

## Abstract

Selenium (Se) deficiency is associated with increased risk of clinical disorders. Yet, it has not been considered as an important public health issue in Africa. The health burden of this 'hidden hunger' remains largely unknown. Using a case study of central Kenya highlands, a cross-sectional survey assesses Se status of agricultural soils, foods, hair, and actual average dietary Se intake of the local population and investigates the soil-food Se concentration and Se intake-individual Se status relationships. The survey examines eight locations characterized by different agricultural soil types and assesses average dietary Se intake among 159 children and 111 women based on 24-h dietary recall data. Soil Se concentration does not explain Se concentration in foods, which instead is associated with soil's pH, organic matter, and P and Fe content. Cereal grains, beans and potato/green banana form a large portion of the local diet while intake of animal-based foods is limited. This results in Se intake of 15 and 33  $\mu\text{g p}^{-1} \text{d}^{-1}$  for children and women, respectively. On average, 87% of children and 97% of women have inadequate average daily dietary Se intake, and the hair Se concentration of 92% children and 94% women is below the reference values. Soil's characteristics contribute to variation in Se concentration in foods and consequently the dietary Se intake. A low diversified diet is a key contributing factor to inadequate dietary Se intake in the region. These findings call for the need to investigate potential intervention measure and the health burden of Se deficiency.