Comparison of Methods for Estimating Discretionary Salt Intake in Field Settings

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Objectives: Accurate and precise estimates of discretionary salt (DS) intake are critical for designing salt fortification interventions and counseling on salt intake reduction. This study compared four methods of estimating DS intake among non-pregnant women of reproductive age (NPWRA) in northern India to inform the design of a trial of multiply-fortified salt.

Methods: Participants were NPWRA (18–49 y) in Punjab, India. Weighed food records (WFR), same-day duplicate diet (DD) composites, and samples of household (HH) salt were collected simultaneously from 100 women and repeated on a subset of 40. Sodium (Na) and iodine contents of the DD composites were analyzed using Inductively Coupled Plasma (ICP)-Optical Emission Spectrometry and ICP-Mass Spectrometry. HH salt samples were also analyzed for iodine. Methods for estimating DS intake included: 1) WFR: DS consumed from recipes or added at time of consumption were weighed; 2) HH salt disappearance (HHSD): total DS used by HH on the observation day divided by number of HH members; 3) Sodium estimation (NaE): Na content of 40 replicate DD composites prepared without DS were subtracted from the Na content of the corresponding original DD and difference multiplied by the molar mass of NaCl; 4) Iodine method (IM): analyzed iodine content of milk and milk products and commercial snacks were subtracted from DD iodine content, and difference divided by the iodine content of the HH's salt sample. The relations between methods were explored using Pearson correlation and Bland Altman analyses.

Results: Mean ± SD intake of DS according to the WFR, HHSD, and NaE methods were 4.7 ± 1.8 g/d, 5.8 ± 3.3 g/d, and 4.1 ± 2.1 g/d, respectively. Results of IM are pending. Pearson correlation coefficients for DS intake estimates obtained from WFR vs. NaE and WFR vs. HHSD were 0.82 ($p < 0.001$) and 0.48 ($p < 0.001$), respectively. Mean ± SD bias (limits of agreement) were 0.68 ± 1.25 g/d (−1.77, 3.13) for WFR vs. NaE, and 1.8 ± 2.93 g/d (−4.56, 6.92) for HHSD vs. WFR methods.

Conclusions: Discretionary salt intake from WFR and NaE showed good agreement and are feasible to implement in field settings.

Funding Sources: Bill & Melinda Gates Foundation.