



NTD Prevention with Folic Acid: Helping to Ensure a Healthier Future

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Neural Tube Defects (NTDs)



Spina Bifida



Anencephaly

- Serious birth defects of spine and brain
- Most prevalent, permanently disabling birth defect
- Leading cause of infantile paralysis in U.S.
- 3,000 pregnancies per year in U.S.; 300,000 worldwide
- Cost per year for NTD-affected children in U.S: \$400 million



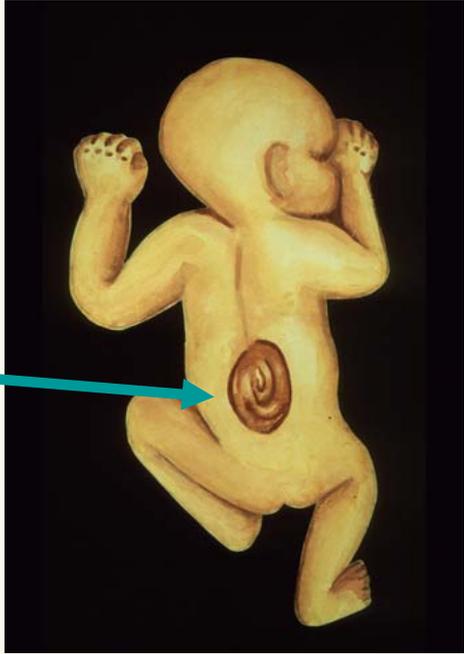
Development of NTDs



Anencephaly



Embryo: 3 weeks*



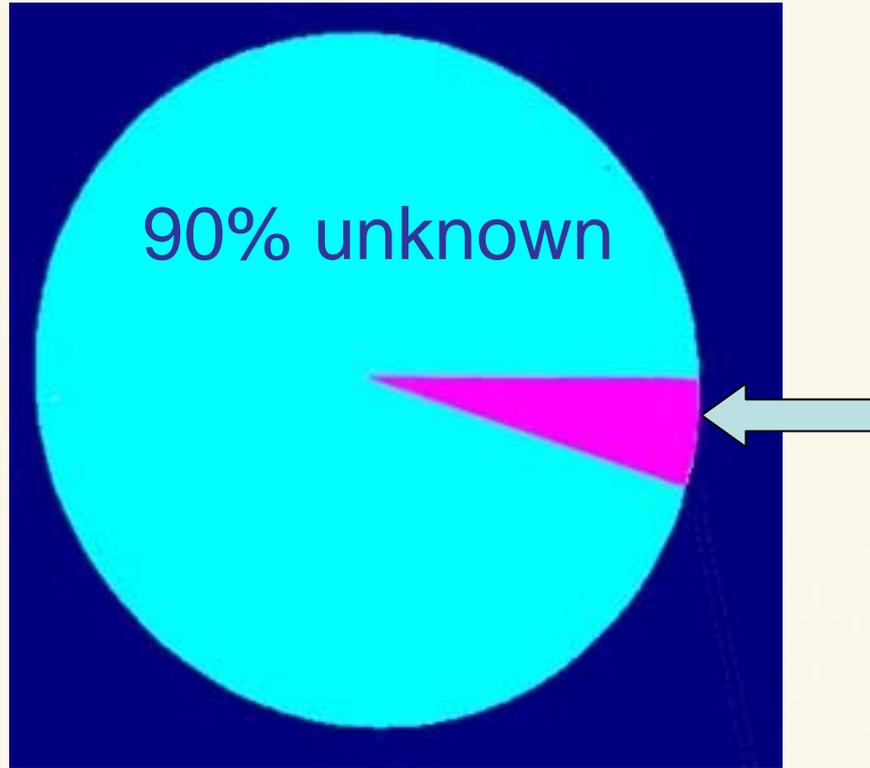
Spina bifida



*With permission, Lennart Nilsson
A Child is Born, 1990.



Causes of NTDs: 1970 – 1980



5% - 10% due to family history, maternal diabetes, antiepileptic drugs, genetic conditions, etc.





