

May 4, 2021

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Reference: Use of Clinical Algorithms That Have the Potential To Introduce Racial/Ethnic Bias Into Healthcare Delivery

Dear Agency Staff:

The Academy of Nutrition and Dietetics (the “Academy”) appreciates the opportunity to submit these comments to the Centers for Disease Control and Prevention relative to its March 5, 2021 information request: *Use of Clinical Algorithms That Have the Potential To Introduce Racial/Ethnic Bias Into Healthcare Delivery*. Representing more than 107,000 registered dietitian nutritionists (RDNs),¹ nutrition and dietetic technicians, registered, and advanced degree nutritionists, the Academy is the world’s largest association of food and nutrition professionals and is committed to a vision of a world where all people thrive through the transformative power of food and nutrition. Every day our members provide medical nutrition therapy for patients in clinical settings across the continuum of care, often via telehealth, with the flexibilities necessary due to the COVID-19 public health emergency.

The Academy supports this request for information to ensure clinical care practices are optimized for all patients, regardless of demographics. We offer the below responses as examples of, and context surrounding, algorithms which may introduce bias in health care delivery, and we look forward to the final report.

Specific Content

A. Bias with algorithms may be categorized by three different methods:

- model bias (models don’t include underrepresented groups)
- model variance (insufficient data included for underrepresented groups)
- outcomes noise (sets of unobserved variables can interact with model predictions due to lack of additional data on variables related to underrepresented groups).²

¹ The Academy approved the optional use of the credential “registered dietitian nutritionist (RDN)” by “registered dietitians (RDs)” to more accurately convey who they are and what they do as the nation’s food and nutrition experts. The RD and RDN credentials have identical meanings and legal trademark definitions.

² Kelly, C.J., Karthikesalingam, A., Suleyman, M. et al. Key challenges for delivering clinical impact with artificial intelligence. *BMC Med* 17, 195 (2019). <https://doi.org/10.1186/s12916-019-1426-2>

B. Examples of bias in algorithms include a hospital mortality algorithm with different error rates for minority groups (black and Hispanic) despite similar base rates. These authors emphasize the importance of collecting sufficient data across diverse groups.³


C. An algorithm used to detect melanomas (and compared it to accuracy with 58 dermatologists) showed underperformance with lesions in darker skin tones due to low availability of validated images in different ethnic/skin tones.⁴


D. Other authors confirm that algorithms may require modification, including “defining nutrition therapy in meaningful ways, selecting [adjusted] cutoff values for healthy body mass indices and waist circumferences, identifying the dietary composition of [nutrition therapy] based on regional availability and preference, and expanding nutrition therapy for concomitant hypertension, dyslipidemia, overweight/obesity, and chronic kidney disease.”⁵

E. The validity of currently accepted adjustments for race/ethnicity in bone density scans has been challenged, but some authors are concerned about such perspectives, stating that use of standard diagnostic tools requires clinical judgement of the provider. The tool’s validity depends upon valid application of ethnicity-specific models to ensure timely treatment is delivered as indicated while avoiding unnecessary interventions.⁶

The Academy appreciates your consideration of our comment for the information request *Use of Clinical Algorithms That Have the Potential To Introduce Racial/Ethnic Bias Into Healthcare Delivery*. Please contact either Jeanne Blankenship at 312-899-1730 or by email at jblankenship@eatright.org or Mark Rifkin at 202-775-8277 ext. 6011 or by email at mrifkin@eatright.org with any questions or requests for additional information.

Sincerely,


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³ Chen, I., Johansson, F.D., Sontag, D. Why Is My Classifier Discriminatory? Advances in Neural Information Processing Systems (NeurIPS 2018). 3543--3554. (Dec. 2018). <https://arxiv.org/abs/1805.12002v2>

⁴ Haenssle, H.A., Fink, C., Schneiderbauer, R., et al. Man against machine: diagnostic performance of a deep learning convolutional neural network for dermoscopic melanoma recognition in comparison to 58 dermatologists. *Ann Oncol*. 2018 Aug 1;29(8):1836-1842. doi: 10.1093/annonc/mdy166.

⁵ Su HY, Tsang MW, Huang SY, Mechanick JI, Sheu WH, Marchetti A; Task Force for Development of Transcultural Algorithms in Nutrition and Diabetes. Transculturalization of a diabetes-specific nutrition algorithm: Asian application. *Curr Diab Rep*. 2012 Apr;12(2):213-9. doi: 10.1007/s11892-012-0252-0.

⁶ Kanis, J. A., Cooper, C., Dawson-Hughes, B., Harvey, N. C., Johansson, H., Lorentzon, M., McCloskey, E. V., Reginster, J. Y., Rizzoli, R., & International Osteoporosis Foundation (2020). FRAX and ethnicity. *Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*, 31(11), 2063–2067. <https://doi.org/10.1007/s00198-020-05631-6>