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

1. Malnutrition is a major problem in Tanzania

Malnutrition is one of the greater challenges facing Tanzania. Over the past decade over 600,000 children aged below 5 years are estimated to have died as a result of inadequate nutrition. In 2010 alone, another 43,000 children will die prematurely because they are malnourished. That averages to one child dying every 12 minutes.

Malnutrition causes death, but rarely because children starve. Children die because their diets are lacking in basic nutrients needed to build strong immune systems and to stay healthy. When malnourished children fall sick with diarrhea, malaria or pneumonia they are more likely to die. Had these children been adequately nourished, their deaths could have been prevented.

The death toll attributable to malnutrition since 2000 is comparable with that of the Rwandan genocide and that of a combined Asian Tsunami and Haiti earthquake, events that shocked the world. But whereas the genocide, Tsunami and earthquake mobilized people into unprecedented action, malnutrition remains ignored and is allowed to continue to take its devastating toll.

Malnutrition hurts the economy. Farmers and other laborers, often women, are weakened by stunting, inadequate energy intake and anemia. Because of this they are unable to exert much effort, leading to smaller harvests and reduced labor productivity. Malnutrition also contributes to lost opportunities for economic growth as adults with stunted brain development caused by inadequate nutrition during childhood are less able to innovate and respond to new market opportunities.

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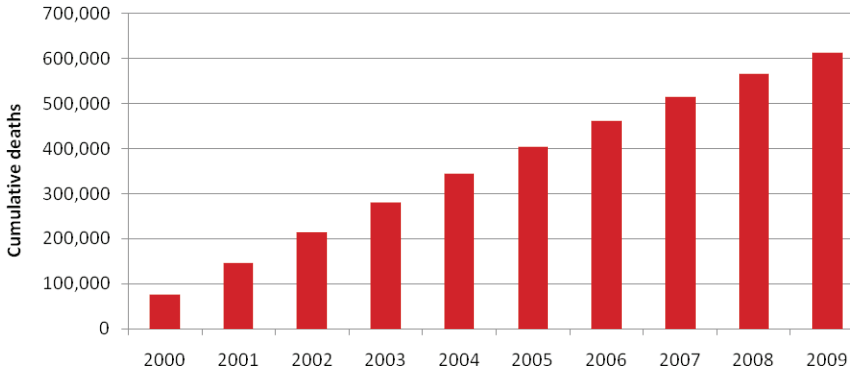
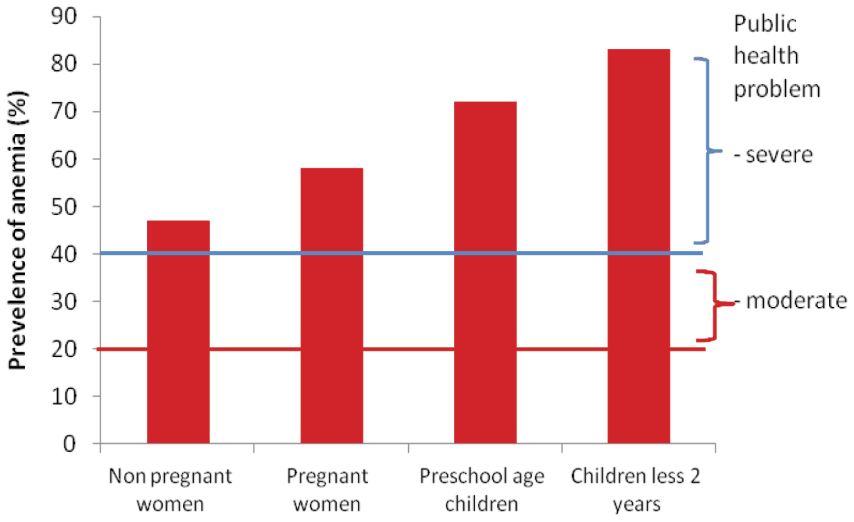
Figure 1: Cumulative number of children who have died as a result of malnutrition in Tanzania since 2000



Source: Authors' calculations based on DHS 1999 and 2004/5 as well as NBS (2006) population projections.

