

Folic acid campaigns in the Netherlands: the Dutch experience

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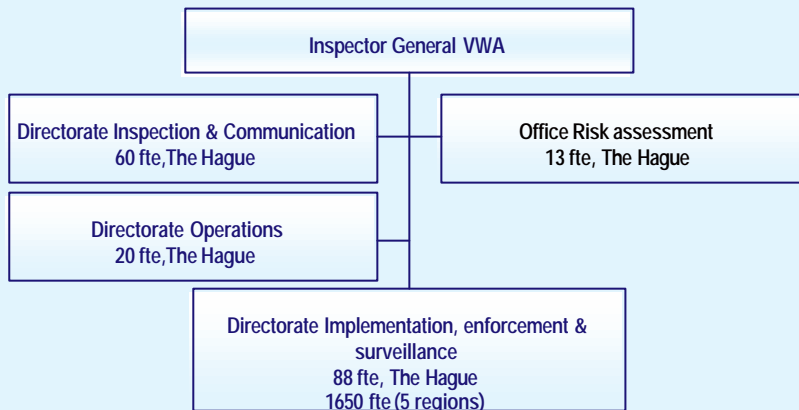
Food and Consumer Product Safety Authority (VWA): history

2002: Voedsel en Waren Autoriteit (VWA) established to replace Netherlands Food Authority (Nva, 2001) and integrate Inspection Services of Food and Products and Livestock and Meat; under Ministry of Health, Welfare and Sport

2003: VWA under Ministry of Agriculture, Nature and Food Quality

- Part of Government, but independent agency
- Total budget 155 million euro; 1800 fte per 1-1-2006

Organisational chart (as of 1-1-2006)



Folic acid fortification in the Netherlands

- Fortification of foods with folic acid is not permitted in NL
- 1995: vitamin restoration (compensation of losses) approved, but not for folates
- 2001: Minister decided not to allow fortification. Argument: small margin between amounts required by humans and possible harmful effects
- 2006: NL can no longer forbid fortification of foods with folic acid (European Court). Further harmonisation in Europe around 2010
- 2006: VWS proposed to allow fortification of foods with 100 µg folic acid per 100 kcal without prior permission to bridge the time until the European law comes into force (2-4 y). Approval from Brussels expected end 2006

Folate intake and recommendation

- Folate intake of women 19-35 years (μg) in 1987/1988: 237.0 ± 81.0 ; in 1997/1998: 230.0 ± 79.0 (3.5% decrease; lower vegetables consumption)
- Main sources: vegetables, bread, potatoes, milk and milk products, fruit, meat and meat products and poultry, and cheese
- Health Council, 2000: acceptable upper limit of 1 mg/d PMG for adults; advised to limit fortification of foods with PMG to foods targeted at women wishing to conceive
- Recommended intake was 200 $\mu\text{g}/\text{d}$; revised recommendation in 2003: 300 $\mu\text{g}/\text{d}$ and additional 100 $\mu\text{g}/\text{d}$ for pregnant and lactating women. The supplement for women wishing to become pregnant is 400 $\mu\text{g}/\text{d}$
- VCP3 (2003) 18-30 jaar: 18% used a food supplement containing folic acid; mean intake estimated at 268 $\mu\text{g}/\text{d}$

Periconceptional folic acid advice in NL

1991/1992: Food Council/Health Council advised:

- Women who had a child with a NTD should take a daily folic acid supplement of 4-5 mg from 1 months prior to until 3 months after conception to reduce chances of having another baby with NTD with 70%. NL: only 5 mg tablets available
- Women planning to conceive should follow the 'Guidelines for a healthy diet' and to use foods rich in folic acid

Revised advice in 1993 based on studies by Czeizel & Dudas and Werler et al.