Increased Risks for NTDS

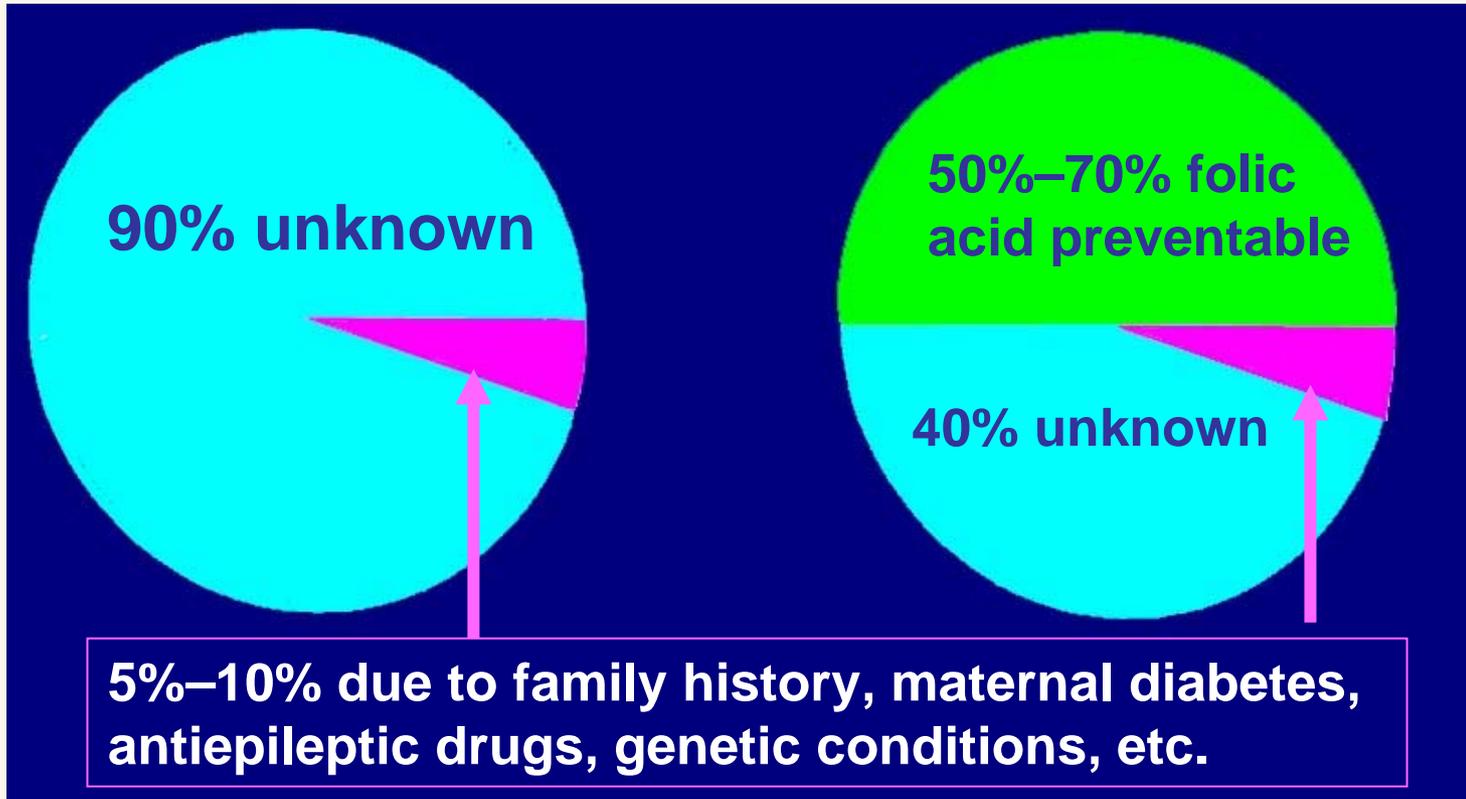
- Previous NTD-affected pregnancy
- Certain medications
- Certain medical conditions—diabetes, obesity
- Genetics—MTHFR
- Race/ethnicity—Hispanics, Blacks
- Exposure to high temperatures early in pregnancy
- Folic acid deficiency



Causes of NTDs

1970's – 1980's

1990's - present

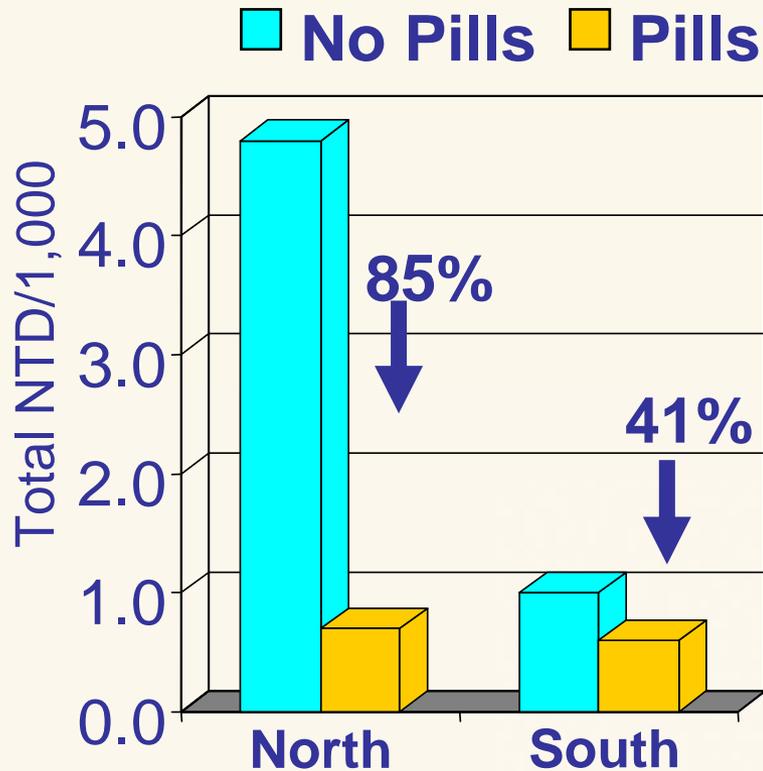


Folic Acid NTD Studies

Studies	% reduction
'80- Smithells	86%
'81- S. Wales	59%
'88- Atlanta	60%
'89- W. Australia	70%
'89- CA/Illinois	7%
'89- Boston	65%
'90- Cuba	100%
'91- UK-MRC	71%
'92- Hungary	100%
'93- New England	60%
'95- California	52%
'99-China	80%



Folic Acid Supplementation: China Study, 1993 - 1996



Berry RJ, et al., NEJM, 1999; 341:1485-90.