Malnutrition leads to waste in public expenditure, too. In the health sector resources are unnecessarily spent on treating diseases that could have been avoided with adequate nutrition. And Tanzania's huge investments in primary and secondary education yield less because children are not getting the basic nutrition they need during the critical first two years of life to enable healthy brain development. [1,2]

Figure 2: Prevalence of anemia in Tanzania in 2004/5



Source: TDHS 2004/5.

[1] According to the 2008 Lancet Series on nutrition height at the age of two is the strongest predictor of future human capital (Victoria et al. 2008).

[2] Children who are malnourished as babies and toddlers have problems learning when they reach elementary school because micronutrient deficiencies have affected their ability to learn. Iodine deficiency alone can lead to a loss of 13.5 IQ points on average (World Bank 2007).

Change is possible, however. In 2008 some of the world's top economic experts considered the question "What are the best ways to advance global welfare, and particularly the welfare of developing countries". The experts presented a list of 30 realistic proposals ordered predominantly by considerations of economic costs and benefits. Addressing malnutrition ranked highest and occupied five of the top ten recommendations (Table 1).

Table 1: Top 10 of interventions with the highest cost-benefit ratios

	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

Source: Copenhagen Consensus 2008. Available at www.copenhagenconsensus.org

This note argues that nutrition needs to be improved, as an expression of humanity, for economic growth, health, education and well-being in general. It demonstrates that better nutrition is achievable if two simple and affordable remedial actions are implemented: food fortification and exclusive breastfeeding.

2. Seven facts about nutrition in Tanzania

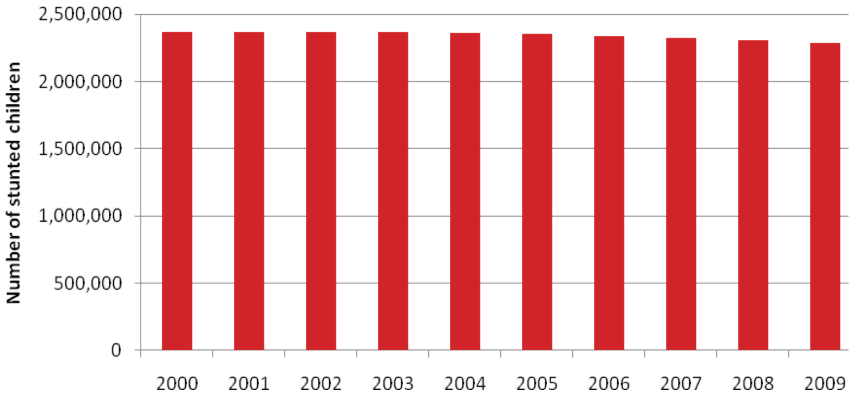
Fact 1: No progress in reducing chronic malnutrition

When children are too short for their age they are said to be stunted. Stunting is an expression of chronic malnutrition. In 2004/5 almost 2.4 million children were stunted (IHI 2009).

Over the last decade very limited progress has been made in reducing the number of children that are stunted (Figure 3). There has been a drop in the percentage of stunted children between 1999 and 2004/5[3] but population growth has offset most of the progress recorded by percentages.

[3] This progress it is believed to be largely due to a reduction in the prevalence of malaria and not a result of nutrition interventions.

Figure 3: Number of stunted children in 2000 to 2009



Source: Authors calculations based on TDHS 2004/5 and NBS (2006) population projections

Fact 2: Micronutrient deficiencies alone cost Tanzania Tshs 700 billion per year

People need micronutrients to stay healthy. Out of every 1,000 births, 3.1 children are born with Neural Tube Defects because of a lack of folic acid (NFFA 2009). And 4.2 million children and 4.3 of women are iron deficient (IHI 2009).

This high prevalence of micronutrient deficiencies causes much human suffering and large economic losses. The National Food Fortification Alliance (NFFA) has made a very careful assessment of the magnitude of these losses. It puts the costs of micronutrient deficiencies at more than Tshs 700 billion per annum or approximately 2.6 percent of GDP.[4]

Table 2. Estimated Losses due to selected micronutrient efficiencies

	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%
Total iron deficiency	**621,794,384**	**88%**
Deaths	28,010,952	4.0%
Survivor Lost Productivity	9,005,335	1.3%
Care & Welfare	1,639,208	0.2%
Total folic acid deficiency	**38,655,495**	**5.5%**
Vitamin A deficiency	**43,947,051**	**6%**
Total	**704,396,930**	**100%**

Source: NFFA 2009.

