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Selenium deficiency in the context of Africa: Cost effective interventions

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Statement: Selenium (Se) deficiency among populations in Ethiopia is consistent with low concentrations of Se in soil and crops that could be addressed partly by Se-enriched fertilizers. This study examines the disease burden of Se deficiency in Ethiopia and evaluates the cost-effectiveness of Se agronomic biofortification. A disability-adjusted life years (DALYs) framework was used, considering goiter, anemia, and cognitive dysfunction among children and women. The potential efficiency of Se agronomic biofortification was calculated from baseline crop composition and response to Se fertilizers based on an application of 10 g ha-1 Se fertilizer under optimistic and pessimistic scenarios. The calculated cost per DALY was compared against gross domestic product (GDP; below 1-3 of national GDP) to consider as a cost-effective intervention. The existing national food basket supplies a total of 28.2 μg of Se for adults and 11.3 μg of Se for children, where the risk of inadequate dietary Se reaches 99.1%–100%. Cereals account for 61% of the dietary Se supply. Human Se deficiency contributes to 0.164 million DALYs among children and women. Hence, 52%, 43%, and 5% of the DALYs lost are attributed to anemia, goiter, and cognitive dysfunction, respectively. Application of Se fertilizers to soils could avert an estimated 21.2–67.1%, 26.6–67.5%, and 19.9–66.1% of DALYs via maize, teff, and wheat at a cost of US$129.6–226.0, US$149.6–209.1, and US$99.3–181.6, respectively. Soil Se fertilization of cereals could therefore be a cost-effective strategy to help alleviate Se deficiency in Ethiopia, with precedents in Finland.

Biography

Abdu Oumer is a passionate clinical nutritionist and researcher from Ethiopia, committed to advancing health and wellness through evidence-based nutritional science. He holds a degree in Clinical Nutrition and Dietetics and has received further training in public health nutrition and metabolic health.

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