**Intervention = 400 mcg daily
folic acid supplement alone**



Folic Acid: An Answer for Many



- Prevents up to 70% of NTDs
- Necessary for cell growth and embryo development
- All women capable of becoming pregnant should consume 400 micrograms (0.4 milligrams) folic acid daily



Approaches to Increase Folic Acid Consumption



Food Folate



Supplements



Fortified Foods



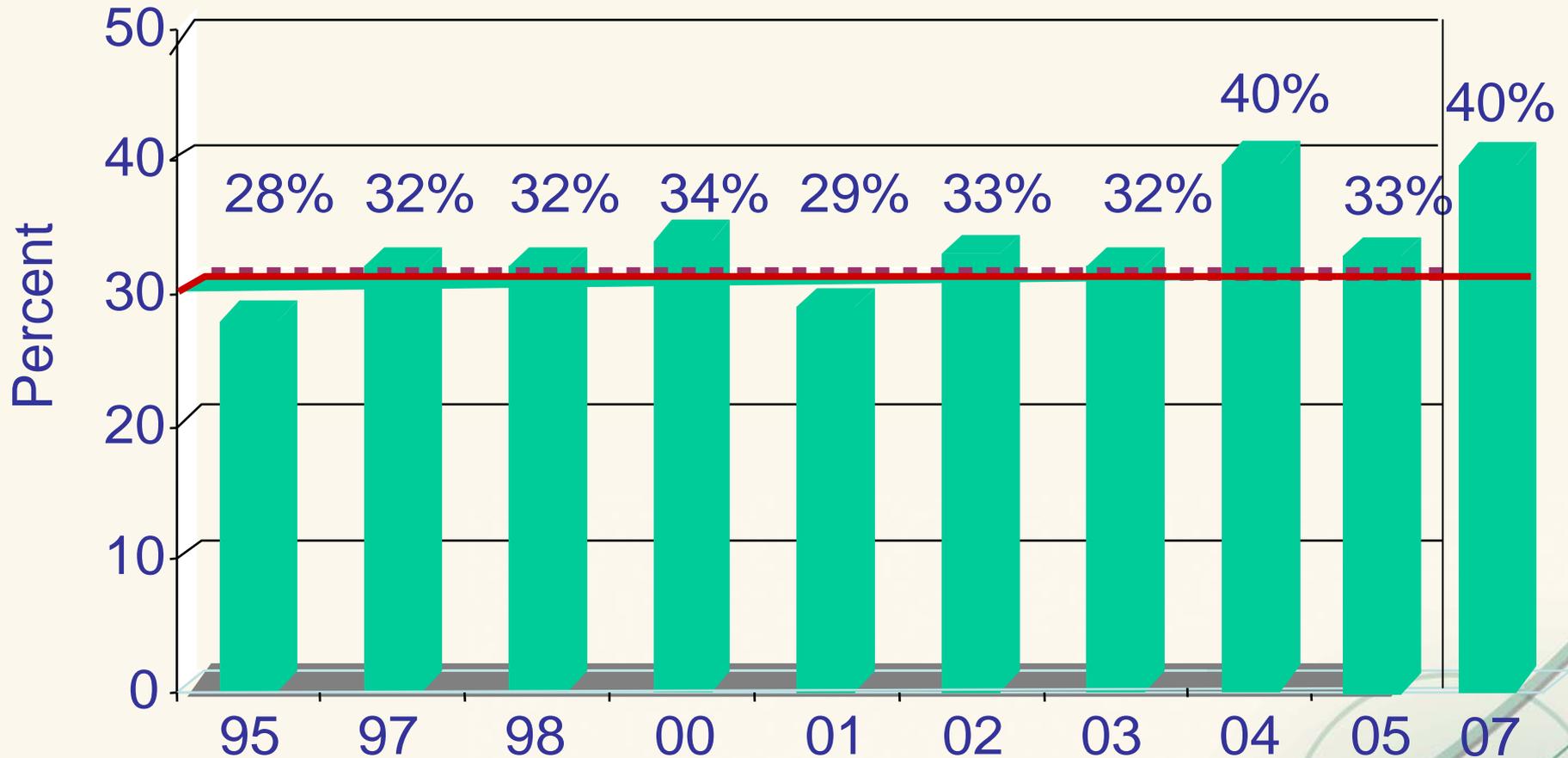
Folic Acid Supplements

- Readily available in stores
- Absorbed and used by body twice as much as food folate
- 2007: 60% U.S. women of childbearing age do not take a multivitamin
- Requires sustained behavior change



