with lower

weight scores at 1 year, but no significant effects were seen for length or head circumference. The authors noted that the overall quality of evidence was low.

Topic expert feedback

No topic expert feedback was relevant to this evidence.

Impact statement

Evidence showed no important effects of PUFA supplementation of infant formula.

New evidence is unlikely to change guideline recommendations.

Prescribing

Recommendations in this section of the guideline

Recommendation 15

Who is the target population?

Hospital doctors, GPs, obstetricians, pharmacists, specialist nurses, dentists and PCT medicine management teams.

Who should take action?

NHS trusts responsible for maternity care and GP surgeries, community health centres, pharmacies and drug and alcohol services.

What action should they take?

- Ensure health professionals and pharmacists who prescribe or dispense drugs to a breastfeeding mother consult supplementary sources (for example, the [Drugs and Lactation Database](#) [LactMed] or seek guidance from the [UK Drugs in Lactation Advisory Service](#)).
- Health professionals should discuss the benefits and risks associated with the prescribed medication and encourage the mother to continue breastfeeding, if reasonable to do so. In most cases, it should be possible to identify a suitable medication which is safe to take during breastfeeding by analysing pharmacokinetic and study data. Appendix 5 of the 'British national formulary' should only be used as a guide as it does not contain quantitative data on which to base individual decisions.
- Health professionals should recognise that there may be adverse health consequences for both mother and baby if the mother does not breastfeed. They should also recognise that it may not be easy for the mother to stop breastfeeding abruptly – and that it is difficult to reverse.

Surveillance decision

Although no new information about this section of the guideline was identified, the decision to do a full guideline update means that this question may be updated.

Child health promotion

Recommendations in this section of the guideline

Recommendation 16

Who is the target population?

Parents and carers of infants and pre-school children.

Who should take action?

- NHS trust and PCT commissioners and managers.
- Health visitors, community nursery nurses, the child health promotion programme (CHPP) team and children's centre teams.

What action should they take?

- Commissioners and managers should work with local partners to ensure mothers can feed their babies in public areas without fear of interruption or criticism.
- Health visitors should assess the needs of all mothers, parents and carers with young children. They should provide relevant, early and ongoing support at home for those with the greatest needs, including any that may be the result of a physical or learning disability or communication difficulties.
- Health visitors and the CHPP team should:
 - support mothers to continue breastfeeding for as long as they choose

- provide mothers and other family members with support to introduce a variety of nutritious foods (in addition to milk) to ensure the child is offered a progressively varied diet from 6 months
- encourage and support parents and carers to make home-prepared foods for infants and young children, without adding salt, sugar or honey
- encourage families to eat together and encourage parents and carers to set a good example by the food choices they make for themselves
- advise parents and carers not to leave infants alone when they are eating or drinking.

Recommendation 17

Who is the target population?

Infants and pre-school children.

Who should take action?

- NHS trust and PCT commissioners and managers.
- GPs, paediatricians, midwives, health visitors and community nursery nurses.

What action should they take?

- As a minimum, ensure babies are weighed at birth and in the first week, as part of an overall assessment of feeding. Thereafter, healthy babies should usually be weighed at 8, 12 and 16 weeks and at 1 year, at the time of routine immunisations. If there is concern, weigh more often, but no more than once a month up to 6 months of age, once every 2 months from 6–12 months of age and once every 3 months over the age of 1 year** **[new 2011]**.
- Ensure infants are weighed using digital scales which are maintained and calibrated annually, in line with medical devices standards (spring scales are inaccurate and should not be used).
- Commissioners and managers should ensure health professionals receive training on weighing and measuring infants. This should include: how to use equipment, how to document and interpret the data, and how to help parents and carers understand the results and implications.
- Ensure support staff are trained to weigh infants and young children and to record the data accurately in the child health record held by the parents.

(See also [intrapartum care](#) NICE guideline CG55)

** This recommendation has been amended to be consistent with the UK World Health Organization child growth charts published in 2009. The original wording was as follows: As a minimum, ensure babies are weighed (naked) at birth and at 5 and 10 days, as part of an overall assessment of feeding. Thereafter, healthy babies should be weighed (naked) no more than fortnightly and then at 2, 3, 4 and 8–10 months in their first year.