[4] The costs are based on the net present value of the reduced value added to the economy, assuming a working life of 37 years (starting at age 15 and continuing until age 52; the current life expectancy), and a 5% discount rate. The costs are adjusted for the current participation rate in the workforce of 89.6% (including agriculture).

Fact 3: Tanzania is 3rd worst affected country in Africa

With respect to malnutrition Tanzania belongs to the 10 worst affected countries across the globe and ranks 10th place in its contribution to all chronically undernourished children in the world. Within Africa, Tanzania is the third worst affected country; only Ethiopia and the Democratic Republic of Congo do worse.

Table 3: Sub-Sahara's ranking in contribution to world's stunted children

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

Source: UNICEF 2009: Tracking Progress on Child and Maternal Nutrition

Fact 4: Tanzania is the only East African country that only fortifies salt

Inadequate iodine intake is the most common cause of preventable mental retardation and brain damage. The condition can cheaply be addressed by iodating salt. Indeed, after the introduction of the Salt Production and Iodation Regulation Act in 1994, the use of iodated salt increased in Tanzania and according to latest available data 73% of households consume it (DHS 2004/5). As a result the prevalence of goiter, a sign of advanced iodine deficiency, decreased from 25% in 1980s to 7% in 2003/4, though in some regions it is still as high as 20% (World Bank et al. 2007).

Iodating salt is one type of food fortification but apart from iodating salt, food fortification does not take place in Tanzania. With this limited adoption of food fortification, Tanzania is alone in the region. Other countries in East Africa have been much more active (Table 4).

Table 4: Food fortification in East Africa

Tanzania	Salt
Kenya	Salt, cooking oil, maize flour, wheat flour
Uganda	Cooking oil, maize flour and wheat flour
Zambia	Sugar and plans underway for maize flour
Malawi	Oil, maize flour and trials with sugar

Source: World Bank et al. 2007

Fact 5: Tanzania performs poorly on exclusive breast feeding

Breastfeeding can avert one out of eight child deaths if practiced at scale, more than any other preventative health intervention (Bhutta et al. 2008). The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life. [5]

In Tanzania many mothers do not have the knowledge or support to follow the advice of the WHO. The number of months during which children are exclusively breastfed stood at 1.8 in 2004/5, admittedly an improvement over 0.6 month registered in 1991, but a dismal performance relative to other countries in East Africa. Only Kenya does worse (Table 5). With only 13.5% of infants exclusively breastfed at 4-5 months of age, the majority children are exposed to the threat of malnutrition from a very early age.

Table 5: Number of months of exclusive breastfeeding

	Year of Survey	Median number of months of exclusive breastfeeding
Kenya	2003	0.5
Tanzania	**2004/5**	**1.8**
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.

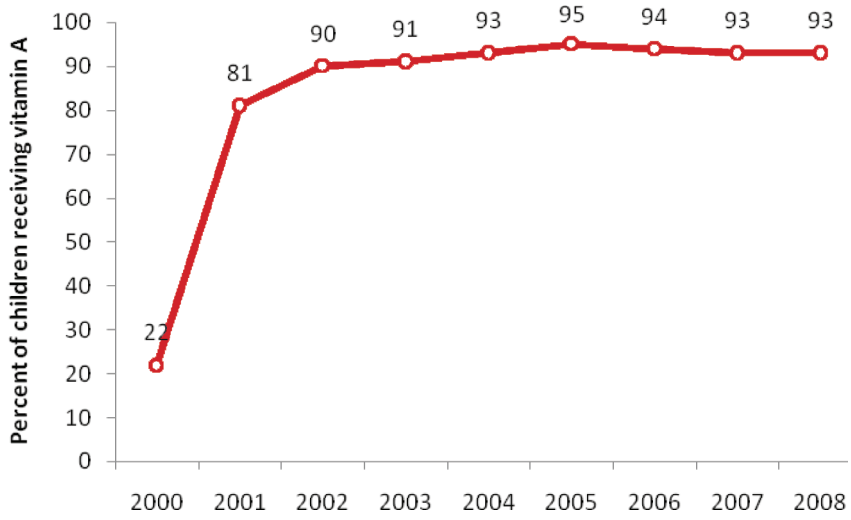
Fact 6: No new large scale nutrition initiatives for a decade

