The important persisting problem of smoking in cars with children: new data from a multi-year national survey of young people

There appears to be a strong case for legislating for smokefree vehicles with children based on past New Zealand research (as recently reviewed\(^1\)). Since this review, data from a series of five national surveys reiterates the size of the problem, especially for Māori and Pacific young people exposed to smoking in vehicles.\(^2\)

However, some authors (Glover et al\(^3\)) have suggested action is not necessary because child in-vehicle exposure is “almost snuffed out”. They made this claim on the basis of an observational study of vehicles which found a point prevalence of 2% of adults smoking while children were present.

To further inform considerations of this issue, we analysed unpublished data from the national-level annual ASH survey of New Zealand’s Year-10 students from 2006-2012.\(^4\)-\(^10\) In these school-based surveys, 14 and 15 year olds were asked whether, in the past week, others had smoked around them in a car or van. Students who reported exposure on at least 1 day in the past week were classified as exposed to secondhand smoke (SHS).

In each of the past 7 years, well over 20% of participants reported such exposure (Figure 1). For Māori, Pacific and those students from low decile schools, a much higher proportion reported exposure (unpublished data, forthcoming). Although prevalence has been declining, the level of decline has been so slow that a simple linear extrapolation suggests it will be 2028 before it drops below 2% (i.e., beyond the smokefree nation goal of 2025).

To put these percentages into perspective, 22% of the 2012 Year-10 student population equates to around 13,000 adolescents (or 260 50-seat busloads) being exposed to in-vehicle SHS during a typical week. Furthermore, this estimate includes only Year-10 students. The total number would likely approach six figures if data for children aged 0 to 13 years were available. Statistics New Zealand estimates the 0–14 year old population was just over 892,000 as at June 2012,\(^11\) so even if the average exposure levels across the full age range was only half of that reported by Year-10 students there are approximately 100,000 children exposed each week.

Results on frequency of exposure from the in-vehicle exposure ASH survey question\(^12\) fielded in 2011 indicate that exposure to SHS in cars occurs frequently: over 50% of children who had been exposed in the previous week reported being in a smoky vehicle on three or more occasions during the prior week and one in every four stated they were exposed to SHS in vehicles each day.
Figure 1. Proportion of Year-10 students (aged 14–15 years) reporting exposure to in-vehicle secondhand smoke during the prior week (national survey data)*

* Point estimates were adjusted for ethnicity and school-level socioeconomic status. Clustering at the school level had no substantive influence on estimate uncertainty. To our knowledge, vehicle exposure results for these years from the ASH snapshot survey have not been published previously. "Don't know" responses were treated as missing in this analysis.

The ASH survey measures large, nationally representative cohorts; over 25,000 students respond each year and, apart from a small level of under-response from children attending lower SES schools, the demographic profile of respondents is very close to that of the national Year 10 population. This, in addition to the consistency in exposure prevalence levels obtained over multiple years and reported in comparable surveys, provides some reassurance that the self-reports reasonably reflect actual levels of in-vehicle SHS exposure amongst this population.

So how can survey-based estimates differ so much from the 2% average point-prevalence reported by Glover et al? It comes down to a mix of interpretation, potential for measurement error, and the fact that point-prevalence studies are different from and underestimate cumulative daily or weekly exposure rates.

First, the 2% figure used by Glover et al is the proportion of all cars in which both adult smoking occurred and children were present. Yet a more appropriate measure to describe is the proportion of cars where smoking was observed among cars with children in them. With this denominator, the average point prevalence in Glover et al’s study was five times higher (10% [63/629]). In fact, it reached 22% (58/269) in one of the three areas monitored (Manurewa).

Second, as acknowledged by Glover et al, vehicle observation research has significant measurement limitations; small children can be difficult to see and quick judgements have to be made about ages, among other things. Those limitations are likely to
systematically undercount infants who may be missed, and possibly also older adolescents, who may be more likely to be classified as adults.

Finally, and most importantly, observations of smoking in vehicles greatly underestimate the population prevalence of in-vehicle smoking within the period they cover, because smoking may cease before, or begin after, the observation point in a trip, or may occur on subsequent trips. In that regard, comparing point-in-time observational data with survey reports of past-week experience is like comparing a photo snapshot taken from the roadside to an all-week in-vehicle video.

There is no accurate way to establish daily or weekly estimates of proportionate exposure for a given population from hour-long observations without knowing the joint distribution of three things: the percentage of the population travelling at different times, the frequency of travel, and the likelihood of in-vehicle smoke exposure on a given trip. This is why, as Patel et al[^13] state, “a survey of high school pupils appears to remain the best indicator of child exposure to SHS in a vehicle over a week.”

Furthermore, SHS exposure measurements based on recall of regular exposure over a defined time period have face validity, in that such measures have been used in most epidemiological studies which have explored and demonstrated the adverse health effects of SHS exposure. Nevertheless, observational studies still have a role and can be used to compare point-prevalence in different places at a certain time (as per other NZ work[^13,14]), or the same place over different times for monitoring trends.

In summary, the national survey data presented here and previous New Zealand research indicates that SHS exposure in vehicles remains a serious and very commonly experienced hazard to children in this country. It also is likely to be contributing to health inequalities. As articulated previously,[^1] there is a strong public health case for New Zealand to follow the international trend in legislating against this hazard.

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References:


