Appendix 1. Evidence summary

Summary of new evidence from 6-year surveillance	Summary of new intelligence from 6-year surveillance (from topic experts or initial intelligence gathering)	Impact
Recommendation 1. Preparing for pregnancy: women with a BMI of 30 or more. evidence statements 1.19, 1.20, 1.21, 1.22; IDE		
This recommendation was not prioritised as part of the literature search for this surveillance review.	The previous review in 2014 states that this recommendation is ambiguous as it is suggested health professionals might need to deliver weight-loss support programmes themselves instead of referring to experts. It noted that the sentiment of the bullet point in Recommendation 1 that states "Health professionals should offer a weight-loss support programme involving diet and physical activity. The programme should follow the principles of good practice, as outlined at the beginning of this section" was not necessarily for the health professionals to deliver these programmes themselves, but to ensure there is access to such programmes. No references relating to this recommendation were provided by the topic experts. The suggestion of losing 5-10% of weight before becoming pregnant was taken from CG43 Obesity which has since been updated, however a version of this text can be found in PH53 Weight management: lifestyle services for overweight or obese adults	**No new evidence was identified, no changes, but a refresh is required.** Recommendation 1 provides guidance on ensuring health professionals understand the importance of achieving a healthy weight before pregnancy. It specifies that health professionals should use any opportunity to provide women with a BMI of 30 or more with information about the health benefits of losing weight before becoming pregnant and advise, encourage and help women with a BMI of 30 or more to reduce weight before becoming pregnant. It states that losing 5-10% of their weight would have significant benefits and encourages women to check their weight and waist measurement periodically. Health professionals should offer a weight loss support programme involving diet and physical activity and offer specific dietary advice in preparation for pregnancy, including the need to take folic acid supplements. In line with the previous surveillance review, it is suggested that text is amended in recommendation 1 to clarify that health professionals should ensure there is access to weight-loss support programmes and not provide these to people themselves. In line with the previous surveillance review, it is suggested that this recommendation is linked to PH11 Maternal and Child Nutrition, as this guideline offers helpful information about preparation for pregnancy. If the guideline was refreshed it would be helpful for

		this recommendation to refer to other NICE guidelines on weight management in adults such as NG7 Preventing excess weight gain Recommendation 3 and PH53 Weight management lifestyle services for overweight and obese adults Recommendation 7. Due to the update of CG43 Obesity it is suggested that the statement "losing 5–10% of their weight (a realistic target) would have significant health benefits" should be correctly referenced against Recommendation 7 in PH53 Weight Management and Lifestyle services for overweight and obese adults guideline which states "The more weight they lose, the greater the health benefits, particularly if someone loses more than 5% of their body weight and maintains this for life".
Summary of new evidence from 6-year surveillance	**Summary of new intelligence from 6-year surveillance**	**Impact**
Recommendation 2. Pregnant Women evidence statements 1.1, 1.18, 1.20, 1.21, 1.26; IDE		
Weight management during pregnancy Eighteen studies (2 meta-analyses[1, 2], 3 SRs[3-5], and 11 RCTs[6-18]) were identified that assessed interventions for weight management in women of healthy weight, women who were overweight and women who were obese during pregnancy. A meta-analysis of 18 randomised controlled trials (n=8712)[1] that evaluated the effects of diet interventions, diet, physical activity and lifestyle interventions, and essential fatty acid supplementation in pregnant women found that the diet intervention group had significantly reduced risks of preeclampsia by 33% (CI 0.53-0.85) compared to those in the other intervention groups. A meta-analysis of 12 systematic reviews[2] (n=not reported) analysing results on trials of interventions on	In the previous surveillance review in 2014 the panel were of the opinion that health professionals should record when advice over weight risks has been given and ensure this is not repeatedly given so as not to cause increased anxiety. The previous surveillance review in 2014 suggested that clarification was needed between the distinction of eating healthily and actively trying to lose weight. The 2014 panel noted that the guideline should acknowledge that eating healthily, being more physically active and adhering to pregnancy alcohol advice, may result in some weight loss. It also suggested that NICE should wait until a number of studies had published before updating this guideline. These studies were the LIMIT randomised controlled trial and the UPBEAT trial, both of which are summarised below.	**New evidence was identified that may change the recommendation** Recommendation 2 states that dieting during pregnancy is not recommended as it may harm the health of the unborn child. It states there are no evidence based UK guidelines on recommended weight-gain ranges during pregnancy. It discusses eating habits and physical activity and advises seeking information and advice on diet and activity from a reputable source. It discusses Healthy Start vouchers and dispels myths about what and how much to eat during pregnancy. It states that moderate intensity physical activity will not harm the mother or the unborn child and at least 30 minutes of moderate intensity activity is recommended each day. It suggests that health professionals should measure