Surveillance decision

Although no new information about this section of the guideline was identified, the decision to do a full guideline update means that this question may be updated. Advice on introducing food to infants' diets is expected to be covered by SACN's report on feeding in the first year of life (in development, publication expected in mid-2018).

Allergies

Recommendations in this section of the guideline

Recommendation 18

Who is the target population?

Pregnant women, mothers and their partners who have a family history of allergy (including eczema, asthma and hay fever).

Who should take action?

Midwives, health visitors, GPs, paediatricians, community dietitians and pharmacists.

What action should they take?

- Advise mothers to feed the baby only on breast milk and to continue breastfeeding while introducing solid foods, when the infant is 6 months. For current dietary advice visit [NHS Choices](#).
- Advise mothers who choose not to breastfeed that there is insufficient evidence to suggest that infant formula based on partially or extensively hydrolysed cow's milk protein helps to prevent allergies.

Surveillance decision

Current guidance does not include recommendations about avoiding potentially allergenic food, so this area should be considered as an addition to the scope of the update.

Introduction of potential allergens

2017 surveillance summary

[Assessing the health benefits and risks of the introduction of peanut and hen's egg into the infant diet before six months of age in the UK](#): A Joint Statement from the Scientific Advisory Committee on Nutrition and the Committee on Toxicity of Chemicals in food, Consumer products and the Environment notes that avoiding 'peanut or hen's egg beyond six to twelve months of age may increase the risk of allergy to the same foods'.

A systematic review and meta-analysis(38) of 37 studies (n>19,000) assessed the effects of hydrolysed formula and risk of allergic or autoimmune disease in infants. Included studies were prospective intervention trials. No significant effects of partial or extensively hydrolysed infant

formula were seen on eczema at age 4. The authors concluded: 'Overall there was no consistent evidence that partially or extensively hydrolysed formulas reduce risk of allergic or autoimmune outcomes in infants at high pre-existing risk of these outcomes.'

A Cochrane review(34) of 11 studies (n=2,542 mother-infant pairs) assessed the addition of food or fluid to breastfeeding before the age of 6 months. Randomised and quasi-randomised studies were included. The early introduction of potentially allergenic foods was not associated with reduced allergy levels at 1–3 years or with visible eczema at 12 months, food protein-induced enterocolitis reactions. No significant difference in infant weight gain was seen with addition of foods from 4 months compared with exclusive breastfeeding until 6 months.

An RCT(39) (LEAP, n=640) assessed consumption compared with avoidance of peanuts until the age of 60 months in children with severe eczema or egg allergy. Avoiding peanut was associated with a significantly higher incidence of peanut allergy at 60 months. This effect was also seen in a subgroup of children who had a positive skin-prick test of peanut extract at study entry (aged 4–11 months).

Topic expert feedback

Topic experts highlighted the LEAP study.

Impact statement

Evidence suggests that avoiding potentially allergenic foods, in particular, peanuts, early in life may be associated with an increased likelihood of developing allergies to those foods. Current guidance does not include recommendations about food avoidance strategies, so the update to NICE PH11 should consider adding this area to the scope of the update.

New evidence identified that may change current recommendations.

Oral health

Recommendations in this section of the guideline

Recommendation 19

Who is the target population?

Parents and carers of infants and pre-school children.

Who should take action?

Health visitors, GPs, dentists, dental hygienists/assistants, community and day care nursery nurses, home-based child carers and others who work with young children.

What action should they take?

- Encourage parents and carers to:
 - use a bottle for expressed breast milk, infant formula or cooled boiled water only
 - offer drinks in a non-valved, free-flowing cup from age 6 months to 1 year
 - discourage feeding from a bottle from 1 year onwards
 - limit sugary foods to mealtimes only
 - avoid giving biscuits or sweets as treats
 - encourage snacks free of salt and added sugar (such as vegetables and fruit) between meals
 - provide milk and water to drink between meals (diluted fruit juice can be provided with meals – 1 part juice to 10 parts water).
- Discourage parents and carers from:
- adding sugar or any solid food to bottle feeds
- adding sugar or honey to weaning (solid) foods

- offering baby juices or sugary drinks at bedtime.

