# Nutrition Before and During Pregnancy: Ensuring mother and child stay healthy

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## Nutrition & Pregnancy: Health of Next Generation

- Start of pregnancy: Nutritional status
- Determines ability to meet needs for the growing foetus from diet and body stores
- Influences health of the foetus and new born infant …. and chronic diseases in adult life such as diabetes, heart disease, stroke, osteoporosis

**Implications for the health of future generations**

***Improving maternal and child nutrition to promote long-term health could also be a driver for future economic growth [World Bank 2006]***

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# Pre-pregnancy Diet

- Adolescence: Nutrient intake important - lead-in to childbearing years
- Childbearing years - Adequate intake of vitamins, minerals and essential fats
- Conception - Nutrient status sufficient to support optimum growth of the foetus

**Women advised to comply with healthy eating advice before and during pregnancy**

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# Nutrient Requirements for Pregnancy

Increased demands:

- Met by increased absorption
- More efficient utilisation of nutrients
- Body stores
- Some nutrients – need for increased dietary intakes

- Energy (last trimester)
- Protein
- Vitamin A
- Vitamin B1
- Vitamin B2
- Folate*
- Vitamin C
- Vitamin D*

* **Requirement for supplementation**

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# Folic Acid Supplementation

- Prior to and for first trimester of pregnancy
- Requirement for 400mcg/day to reduce the risk of neural tube defects in the foetus/infant
- EU authorised health claim to enable communication of this message on commercial packs and websites was secured in Oct 2014
- Application supported by HFMA, PAGB, CRN and by SHINE

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# Low Body Stores of Micronutrients…

- COMA panel on Dietary Reference Values* - some women may not have adequate body stores of nutrients at start of pregnancy
- Endorsed the easy availability of cheap, adequately formulated vitamin tablets for pregnant women – free to those on income support
- Healthy Start Scheme – Vits C, D & folic acid. NICE: cost-effectiveness and targeting in 2015
- Endorsed use of iron supplements when body stores are low at start of pregnancy


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* COMA, 1991 (DH)

# Low Intakes and Low Body Stores of Micronutrients in the UK?

- National Diet and Nutrition Survey
- 1000 nationally representative participants
- 4-day diet diary to record food intake
- Status of various nutrients - blood, urine
- No national data for pregnancy
- Diets of adolescents and women indicate likely status at start of pregnancy

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# NDNS: Dietary Intakes

- Poor dietary variety - e.g. 30% adults achieve 5-a-day
- Low intake of various micronutrients
- Particularly in lower income population
- Among 11-18 years females mean intakes were <RNI for iron, calcium, magnesium, zinc, potassium and iodine

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# NDNS: Dietary Intakes

**IRON**

- 45% 11-18 years and 21% 19-64 years females have intakes from food and supplements below LRNI (sufficient for 2.5%)

**FOLIC ACID**

- 7% 11-18 years and 4% 19-64 years females have intakes from food and supplements below LRNI
- RNI 200mcg/day - but 100mcg/day increment for pregnancy, in addition to 400mcg supplement to reduce risk of NTD

**CALCIUM**

- 19% 11-18 years and 8% women 19-64 years have intakes from food and supplements below LRNI

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# NDNS: Nutrient Status

Evidence of low biochemical status of some micronutrients

**VITAMIN D**

- A high proportion of women are likely to begin pregnancy with low vitamin D status
- NDNS: Females below threshold for adequate vitamin D status
- 24% 11-18 years
- 22% 19-64 years

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# NDNS: Nutrient Status

**FOLATE ….biochemical folate deficiency in females**

NDNS: Serum folate

- 22.1% 16-24 years
- 17.7% 25-34 years
- 13.1% 35-49 years

NDNS: Red cell folate

- 15.6% 16-24 years
- 9.5% 25-34 years
- 10.1% 35-49 years

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# NDNS: Nutrient Status

**IRON**

**Anaemia - low blood haemoglobin in females**

- 7.4% 11-18 years
- 9.9% 19-64 years

**Low Iron Stores - low serum ferritin in females**

- 27.5% 11-18 years
- 15.5% 19-64 years

**Both Indicators**

- 5% 11-18 years and 19-64 years

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# Uptake of Supplements: Folic Acid

- Women who might become pregnant - Low uptake
- NDNS: Of women 19-64 years 1% take folic acid, 14% a multivitamin/minerals
- Southampton study*: Only 44% of women who became pregnant taken any folic acid, and <6% 400mcg/day
- HFMA consumer survey of 10,000 adults, including 4700 women aged 18-50 years
  - 77% aware of the need for women planning pregnancy to take 400mcg folic acid supplement
  - Of 1700 women who said they were likely to become/trying to become pregnant, half not taking 400mcg folic acid supplements