gestational weight gain concluded that dietary interventions were effective in reducing gestational weight gain and reducing risks of gestational diabetes, gestational hypertension and shoulder dystocia, however reported that evidence found was of poor quality and no statistical analysis was reported. Three systematic reviews were found which looked at weight loss interventions in pregnant women. One included 49 RCTs (n=11,444)[3] of diet and/or exercise interventions among pregnant women. High quality evidence showed that diet, exercise, or diet and exercise combined interventions led to significant reductions of 20% in gestational weight gain (CI 0.73-0.87). There were no differences between the intervention groups and the control groups in regard to pre-eclampsia (RR 0.95 CI 0.77-1.16) or caesarean delivery (RR 0.95 CI 0.88-1.03). Other reported outcomes were lower risk of maternal hypertension and neonatal respiratory morbidity and a 15% lower risk of macrosomia (CI 0.73-1.00) for those women at high-risk who received interventions in diet and exercise. Another systematic review (n=4983)[4] looked at 13 RCTs which included diet and exercise interventions compared to no intervention at all in pregnant women. There were few significant differences between the groups other than the women who received combined diet and physical activity interventions were significantly less likely to have a preterm birth, there was a trend towards a lower gestational weight gain mean difference (MD) -0.76 kg (CI -1.55-0.03); and in one RCT women in the intervention group had a shorter antenatal hospital stay (CI -0.49 to -0.05). One systematic review[5] included 6 cohort studies (n=not reported) looking at weight loss in obese women during pregnancy and it was noted that gestational weight loss significantly increased the risks of small for gestational age infants under the 10th percentile (AOR 1.76) (CI 1.45-2.14) and under the 3rd percentile (AOR 1.62) (CI 1.19-2.20) however	In the current surveillance review one topic expert stated "Weight management support can be offered during pregnancy which emphasises the importance of avoiding excess gestational weight gain and which improves certain mother and baby outcomes. There needs to be clarity about the differences between healthy weight management during pregnancy versus restrictive diets which may lead to the production of ketones. The two are not the same". The UPBEAT trial (n=1555)[29] randomised obese pregnant women into two groups, 783 received the behavioural intervention and 772 received standard antenatal care. There were few significant differences between the 2 groups, and no improvements in gestational diabetes or gestational weight gain, however there were no adverse effects reported. The LIMIT trial (n= 2212)[30] randomised overweight women into two groups, 1108 women received dietary and lifestyle interventions and 1104 received standard care. Although the risk of the infant being large for gestational age was not significantly different in the two groups (19% in the intervention group vs 21% in the standard care CI 0.77-1.07), infants born to women in the intervention group were significantly more likely to have a weight lower than 4000g than the control group (15% in the intervention group vs 19% in the standard care CI 0.68-0.99). In a second LIMIT trial (n=2142)[31] infants born to the intervention group were significantly less likely to weight over 4.5kg (2.15% vs 3.69% CI 0.36 to 0.98), to have respiratory distress syndrome (1.22% vs 2.57% CI 0.24-0.90) and were more likely to have a shorter stay in hospital (3.94+/-7.26 days vs 4.41+/-9.87 days CI 0.82-0.97). There were no further significant differences noted between maternal and birth outcomes in the two groups. Topic experts suggested two meta analyses below, both of which showed no adverse effects when weight gain was reduced in pregnant women.	weight and height at first contact and should not weigh women repeatedly during pregnancy as a matter of routine, unless clinical management can be influenced or nutrition is a concern. It states that women with a BMI of 30 or more should not diet while pregnant and that these women should be referred to a dietitian for personalised advice on healthy eating and how to be active and be encouraged to lose weight after pregnancy. Eighteen studies (2 meta-analyses[1, 2], 3 SRs[3-5], and 11 RCTs[6-16]) that assessed interventions for weight management in women of healthy weight, women who were overweight and women who were obese during pregnancy and 10 studies (3 meta-analyses[19-21] and 7 RCTs[22-28]) that assessed interventions for physical activity in women of healthy weight, women who were overweight and women who were obese during pregnancy, looking at maternal and neonatal outcomes were identified. The evidence indicates that, diet and/or physical activity interventions may lead to a reduction in risks to the mother[1-4,15,20,21,28] (such as gestational diabetes) and baby[3-5,7,14,15,21] (e.g. less likely to be large for gestational age); and overall, does not appear to lead to any harms to the mother[3,6,10,13] or baby[10,12,13,14] – only one study[5] reported any possible harmful effect to the baby following weight loss of the mother during pregnancy, this was in relation to being small for gestational age. One topic expert stated that "Weight management support can be offered during pregnancy which emphasises the importance of avoiding excess gestational weight gain and which improves certain mother and baby outcomes. There needs to be clarity