Surveillance decision

The update to the guideline on maternal and child nutrition should investigate effective interventions to improve oral health in children, with consideration of SACN's report on feeding in the first year of life (in development, publication expected in mid-2018).

Pre-school settings

Recommendation 20

Who is the target population?

Parents and carers of infants and pre-school children.

Who should take action?

Nursery nurses, home-based child carers and others working in pre-school day care settings such as nurseries, creches and playgroups.

What action should they take?

- Support breastfeeding mothers by:
 - offering them the opportunity to breastfeed when they wish
 - encouraging them to bring expressed breast milk in a cool bag
 - ensuring expressed breast milk is labelled with the date and name of the infant and stored in the main body of the fridge.
- Implement DH guidance ('Guide to bottle feeding' 2011[†]) on the preparation and use of powdered infant formula to reduce the risk of infection to infants in care settings.

[†] This recommendation has been amended to include the latest Department of Health guidance on bottle feeding. The original wording was as follows: ('Bottle feeding' 2006).

Recommendation 21

Who is the target population?

Infants and pre-school children up to the age of 5 years.

Who should take action?

Teachers, teaching assistants, nursery nurses, home-based child carers and those working in pre-school day care settings such as nurseries, creches and playgroups.

What action should they take?

- Implement a food policy which takes a 'whole settings' approach to healthy eating, so that foods and drinks made available during the day reinforce teaching about healthy eating.

- Take every opportunity to encourage children to handle and taste a wide range of foods that make up a healthy diet by:
 - providing practical classroom-based activities
 - ensuring a variety of healthier choices are offered at mealtimes, and snacks offered between meals are low in added sugar and salt (for example, vegetables, fruit, milk, bread and sandwiches with savoury fillings)
 - ensuring carers eat with children whenever possible.

Surveillance decision

Public Health England has published comprehensive [information to support commissioning of local infant feeding services](#), which covers supporting breastfeeding or provision of expressed breast milk in pre-school settings. The update to the guideline on maternal and child nutrition should investigate effective interventions to increase breastfeeding in pre-school settings, with consideration of Public Health England's information to support commissioning of local infant feeding services.

SACN plans to review the evidence supporting current recommendations on feeding children aged 12–60 months, which may overlap with this section of the guideline. The update to the guideline on maternal and child nutrition should investigate effective interventions to increase healthy eating in pre-school settings, with consideration of SACN's planned work in this area.

Family nutrition

Recommendation 22

Who is the target population?

Families with children aged up to 5 years.

Who should take action?

- Commissioning agencies, local authorities, local strategic partnerships, voluntary agencies and local businesses that fund or provide community projects.
- Public health nutritionists and dietitians.

What action should they take?

- Public health nutritionists and dietitians should offer parents in receipt of Healthy Start benefit practical support and advice on how to use the Healthy Start vouchers to increase their intake of fruit and vegetables.
- Provide support (both practical and financial) to develop and maintain community-based initiatives which aim to make a balanced diet more accessible to people on a low income. Examples include: food cooperatives, 'cook and eat' clubs, 'weaning parties' and 'baby cafes'.
- Work with local retailers to improve the way fresh fruit and vegetables are displayed and promoted.

Surveillance decision

SACN plans to review the evidence supporting current recommendations on feeding children aged 12–60 months, which may overlap with this section of the guideline. The update to the guideline on maternal

and child nutrition should consider whether recommendations in this area should be stood down and replaced with a cross-reference to recommendations from SACN.

The update to the guideline on maternal and child nutrition should investigate effective interventions to increase healthy eating in families with children aged up to 5 years, with consideration of SACN's planned work in this area.

Editorial and factual corrections identified during surveillance

During surveillance editorial or factual corrections were identified.

- In recommendations 2 and 6, there are cross-references to the guideline on diabetes in pregnancy. However the guideline has been updated so the cross-reference should be updated from CG63 to NG3.
 - In recommendation 15, the link to the UK Drugs in Lactation Advisory Service no longer works. It should be updated to reflect the change in the responsible organisation from UK Medicines Information to the Specialist Pharmacy Service: <https://www.sps.nhs.uk/articles/ukdilias/>
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Research recommendations

Prioritised research recommendations

At specified surveillance reviews of guidelines published after 2011, we assess progress made against prioritised research recommendations. We may then propose to remove research recommendations from the NICE version of the guideline and the [NICE database for research recommendations](#). The research recommendations will remain in the full versions of the guideline. See NICE's [research recommendations process and methods guide 2015](#) for more information.