- Stimulate the intake of folic acid-rich foods
- Study possibilities for fortification or restoration of foods with folic acid (intake not to exceed 1 mg/d). As long as these foods are not available: women wishing to become pregnant should use a daily supplement of 400 µg folic acid
- Chief Medical Inspector urged professional groups involved to advise women planning to conceive to use 0.5 mg folic acid daily starting 4 weeks before conception and to continue until at least 8 weeks after conception

- It was estimated that the 400 cases of newborns with spina bifa could be cut in half
- NL: 95% of children with NTD are first borns; prevention can be effective!
- TNO study showed that fortification of foods with folic acid could lead to exceeding the 1 mg/d intake for certain population groups

Mass media education campaign in 1995

Netherlands Nutrition Centre (Voedingscentrum), commissioned by Ministry of Health, Welfare and Sport launched a national mass media campaign (and 2 local campaigns) to inform women about the preventive effect of folic acid and promote intake of folic acid tablets

Campaign was aimed at professionals working in the sector and future mothers

Evaluation of 1995 mass media campaign

Comparing two cross sectional studies, one conducted before the campaign in 1995 and one after the campaign in 1996. Pregnant women in four regions of the Netherlands attending their first or second antenatal visit completed a questionnaire (n=1612)

- In both studies, 90% of the pregnancies were planned
- 41.7% of women in 1995 had heard about folic acid; this increased to 77.3% in 1996: number of women knowing about folic acid had more than tripled

Sources: Van der Pal-de Bruin et al. Paediatric and Perinatal Epidemiology 2000;14:111-117
Prevention of neural tube defects: periconceptional folic acid supplementation (thesis). K.M. van der Pal-de Bruin, October 2002, Leiden
De Walle et al. BMJ 1999;319:291-292

Evaluation, continued

- Use of folic acid increased from 25.1% in 1995 to 53.5% in 1996 (RIVM: 60% in 1999/200)
- Appropriate use (4 weeks before until 8 weeks after conception) increased from 4.8% in 1995 to 21.0% in 1996 (36% in 2000)
- After the campaign, of the informed women who did not take folic acid, 37.8% of high-educated women versus 54.5% of low-educated women ($P=0.02$) would consider taking folic acid in a next pregnancy. Overall, 63.6% preferred to take folic acid in food rather than by tablet; this was not associated with level of education
- No additional effect of local campaign

Evaluation: effect of SES

- In 1996, 25.8% of the women who knew about folic acid before their pregnancy and were aware of the advised period did not take it (49.2% in 1995). The reasons for not taking folic acid did not differ before and after the campaign. Main reasons: being pregnant already; disliking taking drugs during pregnancy; eating healthy food or not thinking about the possibility of taking folic acid
- Similar increase in use in women with high and low SES (30%)
- In 1999/2000, 74% of women with high SES used folic acid; 47% during the entire period; women with low SES: 51% used supplements, 26% during whole period

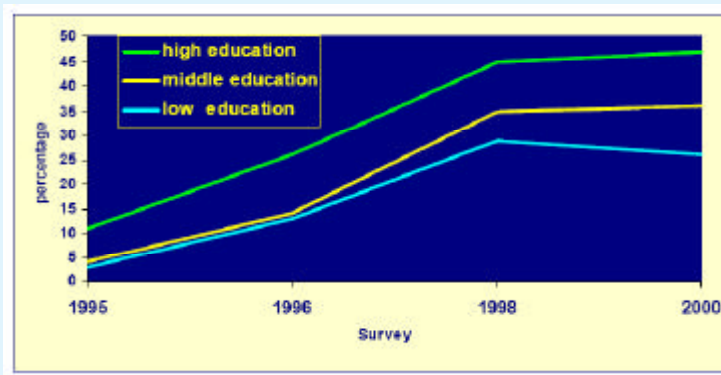
Evaluation 1998

1998: pregnant women completed questionnaire, n=452

- 60% of women with low SES had heard of folic acid before pregnancy; higher SES: 85%, mainly from newspapers and magazines
- Low SES: 50% used folic acid; higher SES: 80%

Source: De Walle et al. Preventive Medicine 2002;35:65-69

The use of folic acid during the entire advised period according to educational level



Evaluation: health care workers

Family doctors and midwives completed questionnaire about use of folic acid in 1996/1997

- 87% of doctors and 94% of midwives indicated to be aware of the campaign
- Half of the doctors and two thirds of the midwives thought use of folic acid to be important
- Two thirds advised the use of folic acid
- In general: positive attitude towards supplements, but room for improvement

Study in 2000

Cross-sectional study in November 2000: pregnant women filled out questionnaire, n=461