*Crozier et al, 2009

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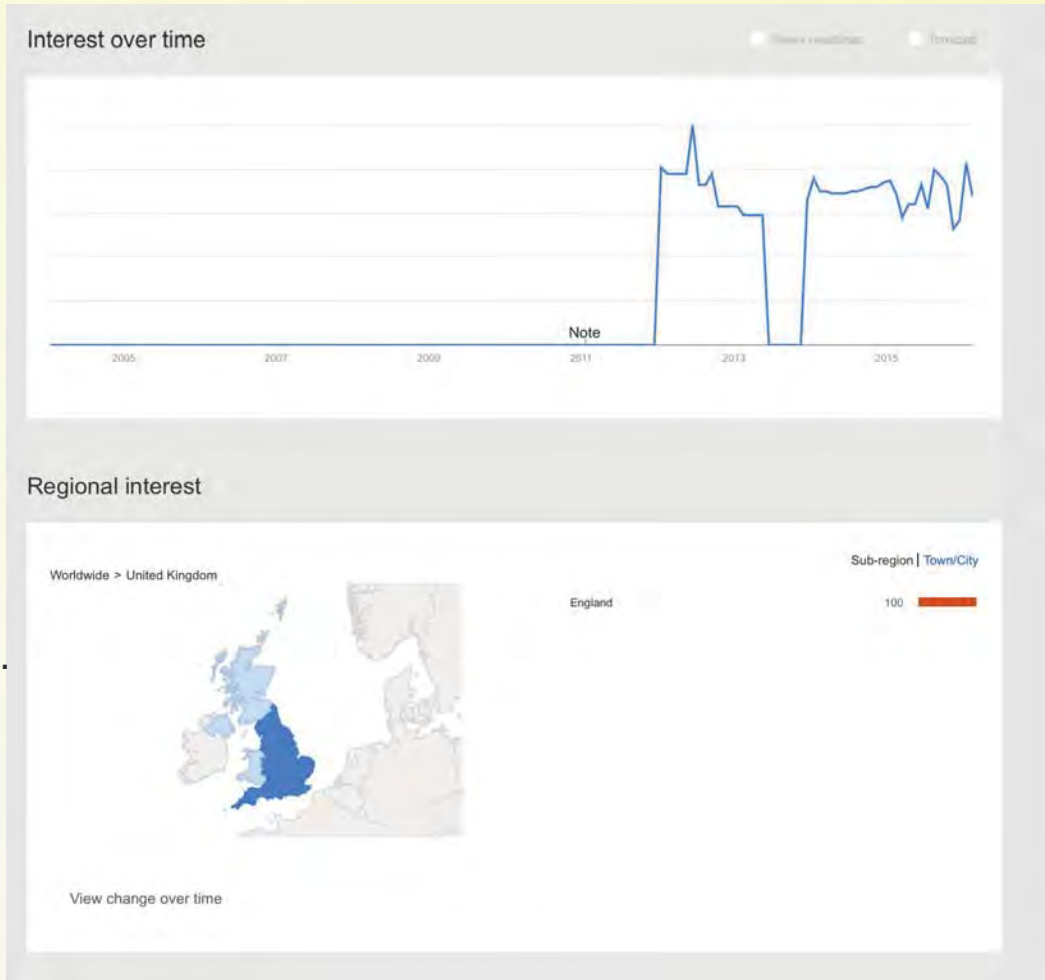
**GOOGLE TRENDS**

UK: Folic Acid Supplements

UK: Folic Acid Supplements Pregnancy

**Not enough search volume to show results.**

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# Uptake of Supplements

- Vitamin D:
  - Low uptake of Healthy Start supplements - less than 10% across many Primary Care Trusts
- General vitamin supplements:
  - NDNS: 4% 19-64 years women take a multivitamin

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# Southampton Survey

- Little change in diet in the period before conception into early pregnancy
- Pre pregnancy recommendations are not publicised widely enough
- Unplanned pregnancies - improve nutrition of women of childbearing age

Crozier et al, 2009

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# BNF Review of Micronutrient Status*

- Reinforces that poor uptake of vitamin D and folic acid supplements needs attention
- Substantial proportions of women of childbearing age are consuming amounts that are likely to be inadequate of other important micronutrients for foetal growth and development - iodine, iron, calcium (Bates et al, 2014)
- **Investment in sustained government programmes aimed at raising awareness or encouraging supplementation of fortification could considerably improve population micronutrient intakes**

*Miller et al, 2016

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# Potential Health Consequences

- Vitamin D - Poor maternal status associated with poor bone development in foetus and rickets in the infant
- Rickets - Pearce & Cheetham 2010: Several hundred children treated for rickets in the UK each year - represent a small proportion of those with suboptimal vitamin D status

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# Potential Health Consequences

- Folic acid - 400mcg supplement prior to conception reduces risk of Neural Tube Defects.
- NTDs - Affect 1 in 1000 established pregnancies in the UK = 900 pregnancies/year; 650 serious birth defects/year
- Iron - deficiency anaemia - Evidence of iron deficiency anaemia in some young women
  - 5% 11-18 years & 19-64 years women have low blood haemoglobin and serum ferritin

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# Other Micronutrients of Concern

- Iodine - Studies are investigating low iodine intake at start of pregnancy and cognitive development in the child
- NDNS: 22% 11-18 years and 10% 19-64 years iodine intakes below LRNI
- Vitamin B12 - 4% 11-18 years girls and 7% 19-64 years women had low status of B12 - also important in reducing risk of NTDs

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# How to Improve the Situation?

1. Need to raise awareness among women of good diet for pregnancy and advice on supplementation
2. But ~50% pregnancies are unplanned (SACN 2011)
   - Importance of teaching nutrition and food in school/college and raising awareness of dietary supplementation policies for pregnancy
   - Food knowledge and ability to cook are important life skills to improve general nutrition
3. Opportunity for health professionals to reinforce dietary advice and public policies on dietary supplementation

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# Summary

- **Nutritional status at start of pregnancy is a key factor for health of the mother and infant**
- **Yet surveys indicate that some women start pregnancy with low nutrient stores and thus have limited ability to meet nutritional demands of pregnancy**
- **Official advice for supplementation during pregnancy has low uptake - yet this simple action could make a big difference to health outcomes**
- **There is an urgent need to raise awareness among women and health professionals of the need for a healthy diet and supplementation policies for pregnancy**

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