These research recommendations were deemed priority areas for research by the Guideline Committee; therefore, a decision will be taken on whether to retain the research recommendations or stand them down.

We applied the following approach:

- New evidence relevant to the research recommendation was found and an update of the related review question is planned.
 - The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database. If needed, a new research recommendation may be made as part of the update process.
- New evidence relevant to the research recommendation was found but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.
 - The research recommendation will be retained because there is evidence of research activity in this area.

- New evidence relevant to the research recommendation was found but an update of the related review question is not planned because evidence supports current recommendations.
 - The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database because further research is unlikely to impact on the guideline.
- Ongoing research relevant to the research recommendation was found.
 - The research recommendation will be retained and evidence from the ongoing research will be considered when results are published.
- No new evidence relevant to the research recommendation was found and no ongoing studies were identified.
 - The research recommendation will be removed from the NICE version of guideline and the NICE research recommendations database because there is no evidence of research activity in this area.
- The research recommendation would be answered by a study design that was not included in the search (usually systematic reviews or randomised controlled trials).
 - The research recommendation will be retained in the NICE version of the guideline and the NICE research recommendations database.
- The new research recommendation was made during a recent update of the guideline.
 - The research recommendation will be retained in the NICE version of the guideline and the NICE research recommendations database.

Research recommendations considered in surveillance

Research recommendation 1

Who should take action?

Research commissioners and funders.

What action should they take?

- Commission research into effective ways of improving the nutritional status of pre-conceptual women, pregnant and breastfeeding women and young children. This should identify effective ways of engaging with women both before and during pregnancy. It should pay particular attention to:
 - teenage parents, low-income families and families from minority ethnic or disadvantaged groups
 - promoting oily fish, vegetable and fruit consumption
 - helping women who may become pregnant, particularly those who are obese, to achieve a healthy body weight prior to pregnancy
 - promoting uptake of folic acid supplements prior to conception and the uptake of vitamin D supplements during pregnancy and while breastfeeding.
- Commission research into how best to encourage and support women to breastfeed exclusively during the first 6 months and how to ensure all women breastfeed for longer.

- Commission research on interventions which reduce the incidence of food allergy among infants and young children, particularly when introducing solid foods.
- Commission research into the acceptability of dietary and lifestyle interventions to improve the vitamin D status of mothers and children aged up to 5 years, particularly those from vulnerable groups. This should also assess the relative contribution made by exposing the skin to ultra-violet light and dietary supplements.
- Commission research into the prevention of early dental caries among children aged up to 5 years, especially those from vulnerable groups. This should focus on children's drinks and snacks.

Summary of findings

[New evidence](#) relevant to the research recommendation was found and an update of the related section of the guideline is planned.

The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database. If needed, a new research recommendation may be made as part of the update process.

Research recommendation 2

Who should take action?

Research councils, national and local research commissioners and funders, research workers and journal editors.

What action should they take?

Include as standard in nutritional research and policy evaluation reports:

- a clear, detailed description of what was delivered, over what period, to whom and in what setting
- the costs of delivering the intervention
- measurable and clearly defined health outcomes
- an estimation of the sample size required to demonstrate, with adequate statistical power, the impact on health
- differences in access, recruitment and (where relevant data are available) uptake according to socioeconomic and cultural variables such as social class, education, gender, income or ethnicity
- a description and rationale of the research methods and forms of interpretation used
- embedded process evaluations that include recipient perspectives (for example, using qualitative techniques such as interviews and focus groups).

Develop methods for synthesising and interpreting results across studies conducted in different localities, policy environments and population groups.

Formulate rigorous and transparent methods for assessing external validity and for translating evidence into practice.

Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database. If needed, a new research recommendation may be made as part of the update process.

Research recommendation 3

Recommendation 3 in this guideline has been replaced by [Vitamin D: supplement use in specific population groups](#) NICE guideline PH56 (2014).

