

# Consequences of micronutrient deficiencies in Africa

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## Now is the time to act!!

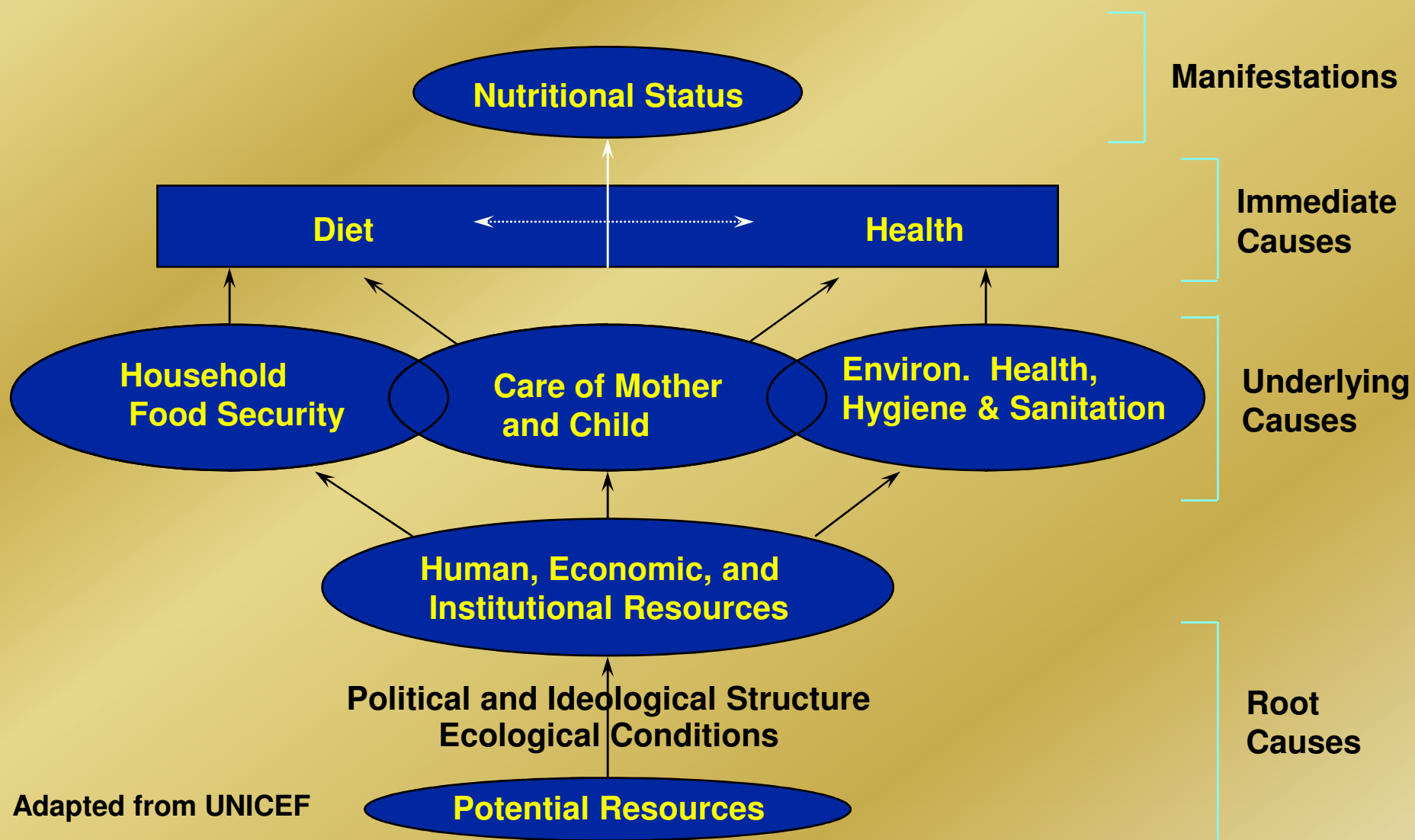


# Today's presentation

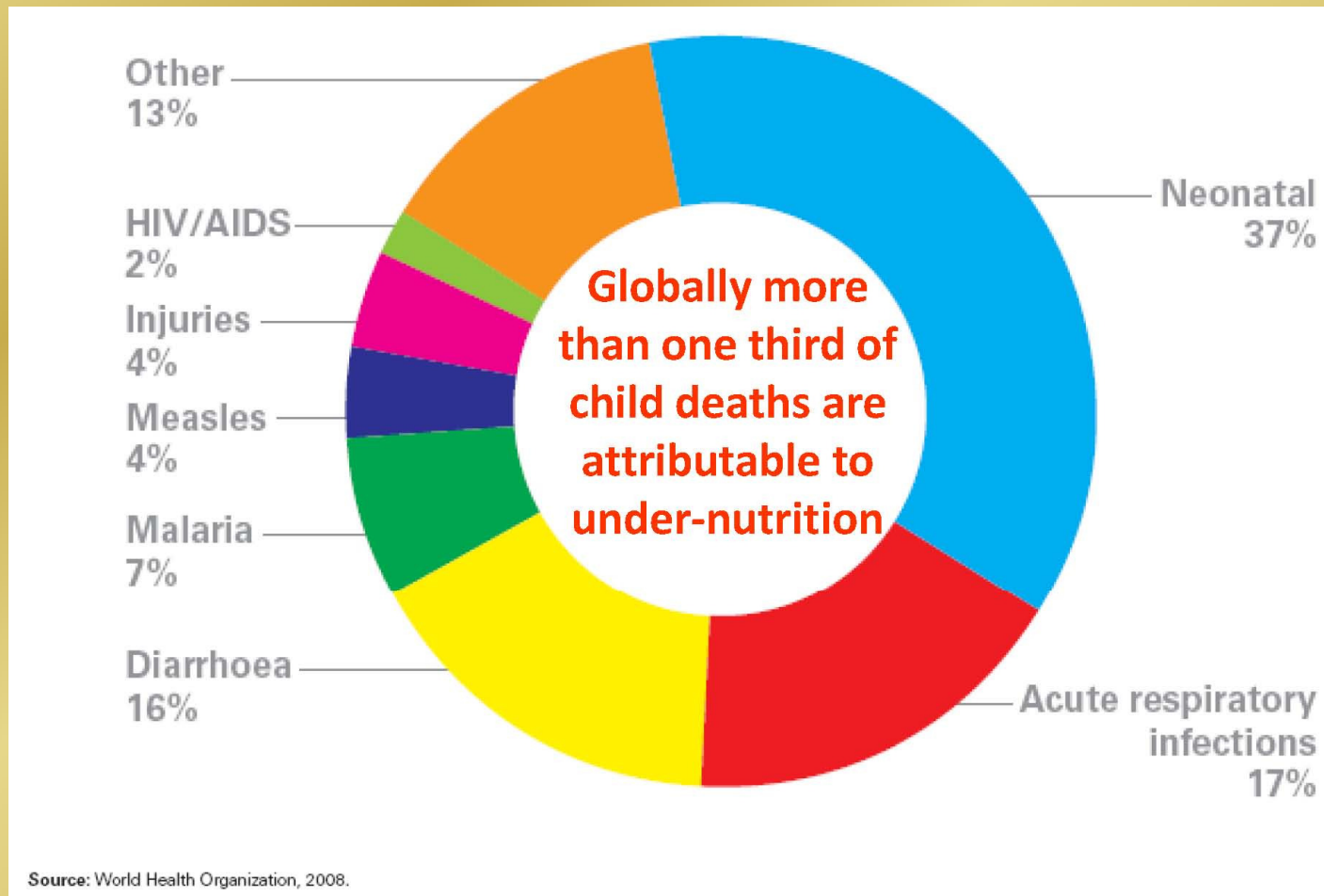
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1. Under nutrition, micronutrient deficiency and its impact on child survival and morbidity
2. Global and Continental trends in addressing Micronutrient Deficiency
3. Food Fortification and its role in reducing MND

