

Was it statistically legitimate to combine data from the four textile mills in Brachman et al.'s (1962) study of the effectiveness of a human anthrax vaccine?

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Abstract

In late 2003, the Brachman et al. (1960, 1962) field study of an earlier anthrax vaccine became one important basis for an FDA regulatory determination that the currently licensed vaccine is effective against *B. anthracis* strains, regardless of the route of exposure. One issue overlooked earlier (Schumm, Brenneman, Arieli, Mayo-Theus, and Muhammad, 2004) was whether or not it was legitimate, from a statistical perspective, to combine the results from the four textile mills to assess the effectiveness of the anthrax vaccine. Therefore, the Brachman et al. (1962) field study was again reexamined in terms of its statistical validity. The Box's M test, which evaluates the statistical legitimacy of combining data from different groups (in this case, the four mills), was very significant ($p < .001$) in all three statistical tests performed, indicating that the data from the four mills should not be combined. Arguments for combining or pooling the data from the four mills cannot be justified from statistical or scientific evidence.

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