



# Universal Flour Fortification



## Why UFF?

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CDC**

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# The Bad News: High Burden of Iron Deficiency

- Up to 80% of world's population may be iron deficient
  - Young children and women particularly affected
  - Primarily in developing countries but also in developed countries
  - Affects rich and poor people

# Consequences of Iron Deficiency in Young Children

- Anemia – can result in death when severe
- Reduced mental development and learning capacity – about 5-7 point loss in I.Q.
- Increased lead absorption – known to damage brain development

# Consequences of Iron Deficiency in Pregnant Women

- Increased risk of maternal death
- Increased risk of premature and low birthweight infants
- Infants are born with very low body iron stores – not protected from iron deficiency

# Consequences of Iron Deficiency in Adults

- Reduced muscle function and endurance
- Reduced work capacity and work output
  - Reduced productivity; results in reduced income

# The Bad News Continued

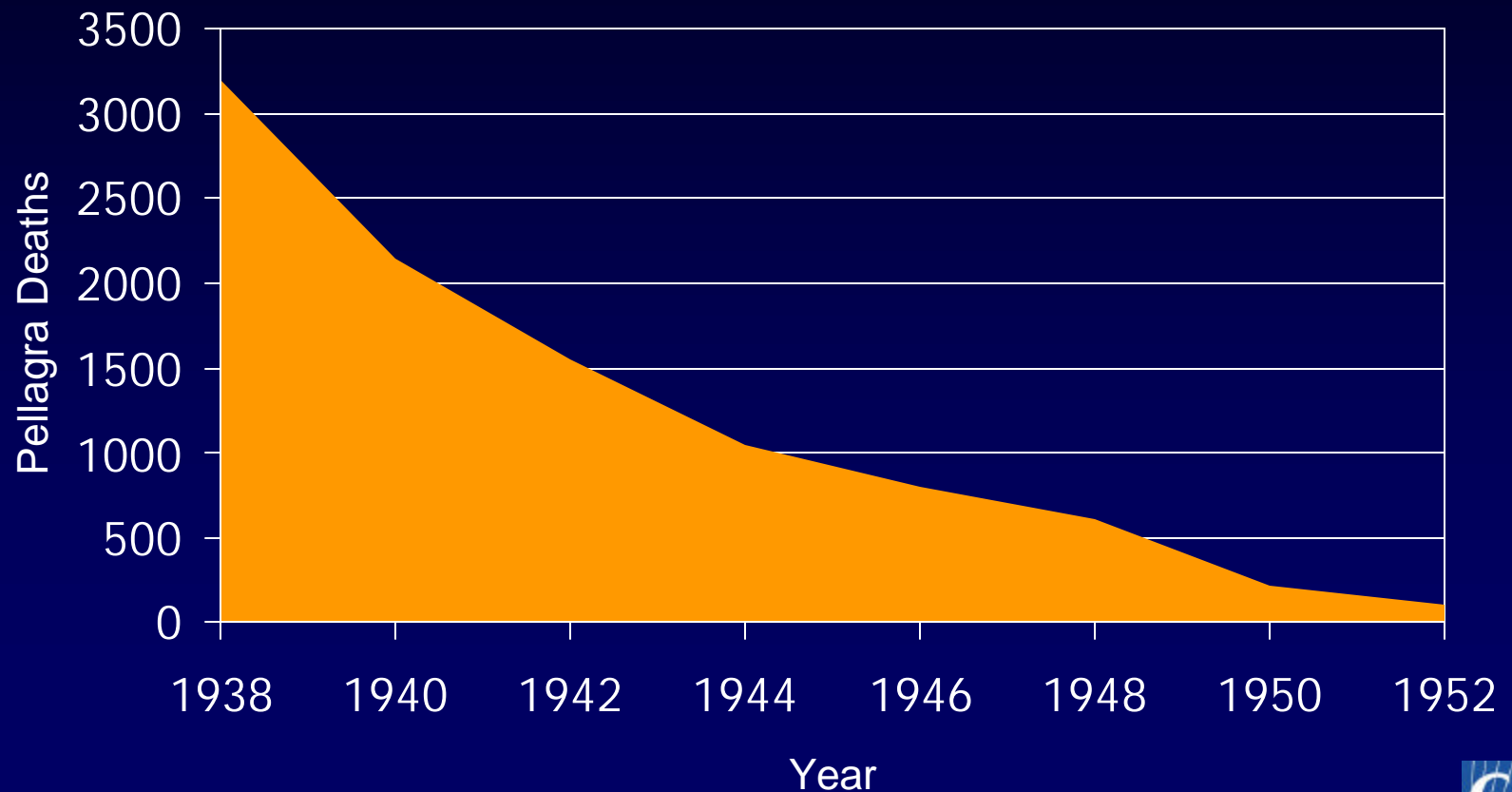
- 350,000 babies with severe birth defects (e.g. spina bifida) born every year:
  - Lifelong disabilities:
    - Paralysis
    - Loss of bowel and bladder control
    - Learning disabilities



