

HLTH 230: Global Health: Challenges and Responses
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By submitting this essay, I attest that it is my own work, completed in accordance with University regulations.—Christina de Fontnouvelle

Nutrition in Zambia

From: Secretary of Health, Zambia

To: Minister of Finance, Zambia

Introduction:

Zambia's three most pressing nutritional problems are protein-energy malnutrition, iron deficiency, and iodine deficiency, which together contribute to nearly half of the country's population being undernourished.⁶ Although these three nutritional problems affect all segments of Zambia's population, the impact is greatest on the very poor and on children under five. The main risk factors for these nutritional problems are food insecurity, insufficient dietary diversity, and suboptimal breastfeeding. Malnutrition causes a variety of social ills as well as physical, immunological, and mental retardation, leading to lost income and productivity. Zambia should implement far-reaching community-based treatment programs for severe malnutrition, as well as micronutrient supplementation and community education programs targeting poor women.

Nature and Magnitude:

*Zambia's three most pressing nutritional problems are protein-energy malnutrition, iron deficiency, and iodine deficiency, which together contribute to nearly half of the country's population being undernourished.*⁶ As of 2014, 48.3% of Zambians are generally undernourished, a term which includes height and weight deficiencies as well as micronutrient deficiencies.⁶ The percentage of undernourished Zambians has been persistently high, ranging between 30% and 50% since 1990.⁶ All seven of Zambia's neighbors have a lower rate of general undernutrition, as do all seven African countries with GNI closest to Zambia's.^{6,22} Within this GNI peer group, Zambia's undernutrition rate is twice that of the second-highest country (Kenya with 24.3%).^{6,22}

Protein-energy malnutrition is a form of malnutrition where there is inadequate calorie or protein intake.¹⁹ Zambia loses 226.9 Disability-Adjusted Life Years (DALYs) per 100,000

inhabitants to protein-energy malnutrition.²⁵ Mauritania and Lesotho, two of Zambia's GNI peers, lose only 25.2 and 9.9 DALYs, respectively.^{23,24,25} Iron deficiency is also a significant problem, causing Zambia to lose 157.2 DALYs per 100,000 inhabitants, as opposed to 64.4 in Mauritania and 20.4 in Lesotho.^{23,24,25} Iodine deficiency is the third pressing nutritional problem. Even though the percentage of Zambians with low urinary iodine levels has been declining since universal salt iodization legislation was reinforced in 1996, 25% of the population still does not consume iodized salt on a regular basis.²² Iodine deficiency causes Zambia to lose 10.2 DALYs per 100,000 inhabitants, as opposed to 4.2 in Mauritania and 4.1 in Lesotho.^{23,24,25}

Affected Populations:

Although these three nutritional problems affect all segments of Zambia's population, the impact is greatest on the very poor and on children under five. About 70% of households in the poorest income quintile contain at least one person with protein-energy malnutrition, compared to 30% of households in the richest income quintile.¹⁸ Iron deficiency and iodine deficiency have a 75% and 37% prevalence (respectively) in households in the poorest income quintile, compared to 32% and 14% in the richest income quintile.¹⁸

The other group most affected by Zambia's nutritional challenges is children under five. Although under-fives are only 17.7% of Zambia's population, they account for 39.5% of DALYs lost to protein-energy malnutrition and 45.2% of DALYs lost to iron deficiency.^{20,25} A third of the Zambians with insufficient iodine intake are between 0 and 5 years old.¹

Unsurprisingly, the impact of nutritional challenges is greatest on under-fives who are also in poor households. Under-fives in Zambia's bottom income quintile have a 41.9% stunting rate.^{8,22} Although those in the upper quintile fare somewhat better, the stunting rate is still high at

28.9%.^{8,22} These data also reinforce the overall severity of Zambia's nutrition challenges, as both protein-energy malnutrition and micronutrient deficiencies contribute to elevated stunting rates.