Daily Folic Acid Consumption

All women age 18 - 45, 1995 - 2007

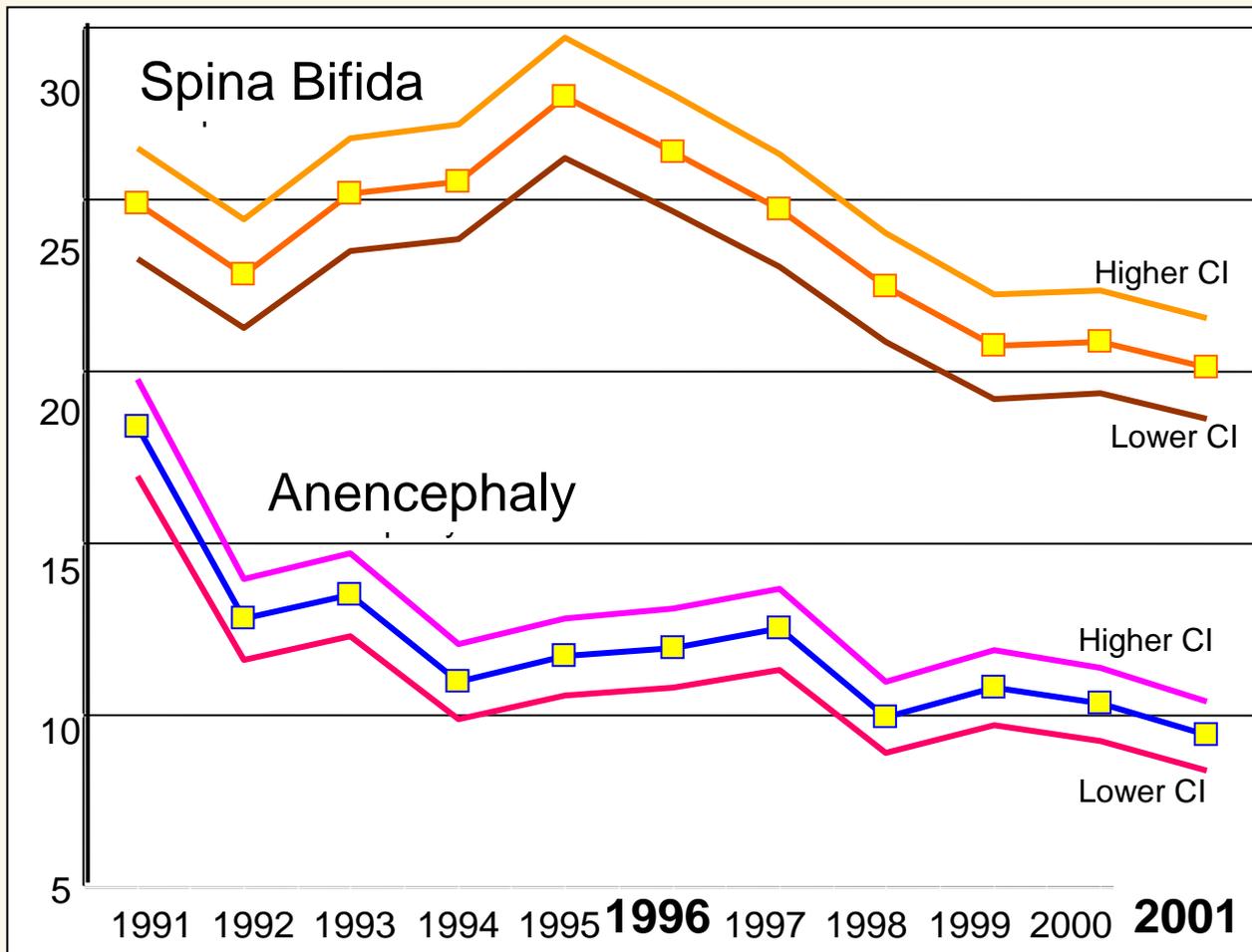


Folic Acid Fortified Foods

- Since 1998 folic acid mandatory in enriched cereal-grain products
- 140 mcg/100 grams of product
- Behavior change not necessary
- Might not be enough to fully prevent all NTDs



