Tobacco taxes have mixed effects on socioeconomic disparities

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Does tobacco taxation continue to be a useful tobacco control policy? Is tobacco tax as or more beneficial to lower socioeconomic groups compared with higher socioeconomic groups? These are the questions tackled by Anna Wilkinson and colleagues[1] in *The Lancet Public Health*, in their interrupted time-series analysis of the prevalence of smoking in Australia in the context of two tobacco tax hikes. In 2010, a tax increase of 25% was imposed without warning and, in 2013–17, a publicly pre-announced series of four annual tax rises of 12·5% were implemented. Wilkinson and colleagues use commercial survey data (from Roy Morgan) with a 30% response rate; prevalence estimates at any timepoint might be subject to response or selection bias but, presuming any such selection bias remains reasonably similar over time, we can interpret trends within the data.

Wilkinson and colleagues found that tobacco tax increases prompted discernible and significant immediate drops in smoking prevalence, and ongoing reductions in smoking prevalence in the years following introduction of the taxes. Their findings occurred in the context of Australia, a country that already had high tobacco prices due to pre-existing taxes. As a result of the taxes levied since 2010, Australia now has the world's highest cigarette prices; for instance, the price of a 25-pack of one brand of cigarettes has increased by AUS$20 since 2010 (from $12·95 to $32·95 [with AUS$32·95 being approximately equivalent to US$23 in Oct, 2019]).

However, the findings by Wilkinson and colleagues showed differences by socioeconomic status (SES). Separating the prevalence trends by SES groups provides some useful insights. To see these differences more clearly, smoking prevalence was plotted by SES group using the interrupted time-series coefficients for factory-made cigarettes and roll-your-own tobacco from the study by Wilkinson and colleagues, as shown in the figure; expected prevalences and inequality measures are shown in the appendix.

Although the lower SES group had a larger immediate reduction in smoking prevalence in response to the 2010 tax than the higher SES group, this decrease was not sustained, with smoking prevalence rebounding over time, possibly due to a high incidence of relapse among this group. Data from the International Tobacco Control Policy Evaluation Project suggest that smokers of lower SES groups are likely to be more vulnerable to relapse because they have higher nicotine dependence, lower quitting self-efficacy, and lower success rates when they try to quit than those in higher SES groups.[2,3] The greater difficulty in maintaining abstinence following a quit attempt might have undermined the longer term impact of the one-off 2010 tax increase for these smokers. From 2013 to 2017, the central estimate of smoking prevalence showed a downward trend for both low and high SES groups, but the 95% CI for the lower SES group included the possibility of no change or even an increase (figure). To gauge the net impact of tobacco taxes on inequalities, it is useful to calculate the counterfactual prevalences by SES in 2017, in the scenario that the 2001–10 pre-tax trends had continued; the low SES group prevalence would have been 21·1% and the high SES group prevalence would have been 11·7% (appendix). The actual 2017 prevalences were 18·5% in low SES groups and 10·4% in high SES groups, an apparent gain associated with the taxes in low SES groups and in high SES groups. It is not possible to define a CI of the difference between the

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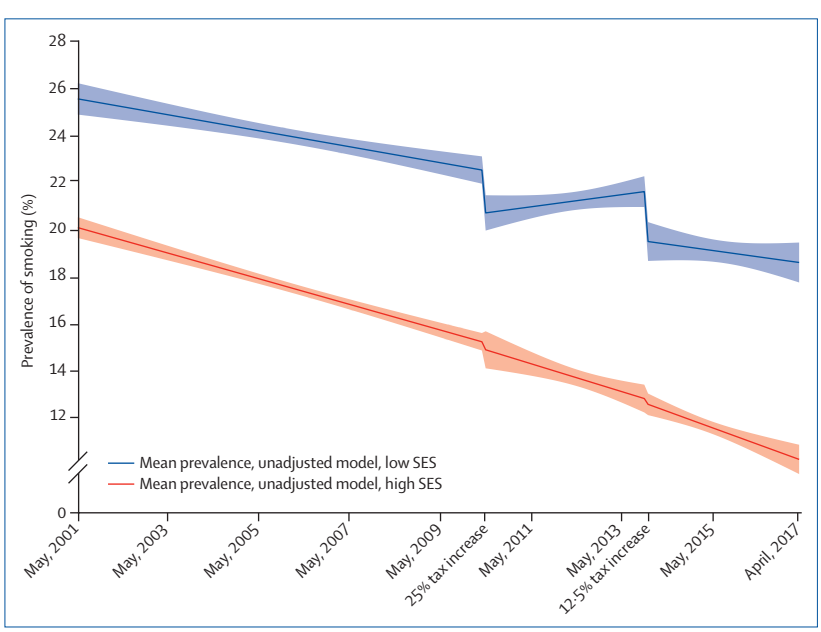

***Figure*: Prevalence of smoking among people of high and low socioeconomic status in Australia in 2001–17**
Smoking prevalence is of manufactured cigarettes and roll-your-own tobacco. Solid lines are derived from the starting prevalence of smoking in 2001, and regression coefficients for changes over time by low and high socioeconomic status from Wilkinson et al. Shaded area is the 95% CI. The breaks in the time series are the coefficients for step changes with the introduction of tax policies; data from Wilkinson et al.[1]

estimates modelled by Wilkinson and colleagues and these counterfactual estimates; however, it appears that inequalities in smoking prevalence between the SES groups might be less in absolute terms in the current context (with tax) compared with the counterfactual context (without tax; an 8·1% difference between the SES groups in 2017, compared with the counterfactual 9·5% without tax; appendix). But, in relative terms, there was no meaningful difference in the prevalence risk ratio for low versus high SES groups (1·78 *vs* 1·81).

As tobacco taxes increase and the cost of tobacco smoking to health budgets is recouped or exceeded (ie, tobacco tax moves from recovering unmet costs to being a so-called sin tax), the vexing issue of whether the tax is regressive cannot be ignored. Although those low-income smokers who quit smoking in response to these tax policies will gain important health and financial benefits, low-income smokers who do not quit in response to increased cigarette prices might experience increased hardship if a greater proportion of the household budget is diverted to pay for tobacco rather than healthy food, housing, and other such essential goods.[4,5] Some researchers have questioned whether there is sufficient evidence that "the overall benefits of further tobacco price increases [in Australia] outweigh the risk of harm from financial hardship among low-income populations".[6] The answer to this question will require a societal perspective and research beyond what Wilkinson and colleagues can traverse with these data, such as by examining individual-level data on tobacco expenditure, purchasing behaviour, and experience of financial hardship.

However, there is still much that we can learn and important conclusions that we can draw from this interrupted time-series analysis. First, tobacco taxation continues to work. Second, the abrupt effects of tobacco taxation prompts greater reductions in smoking prevalence in lower socioeconomic groups, consistent with higher price elasticity in lower income groups.[7] Finally, the greater initial impact of a tax increase (particularly unplanned one-off tax increases) on quitting might not be sustained for lower SES groups without additional ongoing interventions. Thus, to reduce (or further reduce) socioeconomic inequalities in smoking prevalence, one implication from the study by Wilkinson and colleagues is to ensure that tax increases are accompanied by ongoing interventions to reduce relapse among lower socioeconomic groups, including fiscal policies that mitigate tobacco industry marketing of cheaper tobacco product options.

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We declare no competing interests.

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