- 77% had heard about folic acid before being pregnant
- 63% knew about protective effect for NTDs
- 33% knew the entire advised period
- 61% used folic acid during part of the advised period
- 36% used it the entire advised period
- Women with higher SES knew more about folic acid and used it significantly more often in the periconceptual period than women with lower SES

Source: De Walle and de Jong – van den Berg Teratology 2002;66:40-43

In 2000, only 41% of allochtone women knew the advice

Cost effectiveness

Estimated cost effectiveness of periconceptual supplementation of folic acid:
1800 €

This favourable cost effectiveness justifies further stimulation of folic acid supplementation prior to pregnancy

Source: Postma et al. Pharmacy World & Science 2002;24:8-11

Tablets of 0.4-0.5 mg folic acid are available at drugstores without recipe;
costs: 1.5-7 euro for 3 months

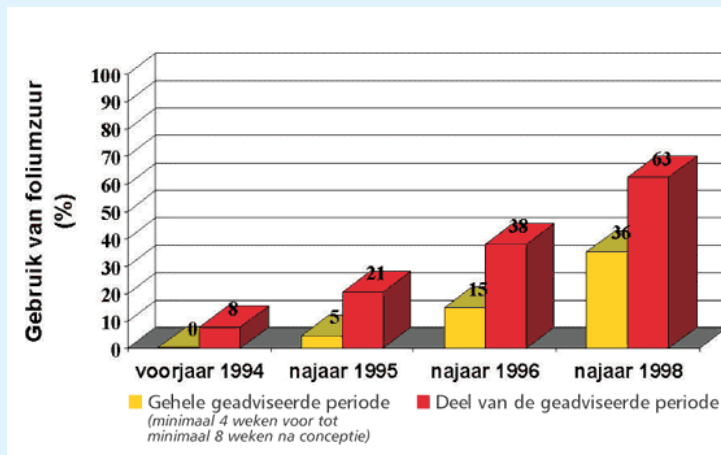
Tablets of 4-5 mg: only available with recipe; 21 euro/3 months paid by insurance

Conclusions from 1995 campaign

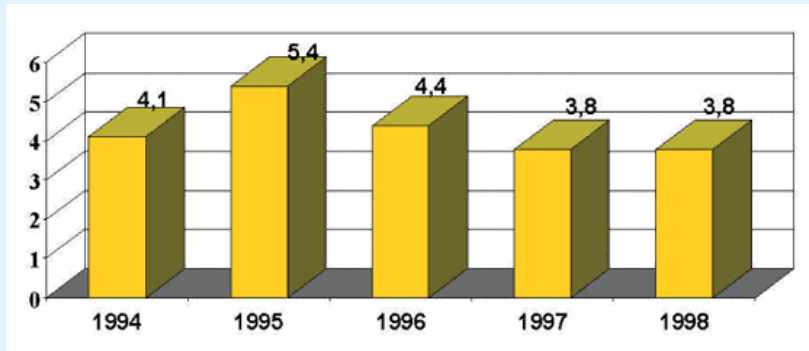
- Folic acid use had increased considerably but target (70% knows about folic acid and use by 46% of women wishing to conceive) was only partly achieved
- A decrease in the Dutch prevalence of NTD during the study period could not be demonstrated due to the relatively small number of women using folic acid preconceptionally
- Knowledge on and use of folic acid had increased. Women with a low socio-economic status (low education) had not been reached sufficiently
- The campaign in 1995-1996 was effective but needed to be repeated on a regular basis

(Erasmus university, 2003): One third of women used folic acid during the entire recommended period. Factors having effect on use of folic acid of pregnant women: level of education and cultural background. Social influence is important; medicine-avoiders, unplanned pregnancies

Use of folic acid supplements by pregnant women in North-Netherlands



Prevalence of NTDs per 10.000 live births in the Netherlands



Recommendations

- Mass media campaign should be repeated regularly
- Information on use of folic acid to be incorporated in curriculum of secondary schools
- Advice and information about folic acid supplements should become routine part of the preconception advice given by general practitioners
- New campaigns: information in different languages, emphasis on prevention of this serious disorder; folic acid is natural vitamin
- Specific interventions are needed for women with a low education level

