

# Malnutrition

## Can Tanzania afford to ignore 43,000 dead children and Tshs 700 billion in lost income every year?

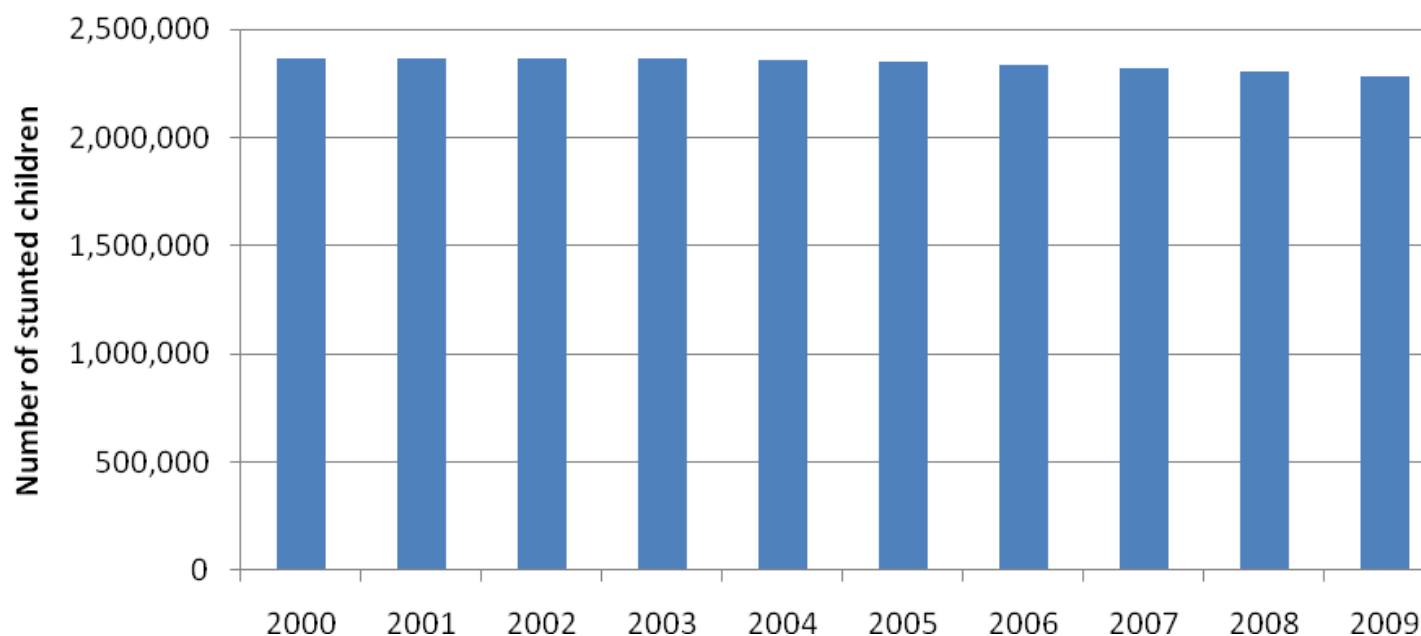


Hans Hoogeveen  
18 March 2010



# Malnutrition is a major concern

**Number of stunted children in 2000 to 2009**



Source: Uwazi et al. 2010.