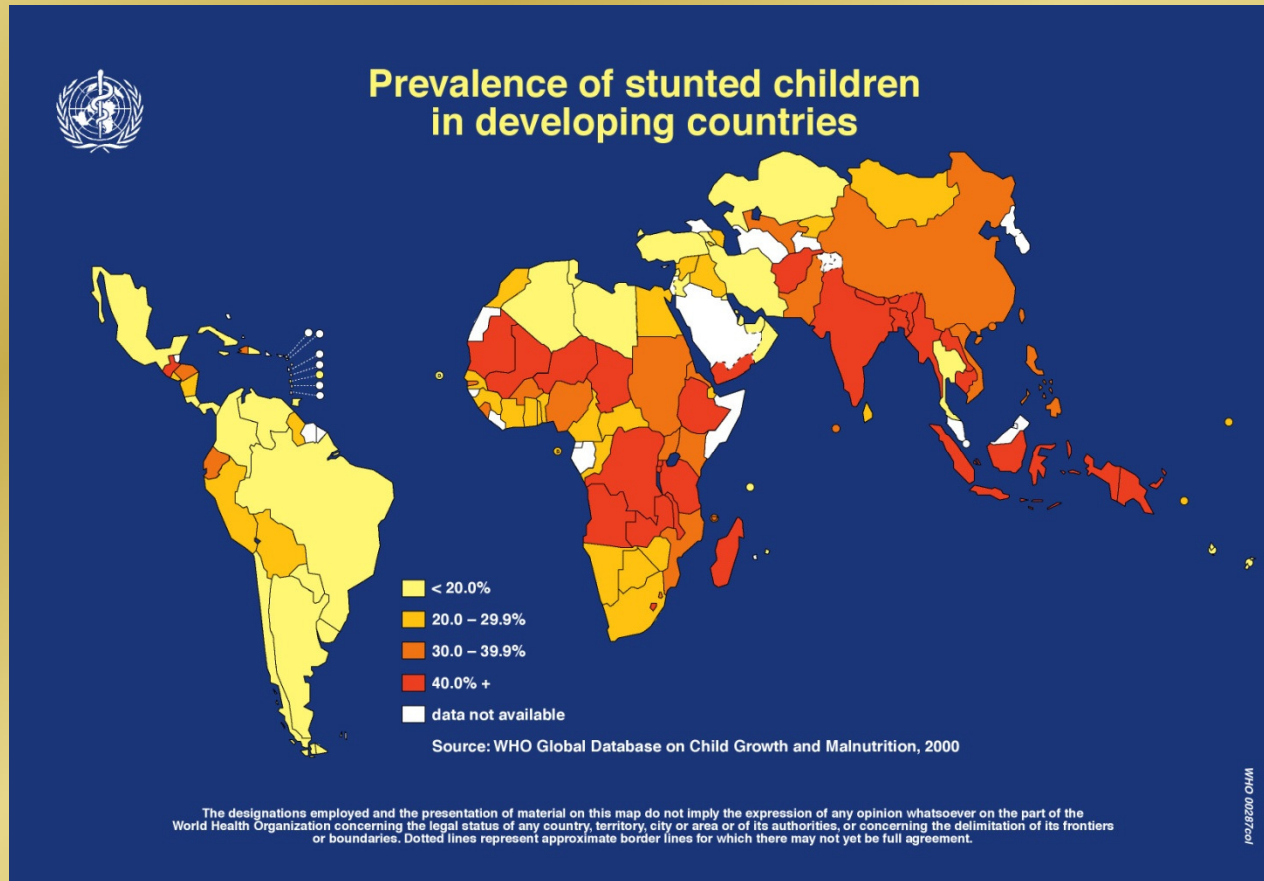
# Conceptual Framework of Undernutrition



# Causes of Child Mortality



# 195 Million under-fives in the developing world are stunted



- >90% of the developing world's stunted children live in Africa and Asia and
- 80% of them live in 24 countries

# And beyond Survival...

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Nutrition is also important for:

- Physical growth
- Behavioral development, cognitive function
- School attendance, performance
- Ultimate income-generating capacity,
- Economic development
- Risk of non-communicable diseases

# Further Global evidence...

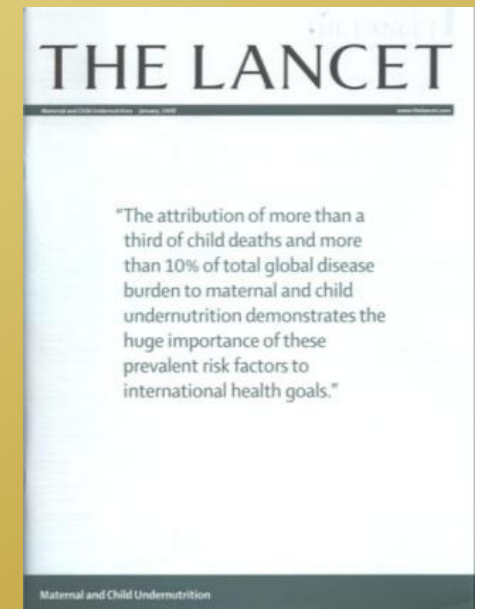
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## Lancet Nutrition Series-February 2008

-Analyzed data from five long-standing prospective cohort studies

-Noted that indices of maternal and child undernutrition (maternal height, birthweight, intrauterine growth restriction, and weight, height, and body-mass index at 2 years were related to adult outcomes (height, schooling, income or assets, offspring birthweight, body-mass index, glucose concentrations, blood pressure).