Follow-up actions

- General practitioners, obstetricians, midwives, and other doctors provide preconception advice at various places in NL
- Project (VWS/ZonMw) on preconception counselling: "Ouders van straks": letter sent to all women aged 18-40 years with invitation to discuss, when they plan to become pregnant, this with their family doctor and obtain the information package, incl. info on folic acid; 27 practices: 1999-2006
- In 2003, drug stores organised campaign: media mailing and posters in stores



Follow-up actions

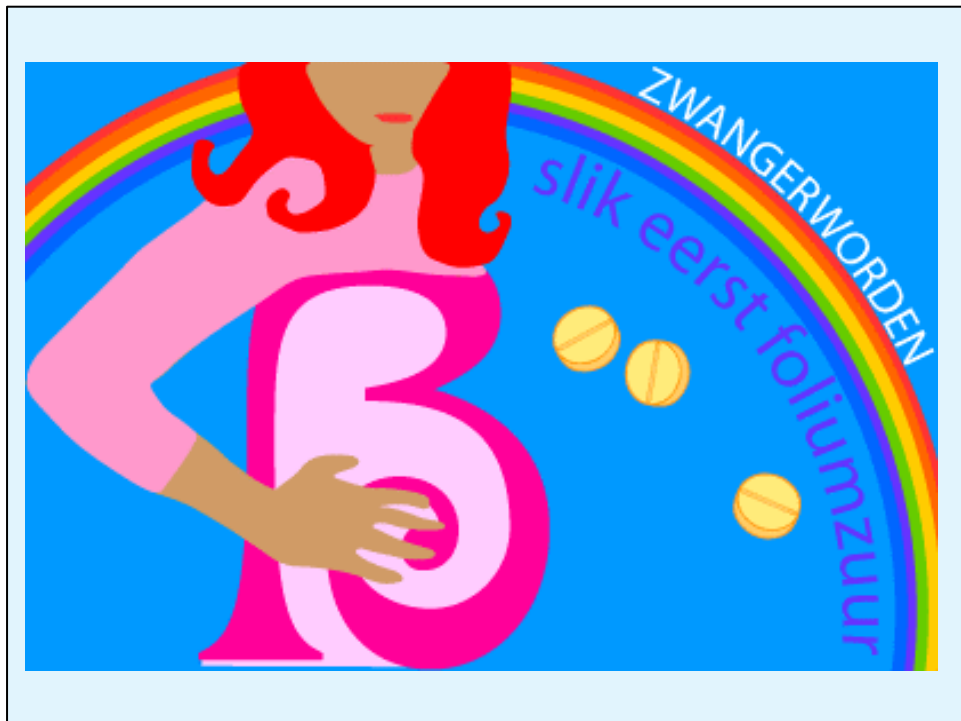
- In 2004, new campaign started from pharmacies; women who want to become pregnant for first time. Approach: stickers etc. with birth control pills. Aim: additional increase of folic acid intake by 30% of women
- In 2004 (VCN), campaign aimed at allochtone women

New activities

2005: Task Force Folic Acid established; aim: 70% of women will use folic acid in recommended period in 2010; emphasis on foreign women and women with low SES

National campaign in 2006 and 2007:

- Pharmacies' campaign "Zorg voor Foliumzuur": 45% of all pharmacies in NL were involved – stickers on birth control pills, brochures. In 2006 and 2007 this campaign will become more national involving 70-75% of all pharmacies
- Health centres: effective information intervention or distribution to be implemented in care programme of centres; more than 90% of mothers visit baby health centres
- Midwives' counselling: pilots how to promote use of folic acid. KNOV (organisation of midwives) will develop guidelines
- Erfocentrum (centre on heredity, established in 2000): information and dissemination of knowledge (site developed: slikeerstfoliumzuur); folders can be downloaded in seven different languages



ZWANGERWORDEN
slik eerst foliumzuur

NEDERLANDS - ENGELS

Zwanger worden? Slik eerst foliumzuur! About to be pregnant? Take folic acid!

De vitamine foliumzuur hoort bij een goed begin van een zwangerschap. Foliumzuur verkleint namelijk de kans op een baby met een ernstige aandoening. Heb je een kinderswens? Slik dan extra foliumzuur voordat je zwanger wordt.

Wat is foliumzuur?

Foliumzuur is een vitamine. Je lichaam heeft deze vitamine nodig om gezond te blijven. De vitamine foliumzuur zit bijvoorbeeld in verse groenten, fruit en volkoren producten.

