

Health and Economic Burden of Micronutrient Deficiencies



Flour Fortification Initiative
A Public-Private-Civic Investment in Each Nation

Presented by Scott J. Montgomery
Flour Fortification Initiative Director
10 December 2013



Flour Fortification Initiative

FFI advocates for and supports fortification of industrially milled cereal grains by collaborating with multi-sector partners.

Smarter, Stronger, Healthier



Vitamin and Mineral Deficiency Contributes to:

- More than one-third of all ***deaths in children*** under the age of 5
- Stunting of an estimated **195 million children** under age 5 in developing countries
- Undeveloped ***cognitive capacity***, productivity and earning potential



Iron Deficiency:

- Affects **more people** than any other health condition
- Reduces **work capacity**
- Impairs a child's physical and **intellectual development**
- Contributes to 20% of all **maternal deaths**
- Is a leading cause of anemia which affects **2 billion people** – over 30% of the world's population



Costs of Anemia



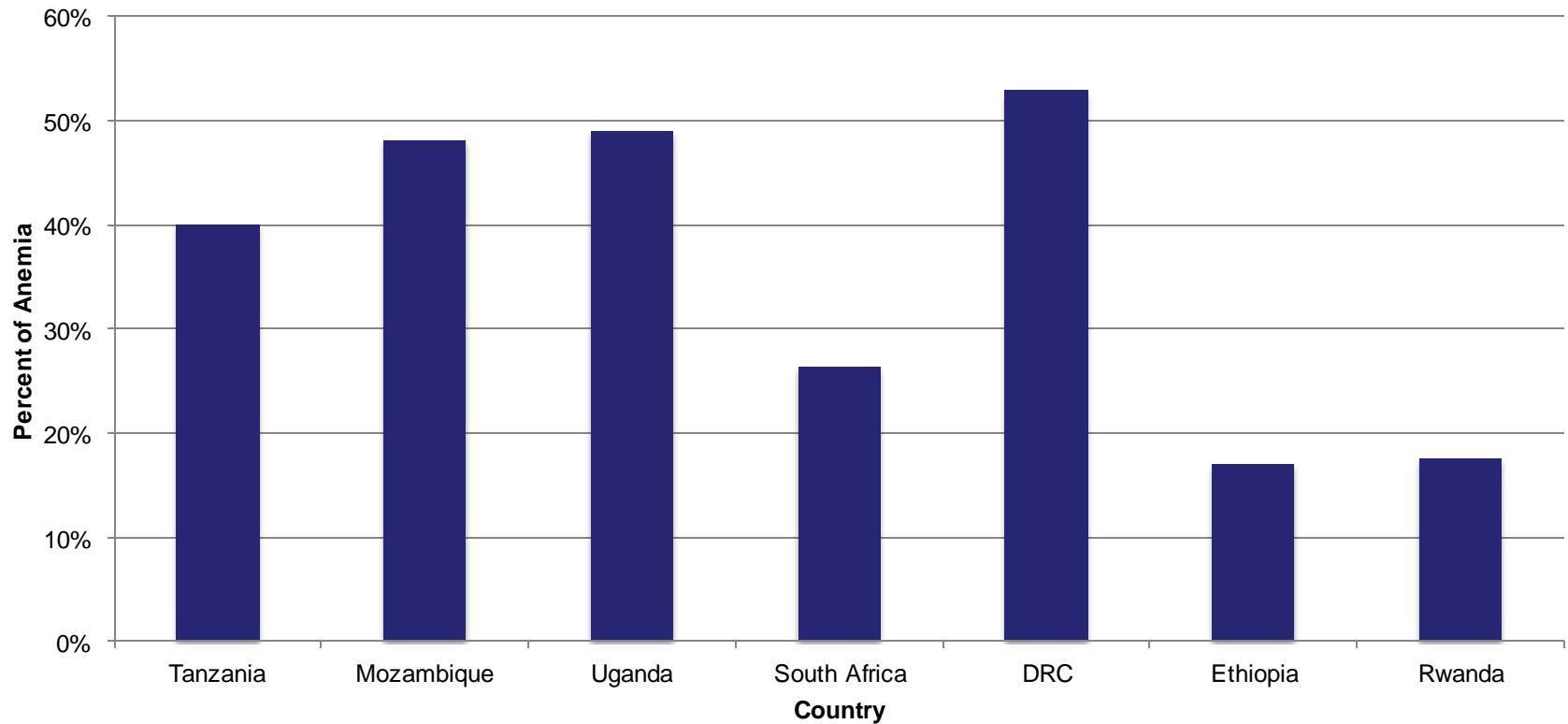
Anemia leads to:

