Health Equity Insights from Machine Learning Models

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The Behavioral Risk Factor Surveillance System (BRFSS) is the United States' (US) largest health survey administered by telephone, and a valuable source of data on social determinants of health (SDH).¹ Clark and colleagues apply machine learning methods to the BRFSS data to identify SDH associated with inequities in self-rated health.² The BRFSS technical documentation recommends applying survey weights to generate estimates representative of the US population.³ Clark and colleagues use weighted logistic regression to predict the odds of excellent or very good health, but do not use survey weights in their descriptive analysis of the sample. Whereas the results section refers to "the weighted prevalence of self-rated health and other study covariates ... in Table 1," the footnote to Table 1 states, "Percentages [are] unweighted and represent the characteristics of survey respondents but not population estimates."

The unweighted percentages in Table 1 reveal a sample that is biased on several characteristics compared to the population it is intended to represent. Comparing Table 1 to the CDC's interactive tool for analyzing 2017 BRFSS data (while applying survey weights),⁴ the unweighted proportion of respondents identifying as non-Hispanic White is 83.3%, vs. a population proportion of 72.3%. Furthermore, 37.6% of sample respondents vs. 26.0% of the population have completed a college degree. Therefore, it is important to accurately label the descriptive analysis as unweighted, and to acknowledge limitations that result from the BRFSS enrolling a sample that over-represents non-Hispanic White and highly educated participants. Surveys which are administered by other modes may achieve better representation of the US population and may

reveal different conclusions about SDH affecting health equity.

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Declarations:

Conflict of Interest: The author declares that he does not have a conflict of interest.

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