significantly decreased the odds of large for gestational age infants over the 90th percentile (AOR 0.57) (CI 0.52-0.62). The following 10 RCTs showed that weight management interventions during pregnancy had positive outcomes in regard to the welfare of the woman and her child and did not harm the unborn child or the mother: In 1 RCT (n=576)[6] the intervention group received low glycaemic index dietary advice compared to general healthy eating advice. At the final assessment glycaemic index had reduced in the intervention group (P<0.001). There were no significant differences in birth weight, foetal percentile or ponderal index. In another RCT (n=542)[7] women were randomised to receive a glycaemic index diet compared to no dietary intervention. The intervention had a beneficial effect on neonatal central adiposity; and the main maternal factor associated with increased birth weight was greater gestational weight gain (p<0.001). In 1 RCT (n=389)[8] obese pregnant women were randomised to 3 separate groups. There was significantly lower Gestational weight gain in the Physical Activity + Dietary advice vs the Control (P=0.01) and the Physical Activity vs Control groups (P=0.042), with no significant differences in gestational weight gain between the intervention groups. In one RCT (n=342)[9] obese pregnant women were randomised to three different groups, one group had a hypocaloric diet and physical activity, one had physical activity interventions solely and one group had standard care. It was noted that high intakes of sugar seemed to relate to 5.4 kg gestational weight gain (CI 2.1-8.7) with no further outcomes being reported. In a cluster RCT (n=250)[10] pregnant women were	A meta-analysis of 44 RCTs (n=7278)[32] which all compared three interventions: diet; physical activity and a mixed approach. There was a 1.42kg reduction (CI: 0.95-1.89kg) in gestational weight gain with any intervention compared with the control. Dietary interventions improved pregnancy outcomes compared to the controls. Another meta-analysis of 30 RCTs (n=4503)[33] looking at weight management interventions in pregnancy reported a significant reduction of 0.97kg in gestational weight gain compared to the control group (CI -160- -0.34). Dietary interventions also improved pregnancy outcomes by reducing risk of pre-eclampsia (RR 0.74 CI 0,53-0,85), gestational hypertension (RR 0.30 CI 0.10 – 0.88), preterm birth (RR 0.68 0.48-0.96), and gestational diabetes (RR 0.52 CI 0.27-1.03). No adverse effects to the mother and child were reported, however this was stated as being low quality evidence. One expert referenced The healthy eating and lifestyle in pregnancy (HELP) feasibility study (n=148)[34] which involved obese women attending weekly weight management groups. Babies born to the 39 women who lost weight did not differ significantly in gestational size to those who did not lose weight and there were no negative impacts on birth outcomes. It was noted that those women who lost weight during pregnancy gave birth to more healthy gestational sized babies than the group who did not lose weight, however no statistical references were provided. One expert referenced the Maternal lighten up weight management service (n=110)[35] which involved obese women attending their choice of weight management programme. Weight was self-reported and follow up data limited, but those attending Slimming World and Dietetics were more likely to stay within the IOM weight gain recommendations and no adverse effects were reported, however there were no statistical	about the differences between healthy weight management during pregnancy versus restrictive diets which may lead to the production of ketones. The two are not the same". And topic experts suggested two meta analyses[32,33], both of which showed a reduction in adverse outcomes for in pregnant women who reduced weight. Topic experts also identified 3 studies[34-36] which reported no adverse effects following participation in weight/physical activity interventions. Five additional studies were referenced by experts but could not be found or have completed but do not yet have published results. The previous surveillance review in 2014 suggested that clarification was needed between the distinction of eating healthily and actively trying to lose weight. The 2014 panel noted that the guideline should acknowledge that eating healthily, being more physically active and adhering to pregnancy alcohol advice, may result in some weight loss. It also suggested that NICE should wait until a number of studies had published before updating this guideline. These studies were the (now published) UPBEAT RCT[29] which reported no adverse effects and the LIMIT RCT[30,31] which reported a reduction in adverse outcomes for babies and mothers. **The evidence from published studies, topic experts and the previous surveillance review indicates that dieting (eating healthily in order to reduce overweight/obesity) during pregnancy may not harm the health of the unborn child, hence the recommendation not to diet during pregnancy due to potential harm to the health of the unborn child may need to be reconsidered.**