-Undernutrition was strongly associated, with shorter adult height, less schooling, reduced economic productivity, and—for women—lower offspring birthweight.



# Micronutrients?

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Most important MND?

- Vitamin A deficiency, iron deficiency, and iodine deficiency disorders
- Followed closely by other nutrients, such as zinc, calcium, riboflavin, vitamin B6 and B12, and folate

Children and women of reproductive age are especially vulnerable:

- Higher physiological needs
- Unfavorable intrahousehold food allocation patterns
- Poor quantity, frequency, and quality of complementary foods and inadequate
- and breastfeeding practices



# Micronutrients?

Micronutrient	Effect on Health
<p><b>Vitamin A deficiency</b></p>	<ul style="list-style-type: none"> <li>✓ Growth faltering ,</li> <li>✓ impaired motor and cognitive development, vision, and immune system</li> <li>✓ In children estimated to account for approximately 20-24% of child mortality from measles, diarrhea, and malaria, and</li> <li>✓ 20% of all-cause maternal mortality</li> <li>✓ Extreme deficiency leads to blindness and death</li> </ul>
<p><b>Iron Deficiency</b> Most prevalent nutrient deficiency estimated to affect 4 to 5 billion people.</p>	<ul style="list-style-type: none"> <li>✓ In young children, iron deficiency may impair growth, cognitive development, and immune function.</li> <li>✓ In school-aged children, it can affect school performance,</li> <li>✓ in adults it may lower work capacity.</li> <li>✓ <b>Iron deficiency anemia</b> is responsible for tens of thousands of maternal deaths each year</li> </ul>
<p><b>Iodine Deficiency</b> The loss of human intellectual, physical, and social potential caused by iodine deficiency has been enormous.</p>	<ul style="list-style-type: none"> <li>✓ Particularly damaging during pregnancy, as it retards fetal development,</li> <li>✓ Results in a range of intellectual, motor, and hearing deficits in the offspring</li> </ul>
<p><b>Zinc Deficiency</b> Even mild zinc deficiency could result in estimated 176,000 diarrhea deaths, 406,000 pneumonia deaths, and 207,000 malaria deaths worldwide</p>	<ul style="list-style-type: none"> <li>✓ In WRA, may result in pregnancy complications, low birth weight, impaired immune function, maternal and infant mortality and morbidity,</li> <li>✓ In children, growth faltering in infancy and childhood</li> <li>✓ Reduced immune function and more susceptible to a variety of infectious diseases</li> </ul>

# Global deaths and disability-adjusted life-years (DALY) in children < 5 yrs attributed to micronutrient deficiencies

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Deficiency	Death	% of death in children < 5yr	Disease burden (1000 DALYs)	% of DALYs in children < 5yr
Vitamin A	667,771	6.5	22,668	5.3
Zinc	453,207	4.4	16,342	3.8
Iron	20,854	0.2	2,156	0.5
Iodine	3,619	0.03	2,614	0.6

# Copenhagen Consensus 2008

Identifies nutrition interventions among the most cost effective interventions to advance global welfare if \$75 billion of resources were available over a four year period:

#1: Micronutrient supplements for children (Vitamin A & zinc)


#3: Micronutrient fortification (iron and salt iodisation)

# 5: Biofortification

#6: Deworming & other nutrition programs in schools

#9: Community based nutrition promotion

**Out of a total of 30 interventions...**



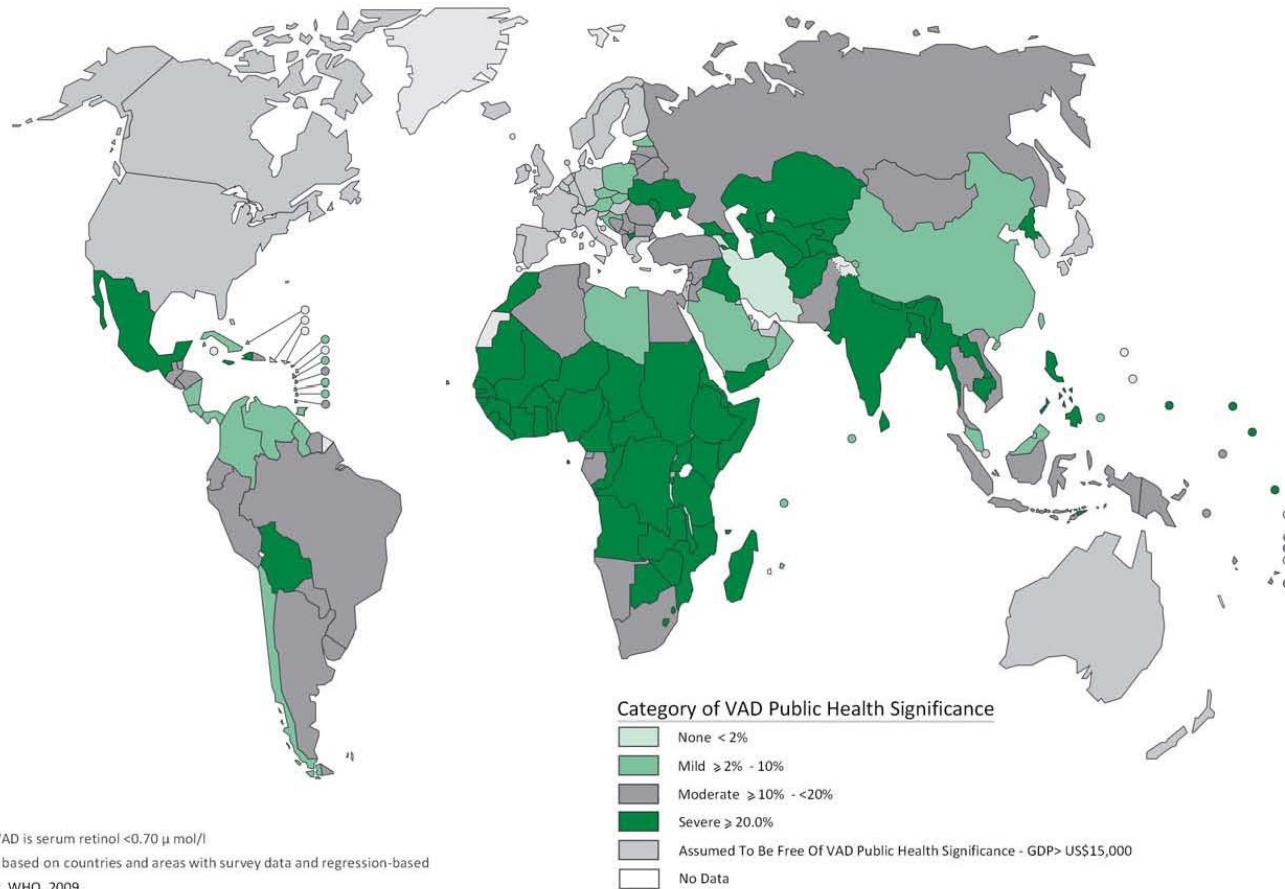
SOLUTION	CHALLENGE
1   Micronutrient supplements for children (vitamin A and zinc)	Malnutrition
2   The Doha development agenda	Trade
3   Micronutrient fortification (iron and salt iodization)	Malnutrition
4   Expanded immunization coverage for children	Diseases
5   Biofortification	Malnutrition
6   Deworming and other nutrition programs at school	Malnutrition & Education
7   Lowering the price of schooling	Education
8   Increase and improve girls' schooling	Women
9   Community-based nutrition promotion	Malnutrition
10   Provide support for women's reproductive role	Women
11   Heart attack acute management	Diseases
12   Malaria prevention and treatment	Diseases
13   Tuberculosis case finding and treatment	Diseases
14   R&D in low-carbon energy technologies	Global Warming
15   Bio-sand filters for household water treatment	Water
16   Rural water supply	Water
17   Conditional cash transfers	Education
18   Peace-keeping in post-conflict situations	Conflicts
19   HIV combination prevention	Diseases
20   Total sanitation campaign	Water
21   Improving surgical capacity at district hospital level	Diseases
22   Microfinance	Women
23   Improved stove intervention	Air Pollution
24   Large, multipurpose dam in Africa	Water
25   Inspection and maintenance of diesel vehicles	Air Pollution
26   Low sulfur diesel for urban road vehicles	Air Pollution
27   Diesel vehicle particulate control technology	Air Pollution
28   Tobacco tax	Diseases
29   R&D and mitigation	Global Warming
30   Mitigation only	Global Warming