# Tanzania is 3<sup>rd</sup> worst affected country in Africa

## Sub-Sahara's ranking in contribution to world's stunted children

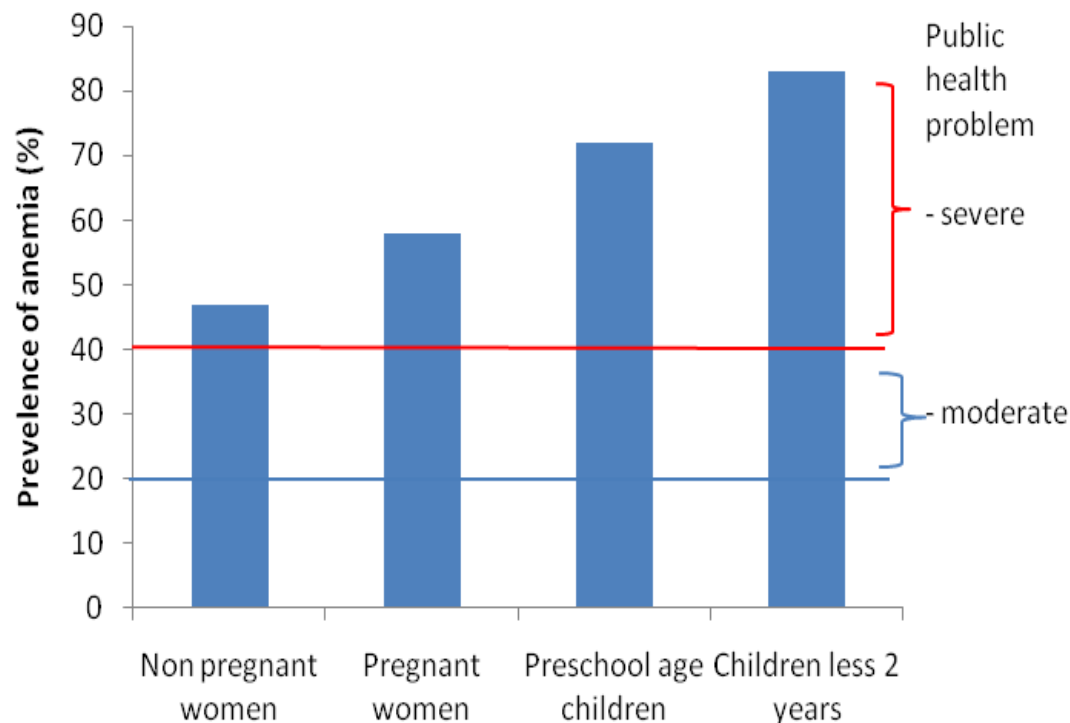
Country	Global rank
Ethiopia	7
Democratic Republic of Congo	8
<b>Tanzania</b>	<b>10</b>
Egypt	12
Uganda	14
Sudan	15
Kenya	16
Mozambique	20
Madagascar	21
Niger	23
South Africa	24

Source: Uwazi et al. 2010



# Anemia is also a major concern

## Prevalence of anemia in Tanzania in 2004/5

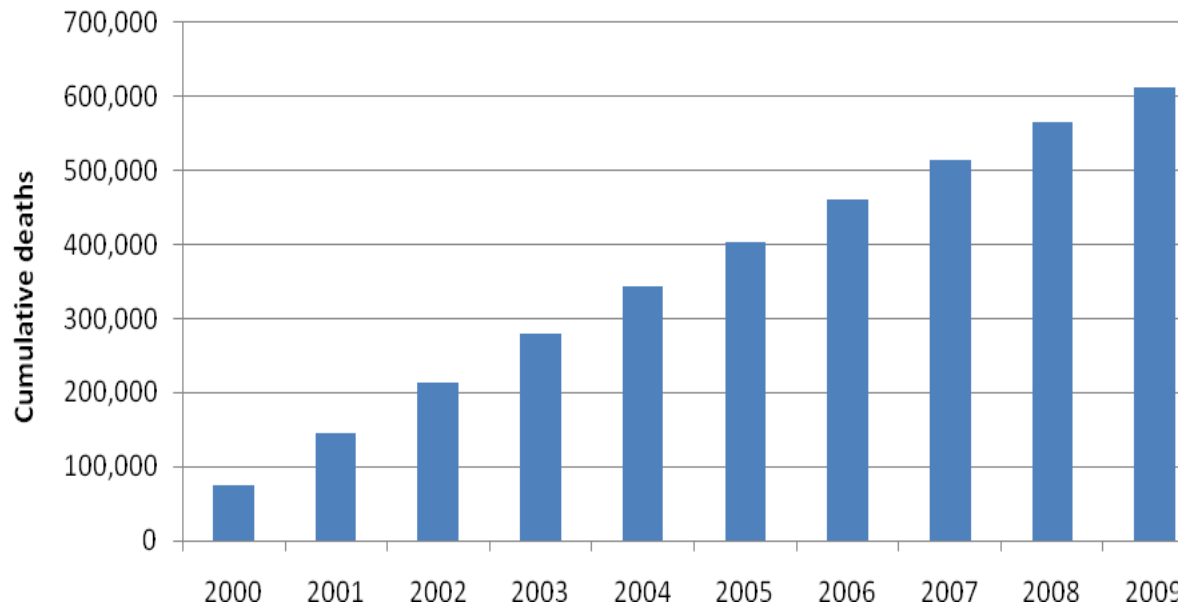


Source: Uwazi et al. 2010.



# Malnutrition causes many deaths

## Cumulative number of children who have died as a result of malnutrition in Tanzania since 2000



43,000 children are expected to die of malnutrition this year. That is two busses crashing every day.

Source: Uwazi et al. 2010.