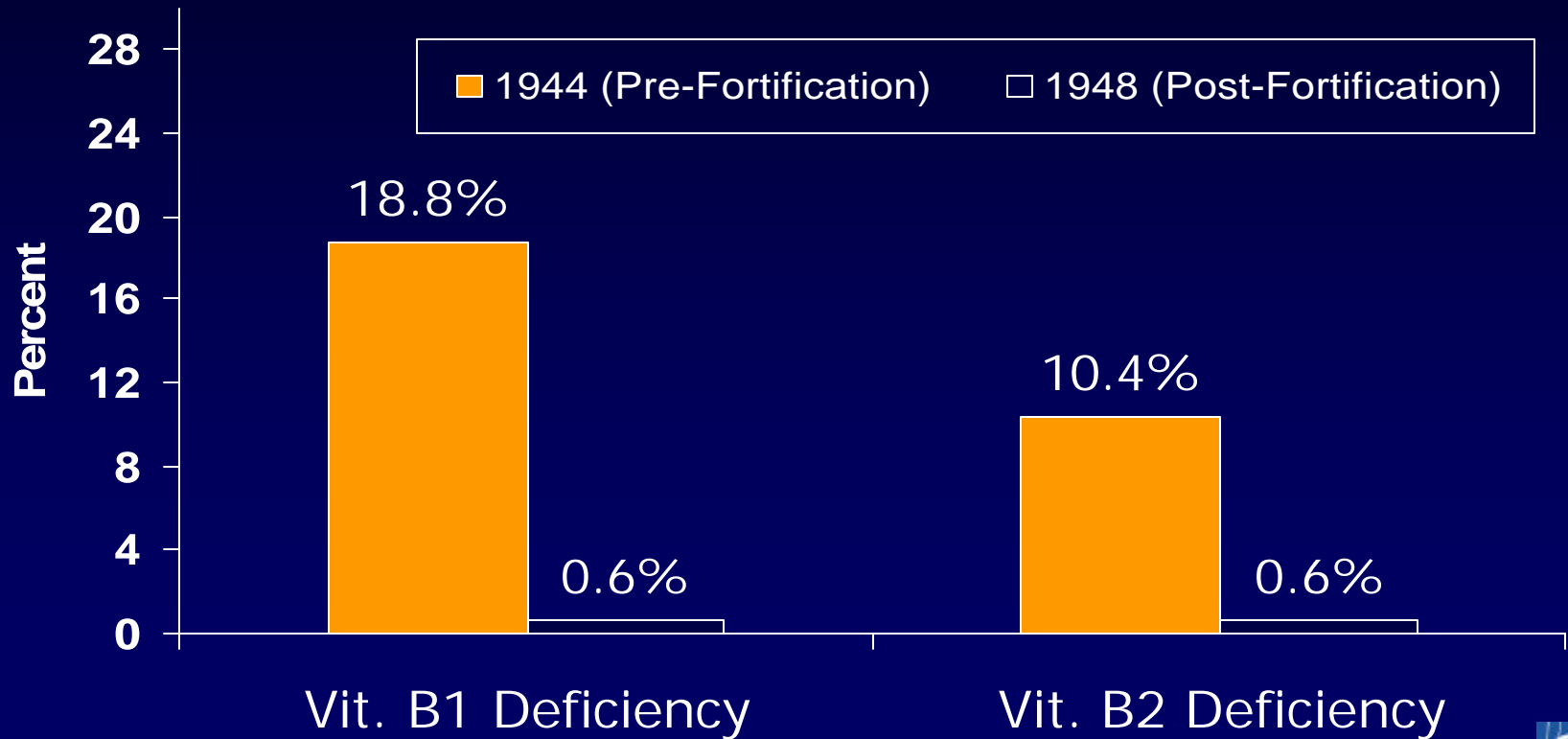
# The Good News!!!