In ordering the proposals, the panel was guided predominantly by consideration of economic costs and benefits. The panel acknowledged the difficulties that cost-benefit analysis must overcome, both in principle and as a practical matter, but agreed that the cost-benefit approach was an indispensable organizing method. In setting priorities, the panel took account of the strengths and weaknesses of the specific cost-benefit appraisals under review, and gave weight both to the institutional preconditions for success and to the demands of ethical or humanitarian urgency. As a general matter, the panel noted that higher standards of governance and improvements in the institutions required to support development in the world's poor countries are of paramount importance.

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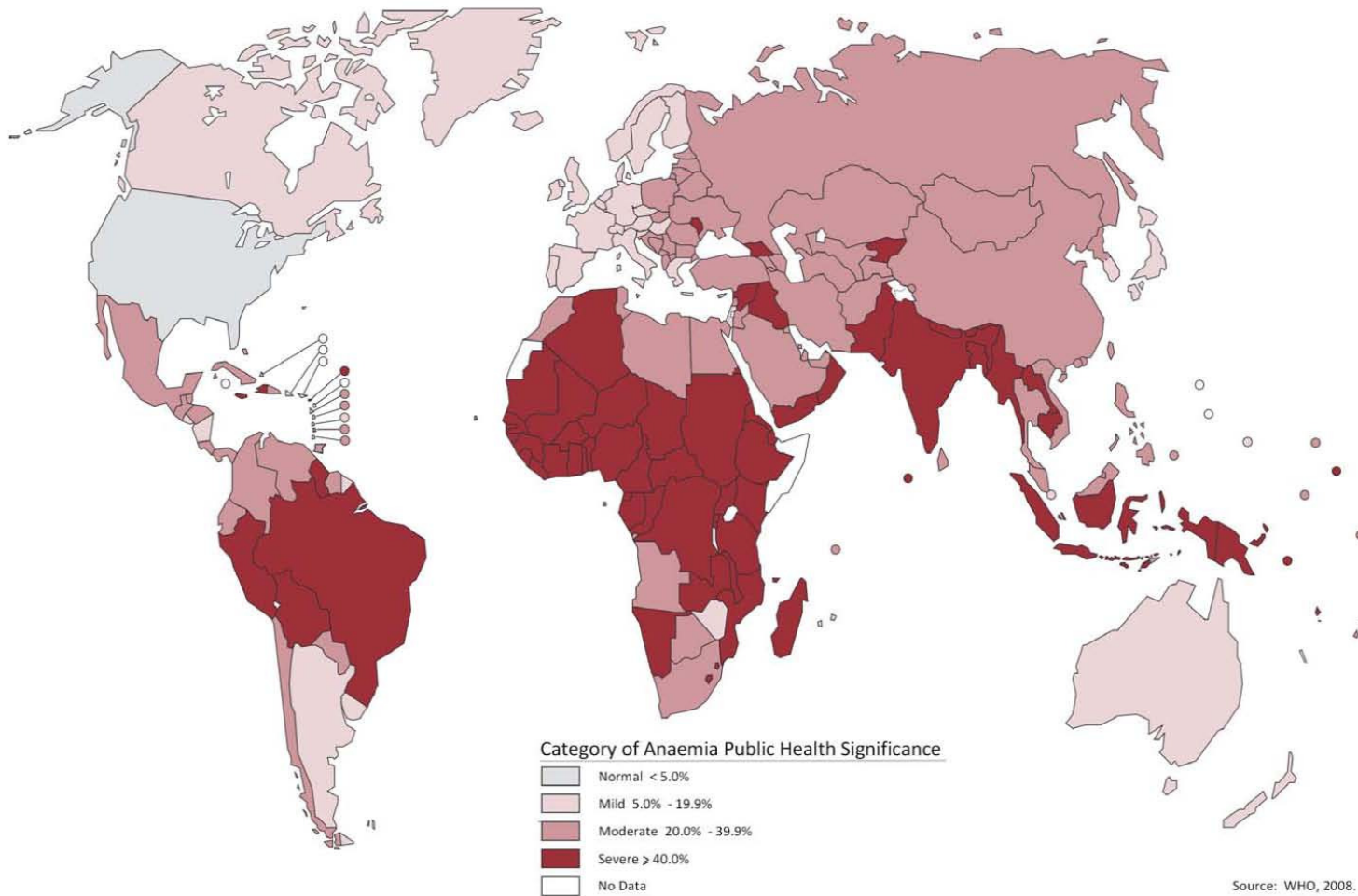
# MND- Vit A

