

*Response to Khoyska's et al. letter to the editor***Spot and overnight urine are inappropriate to assess population sodium intake**

To the Editor:

We thank Khoyska and colleagues for their interest in our paper, "Systematic review of studies comparing 24-hour and spot urine collections for estimating population salt intake" (1), for their comments (2), and for the opportunity to answer and clarify differences in approach.

As stated, our objective was to "to examine the usefulness of urine sodium excretion in spot or timed urine samples to estimate population dietary Na intake" with the intent of informing public policy on the best way to monitor *population* salt intake within the framework of a public health surveillance program. Our review examines the totality of evidence in the literature, and largely follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidance.

The studies that examine spot versus 24-hour urine nearly all utilized correlation analyses that, while appropriate for comparing individuals, are inappropriate for addressing the question of how to assess population averages. Further, and although not the focus of our review, we found no studies designed to appropriately assess individual salt intake with spot urines that would require multiple days of 24-hour urine sampling and spot urine sampling. Single 24-hour urine collections are valid for assessing population salt intake, but are not accurate for individual daily salt intake, which varies from day to day.

More to the focus of our review on population sodium intake, there were no definitive studies for assessing population sodium intake with spot urine samples, and few with adequate design and data analysis. The comments of Khoyska and colleagues are perplexing, as there is no validity to a pooled analysis of erroneous and inadequate measures. Furthermore, the use of 'spot' or 'timed' urine collections that are part of the 24-hour collection will affect correlations to a different extent since they are inherently inter-correlated. These flaws are also present in the study cited by Khoyska and colleagues (3). Rigorously pooling data from poorly designed and inappropriately analyzed studies does not produce a result that has validity. We do suggest, as do Mann and Gerber (4), that a suitable validation study be carried out using 'independent' samples, as would be done in a surveillance program. Indeed, when such a validation is carried out, the results suggest significant bias with the use of 'spot'

urines with poor reliability and reproducibility in assessing 'group mean' sodium excretion compared to 24-hour collections (5).

Clearly there is a need to develop appropriate validation studies using adequate analytical methodologies. Until this new evidence becomes available, 24-hour urine collections should be recommended for monitoring population salt reduction programs.

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On behalf of

**Sub-group for Research and Surveillance of
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