- Fortification of flour with iron is an effective measure to prevent iron deficiency
- Fortification of flour with folic acid can prevent neural tube, and possibly other birth defects
- Addition of nutrients to flour does not change any qualities of the product, and improves its **nutritional value**
- There is a long history of flour fortification in nearly 30 countries

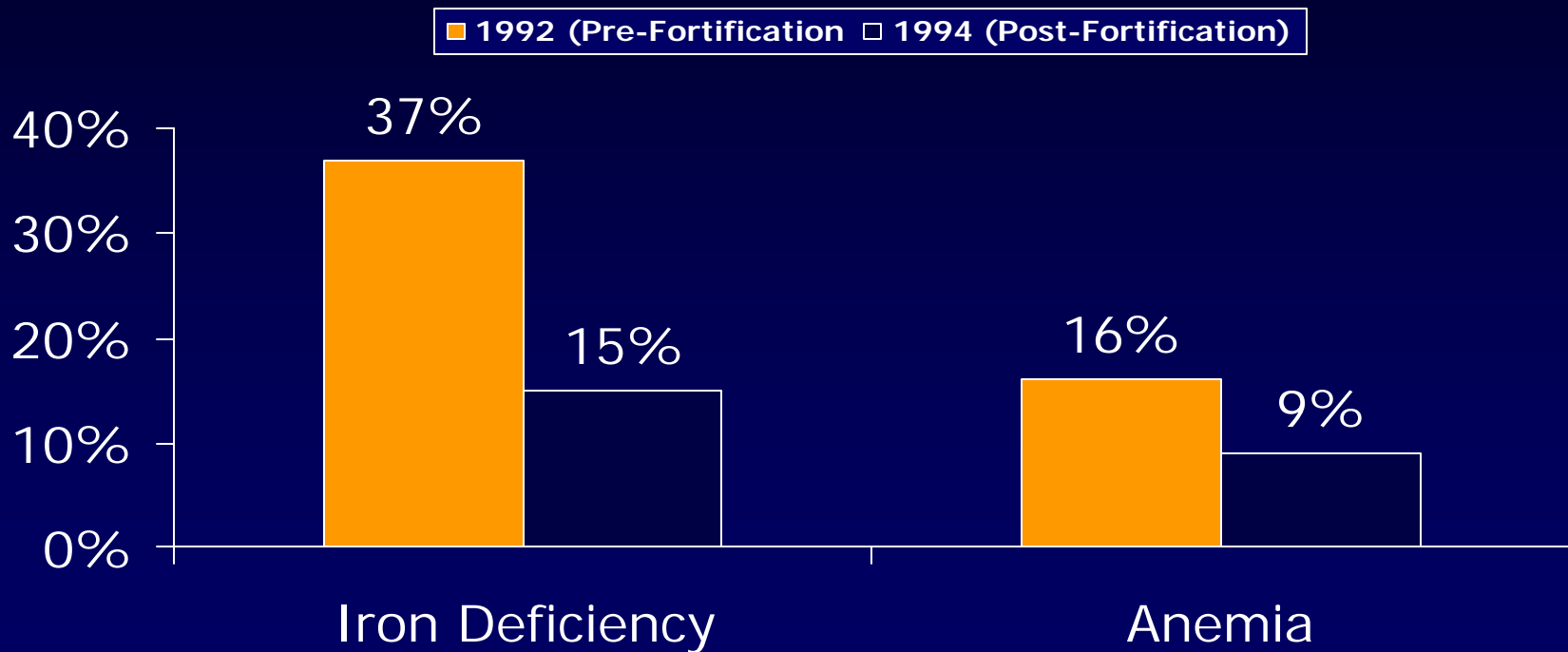
# Elimination of Niacin Deficiency in the United States