# Malnutrition causes huge economic losses

## Estimated Losses due to selected micronutrient deficiencies

	Estimated Economic Losses ('000 Tshs)	Percent of Total
Perinatal	158,200,913	22%
Children	230,062,042	33%
Adults -- Productivity loss	227,290,570	32%
Adults -- Maternal mortality	6,240,859	1%
<b>Total iron deficiency</b>	<b>621,794,384</b>	<b>88%</b>
Deaths	28,010,952	4.00%
Survivor Lost Productivity	9,005,335	1.30%
Care & Welfare	1,639,208	0.20%
<b>Total folic acid deficiency</b>	<b>38,655,495</b>	<b>5.50%</b>
<b>Vitamin A deficiency</b>	<b>43,947,051</b>	<b>6%</b>
<b>Total</b>	<b>704,396,930</b>	<b>100%</b>

2.6% of GDP is lost due to micronutrient deficiencies





# What can be done?

## Top 10 of interventions with the highest cost-benefit ratios

Solution	Challenge
<b>1</b> <i>Micronutrient supplements for children (vitamin A and zinc)</i>	<b>Malnutrition</b>
2 The Doha development agenda	Trade
<b>3</b> <i>Micronutrient fortification (iron and salt iodization)</i>	<b>Malnutrition</b>
4 Expanded immunization coverage for children	Diseases
<b>5</b> <i>Biofortification</i>	<b>Malnutrition</b>
<b>6</b> <i>Deworming and other nutrition programs at school</i>	<b>Malnutrition / Education</b>
7 Lowering the price of schooling	Education
8 Increase and improve girls' schooling	Women
<b>9</b> <i>Community-based nutrition promotion</i>	<b>Malnutrition</b>
10 Provide support for women's reproductive role	Women

Source: Copenhagen Consensus 2008. Available at [www.copenhagenconsensus.org](http://www.copenhagenconsensus.org)




# Fortification is attractive!

## Costs and benefits of food fortification in Tanzania

	`000 Tshs
Benefits: avoided losses	172,448,000
Costs to Government	5,127,200
Costs to Private sector	13,600,000
<b><i>Net benefits</i></b>	<b><i>153,720,800</i></b>

Source: NFFA 2009.



Every Tshs 1,000  
invested in fortification  
yields a return of Tsh  
8,000





# But it is not a practice in Tanzania

## Food fortification in East Africa

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### *Tanzania*

Kenya

Uganda

Zambia

Malawi

### *Salt*

Salt, cooking oil, maize flour, wheat flour

Cooking oil, maize flour and wheat flour

Sugar and plans underway for maize flour

Oil, maize flour and trials with sugar

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Source: World Bank et al. 2007



# Promoting breastfeeding is also a good option

## Number of months of exclusive breastfeeding

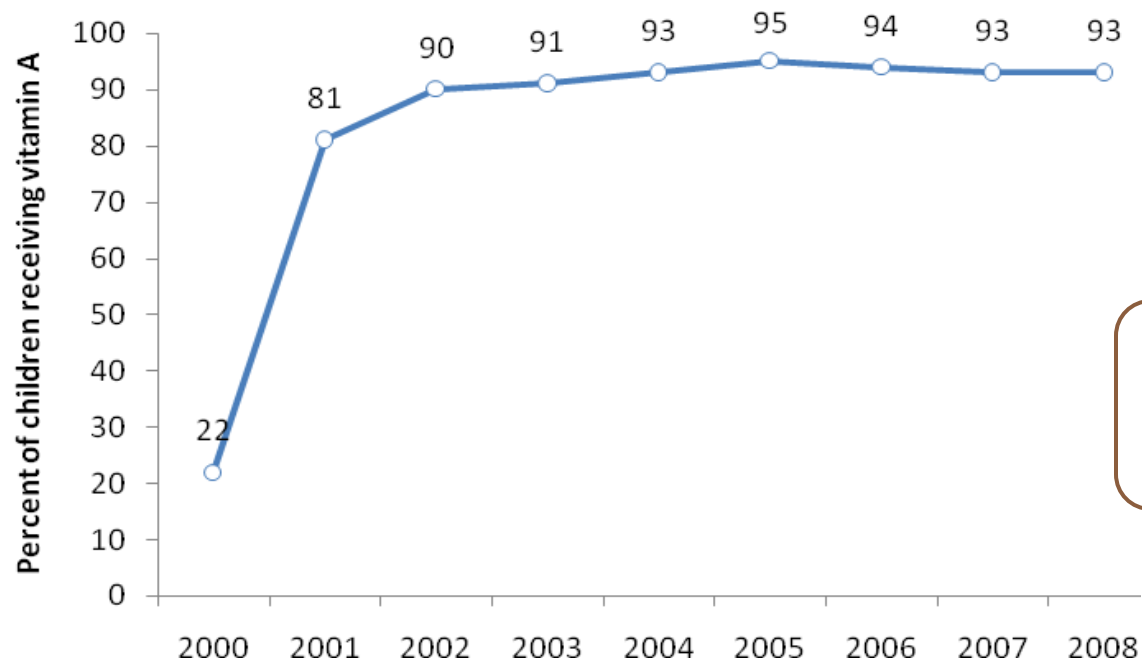
	Year of Survey	Median number of months of exclusive breastfeeding
Kenya	2003	0.5
<b>Tanzania</b>	<b>2004/5</b>	<b>1.8</b>
Eritrea	2002	2.5
Zambia	2007	3.1
Uganda	2006	3.2
Madagascar	2003/4	3.6
Rwanda	2005	5.7