randomised into 2groups with the intervention group receiving 2counselling sessions on diet, weight and physical activity and the control receiving standard care. The intervention group had significantly lower gestational weight gain at 38% compared to 60% (CI 0.3 to 0.9) and there were no significant differences in neonatal or obstetric outcomes. A study[11] reporting 12 month follow-up data found that at 10-12 months following birth the infants born to mothers in the intervention group tended to have a lower BMI, however it is not noted whether this was considered to be harmful or beneficial to the child and no statistical references are provided. Another RCT[12] followed up 157 women who had been randomised to groups with either diet and physical activity interventions or standard care. It had been noted, with no statistical references provided, that there was a small but significant difference in gestational weight gain between the 2 groups with those in the intervention group gaining less weight. It was also noted, again with no statistical references, that there were no differences in body composition or metabolic risk factors outcomes 2.8 years later between the children born to women who had been randomised to these 2 groups. In 1RCT (n=154)[13] pregnant women who were defined as "low risk" were randomised to either an intervention involving personalised diet plans and a follow-up by a dietician or standard care. Gestational weight gain was significantly lower in the intervention group ($p < 0.001$) with no reported negative outcomes to the mother and/or infant. One RCT (n=114)[14] randomised 56 obese women to receive a weight management intervention or a onetime dietary advice guide. There was a significant difference in weight gained between the 2 groups mean difference=-3.8 kg (CI -5.9 to -1.7) with the intervention group gaining less weight from starting the trial to 2 weeks postpartum. The intervention group also had a significantly lower proportion of large	references reported. One expert referenced the DALI Lifestyle Pilot (n=150)[36] which involved obese women from 9 European countries at risk of gestational diabetes mellitus being randomised to 3 groups: healthy eating; physical activity; or healthy eating and physical activity. It was noted that healthy eating interventions were more effective than physical activity interventions in regard to less gestational weight gain (P=0.03) and low fasting glucose (P=0.01); with no adverse effects reported. The following four studies were referenced by experts but these either cannot be found or have completed but do not yet have published results. The publication dates for the below studies are unknown: Effectiveness of regular weighing, weight target setting and feedback by community midwives within routine antenatal care in preventing excessive gestational weight gain: randomised controlled trial (a study looking at the intervention of setting a maximum weight gain for women with an outcome of keeping them within the IOM guidelines)[37]. Pregnancy, exercise and nutrition research study with smart phone app support (Pears): Study protocol of a randomized controlled trial. (A clinical trial to evaluate the effectiveness of a smart phone technology-assisted targeted healthy lifestyle intervention)[38]. Testing the feasibility of a mobile technology intervention promoting healthy gestational weight gain in pregnant women (txt4two) - study protocol for a randomised controlled trial (tailored text messages focusing on healthy nutrition, physical activity and gestational weight gain)[39]. eMoms Electronically-mediated weight interventions for pregnant and post-partum women (Looking for evidence on the efficacy of behavioural interventions in the prevention of excessive GWG and postpartum	The evidence shown in research recommendation 1 below suggests that the Institute of Medicine (IOM) guidelines may be applicable to the UK population and adherence to these recommendations may improve outcomes. The evidence suggests that physical activity during pregnancy has a positive effect on maternal and neonatal outcomes or shows no significant differences between the intervention and control group. However the suggestion of starting with 15 minutes of continual exercise 3 times a week and increasing to 30 minute sessions was taken from CG43 Obesity, and this text is no longer within this guideline and cannot be found in the subsequent updates. Therefore it is suggested this section is updated as, according to the evidence found in PH44, it is giving incorrect advice. PH44 Physical activity: brief advice for adults in primary care recommends "150 minutes of moderate intensity activity a week, taken in 10 minute bouts or 75 minutes of vigorous intensity activity a week". CG62 Antenatal Care 1.3.7.2 focuses on activities that are safe and recommended for pregnant women and it could be useful for this guideline to refer to this recommendation. In line with the previous surveillance review, it is suggested that: evidence concerning eating healthily, being more physically active and adhering to pregnancy alcohol advice might result in some weight loss which would not be harmful to the unborn child and would be beneficial to the health of the mother; consider recommending that midwives record given advice in the "green notes".

for gestational age babies at 9% vs 26% (CI 0.09-0.84). In another RCT (n=90)[15] pregnant women were randomised to either an intervention group receiving individualised lifestyle interventions which focused on exercise and weight monitoring or standard care. Weight management was significantly improved in the intervention group (OR 0.59 CI 0.45-0.72), with no reports of harmful effects to the mother and/or infant. Another RCT (n=60)[16] in overweight pregnant women showed that Therapeutic Lifestyle Changes programmes looking at diet and physical activity compared to standard care led to reduced gestational weight gain (p=0.047) and reduced pregnancy complications such as gestational diabetes mellitus, gestational hypertension and preterm delivery however statistical references were not provided. Two RCTs showed that a weight management intervention during pregnancy did not have positive outcomes in regard to weight management (and did not harm the unborn child or the mother). One RCT (n=1108)[17] had 543 overweight women receiving a DVD educating on diet and exercise as well as consultations with dieticians and 565 overweight women only received the consultations with the dieticians and standard written materials. There were no differences in activity or weight gain in these groups of women at the end of the 10 week session. One RCT (n=382)[18] randomised overweight or obese women into two groups: one group was encouraged to self-weigh and provided with simple dietary advice, the other group received standard care. There were no differences in mean gestational weight gain between the 2 groups (CI -2.0-0.25) and no change in obstetric complications between the groups (CI 0.85-1.14).	weight retention)[40]	

Physical activity during pregnancy Ten studies (3 meta-analyses[19-21] and 7 RCTs[22-28]) were identified that assessed interventions for physical activity in women of healthy weight, women who were overweight and women who were obese during pregnancy, looking at maternal and neonatal outcomes. One meta-analysis included 5 randomised controlled trials looking at interventions related to weight loss (n=not reported) [19] and showed that exercise significantly reduced gestational weight gain (WMD=-2.22 kg) (CI -3.14 to -1.3). One included 13 RCTs (n=2873)[20] which assessed the effectiveness of physical exercise interventions during pregnancy to prevent gestational diabetes mellitus and excessive maternal weight gain and showed that exercise programmes during pregnancy decreased the risk of gestation diabetes mellitus (P = 0.009) and maternal weight (WMD = -1.14 kg) (CI -1.50 to -0.78) with no adverse effects reported. A meta-analysis of 28 randomised controlled trials (n=5322)[21] comparing supervised prenatal exercise to standard care and showed that exercise significantly reduced the odds of having a large for gestational age infant by 31% (CI 0.55-0.86), high gestational weight gain (weighted mean difference -1.1 kg) (CI -1.5 to -0.6) and odds of caesarean delivery (OR 0.80) (CI 0.69-0.94). It was noted that babies born to mothers who had exercised were lighter in weight at birth than the controls (weighted mean difference -31 g) (CI -57 to -4). There were seven RCTs found. Three RCTs showed that physical activity during pregnancy was safe for the mother and unborn child, however physical activity interventions on their own did not have as strong an outcome as diet interventions.		