Waarom foliumzuur slikken?

Aan het begin van een zwangerschap heeft je lichaam extra foliumzuur nodig. Het eten van veel verse groente, fruit en volkoren producten is dan niet genoeg. Voor extra foliumzuur moet je tabletten met foliumzuur slikken.

Folic acid meeting, Berlin, 11 January 2007

A vitamin, folic acid helps get your pregnancy off to a good start. The fact is that folic acid reduces the chance of your having a baby with a serious affliction. Would you like to have a baby? Then take a folic acid supplement before becoming pregnant.

What is folic acid?

Folic acid is a vitamin. Your body needs it in order to stay healthy. Folic acid is present in, for example, fresh vegetables, fruit and whole-wheat products.

Why take folic acid?

At the beginning of a pregnancy your body needs extra folic acid. It is not enough to eat lots of fresh vegetables, fruit and whole-wheat products. Folic acid tablets provide you with the extra folic acid you need.

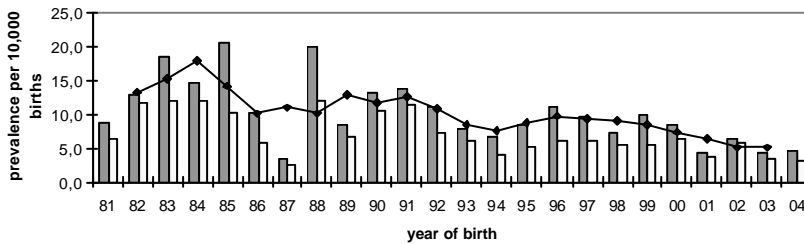
EUROCAT: European registration of congenital anomalies and twins

- A European network of population-based registries for the epidemiologic surveillance of congenital anomalies
- Started in 1979
- More than 1.5 million births surveyed per year in Europe
- 43 registries in 20 countries
- 29% of European birth population covered
- High quality multiple source registries, ascertaining terminations of pregnancy as well as births
- WHO Collaborating Centre for the Epidemiological Surveillance of Congenital Anomalies (www.who.int/genomics)
- NL: northern provinces of Groningen, Friesland and Drenthe

EUROCAT, NL

- In 2000: 36% of pregnant women used folic acid during the entire recommended period
- Difference in educational level of women. Data from 2003 indicate even a decrease of use of low educated women
- 85% of pregnancies is planned.
- NTD: prevalence per 10,000 births from 2000-2004: NL 6.07; all countries (full member registries): 9.85
- Number of NTDs not decreased; call for more effective policy – fortification of flour

Neural tube defects



$\chi^2 = 67.1, p = 0.000$; χ^2 for trend = 26.5, $p = 0.000$

The total birth prevalence of neural tube defects is heterogeneous in time and shows a statistically significant linear decrease. This graph reflects possibly the preventive effect of folic acid supplementation.

Bars: total; open bars: minus induced abortions

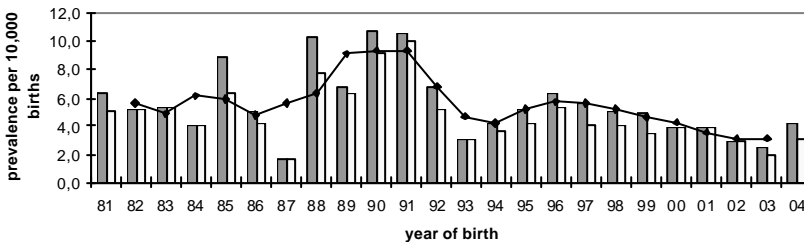
Source:

EUROCAT Northern Netherlands. Prevalence of congenital malformations in the Northern Netherlands 1981-2004. Updated 2006, December 8th. Available from <http://www.rug.nl/umcg/faculteit/disciplinegroepen/medischegenetica/eurocat/tabellen>

EUROCAT Northern Netherlands, Department of Genetics, University Medical Center Groningen, University of Groningen, 2006
Folic acid meeting, Berlin, 11 January 2007

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Spina bifida



$\chi^2 = 41.9, p = 0.009$; χ^2 for trend = 8.6, $p = 0.003$

The total birth prevalence of spina bifida is heterogeneous in time and shows a statistical significant decrease