Summary of findings

For 2017 surveillance, this section of the guideline was not considered because it is now covered by NICE PH56.

Research recommendation 4

Who should take action?

Policy makers, research funders and health economists.

What action should they take?

As a priority, commission research on the cost-effectiveness of maternal and child nutrition interventions. This includes balancing the cost of primary prevention of nutrition-related ill health against the costs of detecting and treating disease (both short and long term).

Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database. If needed, a new research recommendation may be made as part of the update process.

Recommendation 5

Who should take action?

Policy makers, research commissioners and local services.

What action should they take?

Commission research into the impact of routine growth and weight monitoring on child health and parenting behaviour.

Summary of findings

No new evidence relevant to the research recommendation was found and no ongoing studies were identified.

The research recommendation will be removed from the NICE version of the guideline and the NICE research recommendations database. If needed, a new research recommendation may be made as part of the update process.

Gaps in the evidence

1. There is a lack of evidence on the effectiveness of interventions targeting specific socio-economic, ethnic, low-income or vulnerable groups. More evidence is also needed on the differential effectiveness of interventions among these groups – and the effectiveness of different components within each intervention.
2. There is a lack of evidence about the effectiveness and cost effectiveness of interventions to improve the nutrition of mothers and children aged under 5, particularly those from disadvantaged, low-income and minority ethnic groups.
3. There is a lack of good quality economic studies on public health interventions to improve nutrition in the UK.
4. There is a lack of well-designed intervention studies on how to:
 - improve the nutritional status of women before and during pregnancy
 - enable pregnant women who are obese to reduce the associated health risks for both themselves and their babies
 - help postpartum women with their nutritional needs and weight
 - help improve iron intake and reduce salt intake among infants and young children
 - balance the benefits of improving vitamin D status and the associated risks of increased exposure to the sun.
5. There is a lack of studies that have adequately measured and validated nutrition levels before and after an intervention. Studies too often rely on self-reported information alone. In addition, few studies include measured dietary change as an outcome measure (many rely on surrogate measures such as the baby's birth weight, which can be affected by confounding.)
6. There is a lack of intervention studies and evaluations providing process and qualitative data. This is needed so that the effective components of an intervention can be assessed and replicated on a wider scale.
7. There is a lack of well-designed studies that have evaluated the use of food vouchers to encourage healthy eating.