One RCT (n=113)[22] had pregnant women receiving trainer-led exercise sessions 3-5 times a week and two dietary counselling sessions compared to no intervention at all. Lower gestational weight gain and offspring birth weight were noted in those women of healthy weight ($p < 0.05$) however weight related changes were not noted in those women above normal pre-pregnancy BMI. Another RCT (n=510)[23] had 255 pregnant women in the intervention group which focused on moderate-intensity resistance and aerobic exercises three times a week for 55 minute sessions compared to standard care. It was noted that there were no significant differences between the two groups however no statistical summaries were included. In another RCT (n=35)[24] obese pregnant women were randomised to two groups and the intervention group received an individualised exercise plan compared to no plan at all. There were no significant differences found in gestational weight gain between the two groups, however no statistical summaries were included. The following 4 RCTs showed that physical activity during pregnancy was safe for the mother and unborn child and showed important positive outcomes. One RCT (n=200)[25] allocated 107 pregnant women to a group who did 60 minutes of exercise 3 times a week and 93 were randomised to the control group. Women in the intervention group were significantly less likely to gain excessive weight than the control group ($p = 0.02$). In another RCT (n=37)[26] overweight or obese pregnant women were assigned to a walking intervention group or a control group. The intervention group showed trends toward more favourable maternal and birth outcomes compared to the control group, with no statistical summaries included.		

In 1 RCT (n=962)[27] healthy pregnant women were randomly assigned to an intervention group who conducted light-to-moderate intensity aerobic and resistance exercises for 50 minutes a session 3 days a week compared to a control group. Those in the intervention group were significantly less likely to gain weight above the IOM recommendations (OR 0.625) (CI 0.461-0.847). In an RCT (n=342)[28] 101 pregnant women were randomised to the intervention group and exercised for 60 mins 3 times a week and the 156 women in the control group received standard care. The prevalence of gestational diabetes mellitus was significantly reduced in the intervention group (odds ratio = 0.103) (CI 0.013-0.803).		
Summary of new evidence from 6-year surveillance	**Summary of new intelligence from 6-year surveillance**	**Impact**
Recommendation 3. Supporting women after childbirth. evidence statements 1.3, 1.4, 1.7, 1.12, 1.14, 1.15, 1.16, 1.17, 1.19, 1.21, 1.22; IDE		
This recommendation was not prioritised as part of the literature search for this surveillance review.	No references relating to this topic were provided by the topic experts	**No new evidence was identified, no changes, but a refresh is required.** Recommendation 3 suggests health professionals talk about the woman's weight at the 6-8 week post-natal check-up. They should discuss ways of losing weight taking into account family circumstances, tiredness, pelvic floor issues and back problems. They should also discuss breastfeeding, community based services and give advice from a reputable source, and physical activity – using the Royal College of Obstetrics and Gynaecology source. There is a weblink in the guideline for the Royal Collect of Obstetrics and Gynaecology however this link no longer works and it is suggested that this is refreshed appropriately.

Summary of new evidence from 6-year surveillance	Summary of new intelligence from 6-year surveillance	Impact
Recommendation 4. Women with a BMI of 30 or more after childbirth. evidence statements 2.1, 2.3, 2.6, 2.12, 2.13; IDE		
This recommendation was not prioritised as part of the literature search for this surveillance review.	The previous review in 2014 suggested that this recommendation should make references to PH11 Maternal Child and Nutrition. One of the topic experts said they "would like to see Recommendation 4 amended and to include a third category of women - women who start pregnancy at any BMI category but whom gain excessive weight. (Research suggests) that women who gain excess weight during pregnancy are still heavier 15 years on".	***Impact decision: No new evidence was identified, minor changes*** Recommendation 4 suggests health professionals should explain the risks of having a BMI over 30 and encourage women to lose weight. They should offer a structured weight loss programme or a referral to a dietician and use evidence based behaviour change techniques. They should encourage breast feeding. It is suggested this recommendation refers to PH11 Maternal and Child Nutrition at all appropriate stages. The issue around women who gain excessive weight during pregnancy was part of the original remit of this guidance and could be considered as part of a partial update. It is noted that in line with the scope, the issue of excessive weight gained by women of any BMI category during pregnancy will be addressed in an update of the guideline.
Summary of new evidence from 6-year surveillance	**Summary of new intelligence from 6-year surveillance**	**Impact**
Recommendation 5. Community based services. evidence statements 1.1, 1.18, 2.1, 2.3, 2.6, 2.12, 2.13; IDE		
This recommendation was not prioritised as part of the literature search for this surveillance review.	It is stated in the guideline that the following recommendation is taken from CG43 Obesity "Encourage those who have weight concerns before, during or after pregnancy to talk to a health professional such as a GP, practice nurse, dietitian, health visitor or pharmacist", however this cannot be found in CG43 or in subsequent updates.	**No new evidence was identified, no changes, but a refresh is required.** Recommendation 5 suggests that local authority leisure and community services should offer women with babies and children the opportunity to take part in a range of physical or recreational activities. They