Spina Bifida and Anencephaly* 1991-2001



↓ 25%

↓ 21%

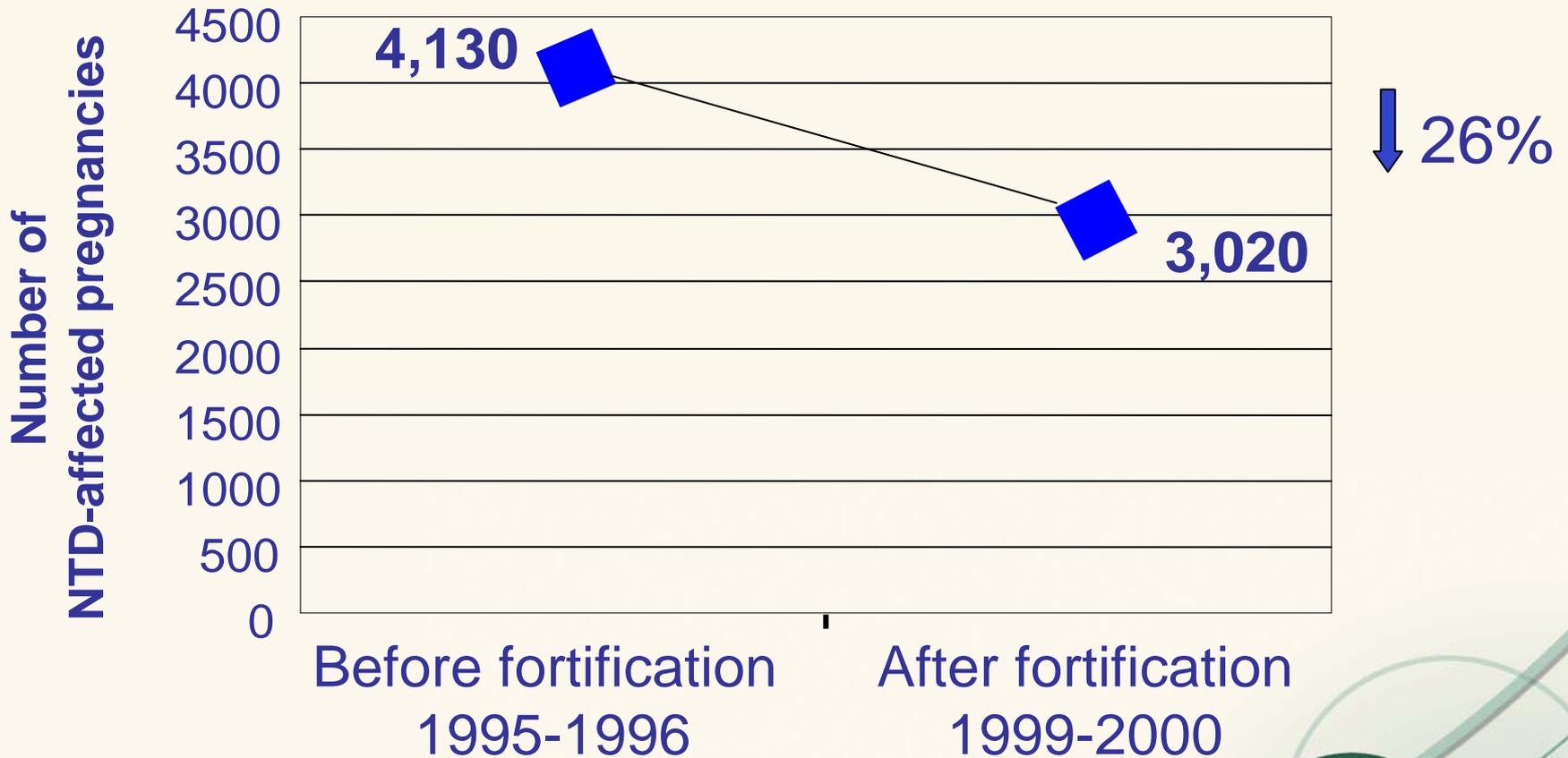


*Per 100,000 U.S. live births

SOURCE: National Vital Statistics System, NCHS, CDC



NTD-Affected Pregnancies in the U.S.



Source: National Birth Defects Prevention Network, includes prenatal ascertainment of cases



What has been tried?

- Folic acid fortification of food products
- Community-wide education efforts to increase the use of supplements containing folic acid
- Health care systems interventions
- Information dissemination



Folic acid fortification

Kroger
QUALITY GUARANTEED

ENRICHED
Thin Spaghetti

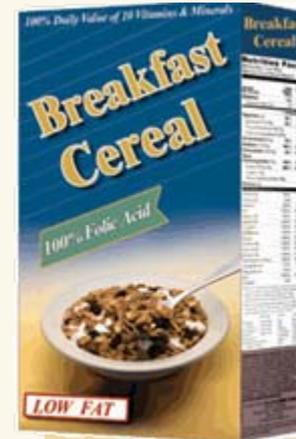
NET WT 32 OZ (2 LB) 907g

Nutrition Facts
Serving Size 2 oz (56 g) 1/16 of a package!
Servings Per Container 16

Amount Per Serving	Calories from Fat 10	% Daily Value*
Calories 210		
Total Fat 1 g		2%
Saturated Fat 0 g		0%
Cholesterol 0 mg		0%
Sodium 0 mg		0%
Total Carbohydrate 42 g		14%
Dietary Fiber 2 g		7%
Sugars 2 g		
Protein 7 g		
Vitamin A 0%	Vitamin C 0%	
Calcium 0%	Iron 10%	
Thiamin 30%	Riboflavin 10%	
Niacin 15%		

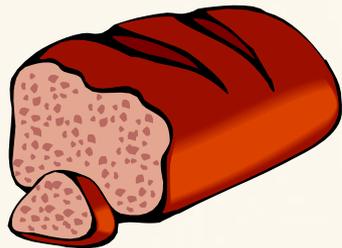
Vitamin A	0%	Vitamin C	0%
Calcium	0%	Iron	10%
Thiamin	30%	Riboflavin	10%
Niacin	15%	Folic Acid	30%

