Estimating the global benefits of salt iodization to correct IDD

There has been tremendous progress over the past twenty-five years to control iodine deficiency disorders (IDD) through universal salt iodization (USI). In 2019, using the median urinary iodine concentration (MUIC), only 19 countries in the world are classified as iodine deficient; in contrast in 1993, using the Total Goiter Rate (TGR), 113 countries were classified as iodine deficient. However, few analyses have tried to quantify the global health and economic benefits of USI programs, and the shift from TGR to MUIC as the main indicator of IDD complicates assessment of progress.

The authors used a novel approach to estimate the impact of USI on IDD, applying a regression model derived from observational data on the relationship between the total goiter rate (TGR) and the MUIC from 24 countries. The model was used to generate hypothetical national TGR values for 2019 based on current MUIC data. TGR in 1993 and modeled TGR in 2019 were then compared for 139 countries, and using consequence modeling, the potential health and economic benefits realized between 1993 and 2019 were estimated.

Based on this approach, the global prevalence of clinical IDD (as assessed by the TGR) fell from 13.1% to 3.2%, and 720 million cases of clinical IDD have been prevented by USI (a reduction of 75.9%) (Figures 1 and 2).

USI has significantly reduced the number of newborns affected by IDD, with 20.5 million cases prevented annually. The resulting improvement in cognitive development and future earnings suggest a potential global economic benefit of nearly $33 billion. However, 4.8 million newborns will be affected by IDD in 2019, who will experience life-long productivity losses totaling a Net Present Value (NPV) of $12.5 billion.

The authors concluded that the global improvements in iodine status over the past 25 years have resulted in major health and economic benefits, mainly in low- and middle-income countries. They emphasize that efforts should now focus on sustaining this achievement and expanding USI to reach the continuing large number of infants who remain unprotected from IDD.
Figures 1 and 2 show the association between TGR and iodine status in 1993 and 2019. In the figures, the color of the bubbles corresponds to the WHO region, while the size of the bubbles reflects the size of the population affected. The target for the virtual elimination of clinical IDD is for a country TGR prevalence to be < 5% and a MUIC in the range between 100 and 299 µg/L, representing optimal iodine status at the population level.