	The review in 2014 raised concerns around non-NHS advisers giving advice to pregnant women. It also suggested that the guideline should be more specific around the nutritional supplements other than folic acid that are recommended to women planning a pregnancy – however the scope for PH27 makes no mention of looking at nutritional supplements. The review in 2014 also noted that some of the actors may have changed and that reputable sources of UK advice would be useful. There was concern around the recommendation that non-NHS health and fitness advisers should give specific dietary advice in preparation for pregnancy. One of the topic experts noted that this recommendation could be much stronger on the need to address health inequalities as not all women will have the means to access weight management support at whichever stage of "the continuum" unless it is free and offered at suitable times of the day at accessible venues.	should be affordable, at suitable times, and accommodate breastfeeding and childcare. Health trainers and advisers should give advice about healthy eating and the importance of physical activity and using evidence-based behaviour-change techniques to motivate and support women to lose weight. They should advise women that a healthy diet and being physically active will benefit both them and their unborn child during pregnancy. They should offer specific dietary advice, for example taking folic acid. It would be useful if references to other guidelines were refreshed and amended. The surveillance team believe that the guideline already provides recommendations around affordable and accessible services so no changes are needed.
Summary of new evidence from 6-year surveillance	**Summary of new intelligence from 6-year surveillance**	**Impact**
Recommendation 6. Professional skills. IDE		
This recommendation was not prioritised as part of the literature search for this surveillance review.	The review from 2014 stated that the people who need to take action here might need to be refreshed and suggested that Health Education England could be added in. No topic expert feedback was provided by the questionnaire.	**No new evidence was identified, no changes, but a refresh is required.** Recommendation 6 suggests health professionals should ensure all have the skills to advise on weight management and nutritional needs, all have behaviour change knowledge and good communication techniques, can dispel common myths and have knowledge and competencies in group facilitation and that their training is regularly monitored and updated.

		It would be useful if consideration of relevant settings could be addressed as part of a refresh to this guideline.
Summary of new evidence from 6-year surveillance	**Summary of new intelligence from 6-year surveillance**	**Impact**
Preamble to recommendations.		
Please see the summary for recommendation 2	Please see the summary for Recommendation 2	**New evidence was identified that may change the recommendation** This section includes a definition of weight management. A definition of how to achieve and maintain a healthy weight which involves suggestions that cycling should be built into everyday life. A statement about how weight loss programmes are not recommended during pregnancy as they may harm the health of the unborn child. Some reputable sources of information and advice about diet and physical activity for women and some information on changing behaviour This section will not exist in the new guideline therefore it is suggested the text within this section is moved to join suitable recommendations. Please note that the links to the following "reputable sources" need updating: The Pregnancy Book has been archived, the Birth to Five Guide has been updated and the Eat Well Website is now the Eatwell Guide. These need to be updated. The section on achieving and maintaining a healthy weight (including the section on effective weight-loss programmes) was originally taken from the Obesity guideline CG43 but this text is no longer within this guideline or subsequent updates. This section could be updated using the new version of this text from NG7 Preventing excess weight gain. It appears that new evidence suggests the statement

		"Weight loss programmes are not recommended during pregnancy as they may harm the health of the unborn child, see recommendation 2" could be changed to reflect any changes to recommendation 2 following update. It would be helpful if the achieving and maintaining a healthy weight section that discusses physical activities within the guideline could reflect CG62 Antenatal Care 1.3.7 which makes women aware of the activities that may potentially be dangerous for women during pregnancy.
Research Recommendations		
RR1 - Are the US Institute of Medicine (2009) guidelines on weight gain in pregnancy appropriate for use with the UK population? Does adherence to these recommendations improve outcomes? Are they effective with women under 18 and those from minority ethnic groups?		
One longitudinal study (n=4607)[41] over 8 geographically diverse urban regions in Brazil, China, India, Italy, Kenya, Oman, United Kingdom and United States measured weight gain at 5 different points in the pregnancy and the mean gestational weight gain was calculated. It was noted that weight gain in pregnancy was similar across the regions studies and therefore weight management guidelines could be used for all populations, however no statistical references were provided. Eleven studies (2 systematic reviews [42,43], 8 cohorts[44-51], and 1 RCTs[52]) were identified that assessed the Institute of Medicine's gestational weight gain guidelines and the outcomes of women who exceeded or fell short of the recommendations. A systematic review (n=740,000)[42] of peer reviewed journal articles from four different countries about gestational weight gain in obese women suggested that for women with class III obesity no gestational weight gain should occur. The results also suggested that obese women will generally gain more than the weight gain recommendations in the Institute of Medicine guidelines. There were no statistical references to confirm this finding however.	One of the topic experts stated "there should be clear guidance on recommendations for weight gain during pregnancy and the IOM guidelines draw upon a huge body of international evidence. However the IOM guidance is limited that the recommendations clump all people with a BMI above 30 in the same category whereas good quality evidence would suggest that women with even higher BMIs should put on even less, if any, weight.	**New evidence was identified that may have an impact on the recommendations** When this guideline was developed the advisory committee believed that the IOM recommendations were not validated by intervention studies. Without evidence from large-scale trials they felt it was not clear whether or not adhering to the recommended ranges lowered the risk of adverse outcomes for mothers and their babies. In addition, the guidelines were developed for the US population and it was not known whether or not they would apply to other populations with a different ethnic composition. The IOM recommendations suggest that women should gain anywhere between 11 and 40 pounds during pregnancy, dependent on their starting BMI. Eleven studies (2 systematic reviews [42,43], 8 cohorts[44-51], and 1 RCTs[52]) were identified that looked at women who gained gestational weight outside of the IOM recommendations, either by exceeding the guidelines or by gaining too little weight. The studies' findings indicated that gaining too much weight was associated with changes in maternal outcomes such as increased risk of caesareans, pre-eclampsia, gestational diabetes, blood transfusion, seizure,