## Vitamin A Deficiency Among Preschool Children by Country: 1995 - 2005

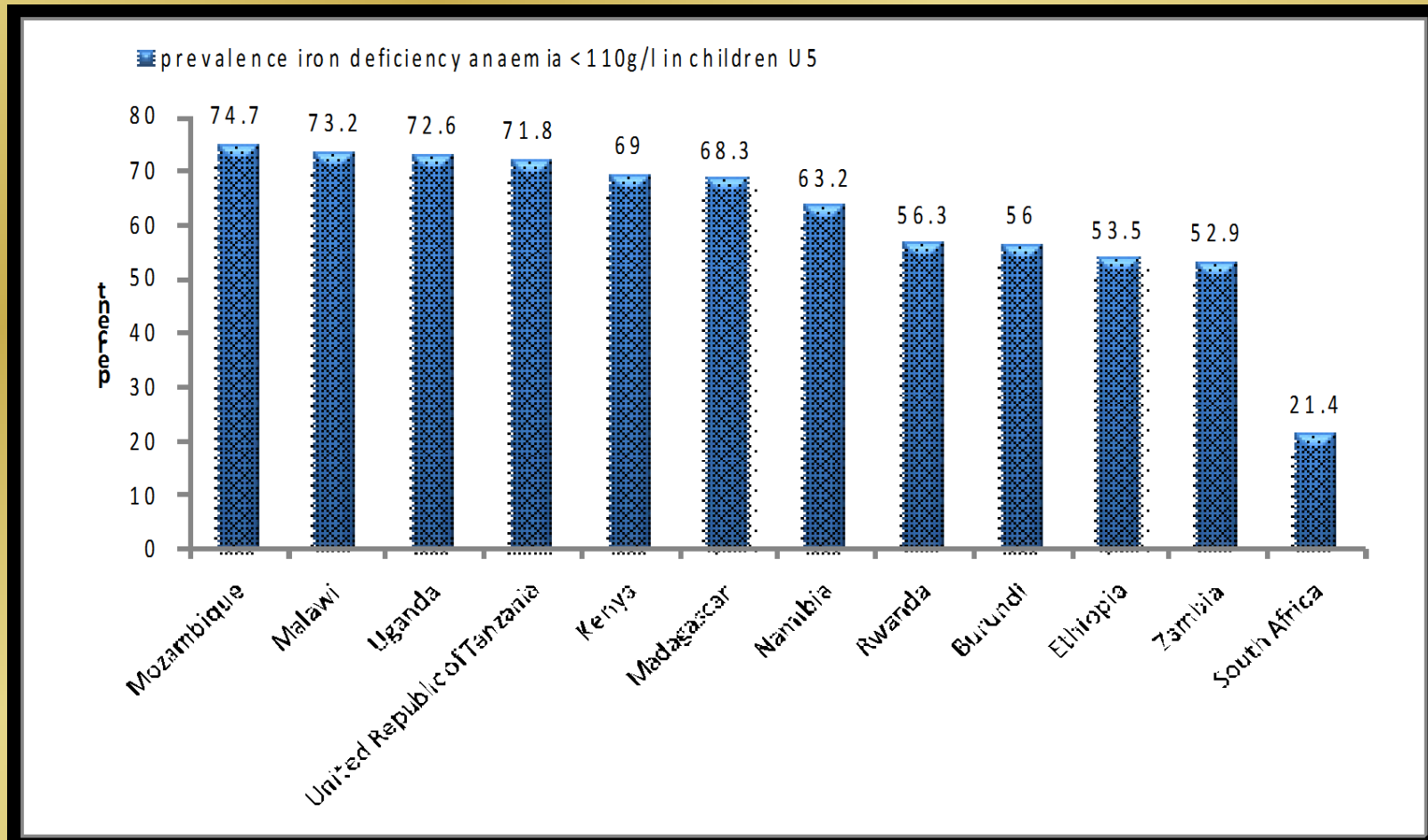


# MND- Iron

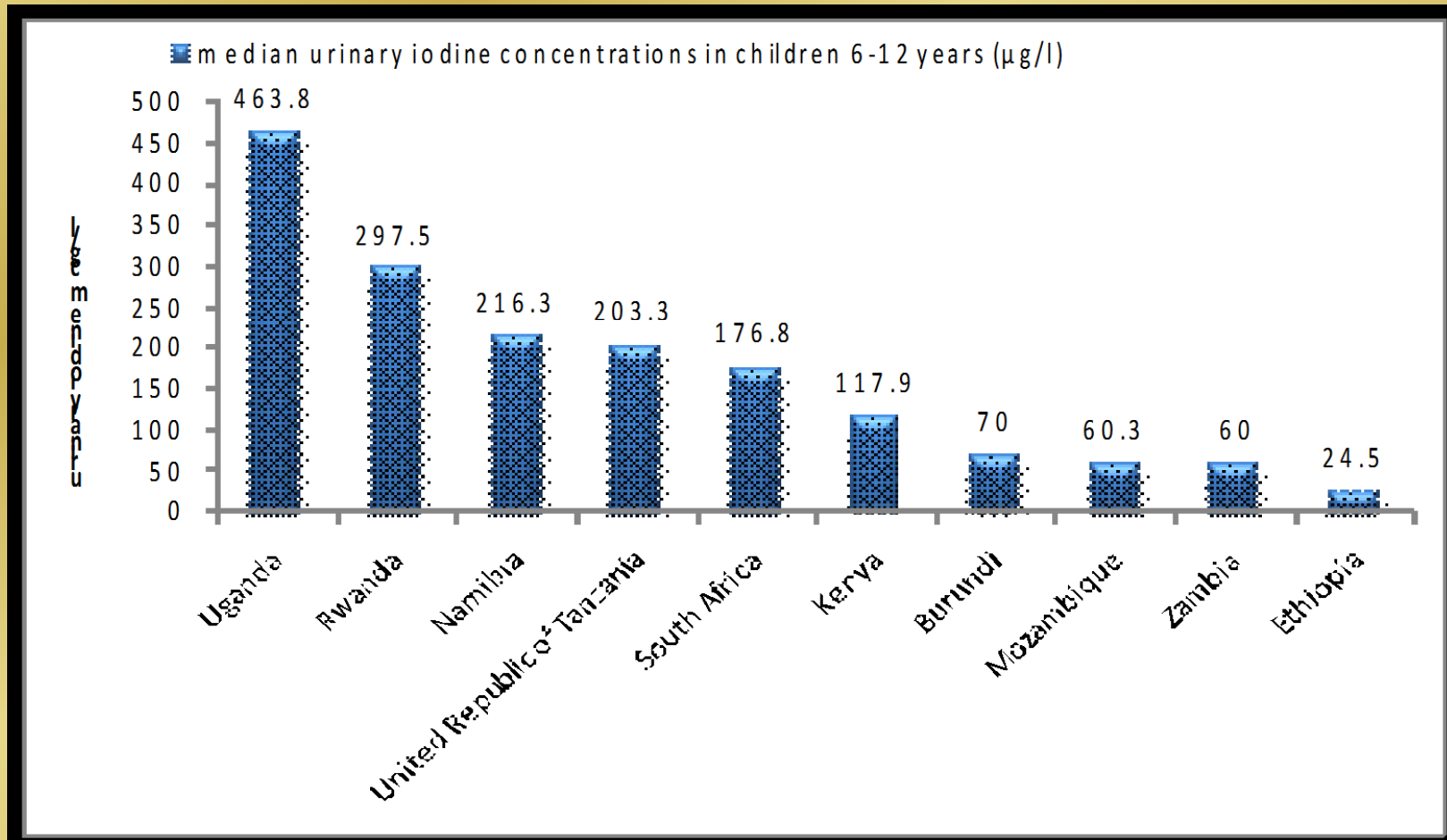
**Anaemia Among Preschool Children By Country**



