

Challenges of Measuring Biological Impact in Food Fortification



Helena Pachón, PhD, MPH
Effectiveness of Large-Scale Fortification
Micronutrient Forum
26 October 2016



Food Fortification Initiative
Enhancing Grains for Healthier Lives



Does food fortification have a public health impact?





Does food fortification have a public health impact?



Effectiveness trials

Real-life conditions



**Challenges with measuring
biological impact in food
fortification programs through
effectiveness trials**



Lack of a control group

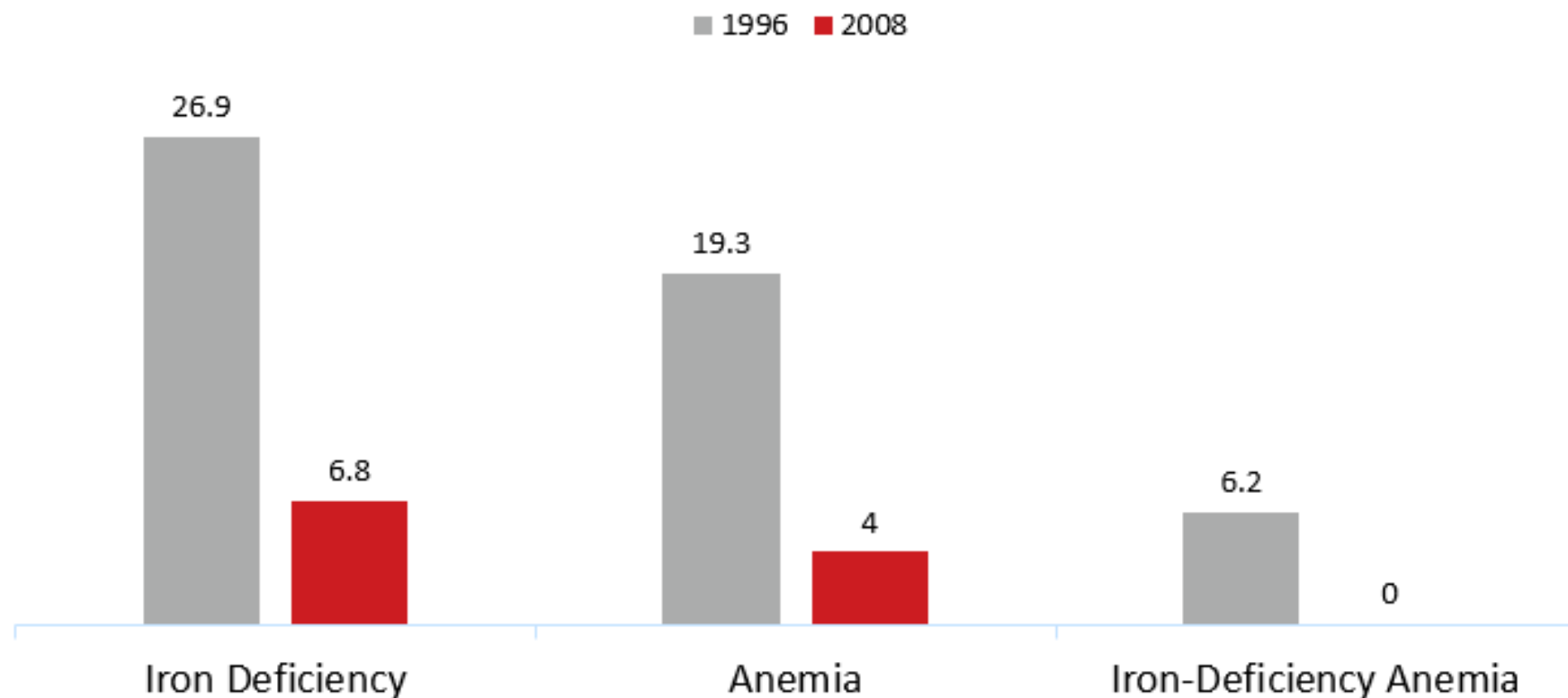


- As of September 2009
- Mandatory fortification with folic acid
- Wheat flour used to make bread
- No opportunity for a control group that does not get fortification
- Difficult to infer causality for fortification



Is it plausible that fortification contributed to biological impact?

