

Letters to the Editor

IMPLICATIONS OF MISSING INCOME DATA

We strongly support the recommendation of the recent article by Kim et al.¹ that health researchers pay heed to the strong social patterning of missing data often exhibited by key variables in epidemiologic studies. Yet, although we agree with the authors' advice that researchers should "at a minimum, carefully examine characteristics of respondents with missing income information," we must strongly caution readers against their recommendation to "routinely includ[e] a separate income category of respondents with missing income information in all analyses."

Contradicting this recommendation is extensive literature on missing data,²⁻⁷ including two articles cited by Kim et al.^{2,4} This research has shown that this "missing indicator" method will result in biased effect estimates under most conditions. In particular, bias occurs even when the missing data are missing completely at random (e.g., people missing data on income are a random sample from all income groups). If the data are missing at random (e.g., missingness on income depends only on variables that are observed), then multiple imputation or weighting techniques can be used to obtain valid effect estimates.⁶ If, however, the data are not missing at random (e.g., there are additional unobserved predictors of missingness), more complex models for non-ignorable nonresponse are required,⁷ and, ultimately, investigators would do well to adopt a sensitivity analysis framework. In all cases, researchers must give serious thought to data quality issues raised by the extent and patterning of missingness, the pathways leading to this missingness, and the implications for valid causal inference.

In summary, the problem of the social patterning of missing data that Kim et al. highlight is very real and troubling for epidemiologic research and underscores why epidemiologists cannot afford to ignore poverty and its impact on both health status and causal inference.⁸ To do the research right, we must use appropriate methods. In 1995, Greenland and Finkle² were alarmed to find that "the indicator method [was] widely perceived as a formally correct method of handling missing values." Because this view continues to persist in some quarters, we must reiterate their recommendation

that epidemiologists avoid the "potentially disastrous ad hoc" missing indicator approach.

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KIM, EGERTER, AND BRAVEMAN RESPOND

As Chen et al. note, we are in agreement that health researchers should pay attention to the potential for strong social patterning of missing data in epidemiologic studies. We believe that the descriptive findings presented in our recent article provide additional evidence of the importance of considering how survey respondents with missing income data may differ systematically from those with known income information.¹ Based on our examination of data from a large population-based postpartum survey in California, we concluded that excluding respondents with missing income information from analyses would bias study findings—posing a potentially serious problem in public health research that informs resource allocations and policy decisions.

We stand by our recommendation that researchers should examine characteristics of respondents with missing income information before deciding on an analytic approach. At the same time, we appreciate the authors' caution against simply including a separate missing income category in analyses to deal with potential bias, and regret our implied endorsement of that approach as an alternative to what we agree are more appropriate techniques, such as multiple imputation, to deal with missing data.

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"ONE HEALTH" INITIATIVE AND ASPH

In April 2007, the Association of Schools of Public Health (ASPH) and the Association of American Veterinary Medical Colleges (AAVMC) hosted a joint symposium on veterinary public health. This seminal meeting was attended by more than 240 participants and represented an important step in collaboration between academic public health and veterinary medicine. Presentations from this symposium laid the foundation for this issue, which is being published collaboratively by the Journals of both organizations—*Public Health Reports* and the *Journal of Veterinary Medical Education*.

At the symposium, the theme of "one health, one medicine" was heard repeatedly. Representatives from both health professions affirmed the need to work together more closely to more effectively address both human and animal health issues, which are now understood to be inextricably linked.

We are pleased to report that AAVMC and ASPH enthusiastically endorse the One Health Initiative, newly launched by the American Veterinary Medical Association (AVMA) and the American Medical Association (AMA), with the aim of promoting collaboration across the human, animal, agricultural, and environmental health sectors to improve human, animal, and environmental health at local, national, and international levels. ASPH and AAVMC are joining forces to inform and educate political leaders and the public about the need for this initiative in both the short and long term, to achieve important human, animal, and environmental health goals and objectives.

Support for this initiative has also been expressed by industry, other professional and educational associations, and individual practitioners and government officials. To date, more than 200 individuals in agencies and organizations across the human, animal, and environmental health spectrum have expressed commitment and support for the One Health Initiative. Among them are AVMA, AMA, the American Public Health Association, the American Society of Tropical Medicine and Hygiene, and the Association of Veterinary Laboratory Diagnosticians, with more joining in support each day.

Both ASPH and AAVMC proudly support the One Health Initiative and we encourage our respective members to vocalize their support as well.

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