# MND- Iron



# MND- Iodine



# Key Interventions for Elimination of Micronutrient Deficiencies

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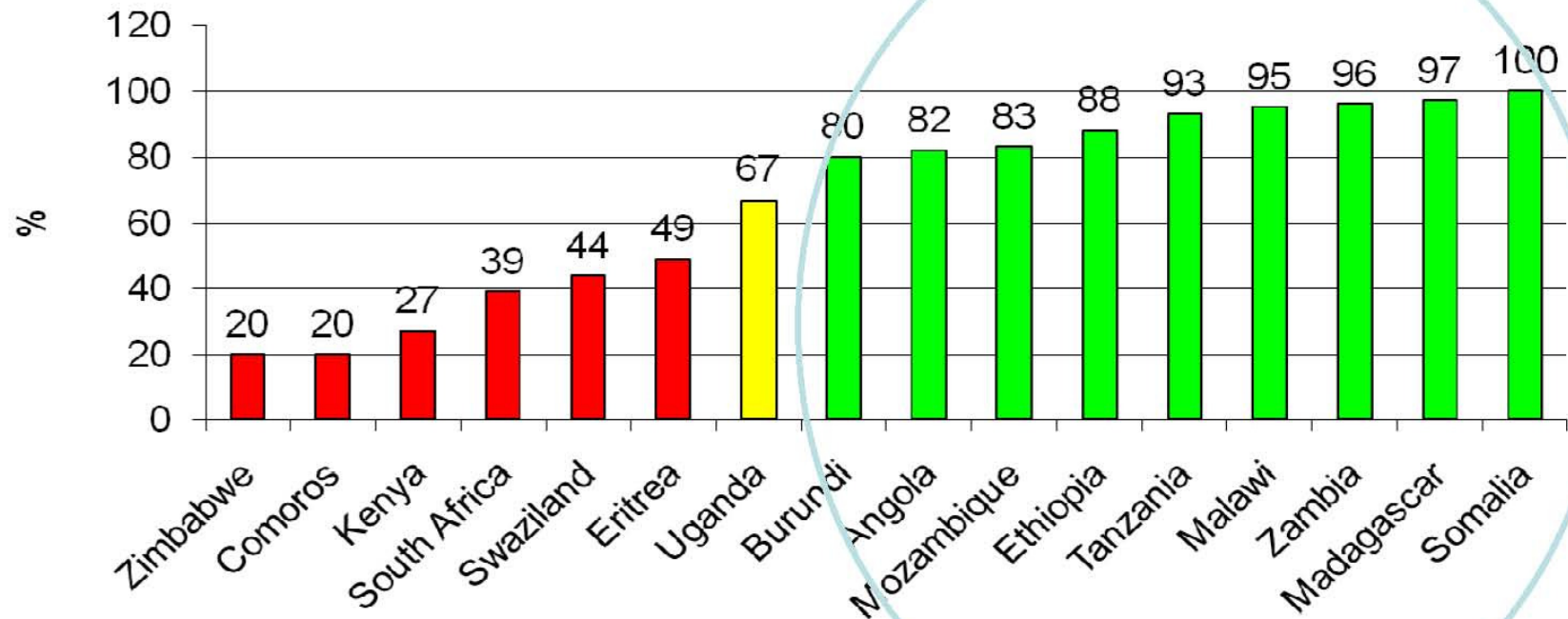
- Supplementation
  - Single multiple or micronutrients
- Fortification
  - Foods for the general population (flour, oil, salt, sugar)
  - Fortification of specific foods, incl home-fortification
- Promotion of optimal feeding & diversified diets
  - Optimal breastfeeding (early BF initiation, EXBF for 6 months, continued BF for up to 2 years)
  - Micronutrient-rich foods, including animal source foods
- Public health measures
  - Infection control
  - Hygiene
  - Immunization