Risk Factors:

The main risk factors for Zambia's three most pressing nutritional problems are food insecurity, insufficient dietary diversity, and suboptimal breastfeeding. About 45% of Zambian households are food insecure, meaning that they do not have sufficient access to calories year round.²² Food insecurity leads to a fivefold increase in the risk of developing protein-energy malnutrition and a threefold increase in the risk of having micronutrient deficiencies.¹

Insufficient dietary diversity is a key risk factor for both iron and iodine deficiency. A 2008 survey found that only 10% of Zambian households consumed at least 10 of the 12 key food groups necessary for a diverse diet.¹² Most households surveyed consumed primarily foods from the groups of grains, vegetables, and sugar, which do not commonly contain significant quantities of iron or iodine.¹²

Since malnutrition has such an outsized impact on the under-five population, we have identified suboptimal breastfeeding as the third significant risk factor. Optimal breastfeeding is key not only for providing sufficient caloric intake and dietary diversity in infants, but also for ensuring their continued health as young children.¹³ Optimal breastfeeding consists of exclusive breastfeeding for six months; only 61% of infants in Zambia are fed in this manner.²²

Health, Economic, and Social Consequences:

Malnutrition causes a variety of social ills as well as physical, immunological, and mental retardation, leading to lost income and productivity. Malnutrition in general has been linked to myriad social consequences including ADD, impaired school performance, and reduced social skills.⁵ Protein-energy malnutrition in particular impedes cognitive function and weakens

the immune system, making sufferers more vulnerable to diseases.¹⁵ Protein-energy malnutrition during pregnancy often leads to decreased birth weight; a child born with low birth weight can cost a country \$528 in infancy medical expenditures alone.²¹ Iron deficiency commonly leads to anemia, which often causes weakness, fatigue, stunted growth, and breathing difficulties.⁴ Childhood anemia alone has been associated with a 2.5% drop in adult wages.²² Iodine deficiency commonly leads to fatigue, mental slowing, and depression.¹⁶ In China, childhood iodine deficiencies have been shown to cause an average drop of 12 IQ points by adulthood.¹⁶

Because of these debilitating health consequences, overall malnutrition can cause productivity losses of up to 10% of lifetime earnings in affected individuals.¹ At the aggregate level, widespread malnutrition can reduce a country's GDP by 3%.¹ Although productivity losses as a result of temporary adult malnutrition can often be reversed, children who are under-nourished between conception and age two are likely to suffer permanent physical and cognitive impairment which will affect their economic and social productivity for the rest of their lives.⁹

Priority Action Steps:

Zambia should implement far-reaching community-based treatment programs for severe malnutrition, as well as micronutrient supplementation and community education programs targeting poor women. Zambia already has a community-based treatment program involving fortified milk and high-calorie foods.¹¹ This program costs \$53 per DALY gained.¹¹ This compares favorably with the \$500 cost-per-DALY for hospital-based treatment, which is the primary alternative to community-based programs.² Since Zambians work at a minimum wage of \$1,218 per year, every \$53 put into this program will in essence yield at least \$1,218 in the future.¹⁰ However, the current program does not adequately reach out to families in the poorest and most remote regions. Only half of parents of severely malnourished children in the lowest

income quintile participate in the existing treatment program, as opposed to 85% in the highest quintile.¹¹ Zambia needs to redouble its efforts to ensure that all sectors of its population know about and have ready access to community-based malnutrition treatment programs.

Zambia should implement supplementation programs to address its enduring iron and iodine deficiencies. Zambia has already made efforts in fortification. Since 2006, Zambia has required that all commercially-produced maize be fortified with iron, and in 1996 the country reinforced its universal salt iodization program.²² Although these efforts have benefitted much of Zambia's population, iron and iodine deficiencies are still major issues. Research has also shown that supplementation is more effective than fortification in reducing micronutrient deficiencies.^{3,17} Thus, Zambia needs to move to supplementation to make any further dent in its micronutrient problem. A 95% coverage yearlong iron supplementation program would cost \$669 per DALY averted, which is again less than the minimum earning potential of \$1,218 of a Zambian adult.^{3,10} To bring down iodine deficiencies, Zambia should implement an iodized oil injection program (IOP) in addition to maintaining its iodized salt program. In India, IOP was shown to be more cost-effective than fortifying salt, with a cost-benefit ratio of 2.00 as opposed to 1.61.¹⁴ Further, any IOP should focus on poor rural regions, which likely contain most of the 25% of Zambian households that still consume non-iodized salt.²²

Given that poor children are the most at-risk group for malnutrition, Zambia should implement community-based education programs targeting poor women. We should implement community-based programs to educate current and expecting mothers on how to breastfeed properly, how to diversify their cooking and increase calorie intake without spending more on food, and how to access severe malnutrition treatment programs and supplementation programs. Such a nutrition education program typically costs only \$2.50 per participant.⁷

The cost of implementing these three recommendations is truly insignificant compared to the tremendous potential for lasting change that we can have by improving the nutrition of the most vulnerable segments of Zambian society.

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