INGREDIENTS: Semolina, Ferrous Sulfate, Nicotinamide, Thiamin Mononitrate, Riboflavin



Supplement Facts

	Amount Per Serving	% Daily Value
Folic Acid	400 mcg	100%
Vitamin B12	6 mcg	100%
Pantothenic Acid	5 mg	50%
Calcium	450 mg	45%
Iron	18 mg	100%
Magnesium	50 mg	12%
Zinc	15 mg	100%





<http://www.thecommunityguide.org/>

Reducing the Number of Pregnancies Affected by Neural Tube Defects

Community-wide education campaigns to increase the use of supplements containing folic acid by women of childbearing age



Folic acid fortification of food products



Recommended



Insufficient evidence



Recommend against





Impact of Folic Acid Fortification in the Americas

Percentage Reduction in NTD Prevalence Rates

Country	Spina Bifida & Anencephaly	Year mandated
USA	↓ 26%	1998
Canada	↓ 48% to ↓ 78%	1998
Costa Rica	↓ 35%	1998
Chile	↓ 41% to ↓ 48%	2000



Corn Flour Fortification

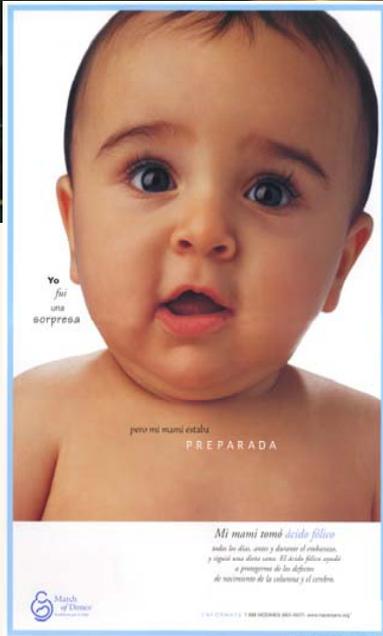
- Supported fortified corn flour
- Engaged
 - National Council of La Raza
 - Wal-Mart Stores
 - Local and state partners
- Provide technical assistance



GRUMA recently announced initiation of research and product testing for fortification of its corn flour products with folic acid



Community-wide education efforts





<http://www.thecommunityguide.org/>

Reducing the Number of Pregnancies Affected by Neural Tube Defects

Community-wide education campaigns to increase the use of supplements containing folic acid by women of childbearing age



Folic acid fortification of food products



Recommended



Insufficient evidence



Recommend against



Health care systems interventions



Clinical Preventive Services Guidelines

RECOMMENDATION (p. 467):

A daily multivitamins with folic acid to reduce the risk of neural tube defects are recommended for all women who are planning or capable of pregnancy.

CLINICAL INTERVENTION (p. 479):

For women with previous NTD: FA 4 mg/day for 1-3 months prior to conception

For women planning a pregnancy: daily multivitamin or mv-mm supplement containing folic acid at a dose of 0.4-0.8 mg at least 1 month prior to conception through the first trimester

For women capable of becoming pregnant: daily multivitamin containing .4 mg of folic acid to reduce NTDs in unplanned pregnancies

A Purchaser's Guide to Clinical Preventive Services: Moving Science into Coverage

*Overview of a Purchaser's Guide to
Clinical Preventive Services*

<http://www.businessgrouphealth.org/benefitstopics/topics/purchasers/fullguide.pdf>



Information dissemination

The screenshot shows a web browser window with the following elements:

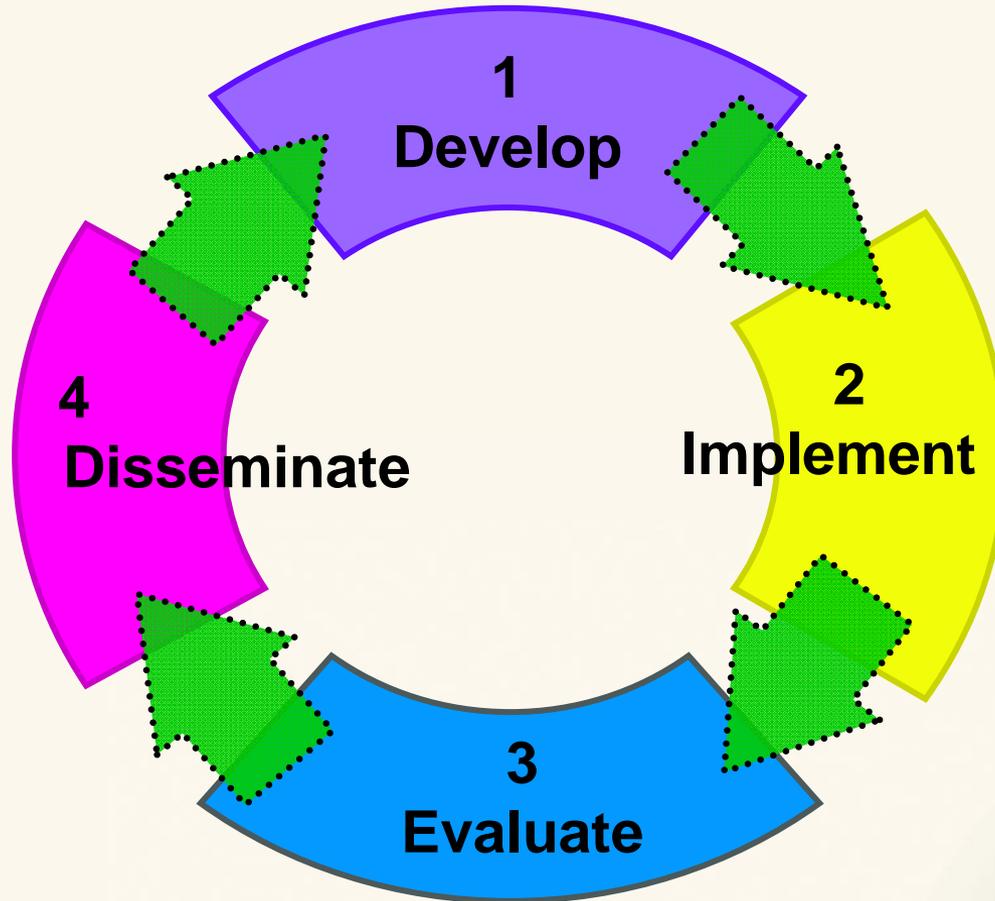
- Address Bar:** <http://www2.cdc.gov/ncbddd/faorder/orderform.htm>
- Navigation:** File, Edit, View, Favorites, Tools, Help
- Page Title:** Folic Acid Publications, DBDCDDH -Division of Birth Def...
- Navigation Menu:** Home | About CDC | Press Room | Funding | A-Z Index | Centers, Institute & Offices | Training & Employment | Contact Us
- CDC Logo:** Department of Health and Human Services, Centers for Disease Control and Prevention
- Search:** Search: GO
- Menu:** Health & Safety Topics | Publications & Products | Data & Statistics | Conferences & Events
- Section Header:** CDC Folic Acid Publications
- Section Header:** Order Form
- Text:** **NEW!**
Spanish-language folic acid materials
and
Infections in Pregnancy tip sheet
- Text:** New Spanish-language materials have been developed based on findings from extensive formative research conducted with Spanish-speaking Latinas of childbearing age.
- Text:** Limited quantities of the following publications are available free of charge. You may order more later. **Please enter the number of copies you would like to receive for each item. The request limit is next to each box. To see an enlarged copy of the front cover of each material, click on the photo.**
- System Tray:** Local intranet, 100%, 9:41 AM



<http://www2.cdc.gov/ncbddd/faorder/orderform.htm>



Our Process





Publications Clearinghouse

- Develop
 - Various folic acid educational materials
- Implement
 - Used by HCPs, state and local health departments, campaign workers, educators, individuals
- Evaluate
 - Internal evaluation by staff
 - Feedback from partners and the public
- Disseminate
 - Online order form
 - Free



Available Materials

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Anten

Preventing Birth Defects

Fo

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neural

This
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Yo

Thinking About a Baby?
Healthy Mothers Have
Healthier Babies
with Folic Acid

Folic a
help
used for
e'

You
100
hair

Get

A Guide for
OB/GYN
Health
Practitioners
and Educato

The U.S. Public
Health Service
recommends that a
women who are cap
of becoming pregna
consume folic acid
day to reduce their
for having a pregna
affected with spina
anencephaly, or oth
neural tube defects
(NTDs).

Taken periconcepti
folic acid, a B vitan
can prevent 50%-7
of NTDs. Folic aci
also decreases blood
homocysteine levels
may reduce the risk
cardiovascular disea
some cancers.

Did you kn

Only 10%-15%
women know that
need folic acid be
and in the first w
pregnancy.

Women report th
they are more lik
consume folic aci
encouraged by th
health care provid

CDC

emma's Story

SAFER • HEALTHIER • PEOPLE

prevention of neural tube defects in babies. 1-800-232-6769

NEW Educational Materials for Latinas



Las latinas somos unas madres extraordinarias...

Entonces, ¿por qué es más común que tengamos bebés con algunos graves defectos de nacimiento del cerebro y la columna vertebral?

Muchas latinas tienen bebés con algunos graves defectos de nacimiento del cerebro y la columna vertebral. Estos defectos pueden causar parálisis o, peor aún, la muerte del bebé.

Pero hay buenas noticias:

- Los estudios demuestran que tomar suficiente ácido fólico todos los días puede reducir el riesgo de tener un bebé con estos defectos de nacimiento.
- Se pueden comprar vitaminas que contengan 400 microgramos (mcg) de ácido fólico en cualquier tienda o farmacia, sin receta médica.

Haber tenido ya un bebé saludable no es garantía de que en el futuro tenga un bebé sin defectos de nacimiento. De manera que, protéjelo a su futuro bebé. Toma todos los días 400 mcg de ácido fólico durante sus años fértiles.

