

Response to the Validity of Self-Reported Nicotine Product Use in the 2001–2008 National Health and Nutrition Examination Survey

To the Editor:

Yeager and Krosnick¹ report a high concordance of self-reported smoking and cotinine verification in smokers providing blood samples to verify their self-report. This is not surprising, and does not provide any information on the veracity of self-reports by smokers who are not providing any validation samples and so are not exposed to the potential embarrassment of a discrepancy between the 2 measures. Their conclusion that this justifies confidence in self-reported smoking is not warranted. Only a study collecting validation samples surreptitiously can provide such evidence. There are studies which analyzed blood samples collected for other reasons for nicotine metabolites, and related the findings to self-reported smoking status obtained at the time of sampling. Such retrospective analyses pose ethical issues due to lack of informed consent, but the results are informative. Comparisons of self-reported smoking status with cotinine levels in blood samples collected from pregnant women have shown 30 of 107 smokers reporting abstinence (28% deception rate) in one study² and 259 out of 328 smokers reporting abstinence (79% deception rate) in another study.³

Peter Hajek, PhD
Sarah Snuggs, MA (Oxon)
 Wolfson Institute of Preventive Medicine
 Queen Mary University of London
 Barts and the London School of Dentistry
 London, England

REFERENCES

1. Yeager DS, Krosnick JA. The validity of self-reported nicotine product use in the 2001–2008 National Health and Nutrition Examination Survey. *Med Care*. 2010;48:1128–1132.
2. Ford RPK, Tappin DM, Schluter PJ, et al. Smoking during pregnancy: how reliable are maternal self reports in New Zealand? *J Epidemiol Community Health*. 1997;51:246–251.
3. Pärna K, Rahu M, Youngman LD, et al. Self-reported and serum cotinine-validated smoking in pregnant women in Estonia. *Matern Child Health J*. 2005;9:385–392.

Re: Response to the Validity of Self-Reported Nicotine Product Use in the 2001–2008 National Health and Nutrition Examination Survey

To the Editor:

Hajek and Snuggs said that our evidence of the validity of smoking self-reports was uninformative because smokers probably opted

out of providing blood samples to avoid being forced to admit that they smoked.

But in fact, in the NHANES surveys we analyzed, respondents were given a list of the tests that would be performed with their blood samples, and detecting cigarette consumption was not listed (http://www.cdc.gov/nchs/data/nhanes/nhanes_03_04/examinationconsent_0304.pdf).

Furthermore, according to an official from the Centers for Disease Control and Prevention, who runs the surveys, “participants do not know that we will be testing their blood for cotinine levels or for exposure to environmental tobacco smoke” (D.J. Brody, personal communication, January 9, 2011). Therefore, it is unlikely that some smokers declined to provide a blood test because they did not want their smoking to be detected.

Hajek and Snuggs cited 2 studies^{1,2} purportedly showing high rates of under-reporting of smoking among pregnant women who were not aware that their blood samples would be compared with their self-reports. But these studies are atypical as many other studies of pregnant women documented low levels of misreporting. For example, Derauf et al³ found that only about 3% of pregnant women manifested elevated levels of cotinine in their babies’ meconium yet claimed not to smoke cigarettes during the routine patient intake questionnaire administered immediately before delivering the baby. These women were not told that their meconium would be compared with their self-reports.

Similarly, Klebanoff et al^{4,5} compared cotinine levels in blood samples taken during a routine OB examination in the first trimester (not described as part of a study of smoking behavior) with self-reports provided at the same time and found that only about 5% of the women said they were not smokers yet manifested elevated cotinine levels. Similar findings have been reported by numerous other investigators.^{6–8} Based on such evidence, Klebanoff et al⁵ concluded that in many circumstances measurements of smoking “are not likely to differ substantially whether based on self-report or cotinine.”

The prevalence of underreporting in these studies of pregnant women is very similar to what we found when we compared self-reports of cigarette smoking from American general public samples with the results of contemporaneous blood tests: 5.2%. Furthermore, the NHANES data documented that this figure is inflated due to the use of other products containing nicotine. Taking into account passive smoking as well, the rate of intentional misreporting appeared to be near zero.

A likely reason why Ford et al¹ and Pärna et al² found higher rates of mismatching is that they compared the results of blood tests with women’s reports made months later of whether they had been smoking at the time of the blood

tests. In other words, these studies assessed the accuracy of long-term recollections of smoking status, not the accuracy of reports of smoking status at the time the reports were provided. Thus, the apparent inaccuracy of the self-reports could be the result of intentional misrepresentation, or it could be the result of unintentional misremembering instead.

Finally, consider experiments in which some adults (selected randomly) provided self-reports of their smoking behavior after providing physiological samples that they were told will reveal their cigarette consumption, and other adults provided self-reports and were not asked to give physiological samples. Rates of self-reported smoking were the same in both groups in such experiments,⁹ suggesting that adult smokers do not lie when providing self-reports.

For all these reasons, we do not view Ford et al¹ and Pärna et al² as challenging our conclusions and we do not believe that our findings are distorted by smokers opting out of the measurement process to hide their smoking.

David Yeager, MA
Jon A. Krosnick, PhD
 Stanford University
 Stanford, CA

REFERENCES

1. Ford RPK, Tappin DM, Schluter PJ, et al. Smoking during pregnancy: how reliable are maternal self reports in New Zealand? *J Epidemiol Community Health*. 1997;51:246–251.
2. Pärna K, Rahu M, Youngman LD, et al. Self-reported and serum cotinine-validated smoking in pregnant women in Estonia. *Matern Child Health J*. 2005;9:385–392.
3. Derauf C, Katz AR, Easa D. Agreement between maternal self-reported ethanol intake and tobacco use during pregnancy and meconium assays for fatty acid ethyl esters and cotinine. *Am J Epidemiol*. 2003;158:705–709.
4. Klebanoff MA, Levine RJ, Clemens JD, et al. Serum cotinine concentration and reported smoking among pregnant women. *Am J Epidemiol*. 1998;148:259–262.
5. Klebanoff MA, Levine RJ, Morris CD, et al. Accuracy of self-reported cigarette smoking among pregnant women in the 1990s. *Paediatr Perinat Epidemiol*. 2001;15:140–143.
6. Haddow JE, Palomaki GE, Knight GJ. Use of serum cotinine to assess the accuracy of self-reported smoking. *BMJ*. 1986;293:1306.
7. Nafstad P, Kongerud J, Botten G, et al. Fetal exposure to tobacco smoke products: a comparison between self-reported maternal smoking and concentrations of cotinine and thiocyanate in cord serum. *Acta Obstet Gynecol Scand*. 1996;75:902–907.
8. Ross JA, Swensen AR, Murphy SE, et al. Prevalence of cigarette smoking in pregnant women participating in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). Presented at the Annual Meeting of the Society for Pediatric and Perinatal Epidemiologic Research; June 2000; Seattle, WA.
9. Aguinis H, Pierce CA, Quigley BM. Conditions under which a bogus pipeline procedure enhances the validity of self-reported cigarette smoking: a meta-analytic review. *J Appl Soc Psychol*. 1993; 23:352–373.