

Garabrant et al. Respond to Wartenberg and Buckler

David H. Garabrant,¹ H. Daniel Roth,² Romain Parsad,² Gui-Shuang Ying,³ and Jay Weiss⁴

We thank Dr. Wartenberg and Ms. Buckler (1) for their interest in and comments regarding our paper (2). We strongly support the use of the Third National Health and Nutrition Examination Survey (NHANES III) data for exploratory analyses, as they do, and point out that these data are widely used to address existing public health concerns, including investigations of disease etiology. The data are viewed as a unique resource for these purposes. Wartenberg and Buckler raise concerns about our use of the NHANES III data that are based on erroneous assumptions. Their concerns about our conclusions should be interpreted in light of these errors.

Wartenberg and Buckler seemingly confuse allergic sensitization with clinical allergic reactions. The NHANES III data contain no information on clinical allergic reactions to latex. The impression that Wartenberg and Buckler have that "NHANES III reports only on the most severe of these [adverse reactions to latex], the sensitization and possible allergic reaction..." (1, p. 524) is incorrect. We agree with their point that other adverse effects are also of concern and should be studied, but the lack of information on other health conditions does not detract from the value of our study of sensitization.

The AlaSTAT EIA (Diagnostic Products Corporation, Los Angeles, California) assay upon which the NHANES III results were based has been reported to have 91.1 percent specificity at the 0.35 IU/ml criterion for positivity and 98.4 percent specificity at the 1.50 IU/ml criterion for positivity (3) for determining latex sensitization when compared with skin prick tests. In contrast to these published performance characteristics, Wartenberg and Buckler claim that the AlaSTAT EIA has a specificity of 80.6 percent. This is not correct, as they are referring to the performance of the AlaSTAT EIA with respect to clinically diagnosed latex allergy, not with respect to latex sensitization. Their conclu-

sion that the elevated prevalence of latex sensitization is due in part to the low specificity of the AlaSTAT test is based on this faulty assumption and should be disregarded. Moreover, in our study, since health care workers and nonhealth care workers were tested by the same methods and had similar prevalences of latex sensitization, the AlaSTAT test would be expected to give the same proportion of false-negative results in both groups. Thus, the alleged low specificity of the AlaSTAT EIA test is an untenable explanation for the lack of difference between health care workers and other subjects.

We concur with the desire of Wartenberg and Buckler for more detailed information regarding glove use and for a complete job history. However, the lack of more detailed information does not detract from the results we presented, in which health care workers were compared with those in other occupations. It is precisely this comparison that is of great interest because of published studies that speculate on the relative risks of latex sensitization among health care workers in the absence of estimates of the risk of sensitization among comparable nonhealth care workers (3–9). It should also be noted that in none of these studies did measures of glove use show a clear association with latex sensitization. A recent National Institute of Occupational Safety and Health study among health care workers found no associations between latex sensitization and any measure of past or present glove use or measured exposure to latex particulates (10). That study also addressed the issue of selection of workers out of exposed jobs. Contrary to the speculation by Wartenberg and Buckler, there was no evidence that such job changes were associated with latex sensitization.

Wartenberg and Buckler suggest that in our study a low proportion of subjects reporting on glove use may have led to substantial reporting bias. This is not the case. There were 13,721 subjects between ages 17 and 60 years included in the NHANES III data. Of these, 10,107 (74 percent) reported a current occupation that was coded to the Bureau of Census 1980 Occupational Classification System, 3,159 (23 percent) did not have a current occupation, and 455 (3 percent) had missing or "don't know" responses. Of the 10,107 who reported a valid occupation, 9,713 (96 percent) provided information on the use of personal protective equipment. Of the 3,571 who reported wearing personal protective equipment, only 16 (0.4 percent) did not provide information about glove use. These response rates indicate that, for every question, the response rates were extremely high, consistent with the reputation for excellence that has characterized the NHANES project over the past 2 decades. Among the 453 current health care workers, 97 percent provided information

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Abbreviations: IgE, immunoglobulin E; NHANES III, Third National Health and Nutrition Examination Survey.

¹ Department of Environmental and Industrial Health, University of Michigan School of Public Health and University of Michigan Medical School, Ann Arbor, MI.

² Roth and Associates, Inc., Rockville, MD.

³ Department of Biostatistics, University of Michigan School of Public Health, Ann Arbor, MI.

⁴ Diagnostic Products Corporation, Los Angeles, CA.

Reprint requests to Dr. David H. Garabrant, University of Michigan School of Public Health, 109 S. Observatory Street, Ann Arbor, MI 48109–2029 (e-mail: dhg@umich.edu).

on use of personal protective equipment, and all of them answered the question on glove use. Thus, the response rates among the current health care workers were extremely high and were comparable with those in the entire adult population. Low response rates and reporting bias are therefore not plausible explanations for our findings.

The most perplexing comment by Wartenberg and Buckler is that, because our estimates of the prevalence of latex sensitization are higher than those in other studies, the validity and generalizability of our results are in question. The validity of a scientific investigation is not determined by the degree to which the results match others. Rather, the validity of a study is based on reliable data as well as on appropriate study design, methods, and analyses. The reasons for variation in the results among studies clearly need to be explored. Recent reports suggest that the general population prevalence of latex-specific immunoglobulin E (IgE) is not appreciably different from what we report. Fourteen percent of blood bank donors in Los Angeles and 20 percent of blood bank donors in Hawaii are latex IgE positive at 0.35 IU/ml or greater (11) compared with our estimate of 18 percent. A recent study of British blood bank donors showed appreciable variation in seropositivity by sex, age, and season of the year (12); most notably, among males aged 20–34 years, the prevalence of latex-specific IgE was between 13 and 14 percent. Our observations are consistent with these estimates and suggest that confounding by factors such as age, sex, and season may be important determinants of latex seropositivity. We strongly endorse further studies to explore these issues.

We hope these clarifications will allay the concerns raised by Wartenberg and Buckler and that this dynamic discussion illustrates the need for further study of the determinants of latex sensitization in the general population.

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