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Using Big Data to Determine Reference Values for Laboratory Tests

Arjun K. Manrai, PhD, Chirag J. Patel, PhD, John P. A. Ioannidis, MD, DSc

Department of Biomedical Informatics, Harvard Medical School, Boston, Massachusetts (Manrai, Patel); Meta-Research Innovation Center at Stanford, Stanford University, Stanford, California (Ioannidis).

In Reply We agree with Dr Obstfeld and colleagues that harmonizing measurements across laboratory test platforms is critical to the success of personalized laboratory medicine. The efforts cited by the authors will contribute to reducing technical variation and measurement error across test platforms. However, the fact that large-scale data sets often contain data from multiple test platforms is not reason to avoid using them altogether, but is a cogent argument for using them to understand test variation simultaneously across test platforms and demographic strata, especially as such test variation relates to clinical outcomes. Improving the derivation and collection of meta-data will enable such systematic comparisons. As we argued,¹ electronic health records are one possible data modality that can be used for these purposes (along with research cohorts, insurance claims data sets, and other data types), but the generalizability of findings from such observational data sets across different clinical settings is unclear. In the absence of systematic analyses of new large-scale data, the status quo, in which convenience samples from a few dozen individuals often validate monolithic reference ranges used across millions of individuals in some laboratories, will likely remain. This data-limited approach is likely to be inferior to almost any data-rich solution, but we acknowledge the current heterogeneity inherent to available big data.

References

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Corresponding Author: John P. A. Ioannidis, MD, DSc, Stanford Prevention Research Center, Stanford University, 1265 Welch Rd, M/C 5411, Medical School Office Building, Stanford, CA 94305 (jioannid@stanford.edu).

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