- 17% ***lower productivity*** in heavy manual labor
- 5% ***lower productivity*** in other manual labor
- Estimated 2.5% loss of earnings due to ***lower cognitive skills***



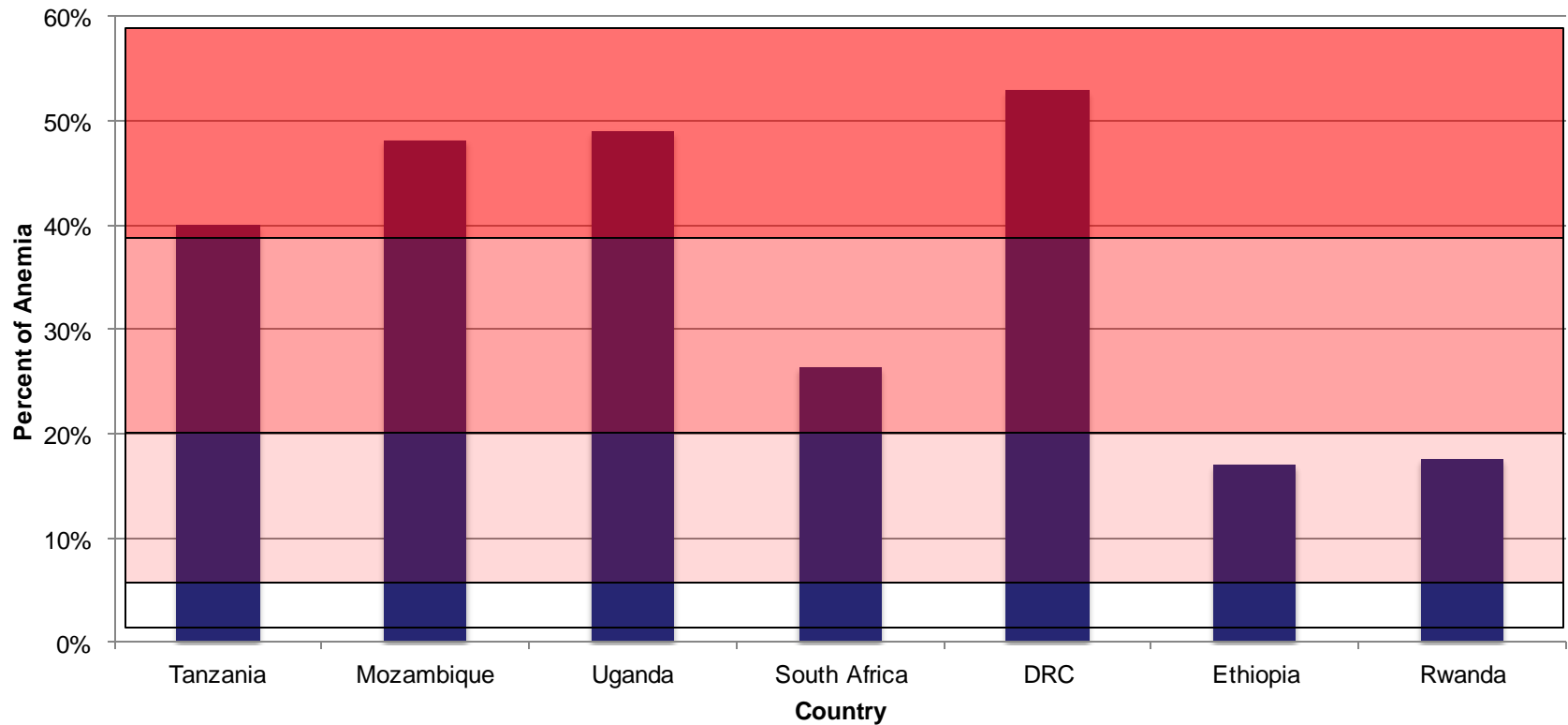
Anemia in Seven Countries

Percent of anemia in non-pregnant women of reproductive age



Anemia in Seven Countries

Percent of anemia in non-pregnant women of reproductive age



Folic Acid

- Vitamin B9
- 400 micrograms daily recommended for women who might become pregnant
- Deficiency can also cause anemia



Neural Tube Defects

- An estimated **300,000 neural tube defects** (NTDs) occur every year globally.¹
- Most of these birth defects are **preventable** if the mother has enough folic acid at the right time.²



Spina bifida is malformation of the baby's spine. It causes permanent disability.



Anencephaly is malformation of the baby's brain. It is always fatal.

¹ Global Report on Birth Defects, March of [Dimes](#) Birth Defects Foundation, 2006

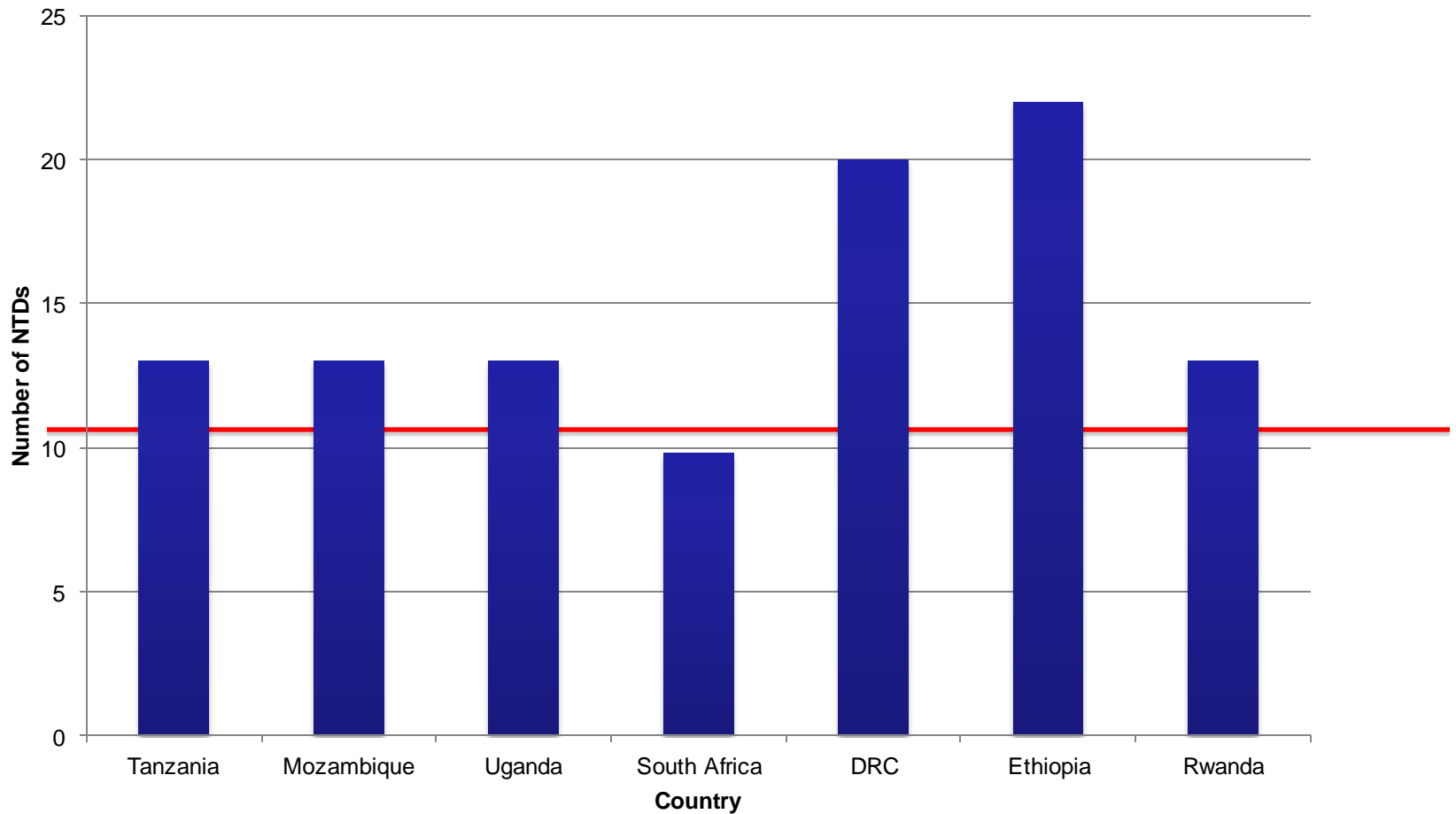
² U.S. Centers for Disease Control and Prevention: <http://www.cdc.gov/ncbddd/folicacid/faqs.html>