# Impact of Wheat Flour Fortification on Vitamin Deficiencies in Canada

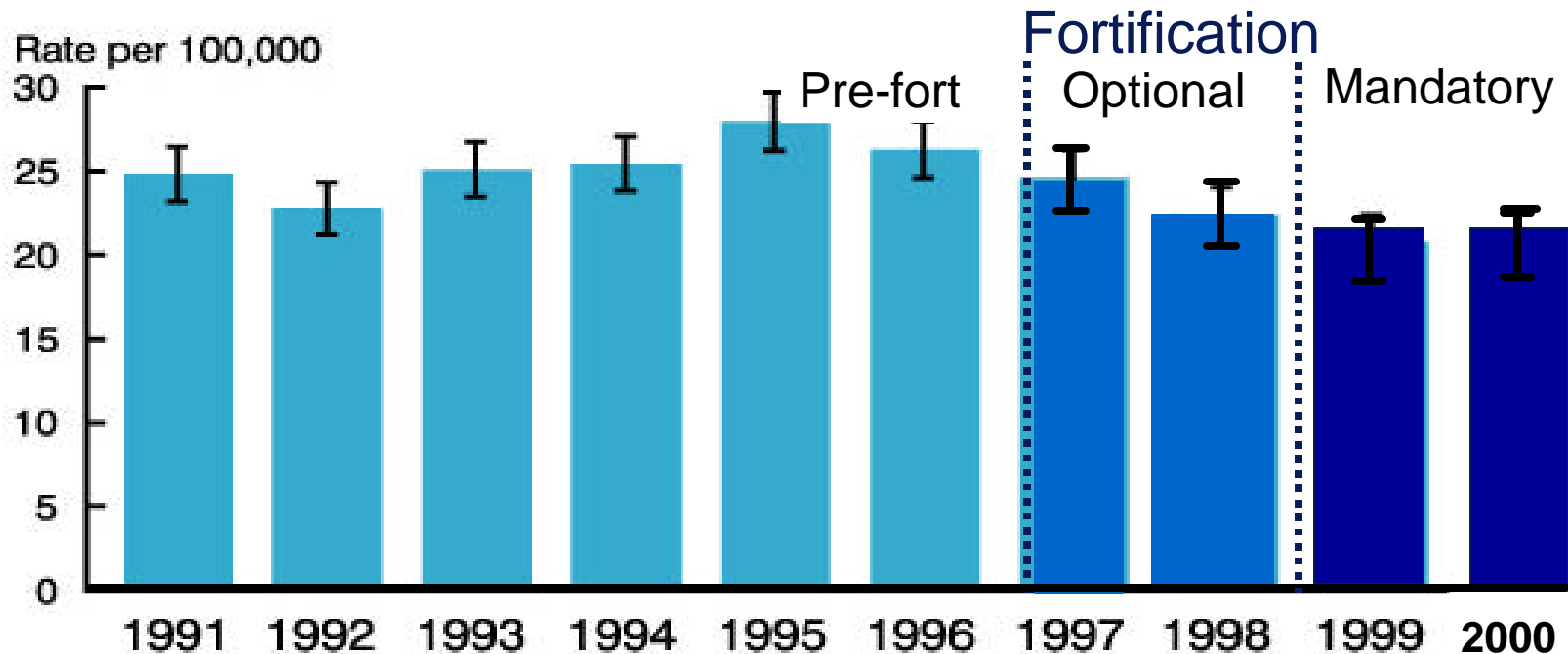


# Impact of Wheat and Corn Flour Fortification on Iron Deficiency and Anemia Caracas, Venezuela



# Flour Fortification Works