Another systematic review looked at 18 cohort studies (n=not reported)[43] and noted that gestational weight gain below the IOM guidelines had significantly higher risks of preterm birth (AOR 1.46 CI 1.07-2.00) and small for gestational age infants (AOR 1.24 CI 1.13-1.36) and significantly lower risks of large for gestational age infants (AOR 0.77 CI 0.73-0.81), macrosomia (AOR 0.64 CI 0.54-0.77), gestational hypertension (AOR 0.70 CI 0.53-0.93), pre-eclampsia (AOR 0.90 CI 0.82-0.99) and caesareans (AOR 0.87 CI 0.82-0.92). When comparing women's health against the IOM recommendations the following 9 studies showed that women who gained less weight had healthier outcomes. In one retrospective cohort study (n=340)[44] large for gestational age (AOR 3.08 CI 1.13-8.39) and macrosomia (AOR 4.02 CI 1.16-13.9) in infants increased in those who gained greater gestational weight than the IOM recommendations. There were no other significant differences reported. In another retrospective cohort study (n=635)[45] the risk of caesarean delivery, preeclampsia, macrosomia and large for gestational age increased in those that exceeded the IOM recommendations for weight gain, however no statistical references were given. In a cohort study (n=1241)[46] of overweight and obese women 1053 gained more than 5kg during pregnancy and 188 either lost weight or gained less than 5kg. Those who lost or gained less weight had 9.6% chance of small for gestational age babies compared to 4.9% for those who gained weight (CI 1.4-4.7). There were no other significant differences in babies born to the two groups. In a cohort study (n=675)[47] it was noted that gestational weight gain above the IOM limits in pregnant women with gestational diabetes mellitus		ventilation use and hypertension, and affected neonatal outcomes in regard to high neonatal measurements, large for gestational weight infants and macrosomia. Those who did not gain enough weight were generally associated with small for gestational age infants. One longitudinal study suggested that gestational weight gains and outcomes across varied populations of women were similar. The research indicates that the US Institute of Medicine's "Weight gain during pregnancy guidelines" 2009 may be relevant to women in the UK population, including those from some minority ethnic groups. However, in order to follow these recommendations regular weighing may then be necessary and more research would be needed to look into the effect this has on the health and mental wellbeing of pregnant women. CG62 antenatal care guideline currently states that "measuring maternal weight (or height) routinely during pregnancy should be abandoned as it may produce unnecessary anxiety with no added benefit. The exception is pregnant women in whom nutrition is of concern". One of the topic experts stated "there should be clear guidance on recommendations for weight gain during pregnancy and the IOM guidelines draw upon a huge body of international evidence. However the IOM guidance is limited that the recommendations clump all people with a BMI above 30 in the same category whereas good quality evidence would suggest that women with even higher BMIs should put on even less, if any, weight. Whether the IOM guideline recommendations are safe and effective with women under 18 was not part of the search criteria for this surveillance update and no references relating to this recommendation were provided by the topic experts. It is suggested that this research recommendation is superseded by updating recommendation 2, taking into account the new evidence surrounding Institute of

were significantly linked to higher neonatal measurements and a higher rate of large for gestational age infants, however no statistical references were given. Gestational weight gain until gestational diabetes mellitus was linked with higher birth weight percentile (P=0.002). A cohort study of pregnant women (n=not reported)[48] noted that women who gained weight over the IOM recommendations were significantly more likely to have adverse maternal outcomes such as preeclampsia (AOR 2.78 CI 2.82-2.93), eclampsia (AOR 2.51 CI 2.27-2.78), ventilation use over 6 hours (AOR 1.24 CI 1.15-1.33), caesarean (AOR 2.1 CI 2.14-2.19), blood transfusion (AOR 1.22 CI 1.11-1.33), neonatal outcomes (5 minute Apgar AOR 1.22 CI 1.14-1.31) and seizure (AOR 1.53 CI 1.24-1.89). Women who gained less than the IOM recommendations had lower risk of hypertensive disorders of pregnancy and obstetric interventions but were at higher risk of giving birth to small for gestational age infants (no statistical references given). A cohort study (n= 20,950)[49] of obese women noted that losing weight led to lower risk of caesareans for women in obesity class I (OR 0.21 CI 0.11-0.42) and increased risk of small for gestational age infants (CI 1.3-2.5) in obesity class I. Large amounts of weight gain were significantly associated with increased risk of large for gestation age infants (OR 1.8 CI 1.9-2.9) in obesity class I. It was concluded that the best maternal and neonatal outcomes occur when obese women gain less weight than the current IOM recommendations. In another cohort study (n= 8,293)[50] it was noted that excess weight gain above IOM recommendations was associated with an increased risk of hypertensive disorders, caesarean delivery and large for gestational age infants. Excess weight gain was associated with a decrease in risk of small for gestational size infants, however no statistical		Medicine guidelines, and if there are any gaps in the evidence subsequent to an update, research recommendations may be added in response to that.