Source: DHS, various years and countries.



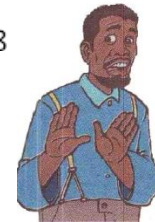
# With commitment from the nutrition authorities much can be done

## Percent of children aged 6-59 months receiving vitamin A



No major new nutrition initiatives were taken after the introduction of vitamin A

Source: UNICEF 2009





# Focus on implementing solutions seems to have been lost in research...

**2009:** Assey V; Peterson S; Kimboka S; Ngemera D; Mgoba C; Ruhiye D; Ndossi G; Greiner T; Tylleskär T **Tanzania national survey on iodine deficiency: impact after twelve years of salt iodation.** BMC public health 2009;9():319.

**2007:** Assey V; Mgoba C; Mlingi N; Sanga A; Ndossi G; Greiner T; Peterson S **Remaining challenges in Tanzania's efforts to eliminate iodine deficiency.** Public health nutrition 2007;10(10):1032-8.

**2007:** Tatala S; Ndossi G; Ash D; Mamiro P **Effect of germination of finger millet on nutritional value of foods and effect of food supplement on nutrition and anaemia status in Tanzanian children.** Tanzania health research bulletin 2007;9(2):77-86.

**2007:** Kass NE; Hyder A; Ajuwon A; Appiah-P; Barsdorf N; Elsayed Dy; Mokhachane M; Mupenda B; Ndebele P; Ndossi G; Sikateyo B; Tangwa G; Tindana P **The structure and function of research ethics committees in Africa: a case study.** PLoS medicine 2007;4(1)

**2006:** Masanja H; Schellenberg J; Mshinda HM; Shekar M; Mugyabuso JK L; Ndossi GD; de Savigny D **Vitamin A supplementation in Tanzania: the impact of a change in programmatic delivery strategy on coverage.** BMC health services research 2006;6():142.

**2003:** Latham M; Ash D; Makola D; Tatala S; Ndossi G; Mehansho H **Efficacy trials of a micronutrient dietary supplement in schoolchildren and pregnant women in Tanzania.** Food and nutrition bulletin 2003;24(4 Suppl):S120-8.

**2003:** Makola D; Ash D; Tatala S; Latham M; Ndossi G; Mehansho H **A micronutrient-fortified beverage prevents iron deficiency, reduces anemia and improves the hemoglobin concentration of pregnant Tanzanian women.** The Journal of nutrition 2003;133(5):1339-46.

**2003:** Ash D; Tatala S; Frongillo E; Ndossi G; Latham M **Randomized efficacy trial of a micronutrient-fortified beverage in primary school children in Tanzania.** The American journal of clinical nutrition 2003;77(4):891-8.

**2002:** Villamor E; Mbise R; Spiegelman D; Hertzmark E; Fataki M; Peterson K; Ndossi G; Fawzi W **Vitamin A supplements ameliorate the adverse effect of HIV-1, malaria, and diarrheal infections on child growth.** Pediatrics 2002;109(1):E6.

**2001:** Lietz G; Henry C J; Mulokozi G; Mugyabuso J K; Ballart A; Ndossi G D; Lorri W; Tomkins **A Comparison of the effects of supplemental red palm oil and sunflower oil on maternal vitamin A status.** The American journal of clinical nutrition 2001;74(4):501-9.

**2001:** Latham M C; Ash D; Ndossi G; Mehansho H; Tatala S **Micronutrient dietary supplements--a new fourth approach.** Archivos latinoamericanos de nutrición 2001;51(1 Suppl 1):37-41.

**2000:** Fawzi W W; Mbise R; Spiegelman D; Fataki M; Hertzmark E; Ndossi G **Vitamin A supplements and diarrheal and respiratory tract infections among children in Dar es Salaam, Tanzania.** The Journal of pediatrics 2000;137(5):660-7.