Lack of vitamin A compromises the immune system and increases a child's susceptibility to infectious diseases and was a major cause of child deaths in Tanzania's recent past. Severe vitamin A deficiency can cause eye damage and is a leading cause of childhood blindness. Starting in 2000, twice yearly campaigns to provide vitamin A supplements and deworming tablets[6] to all children aged 6 months to five years has had a significant impact on improving children's immunity and survival (Figure 4). It is believed that this program is one of the reasons behind the drop in child mortality rates from 156 in 1995-99 to 112 in 2000-04 (Masanja et al. 2008).

[5] Avoiding the introduction of other foods and drinks is recommended during the first six months because these foods are often nutritionally inferior to breast milk and may be contaminated with germs. From the age of six months, babies need a variety of additional foods. However, breastfeeding should continue until the child is at least two years old.

[6] Deworming tables are only given to children aged 12-59 months.

Figure 4: Percent of children aged 6-59 months receiving vitamin A



Source: UNICEF 2009

While this success should be celebrated, it is critical to note that since 2000 and despite the success of vitamin A supplementation, no new nutrition initiatives appear to have been taken to scale by those responsible for nutrition. Food fortification and scaling up of exclusive breastfeeding are two major missed opportunities.

Fact 7: Reducing malnutrition is possible and cost effective

Food fortification is affordable and provides a low cost and effective way to reduce malnutrition. Because it immediately improves labor productivity and reduces the burden of disease, it yields a high return. Estimates by the National Food Fortification Alliance suggest that every shilling invested in food fortification will yield a return of eight shillings (NFFA 2009).

Few individuals would forego an opportunity to invest 1,000 Shillings to earn 8,000 Shillings, yet Tanzania appears to be foregoing it. The Alliance has determined that food fortification would reduce the prevalence of anemia amongst children and women of childbearing age by 20% to 30%. It would also reduce the prevalence of Neural Tube Defects by 30% and reduce vitamin A deficiency by 30%.

The introduction of food fortification requires an investment of Tshs 19 billion of which the bulk would be borne by the private sector (Tshs 14 billion) which in turn, would pass it on to the consumer. It is estimated that eating a daily serving of fortified maize, wheat and oil would cost a consumer Tshs 85 per month, a cost that would barely be felt. In return labor productivity would go up, susceptibility to diseases would go down and 6,767 lives would be saved (NFFA 2009).

In addition to consuming fortified foods, exclusive breastfeeding for a period of 6 months is an affordable activity that could be embraced by citizens. Doing so will require the commitment of mothers, as well as the support of their family and of health service

providers. Evidence from Rwanda shows that it is possible for mothers to exclusively breastfed their children for close to six months, and evidence from Ghana and Zambia demonstrates that with the right approach exclusive breastfeeding can be adopted widely. In Ghana exclusive breastfeeding increased from 7 percent on 1993 to 63 percent in 2008. In Zambia it increased from 19 percent in 1996 to 61 percent in 2008 (UNICEF 2009).

Table 6: Costs and benefits of food fortification

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

Source: NFFA 2009.

3. Relevant authorities need to do their job

The facts above illustrate the seriousness of malnutrition. They also show that there is much that can be done to reduce it. By exclusively breastfeeding babies for six months and consuming fortified foods citizens can significantly reduce malnutrition. Yet without proper information about the merits of breastfeeding and without fortified foods being available in shops, people cannot be expected to take up such beneficial actions. To make this happen, leadership is required.

Nationally, the Tanzania Food and Nutrition Centre (TFNC) is charged to lead on nutrition. Its primary responsibility is to improve nutrition and its mandate includes policy formulation, planning and initiation of nutrition programs, advocacy, capacity development, harmonization, coordination, research, and monitoring and evaluation of nutrition services in the country.