## Spina Bifida Rates, U.S., 1991-2000

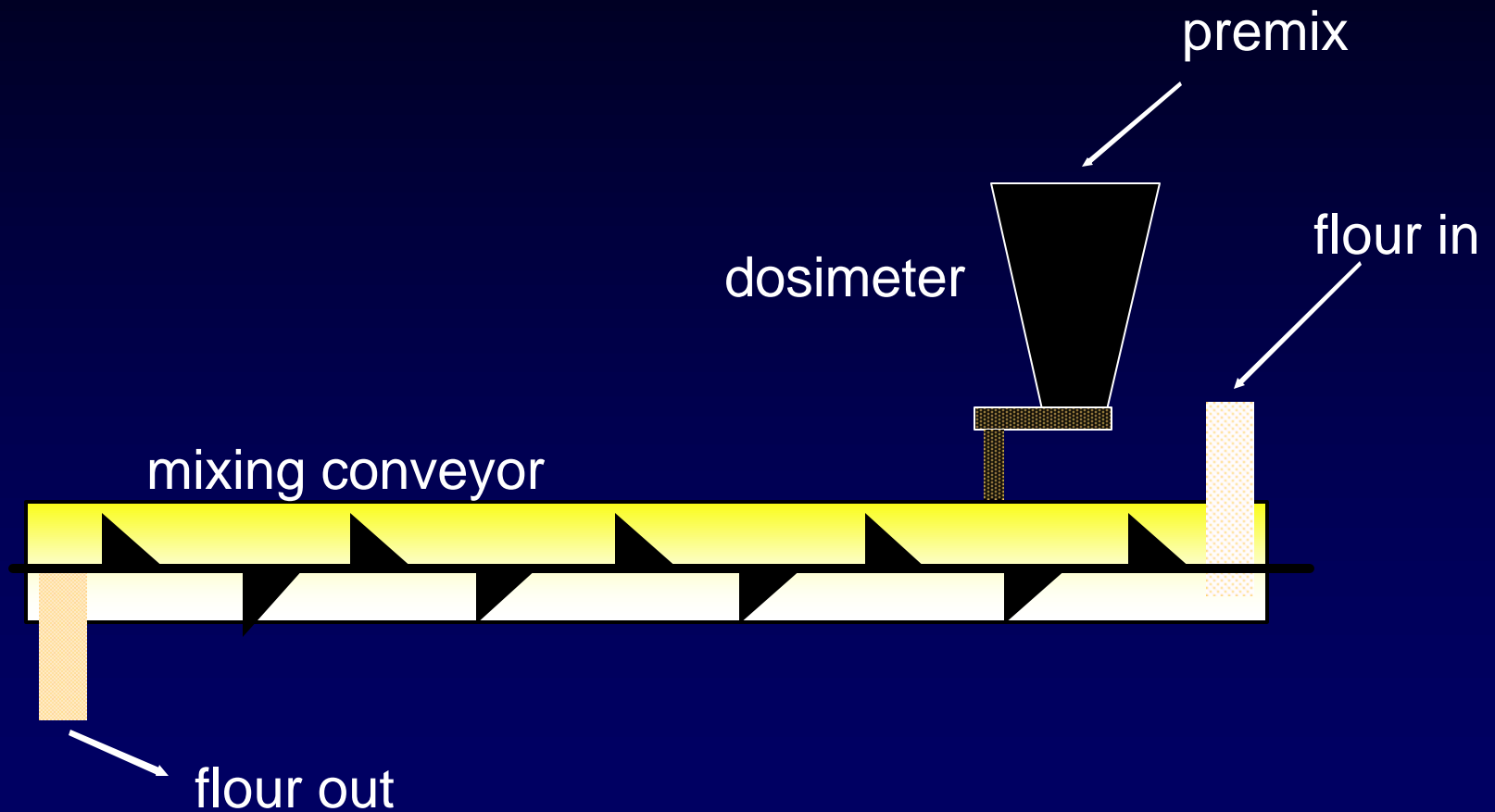


NOTE: Excludes data for Maryland, New Mexico, and New York which did not require reporting for spina bifida for some years. Data for 1999 is preliminary.