**2000:** Villamor E; Mbise R; Spiegelman D; Ndossi G; Fawzi W W **Vitamin A supplementation and other predictors of anemia among children from Dar Es Salaam, Tanzania.** The American journal of tropical medicine and hygiene 2000;62(5):590-7.



# ...and in meetings

**November 2002:** The **36<sup>th</sup> Regional Health Ministers conference** (Uganda): Tanzania agrees on “Enhanced Implementation and Coordination of Food Fortification Interventions both at the Regional and National Levels”

**March 2003:** The National Food Fortification Alliance (NFFA) is established

**March 2004:** **1<sup>st</sup> Regional Food Fortification Workshop** (Zambia) to set “Regional Approaches for Joint Food Fortification Activities in ECSA”

**July 2004:** Tanzanian delegates participate in the **2nd Regional Food Fortification Workshop** (South Africa) in “Preparing for Optimal Implementation and Use of Food Fortification for the Reduction of Micronutrient Malnutrition”

**November 2004:** **40<sup>th</sup> Regional Health Ministers’ Conference** (Zimbabwe): Tanzania adopts food fortification as a strategy to Prevent and Control Vitamin and Mineral Deficiencies

**May 2005:** TBS and TFNC participate in the **ECSA training workshop for laboratory personnel** (South Africa)

**August, 2005:** Tanzanian delegates participate in the **3<sup>rd</sup> Regional Food Fortification Workshop** (Uganda) on “Creating Good Partnerships to Accelerate Progress”

**March 2007:** **ECSA workshop** “Harmonization of Regional Regulations and Standards of Fortified Foods” (Arusha) to develop regional guidelines and standards for a safe and efficacious fortification program.

**March 2007:** **ECSA workshop** “Strengthening Quality Control and Inspection of Fortified Foods” (Arusha) to discuss ways of strengthening quality control throughout the production and distribution chain of fortified foods.

**February 2008:** The **46<sup>th</sup> Regional Health Ministers’ Conference** (Seychelles): Tanzania agrees to immediately adopt and support implementation of ECSA food fortification guidelines by end of 2009, and increase financial resources by at least 20% within the next two years for nutrition with a focus on micronutrients interventions

**March, 2008:** **2<sup>nd</sup> ECSA Laboratory Proficiency Testing Review Meeting** (Malawi) to introduce the Manual of Laboratory Methods for fortified foods

**October, 2008:** **3<sup>rd</sup> ECSA Laboratory Proficiency Testing Review Meeting** (Kenya) to receive updates on analytical assays in support of food fortification programs.

**November, 2008:** **1<sup>st</sup> African Flour Fortification Initiative** (Arusha): MoHSW, TFNC, TBS, TFDA and MoITM commit themselves personally and institutionally to accelerate action towards successful flour fortification.

**February, 2009:** **SAFO Workshop:** “Towards a Sustainable Cost-Effective Food Fortification Partnership for Tanzania” - mutual understanding about stakeholders capacities, engagement opportunities, public-private partnership set-up and implementation.

**February, 2009:** **SAFO Expert Workshop:** “Standard Setting in Food Fortification in Tanzania” - current strengths in Tanzanian efforts towards standard setting for food fortification, international experiences in standard setting for food fortification, and discussion of concrete and specific issues around selected standards.

**February-April, 2009:** Two consultants begin drafting the **Fortification Action Plan** together with stakeholders.

**March 2009:** **48<sup>th</sup> Regional Health Ministers’ Conference** (Swaziland): Tanzania agrees to implement key high impact health and nutrition interventions such as food fortification.

**May, 2009:** **Technical Stakeholders Review:** discusses the draft Action Plan and decides on an appropriate programme management structure, approach and schedule for the implementation of the Action Plan.

**September, 2009:** **High Level Forum on Food Fortification:** Participants agree to adopt the Food Fortification Action Plan, promise to take ownership and assume responsibility for the implementation of the Plan

**September, 2009:** **4<sup>th</sup> Regional Food Fortification Workshop** “Consolidating Roles of the Public Sector to Enhance Private Sector Involvement in Food Fortification” (Kenya): countries share experiences and lessons learnt in start up and implementation of national fortification programmes and identify best practices 2000;62(5):590-7.



# Focus on solutions: reduce malnutrition by ...

- Introducing fortified foods
  - Large scale millers are ready
  - Main obstacle is setting a standard
- Promoting exclusive breast feeding

Achieving these objectives requires leadership from the nutrition authorities:

- TFNC
- Ministry of Health
- TFDA
- TBS