Costa Rica Children 1-7 Years:
Prevalence Pre and Post Fortification with Iron



Foods fortified with iron: wheat flour, maize flour, milk

Martorell 2015



SOLUTION

Gather complementary information to argue for fortification's contribution

Potential to benefit (presence of micronutrient deficiencies)



Program Impact Pathway



SOLUTION

Gather complementary information to argue for fortification's contribution

Potential to benefit (presence of micronutrient deficiencies)



Fortification policy created and legislation passed



Program Impact Pathway



SOLUTION

Gather complementary information to argue for fortification's contribution

Program Impact Pathway

Potential to benefit (presence of micronutrient deficiencies)



Fortification policy created and legislation passed



Bioavailable fortificant is mandated for food(s) that are consumed by the nutritionally needy





SOLUTION

Gather complementary information to argue for fortification's contribution

Program Impact Pathway

Potential to benefit (presence of micronutrient deficiencies)



Fortification policy created and legislation passed



Bioavailable fortificant is mandated for food(s) that are consumed by the nutritionally needy



Foods are fortified at mandated levels and compliance is monitored and enforced





SOLUTION

Gather complementary information to argue for fortification's contribution

Program Impact Pathway

Potential to benefit (presence of micronutrient deficiencies)



Fortification policy created and legislation passed



Bioavailable fortificant is mandated for food(s) that are consumed by the nutritionally needy



Foods are fortified at mandated levels and compliance is monitored and enforced



Fortified foods are consumed in adequate amounts (meaningful contribution to requirements)





SOLUTION

Gather complementary information to argue for fortification's contribution

Program Impact Pathway

Potential to benefit (presence of micronutrient deficiencies)



Fortification policy created and legislation passed



Bioavailable fortificant is mandated for food(s) that are consumed by the nutritionally needy



Foods are fortified at mandated levels and compliance is monitored and enforced



Fortified foods are consumed in adequate amounts (meaningful contribution to requirements)



Public health impact (reductions in micronutrient deficiencies)