references were provided. In a retrospective cohort study (n= 1,034)[51] weight gain below IOM guidelines was associated with lower odds of preterm birth (OR 1.82 CI 0.60-5.59) and low birth weight (OR 1.20 CI 0.57-2.49) and was associated with significantly lower large for gestational age rates (OR 0.50 CI 0.32-0.77). Excessive weight gain above the IOM guidelines was significantly associated with increased risk of hypertension (OR 1.96 CI 1.26-3.03) and caesarean delivery (OR 0.84 CI 1.00-1.97). An RCT (n=179)[52] comparing women who had given birth to infants of low birth weight, compared to a control group noted that there was an increased risk of caesarean delivery (OR 2.53 CI 1.33-4.83) and neonatal asphyxia within one week of birth (OR 5.71 CI 1.21-26.83) among the women who had low birth weight infants. Women who were of a healthy weight and followed IOM recommendations were not at risk of low birth weight infants. Women who were underweight were five times more likely to have low birth weight infants if they followed the lower range of IOM recommendations (CI 1.61-25.51). It was noted that underweight women should follow the higher range of IOM guidelines in order to avoid low birth weight infants.		
RR2 - What are the most effective and cost-effective ways of helping women to manage their weight before pregnancy? This includes women who are obese, those who are under 18 and those from disadvantaged, low income and minority ethnic groups.		
No evidence	No evidence	None
RR3 - What are the most effective and cost-effective ways of helping women to manage their weight during pregnancy? This includes women who are obese, those who are under 18 and those from disadvantaged, low income and minority ethnic groups.		
No evidence	No evidence	None
RR4 - What are the most effective and cost-effective ways of helping women to manage their weight after childbirth? This includes women who are obese, those who are under 18 and those from disadvantaged, low income and minority ethnic groups. • When is the most appropriate time to start managing weight after childbirth? • What is the optimal rate of weight loss to ensure long-term success?		

• How does resuming behaviours such as smoking and drinking influence postpartum weight management?		
No evidence	No evidence	None
RR5 - How can breastfeeding help with postpartum weight management, both in terms of energy expenditure and energy balance?		
No evidence	No evidence	None
Gaps in the evidence		
Gap 01 - There is a lack of evidence on the underlying mechanisms linking gestational weight gain and pregnancy outcomes. This is needed to help determine whether weight management is safe and appropriate for pregnant women.		
No evidence	No evidence	None
Gap 02 - There is a lack of evidence on how much weight should be gained during pregnancy, when is the most effective time for women to start managing their weight after childbirth and the optimal rate of weight loss.		
No evidence	No evidence	None
Gap 03 - There are few well-designed UK intervention studies on weight management in pregnancy and after childbirth. In particular, there is a lack of evidence on safe, effective interventions for women who are obese but who do not have diabetes, and those who are breastfeeding.		
All studies relating to recommendation 2 are on weight management during pregnancy, but it is not possible to determine, on the basis of abstract alone, how well the studies have been designed as we only look at abstracts.	No evidence	None
Gap 04 - There is a lack of evidence about the effectiveness and cost effectiveness of weight management interventions for women before pregnancy – including for those who may be planning a pregnancy.		
No evidence, however NICE has published a guideline on lifestyle weight management programmes, PH53.	No evidence	None
Gap 05 - There is limited evidence about the effectiveness and cost effectiveness of weight management interventions in pregnancy and after childbirth for women from disadvantaged, low-income and minority ethnic groups.		
No evidence	No evidence	None
Gap 06 - Few weight management interventions include adequate and validated measures of diet and physical activity. They often rely on self-reporting.		

No evidence	No evidence	None
Gap 07 - Few studies of weight management before, during and after pregnancy include interventions that are evaluated using process and qualitative data to determine which components are effective.		
No evidence	No evidence	None
Gap 08 - There is limited evidence on the role of breastfeeding in helping women to gain or retain a healthy weight after childbirth.		
No evidence	No evidence	None

Ongoing research

Ongoing research was identified through topic experts and the initial intelligence gathering (NIHR research in progress). Research that is within the scope inclusion criteria for PH27 is detailed below:

- Effects of weight management interventions on maternal and fetal outcomes in pregnancy: Individual patient data (IPD) meta-analysis of randomised trials and model based economic evaluation. This will be an update of the previous 2012 systematic review. A meta-analysis of randomised controlled trials (RCTs) looking to estimate the effects of weight management interventions and create recommendations on suggested weight gain in pregnancy. Due to publish in August 2016
- GLOWING - A pilot cluster RCT of a guideline implementation intervention for the management of maternal obesity by midwives. The trial is aiming to change community midwives' routine behaviour through training using PH27. NICE is working alongside the principle investigator throughout this trial. It is due to end 31st July 2017.
- A woman-centred, tailored SMS-delivered multi-component intervention for weight loss and maintenance of weight loss in the postpartum period: intervention adaptation and pilot RCT - A weight management intervention to provide tailored support and information via text messages to help with weight loss after pregnancy. This is due to publish in March 2019.

- A two arm feasibility trial of lifestyle information and Slimming World groups to promote weight management and positive lifestyle behaviour in postnatal women from an ethnically diverse inner city population - A study to show if attendance at Slimming World could aid women to manage postnatal weight and support positive behaviour change. Due to publish in June 2018.