¡Comienza ahora! Para conocer más, llama al 1-800-232-4636 (CDC-INFO) o visita www.cdc.gov/acidofolico.

Toma ácido fólico ahora... porque al ser madre comienza antes del embarazo.



Aunque no te estés cuidando, ten cuidado de hacer todo lo posible para prevenir graves defectos de nacimiento del cerebro y la columna vertebral.



Si esperas ser madre algún día, no tienes al destino. Durante tus años fértiles, toma todos los días una vitamina que contenga 400 microgramos (mcg) de ácido fólico. Así, cuando quedes embarazada, la vitamina ayudará a prevenir algunos graves defectos de nacimiento del cerebro y la columna vertebral. Estos defectos pueden causar parálisis o, peor aún, la muerte del bebé.

Puedes comprar estas vitaminas sin receta médica en cualquier tienda o farmacia.

Para más información sobre el ácido fólico y los defectos de nacimiento, llama al 1-800-232-4636 (CDC-INFO) o visita www.cdc.gov/acidofolico.



Hoy y todos los días, toma una vitamina con ácido fólico.

Haz algo hoy por todos los bebés del mañana (Uno de ellos podría ser el tuyo)



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Ácido fólico hoy para prevenir graves defectos de nacimiento mañana.

Issues to address if you want to affect m-v behaviors of young women

- Communication efforts must...
 - Increase perceived need/benefits
 - Increase self-efficacy
 - Increase awareness of chewables
 - Address food issues (tread lightly)
 - Address actual/perceived cost issues
 - Present alternative forms of multivitamins





Ads for promoting multivitamin use among young women

IS YOUR BODY WORTH 10 SECONDS?

It takes time to get ready in the morning. It takes ten seconds to take a multivitamin. You make time to look good, but do you take time to feel good? As a woman, taking care of yourself means eating right, but that can be hard to do every day. Multivitamins are an easy way to support your diet.

- Protect your reproductive health for the future
- Get essential vitamins like folic acid that are hard to get from food alone
- A month's supply of tablets or chewables costs less than a lip gloss

You owe it to yourself. Take one today and every day.

Get the facts. Visit vital01.org.

MULTIVITAMINS
No excesses.

IS YOUR BODY WORTH 10 SECONDS?

It takes thirty seconds to test your roommate. It takes ten seconds to take a multivitamin. You're a busy woman—and that can make eating right hard to do every day. So support your diet and toss multivitamin tablets or chewables into your purse. They belong there just as much as your cell phone.

- Protect your reproductive health for the future
- Get essential vitamins like folic acid that your body needs every day
- A week's supply costs less than a bottle of water

You owe it to yourself. Take one today and every day.

Get the facts. Visit vital01.org.

MULTIVITAMINS
No excesses.

*It took 2 months to realize he was a JERK.
It takes 10 seconds to take a multivitamin.*

IS YOUR BODY WORTH 10 SECONDS?

You take the time to do what's right for your heart, but what about the rest of your body? Taking care of yourself means eating right, but that can be hard to do every day. So make a commitment to yourself. Support your diet with multivitamins.

- Protect your reproductive health for the future
- Look for multivitamins with folic acid in tablets or chewables
- Get the vitamins and minerals a woman's body needs every day

You owe it to yourself. Take one today and every day.

Get the facts. Visit vital01.org.

MULTIVITAMINS
No excesses.

Available upon request from the CDC Foundation,
contact John Moore at JRMoores@cdc.gov or 404-523-3495



Summary



CENTERS FOR DISEASE CONTROL AND PREVENTION
MMWR
 MORBIDITY AND MORTALITY WEEKLY REPORT
 September 11, 2008 / Vol. 57 / No. 36

Recommendations and Reports

Recommendations for the Use of Folic Acid to Reduce the Number of Cases of Spina Bifida and Neural Tube Defects



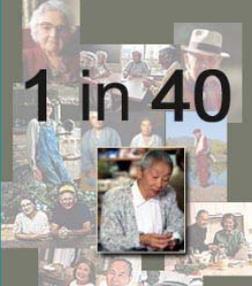
Thinking About a Baby?
Healthy Mothers Have Healthier Babies with Folic Acid



1 in 40

adults 50 years of age and older have

vitamin B₁₂



DRAFT DRAFT DRAFT DRAFT DRAFT



IS YOUR BODY WORTH 10 SECONDS?

Make a commitment to yourself. Take one today and every day.

MULTIVITAMINS

CDC



HEALTH AND HUMAN SERVICES
 U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
 CENTERS FOR DISEASE CONTROL AND PREVENTION
 1600 Clifton Road, NE
 Atlanta, Georgia 30333



Public Health GRAND ROUNDS



MMWR
 Morbidity and Mortality Weekly Report

September 8, 2008 / Vol. 57, No. 36

National Birth Defects Prevention Month and National Folic Acid Awareness Week

Improved National Prevalence Estimates for 18 Selected Major Birth Defects — United States, 1999–2009

100 Update: Influenza Activity — United States, 1998–2008

DEPARTMENT OF HEALTH AND HUMAN SERVICES
 CENTERS FOR DISEASE CONTROL AND PREVENTION