TFNC is well equipped to exert leadership in the fight against malnutrition. It employs 200 odd staff (Leach 2007) of whom an impressive number hold PhDs and MScs. It is also allocated 12% of the health basket fund budget of the Ministry of Health and Social Welfare[7]. With such resources and such a pool of talented people it is reasonable to expect real leadership and progress in reducing malnutrition.

It is therefore puzzling to see that reducing malnutrition has remained elusive over the last decade. It raises questions about the effectiveness of TFNC as well as about its priorities. The institution appears to spend much time on research (box 1) and consultancies, training and meetings (box 2), but whether these translate into changes in children's nutritional status and wellbeing is uncertain.

[7] Data refers to 2008/9 budget.

Questions may also be raised about TFNC's priorities. For example, the Centre reportedly requested Tshs 8 billion to upgrade laboratory facilities from the health basket support in 2009-10,[8] while no money was asked for food fortification, micro-nutrient supplementation or breastfeeding promotion[9].

Box 1: A decade of research did not bring tangible progress

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.

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Source: Biomedexperts.com

TFNC is not solely responsible for reducing malnutrition. The Ministry of Health and Social Welfare (MoHSW), to whom TFNC reports, is responsible for providing adequate oversight and to ensure value for money for the resources availed to TFNC.

The reality today is that despite the clear evidence and recommendations of international meetings and publications, promising interventions like food fortification

8 Another example illustrating this point is that of a training package on infant feeding developed in Tanzania by URC. It was rolled out nationwide in Kenya, but has yet to be officially endorsed in Tanzania.

9 This while various evaluations concluded that research should better be left to other agencies in Tanzania such as the Bureau of Standards or the Food Science and Technology Department at Sokoine University (World Bank et al. 2007).

have not materialized. The first step to rectify this is to set fortification standards. But unless TFNC and the Ministry push hard, the Tanzania Bureau of Standards appears unlikely to set them any time soon, allowing malnutrition to continue to exert its toll unabated. This situation is particularly agonizing as many in the food industry have indicated their readiness to implement fortification, once standards have been set (NFFA 2009:27).

Box 2: Nearly 10 years of meetings and no real progress in food fortification

November 2002: The **36th 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: Tanzanian delegates participate in the **1st 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: **40th 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 **3rd 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 **46th 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: 2nd ECSA Laboratory Proficiency Testing Review Meeting (Malawi) to introduce the Manual of Laboratory Methods for fortified foods

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

November, 2008: 1st 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: **48th 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: 4th 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

Source: Development Partner Nutrition Group, personal communication.

4. Conclusion

Tanzania cannot allow another 43,000 children to die in 2010 from malnutrition, and cannot afford to ignore the economic costs of inadequate nutrition or to forego opportunities to improve learning and to reduce the burden of disease. The time to act is now.

Two simple actions should be implemented as a priority:

a. Introduce fortified foods

By adding vitamin A to cooking oil and other micronutrients to flour, malnutrition can be effectively reduced. For this to happen, the Tanzania Bureau of Standards needs to set fortification standards. In parallel, the Tanzania Food and Drug Authority (TFDA) and TFNC need to work with food processors to ensure adequate compliance and to inform citizens about the benefits of consuming fortified foods.

b. Promote and support exclusive breastfeeding

Exclusive breastfeeding for the first 6 months of life is extremely effective against malnutrition. Implemented at scale it can prevent one out of eight child deaths. To make this happen, parents and other influential family members need to be better informed about the benefits of exclusively breastfeeding. TFNC and MOHSW are critical in promoting this at scale. Mothers need access to support from their peers and the health care providers when they have concerns or face difficulties in breastfeeding.

These simple actions, if taken, would have a huge impact on the health and economic well-being of citizens and would help reduce child and maternal mortality. For it to happen, leadership needs to be exercised by the relevant authorities: TFNC, TFDA, the Ministry of Health and Social Welfare and the Tanzania Bureau of Standards. Together they can ensure that breastfeeding is promoted and that standards for fortification are set and complied with.

With 43,000 lives at stake and in the face of significant economic, health and education benefits, the nation cannot afford to continue to ignore nutrition.

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