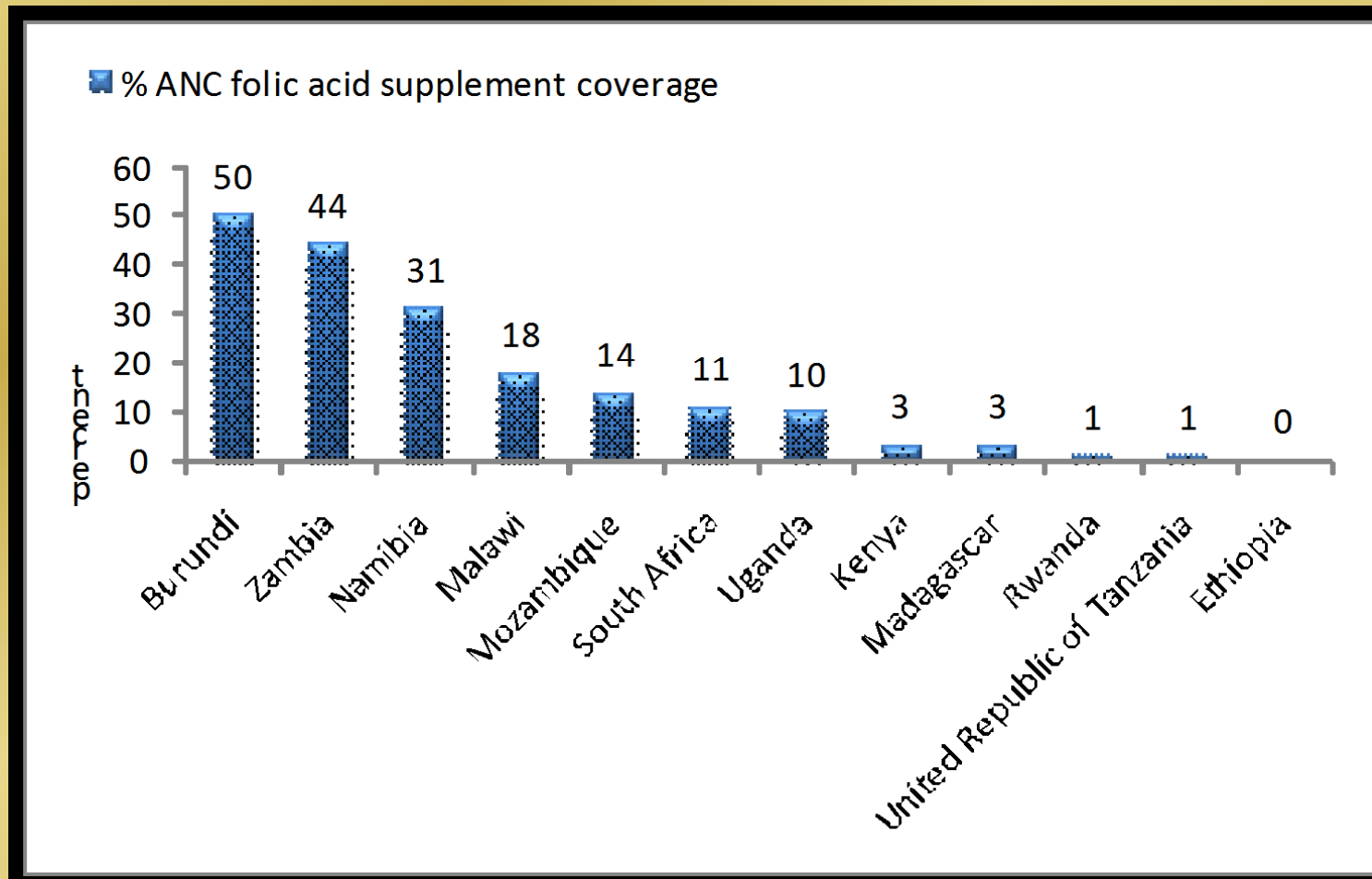
# Supplementation..success

Two Dose Vitamin A Coverage of Children 6-59 months

Source: UNICEF SOWC Special Edition, Nov. 2009



# Supplementation.. More limited success

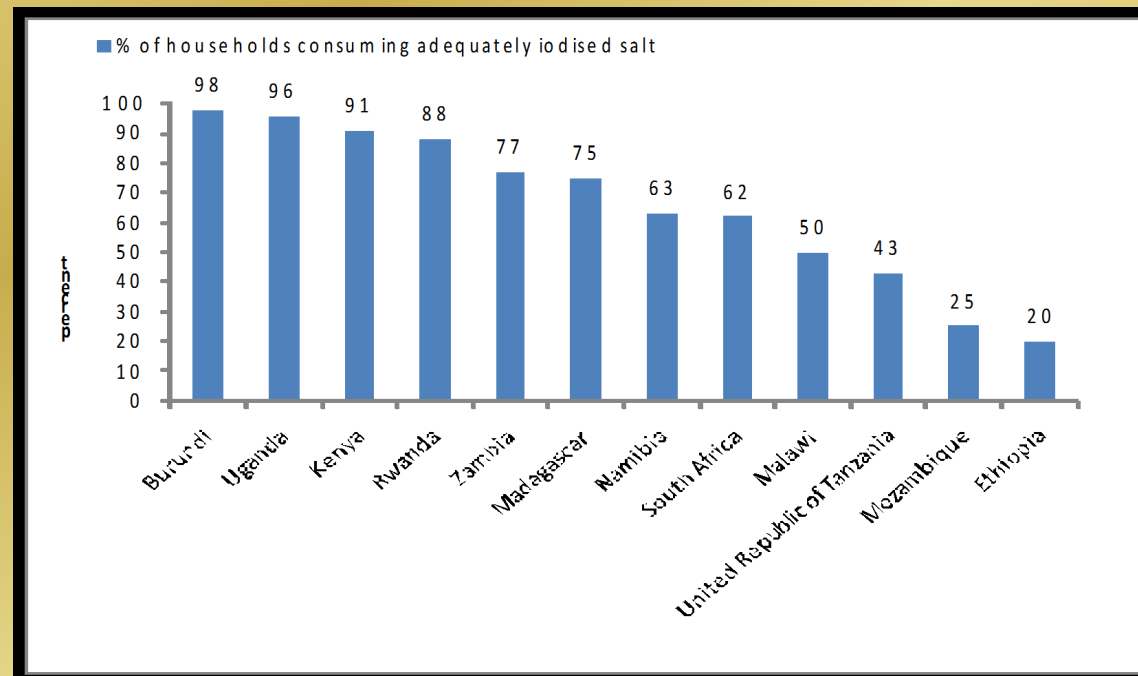


# Addressing IDA..

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- Anaemia in pregnant women remains a severe Public health problem- (Uganda, Tanzania, Kenya, Madagascar, Malawi, Burundi & Zambia)
- While it can be prevented and treated by iron folic acid (IFA) supplementation, access remains a concern -with only Burundi and Zambia having the highest coverage among the 12 ESA countries at 50 & 44 % respectively.
- With limited reach of IFA supplementation countries need to seriously consider alternative strategies including promotion of diversified diet and fortification.
- Countries could draw on existing experiences of mandatory large scale wheat and maize flour in partners countries and accelerate action