CHALLENGE

Establishing a baseline before fortification implementation

1951

Wheat flour fortification mandated

1965

Iron compound changed to ferrous sulfate

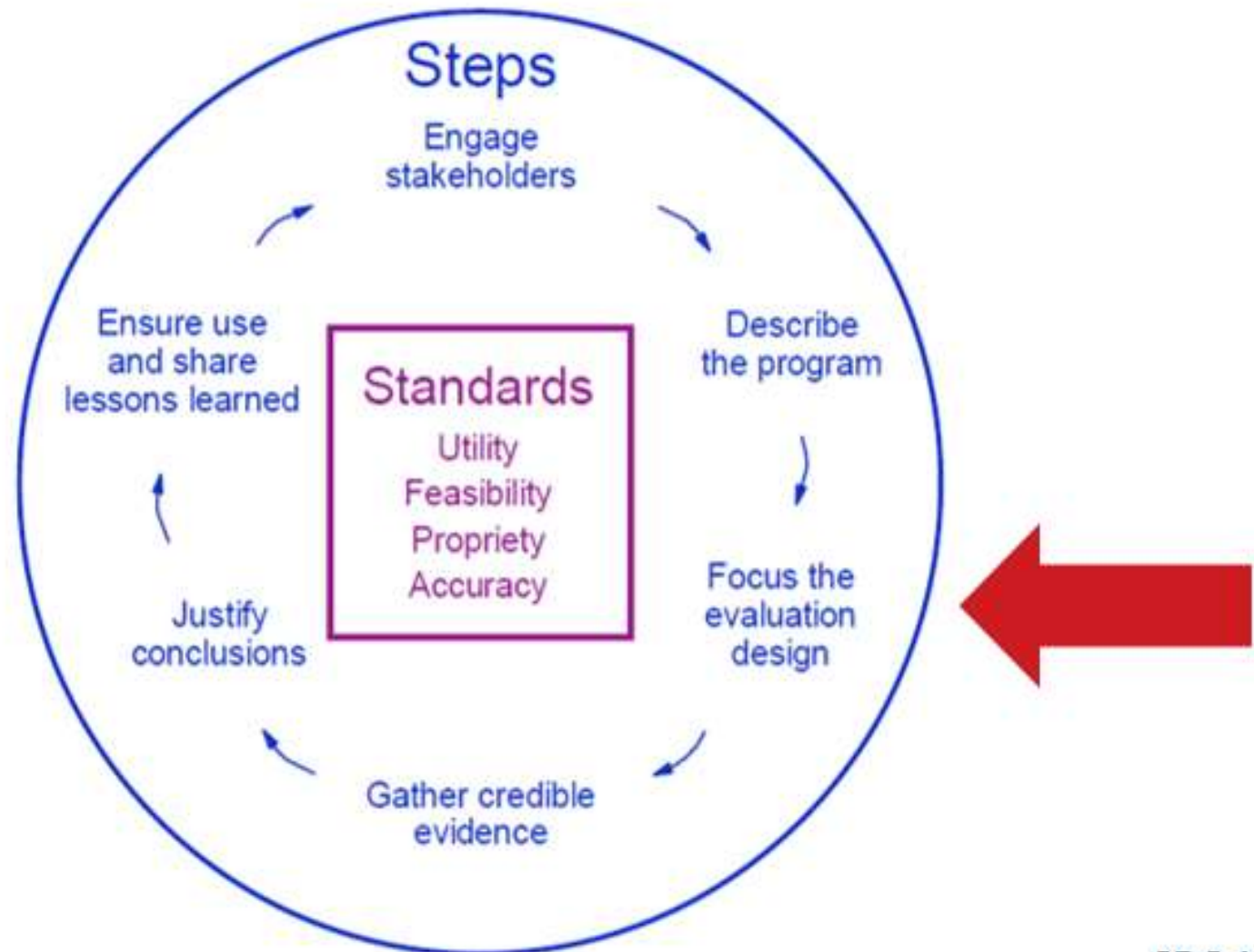
1974

First national survey to assess anemia





Plan for evaluation





SOLUTION

Use other methods to assess fortification's contribution

National Micronutrient Status and Fortified Food Coverage Survey, Oman, 2004



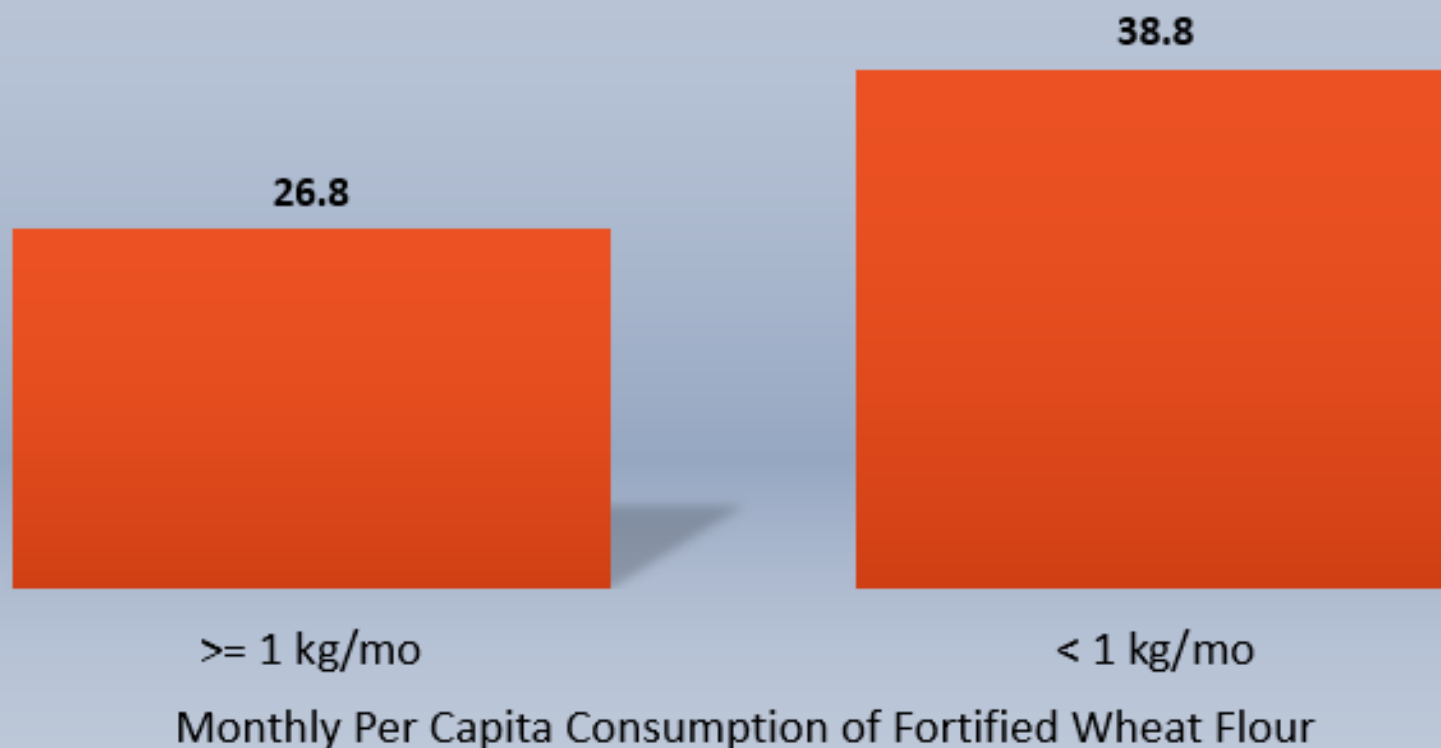
- Cross-sectional survey
- Non-pregnant women of childbearing age: % iron deficiency
- Families: monthly per capita consumption fortified wheat flour



SOLUTION

Use other methods to assess fortification's contribution

Prevalence of Iron Deficiency Among Non-Pregnant Women 15-49 Years in Oman





Impact evaluation surveys can be costly





Use existing data



- Wheat and maize flour fortification mandated in June 2004: iron & folic acid
- National Information System on Live Births
- Neural tube defects quantified pre-fortification (2000-2004) and post-fortification (2005-2006)
- No primary data collection required



Use existing data-collection systems

Cambodia



Demographic and
Health Survey

2014

- Nationally representative DHS survey
- Added micronutrients module
- Blood samples: iron, vitamin A, vitamin D, calcium, folate, vitamin B12 status
- Urine samples: iodine status



Conclusions

- Measuring biological impact of food fortification programs through effectiveness trials presents many challenges
- Some of these challenges can be overcome by:
 - Gathering complementary information which allows assessing the plausibility that fortification contributed to biological outcomes
 - Planning for impact evaluation surveys while planning for fortification implementation overall
 - Employing non-traditional impact-evaluation study designs
 - Using existing data and data-collection systems to reduce costs

For more information:

www.FFInetwork.org

[www.Facebook.com/FFInetwork](https://www.facebook.com/FFInetwork)

<https://twitter.com/FFINetwork>

Join the Food Fortification Initiative
group on [Linked In](#)



**Food
Fortification
Initiative**

Enhancing Grains for Healthier Lives

Contact:

Helena.Pachon@emory.edu

