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Communicating uncertainties in spatial predictions of grain micronutrient concentration

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The concentration of micronutrients in staple crops varies spatially. Quantitative information about this can help in designing efficient interventions to address micronutrient deficiency. The concentration of a micronutrient in a staple crop can be mapped from limited samples, but the resulting statistical predictions are uncertain. Decision-makers must understand this uncertainty to make robust use of spatial information, but this is a challenge due to the difficulties of communicating quantitative concepts to a general audience. We proposed strategies to communicate uncertain information and present a systematic evaluation and comparison in the form of maps. We proposed to test five methods to communicate the uncertainty about the conditional mean grain concentration of an essential micronutrient, selenium (Se). Evaluation of the communication methods was done through questionnaire by eliciting stakeholder opinions about the usefulness of the methods of communicating uncertainty. We found significant differences in how participants responded to the different methods. In particular, there was a preference for methods based on the probability that concentrations are below or above a nutritionally-significant threshold compared with general measures of uncertainty such as the confidence interval of a prediction. There was no evidence that methods which used pictographs or calibrated verbal phrases to support the interpretation of probabilities made a different impression than probability alone, as judged from the responses to interpretative questions, although these approaches were ranked most highly when participants were asked to put the methods in order of preference.