

# Letter to the Editor

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## Universal *v.* risk-based screening for food insecurity

Madam

The recent paper by Gundersen and colleagues in *Public Health Nutrition* provides information on the validity of two-item tools for detecting food insecurity that will help health-care organizations design screening programmes for this important social determinant of health<sup>(1)</sup>.

The authors assert that 'risks associated with misidentifying a patient as food insecure are low'. As a result, their analyses prioritize the sensitivity of the screening instrument (defined as the proportion of patients who actually have food insecurity who indicate this on the two-item screener) over its specificity (the proportion of patients without food insecurity who indicate that they are not food insecure). This approach minimizes 'false negatives' (patients with food insecurity not detected by screening) at the expense of 'false positives' (patients without food insecurity identified as potentially food insecure).

While we agree that the risk of misidentification is low for an individual patient, the cumulative effort by clinicians or staff to distinguish between 'true positive' individuals with food insecurity and false positive screening tests may be substantial. This problem is quantified by the positive predictive value, the proportion of 'positive' responses to screening that truly represent food insecurity. This proportion is determined primarily by the specificity of the screening test and the prevalence of food insecurity in the underlying population.

Table 1 presents several screening scenarios, varying both the sensitivity and specificity of screening based on Gundersen and colleagues' paper, and the prevalence of food insecurity from 25%, which might be the case in a community health centre, to 13%, the estimated rate of food insecurity in all US households<sup>(2)</sup>, to 5%, a conceivable rate in a private practice. If food insecurity is highly prevalent, the positive predictive value of screening is high; most of those who indicate that they have food insecurity on the

survey really have it. However, at low prevalence, even 90% specificity results in a positive predictive value of only 34%. In practical terms, a private, multi-clinician practice of 10 000 patients with a 5% prevalence of food insecurity would need to follow up 1440 individuals in order to identify 490 who have food insecurity.

Garg and colleagues<sup>(3)</sup> recently argued that universal screening for social determinants of health is necessary to assure equity, since targeted screening may be discriminatory. Health-care organizations will need to weigh this ethical consideration against the downstream effort needed to differentiate those who truly have food insecurity from those who do not. Universal screening for food insecurity raises concerns that have been debated in cancer screening programmes for decades. If a practice decides that the prevalence of food insecurity is too low or the rate of false positive screening tests is too high to justify universal screening, it may need to consider risk-based screening for the sub-population of patients at highest risk. In either case, the paper by Gundersen and colleagues provides valuable information to guide this difficult decision.

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**Table 1** Screening scenarios and their effect on positive predictive value

Sensitivity (%)	Specificity (%)	Prevalence (%)	Positive predictive value (%)
97	74	25	55
97	74	13	36
97	74	5	16
98	90	25	77
98	90	13	59
98	90	5	34

### References

- Gundersen C, Engelhard EE, Crumbaugh AS *et al.* (2017) Brief assessment of food insecurity accurately identifies high-risk US adults. *Public Health Nutr* (Epublication ahead of print version).
- Coleman-Jensen A, Rabbitt M, Gregory C *et al.* (2016) *Household Food Security in the United States in 2015. Economic Research Report* no. ERR-215. Washington, DC: US Department of Agriculture, Economic Service Research.
- Garg A, Boynton-Jarrett R & Dworkin PH (2016) Avoiding the unintended consequences of screening for social determinants of health. *JAMA* **316**, 813–814.