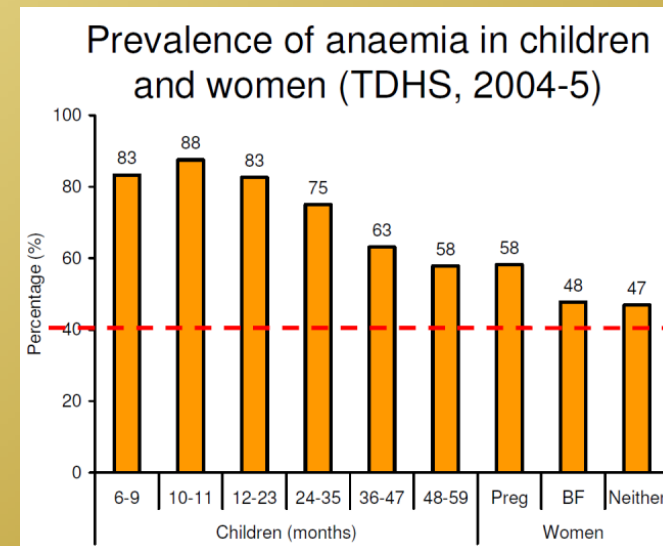
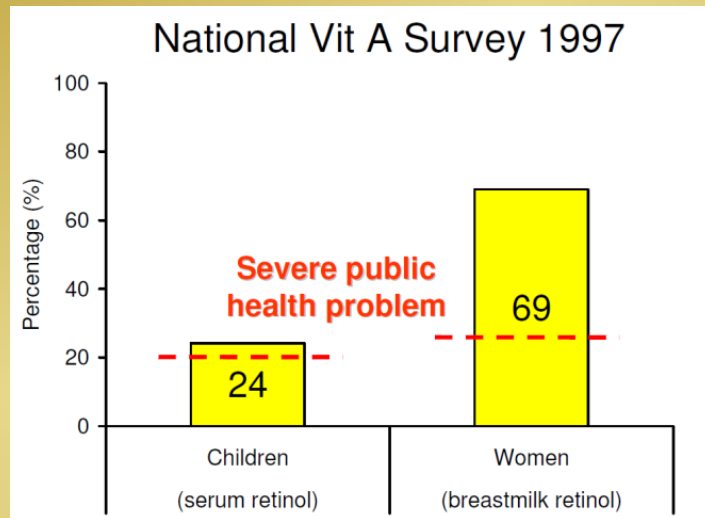
# Universal Salt Iodisation...



- ✓ Three of the 12 countries-Burundi , Kenya and Uganda have achieved the Universal Salt Iodisation
- ✓ Another 3 countries are nearing the USI goal-Rwanda, Zambia and Madagascar
- ✓ Household access to iodised salt is below 50 percent in remaining countries-Tanzania, Mozambique and Ethiopia, requiring urgent priority attention

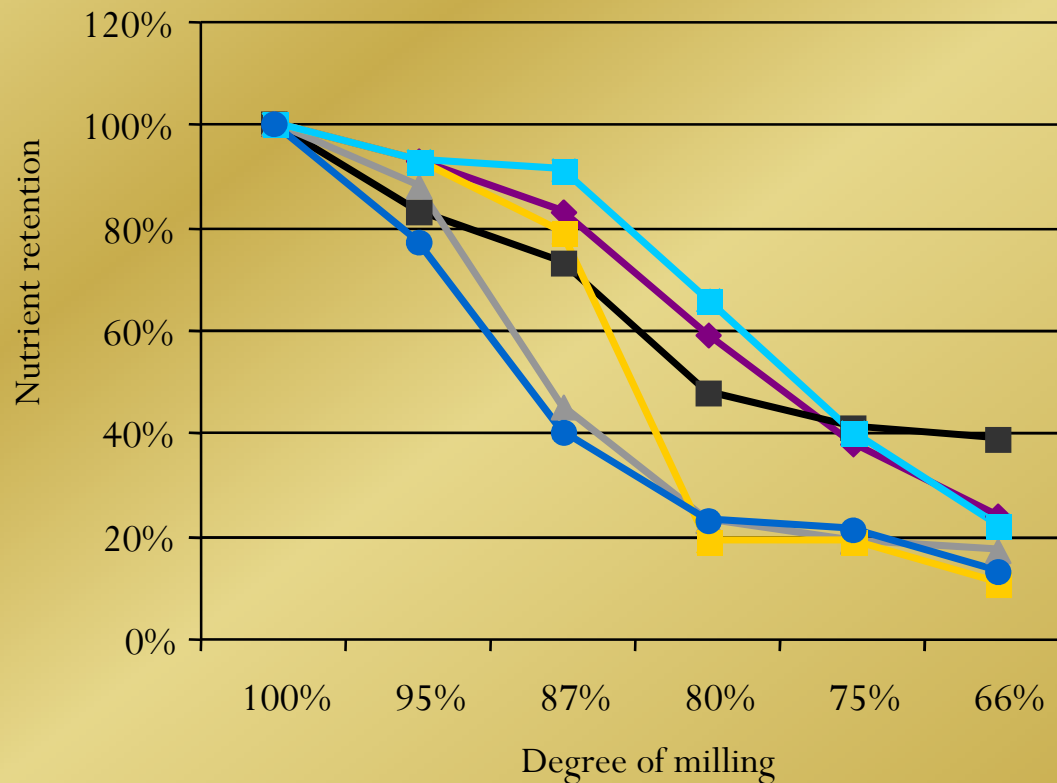
# Why do we need to fortify? - Example Tanzania

- Vitamin and mineral deficiencies are severe problems in Tanzania causing a heavy burden of disease and disability as well as exacting a heavy economic toll



# Why do we need to fortify?

## Loss of vitamins and minerals during milling of wheat



- During the processing of grains and oil, essential vitamins and minerals are lost, making these foods less nutritious after processing
- Fortification replaces nutrients lost during the processing of foods and can add other vitamins and minerals and can that way also be used to address micronutrient deficiencies



# Conclusion

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- ✓ In most of the regions, diets are deficient in vitamin A, iron , zinc and Iodine- These deficiencies are of Public health concern
- ✓ Everyday bulky foods do not offer the density of essential nutrients that people need, particularly during periods of high physiological needs and acute vulnerability
- ✓ Large scale micronutrient malnutrition and its consequences call for immediate and large-scale action
- ✓ Fortifying major food vehicles -wheat or maize flour, sugar and oil is highly most cost-effective strategy to address micronutrient malnutrition

# Thank you!

UNICEF, WB/Tanzania