References

1. Tieu J, Shepherd E, Middleton P, Crowther CA (2017 [cited 2017 Nov 7]) Dietary advice interventions in pregnancy for preventing gestational diabetes mellitus. Chichester, UK: John Wiley & Sons, Ltd
2. Bricker L, Reed K, Wood L, Neilson JP (2015 [cited 2017 Nov 7]) Nutritional advice for improving outcomes in multiple pregnancies. Chichester, UK: John Wiley & Sons, Ltd
3. Ota E, Hori H, Mori R, Tobe-Gai R, Farrar D (2015 [cited 2017 Nov 7]) Antenatal dietary education and supplementation to increase energy and protein intake. Chichester, UK: John Wiley & Sons, Ltd
4. De-Regil LM, Peña-Rosas JP, Fernández-Gaxiola AC, Rayco-Solon P (2015 [cited 2017 Nov 7]) Effects and safety of periconceptual oral folate supplementation for preventing birth defects. Chichester, UK: John Wiley & Sons, Ltd
5. Imdad A, Ahmed Z, Bhutta ZA (2016 [cited 2017 Nov 7]) Vitamin A supplementation for the prevention of morbidity and mortality in infants one to six months of age. Chichester, UK: John Wiley & Sons, Ltd
6. McCauley ME, van den Broek N, Dou L, Othman M (2015 [cited 2017 Nov 7]) Vitamin A supplementation during pregnancy for maternal and newborn outcomes. Chichester, UK: John Wiley & Sons, Ltd
7. Oliveira JM, Allert R, East CE (2016 [cited 2017 Nov 7]) Vitamin A supplementation for postpartum women. Chichester, UK: John Wiley & Sons, Ltd
8. Darlow BA, Graham PJ, Rojas-Reyes MX (2016 [cited 2017 Nov 7]) Vitamin A supplementation to prevent mortality and short- and long-term morbidity in very low birth weight infants. Chichester, UK: John Wiley & Sons, Ltd
9. Haider BA, Bhutta ZA (2017 [cited 2017 Nov 7]) Multiple-micronutrient supplementation for women during pregnancy. Cochrane Database of Systematic Reviews
10. Abe SK, Balogun OO, Ota E, Takahashi K, Mori R (2016 [cited 2017 Nov 7]) Supplementation with multiple micronutrients for breastfeeding women for improving outcomes for the mother and baby. Chichester, UK: John Wiley & Sons, Ltd
11. Suchdev PS, Peña-Rosas JP, De-Regil LM (2015 [cited 2017 Nov 7]) Multiple micronutrient powders for home (point-of-use) fortification of foods in pregnant women. Chichester, UK: John Wiley & Sons, Ltd
12. Salam RA, Zuberi NF, Bhutta ZA (2015 [cited 2017 Nov 7]) Pyridoxine (vitamin B6) supplementation during pregnancy or labour for maternal and neonatal outcomes. Chichester, UK: John Wiley & Sons, Ltd
13. Rumbold A, Ota E, Nagata C, Shahrook S, Crowther CA (2015 [cited 2017 Nov 7]) Vitamin C supplementation in pregnancy. Chichester, UK: John Wiley & Sons, Ltd
14. Rumbold A, Ota E, Hori H, Miyazaki C, Crowther CA (2015 [cited 2017 Nov 7]) Vitamin E supplementation in pregnancy. Chichester, UK: John Wiley & Sons, Ltd
15. Harding KB, Peña-Rosas JP, Webster AC, Yap CM, Payne BA, Ota E, et al. (2017 [cited 2017 Nov 7]) Iodine supplementation for women during the preconception, pregnancy and postpartum period. Chichester, UK: John Wiley & Sons, Ltd
16. Peña-Rosas JP, De-Regil LM, Garcia-Casal MN, Dowswell T (2015 [cited 2017 Nov 7]) Daily oral iron supplementation during pregnancy. Chichester, UK: John Wiley & Sons, Ltd
17. Peña-Rosas JP, De-Regil LM, Gomez Malave H, Flores-Urrutia MC, Dowswell T (2015 [cited 2017 Nov 7]) Intermittent oral iron supplementation during pregnancy. Chichester, UK: John Wiley & Sons, Ltd
18. Buppasiri P, Lumbiganon P, Thinkhamrop J, Ngamjarus C, Laopaiboon M, Medley N (2015 [cited 2017 Nov 7]) Calcium supplementation (other than for preventing or treating hypertension) for improving pregnancy and infant outcomes. Chichester, UK: John Wiley & Sons, Ltd
19. Ota E, Mori R, Middleton P, Tobe-Gai R, Mahomed K, Miyazaki C, et al. (2015 [cited 2017 Nov 7]) Zinc supplementation for improving pregnancy and infant outcome. Chichester, UK: John Wiley & Sons, Ltd