Photos from Google Images



NTD Prevalence

Neural Tube Defects per 10,000 live births



Equivalent of 400 µg of Folic Acid

To get the equivalent of 400 micrograms of folic acid a day, eat:

- 4 slices of beef liver or
- 44½ medium ripe tomatoes or
- 14½ cups of raw broccoli or
- 17½ cups of orange juice or
- 5½ cups of black beans or
- 200 medium red apples or
- 19½ cups of raw green beans



Fortification Strategy

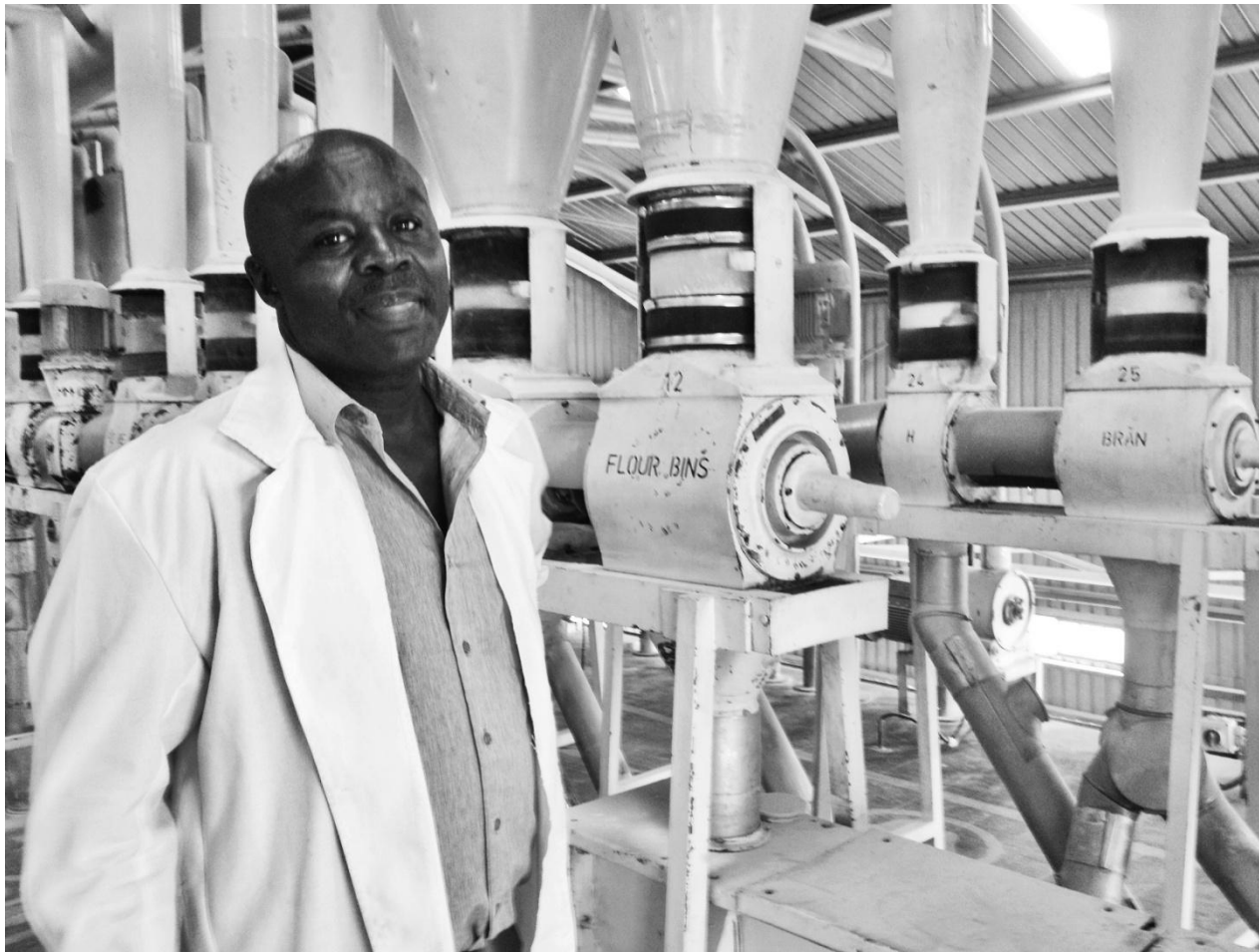


Photo by Crystal Stafford



Fortification For NTD Prevention

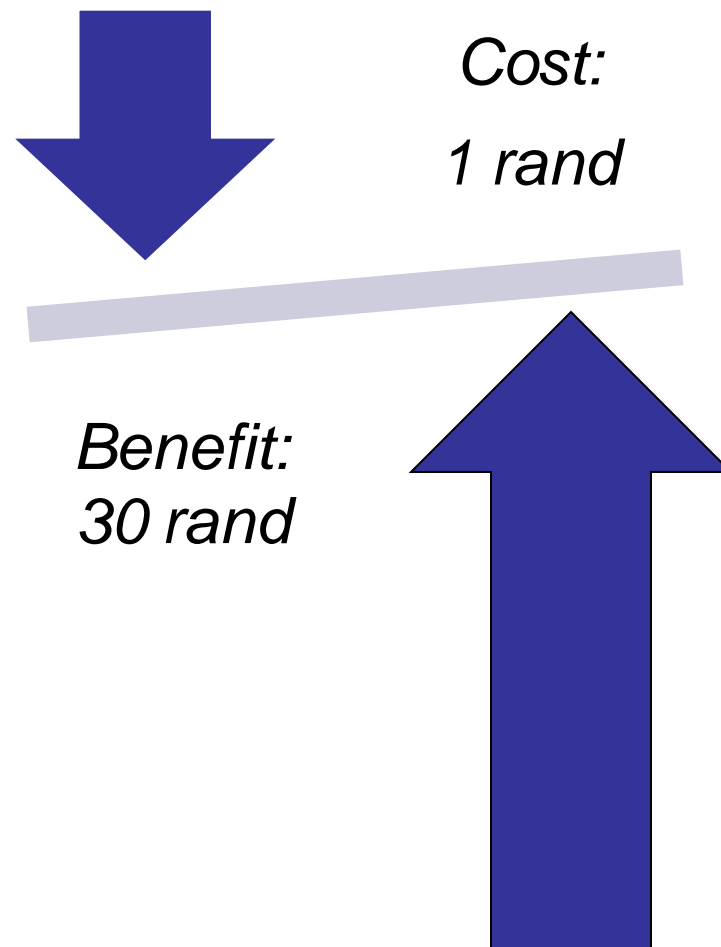
Meta-analysis published in 2010:

8	Included 8 studies published between 2002 to 2008 by 8 different authors
5	Reflected studies using sub-national data in 5 countries: Argentina, Canada, Chile, South Africa, USA
31 – 78%	Neural tube defect reductions ranged from 31% to 78%
46%	Overall reduction in risk of neural tube defects was 46%



South Africa

- 41.6% decline in spina bifida after fortification
- 30 rand saved in healthcare costs for every one rand spent on fortification



Vitamin A Deficiency

An estimated 250 million preschool children are vitamin A deficient:

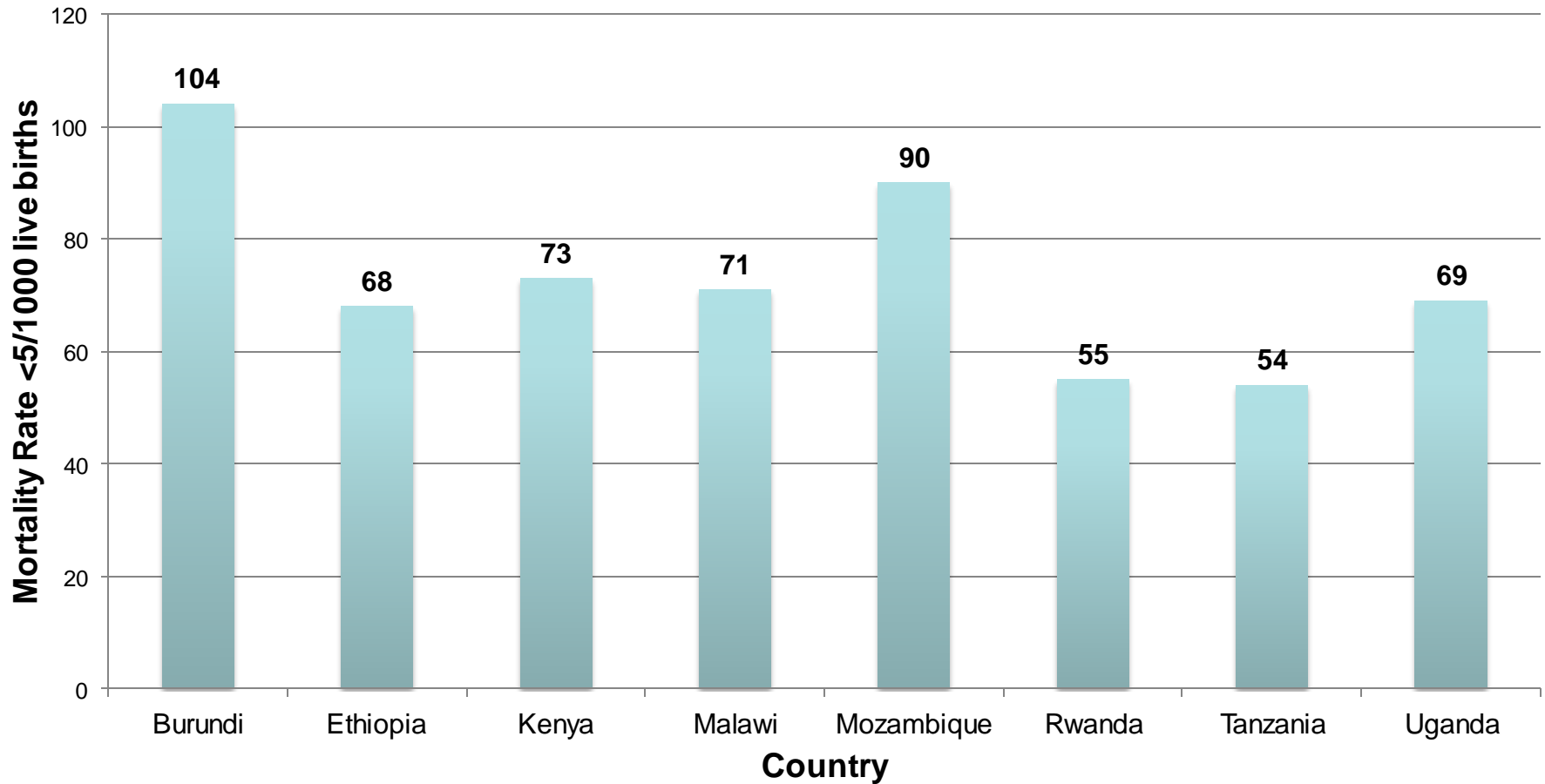
- Leading cause of preventable childhood blindness
- Significantly increases risk of severe illness and death from infections, diarrheal disease and measles
- 3 meta-analysis find Vitamin A Supplementation, including fortification, reduce mortality in children < 5 years of age 23-30% (Lancet 2013).

In pregnant women:

- Causes night blindness
- May increase risk of maternal mortality



Children <5 Mortality Rates



Fortifying with Vitamin A

- Can be added to wheat flour and maize products
- Usually more practical in cooking oil or sugar



Thank You



For more information:

www.FFInetwork.org

[Facebook](#)

[LinkedIn](#)

[Twitter](#)