SOURCE: CDC/NCHS, National Vital Statistics System

# Feasibility of Flour Fortification

# Fortification of Wheat Flour: A Simple Process

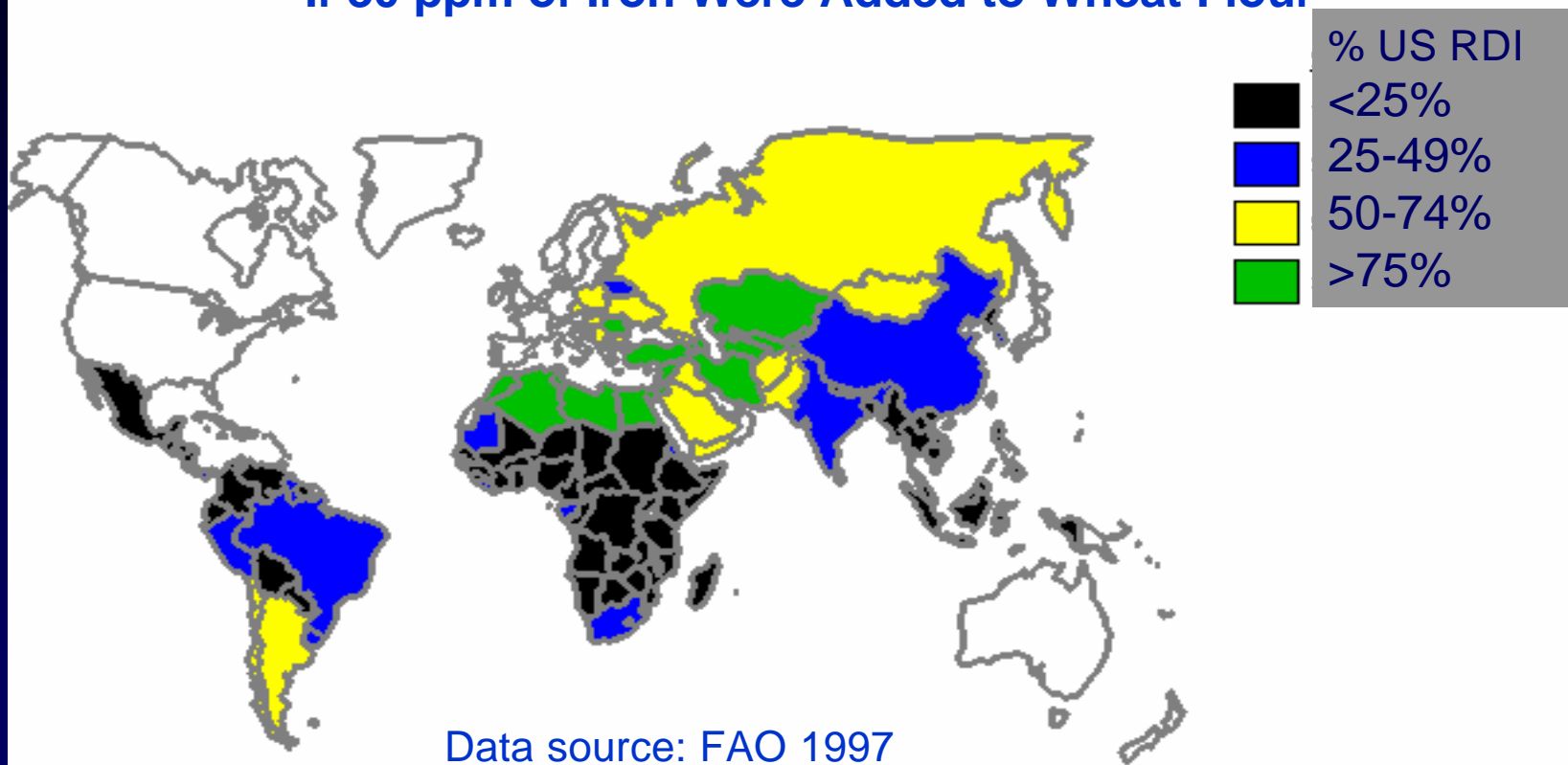


# Cost of Flour Fortification

- Nutrient premix (30 mg ferrous sulphate plus 1.5 mg folic acid) costs \$0.50 per MT of flour
  - Translates to about \$0.07/consumer/year
- Dosimeter costs \$1000 - \$5000
- In most cases, minimal additional costs of fortification can be passed on to the consumer

# Potential Benefit of Flour Fortification to Iron Intake

Contribution to % Iron RDI  
If 30 ppm of Iron Were Added to Wheat Flour



# In Summary

- The burden of iron and folic acid deficiencies in the world is very high, but can be eliminated
- Flour fortification is a simple, low cost, and well established method for reducing the health, economic and societal burden of nutrient deficiencies
- Fortification improves the nutritional quality of flour
- Flour producers and health sector can become partners in improving health and well-being of people throughout the world

# Why UFF?



# Universal Flour Fortification



Why not?  
Why not every where?  
Why not now?

**Thank you!**