Cigarette Filter Ventilation and Biomarkers—Reply

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We thank Lee and Fry for their input on our article. To summarize, we compared smokers' levels of urinary or blood biomarkers of exposure and potential harm by level of filter ventilation of their cigarette brand (1). We also examined the relationship between filter ventilation of the smokers' cigarette brand and perceptions of harm of one's own brand of cigarettes versus other cigarette brands. We found no association between filter ventilation and biomarkers. We also found that more smokers of higher versus lower ventilated cigarettes perceived their cigarette brand to be less harmful than other cigarette brands. Our article contributes to the literature showing a public misperception of filter-ventilated cigarettes which likely is due to the lighter taste and from decades of prior marketing by cigarette manufacturers who falsely portrayed low-yield cigarettes as lower risk because of the promised delivery of less tar determined through smoking machines.

Lee and Fry stated "While of course their original conclusion is important, and the accuracy of their analysis undisputed, it is also important to be aware of exposure and harm on a per cigarette basis. Adding this significant covariate into the multivariate analysis, allows for more direct comparison between groups, and shows the interesting contrast with the published results."

Our analyses focused on levels of a given biomarker as a function of the smokers' cigarette brand filter ventilation level. Given the observational nature of the study, we attempted to isolate the impact of filter ventilation on biomarkers by controlling for potential confounders in modeling which included age, sex, race, duration regular smoking, use of mentholated cigarettes, and quit effort. While adjusting for cigarettes per day (CPD) may be an interesting analysis, it may not provide an accurate description of exposure. That is why we purposely did not adjust for CPD. Despite higher versus lower ventilated cigarettes having lower machine-determined tar/nicotine yields, similar levels of exposure to the smoker may be achieved through users of higher ventilated cigarettes consuming more CPD as a way to "compensate" for the lower nicotine (2). Greater CPD among smokers of higher versus lower filter-ventilated cigarettes has been shown in prior studies summarized in NCI's Monograph 13 (2) and in our study where smokers in the top quartile of filter ventilation had a mean CPD of 16 versus 13 among smokers in the first quartile of filter ventilation. Thus, and as described previously (2), controlling for CPD may erroneously bias the estimates in favor of finding lower biomarkers among higher filter-ventilated smokers—which is what Lee and Fry observed in an approximate analysis of the aggregate-level data provided in our article. For these reasons, we believe our analysis is a more accurate reflection of the true exposure experienced by smokers than an analysis adjusting for CPD.

Authors' Disclosures

No disclosures were reported.

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