20. Makrides M, Crosby DD, Bain E, Crowther CA (2014 [cited 2017 Nov 7]) Magnesium supplementation in pregnancy. Chichester, UK: John Wiley & Sons, Ltd
21. Gunaratne AW, Makrides M, Collins CT (2015 [cited 2017 Nov 7]) Maternal prenatal and/or postnatal n-3 long chain polyunsaturated fatty acids (LCPUFA) supplementation for preventing allergies in early childhood. Chichester, UK: John Wiley & Sons, Ltd
22. Delgado-Noguera MF, Calvache JA, Bonfill Cosp X, Kotanidou EP, Galli-Tsinopoulou A (2015 [cited 2017 Nov 7]) Supplementation with long chain polyunsaturated fatty acids (LCPUFA) to breastfeeding mothers for improving child growth and development. Chichester, UK: John Wiley & Sons, Ltd
23. Crawford TJ, Crowther CA, Alsweiler J, Brown J (2015 [cited 2017 Nov 7]) Antenatal dietary supplementation with myo-inositol in women during pregnancy for preventing gestational diabetes. Chichester, UK: John Wiley & Sons, Ltd
24. Barrett HL, Dekker Nitert M, Conwell LS, Callaway LK (2014 [cited 2017 Nov 7]) Probiotics for preventing gestational diabetes. Chichester, UK: John Wiley & Sons, Ltd
25. Mayo-Wilson E, Junior JA, Imdad A, Dean S, Chan XHS, Chan ES, et al. (2014 [cited 2017 Nov 7]) Zinc supplementation for preventing mortality, morbidity, and growth failure in children aged 6 months to 12 years of age. Chichester, UK: John Wiley & Sons, Ltd
26. Schindler T, Sinn JK, Osborn DA (2016 [cited 2017 Nov 7]) Polyunsaturated fatty acid supplementation in infancy for the prevention of allergy. Chichester, UK: John Wiley & Sons, Ltd
27. Kristjansson E, Francis DK, Liberato S, Benkhalti Jandu M, Welch V, Batal M, et al. (2015 [cited 2017 Nov 7]) Food supplementation for improving the physical and psychosocial health of socio-economically disadvantaged children aged three months to five years. Chichester, UK: John Wiley & Sons, Ltd
28. Balogun OO, O'Sullivan EJ, McFadden A, Ota E, Gavine A, Garner CD, et al. (2016 [cited 2017 Nov 7]) Interventions for promoting the initiation of breastfeeding. Chichester, UK: John Wiley & Sons, Ltd
29. Lumbiganon P, Martis R, Laopaiboon M, Festin MR, Ho JJ, Hakimi M (2016 [cited 2017 Nov 7]) Antenatal breastfeeding education for increasing breastfeeding duration. Chichester, UK: John Wiley & Sons, Ltd
30. McFadden A, Gavine A, Renfrew MJ, Wade A, Buchanan P, Taylor JL, et al. (2017 [cited 2017 Nov 7]) Support for healthy breastfeeding mothers with healthy term babies. Chichester, UK: John Wiley & Sons, Ltd
31. Whitford HM, Wallis SK, Dowswell T, West HM, Renfrew MJ (2017 [cited 2017 Nov 7]) Breastfeeding education and support for women with twins or higher order multiples. Chichester, UK: John Wiley & Sons, Ltd
32. Ndikom CM, Fawole B, Ilesanmi RE (2014 [cited 2017 Nov 7]) Extra fluids for breastfeeding mothers for increasing milk production. Chichester, UK: John Wiley & Sons, Ltd
33. Fallon A, Van der Putten D, Dring C, Moylett EH, Fealy G, Devane D (2016 [cited 2017 Nov 7]) Baby-led compared with scheduled (or mixed) breastfeeding for successful breastfeeding. Chichester, UK: John Wiley & Sons, Ltd
34. Smith HA, Becker GE (2016 [cited 2017 Nov 7]) Early additional food and fluids for healthy breastfed full-term infants. Chichester, UK: John Wiley & Sons, Ltd
35. Jaafar SH, Ho JJ, Jahanfar S, Angolkar M (2016 [cited 2017 Nov 7]) Effect of restricted pacifier use in breastfeeding term infants for increasing duration of breastfeeding. Chichester, UK: John Wiley & Sons, Ltd
36. Jaafar SH, Ho JJ, Lee KS (2016 [cited 2017 Nov 7]) Rooming-in for new mother and infant versus separate care for increasing the duration of breastfeeding. Chichester, UK: John Wiley & Sons, Ltd
37. Jasani B, Simmer K, Patole SK, Rao SC (2017 [cited 2017 Nov 7]) Long chain polyunsaturated fatty acid supplementation in infants born at term. Chichester, UK: John Wiley & Sons, Ltd
38. Boyle RJ, Ierodiakonou D, Khan T, Chivinge J, Robinson Z, Geoghegan N, et al. (2016 [cited 2017 Nov 7])

Hydrolysed formula and risk of allergic or autoimmune disease: systematic review and meta-analysis. *BMJ (Clinical research ed.)* 352:i974

39. Du Toit G, Roberts G, Sayre PH, Bahnson HT, Radulovic S, Santos AF, et al. (2015 [cited 2017 Nov 7]) Randomized Trial of Peanut Consumption in Infants at Risk for Peanut Allergy. *New England Journal of Medicine* 372(9):803–13