

## **Comments on the Philip Morris-funded London Economics report “An analysis of smoking prevalence in Australia, Final”, November 2013**

**Provided by: Cancer Council Victoria**

### Introduction

These comments pertain to the Philip Morris-funded report released by London Economics which is embargoed to be released at 5pm GMT on Monday 25 November. This brief report outlines the results of three cross-sectional surveys of Australian adults—one conducted in July-October 2012 prior to the implementation of plain packaging and larger graphic health warnings—and two conducted shortly after implementation, in March 2013 and in July 2013. The report describes itself as “one of the first comprehensive studies considering smoking prevalence following plain packaging” and draws a conclusion that there has been no change in smoking prevalence since the introduction of plain packaging.

These notes have been provided to highlight conceptual errors evident in the report and to outline a series of major scientific limitations of the Philip Morris-funded study, in order to assist interpretation of the claims made.

### Conceptual underpinning

This Philip Morris-funded survey has been conducted on the mistaken assumption that adult smoking prevalence ought to have markedly declined immediately following the introduction of plain packaging and refreshed larger graphic health warnings in Australia. No tobacco control intervention in history has ever achieved that. Unsurprisingly, this was therefore not the expectation of government or the public health community.

Rather, the more proximal aims of the plain packaging legislation were to reduce appeal of packaging, especially for young people; increase the salience of health warnings; and reduce the ability of packaging to mislead consumers about the harmful effects of tobacco use. The legislation was introduced as one of a number of tobacco control strategies, including tobacco tax increases and mass media campaigns, to contribute to reducing overall smoking prevalence.

### Methodology

The most important methodological difference between this attempt to assess smoking prevalence and the approach used in the three-yearly government-funded survey called the National Drug Strategy Household Survey (NDSHS), is that *the Philip Morris study failed to use a probability-based sampling approach*. It is a basic tenet of population survey research that the most representative samples are those where every population member has an equal probability of being included in the survey.

Because the Philip Morris survey used an online panel to obtain responses from Australians and it used those responses to estimate prevalence, only Australians who are members of online market research panels could be included. While panel members comprise people of a wide range of demographic characteristics, these people opt-in to become members of an ongoing online panel for the purpose of taking part in many different surveys or studies and they earn rewards each time they participate. In this way, they are going to be different from a representative cross-section of the Australian population. The Philip Morris survey would likely have mixed together several on-line panels to achieve these numbers. The survey used quota-sampling (that is, it required its sample to have a particular mix of age, gender and regional characteristics), presumably to try to compensate for its non-probability based sampling approach. However, *quota-based sampling cannot ensure the survey is representative of the wider Australians population who are not members of online survey panels.*

By comparison, the NDSHS uses a household sampling approach, where all residential Australian private households are eligible for inclusion in the sample. The non-representative nature of internet panels in Australia is the most likely reason that the LE Philip Morris report estimates daily smoking prevalence (around 20% in each survey attempt) to be much higher than the far more representative NDSHS, when it recorded 17.4% daily smoking among 18+ year olds back in 2010.

The three attributes the report authors highlight to suggest it is a high quality survey (under “Quality Assurance”) are in fact ordinary, basic elements of survey practice. However, this section is silent on the survey response rate achieved, which is another critical survey attribute—that is, out of all people approached to do the survey, what proportion responded. Since the survey did not use a probability-based sampling frame, it is unlikely to be a reliable reflection of Australian smoking prevalence (and its over-estimated smoking prevalence figures show that in each of the surveys), but *since it did not report survey response rates, readers cannot know if it is even a true reflection of Australian online panel members.*

The relatively large numbers used in the survey and the use of questions consistent with those used in the NDSHS, cannot make up for the failure to use a probability-based sampling frame from which to select a sample in the first place, and the lack of information on survey response rate.

As noted at the outset, the aim of the legislation that introduced plain packaging with larger graphic health warnings was to weaken the appeal of smoking and strengthen knowledge of health effects: it did not involve any immediate call to action. Its effect is likely to be a longer term one, enhancing the effects of campaigns and tax increases in discouraging youth smoking uptake and prompting quit attempts and thereby contributing to the decline in the prevalence of smoking over the longer term. But *even if the aim had been to prompt*

*an immediate drop in prevalence, the Philip Morris study was not sufficiently powered to find one.*

While survey samples of around the 5000 mark are adequate to detect large changes in attitudes and behaviour, this number is nowhere near large enough to detect the very small changes in prevalence in any country that might be expected year to year. The National Drug Strategy Household Survey with a sample of 24,000 Australians is large enough to pick up declines in prevalence of smoking of 1 to 2%, the sorts of drops that might be feasible over a three-year period. To pick up a 0.5% decline in prevalence (a decline of the sort of magnitude that might be expected over a 12-month period) would require a sample size of over 90,000 respondents. The follow-up surveys of just over 5000 respondents used in the London Economics reports would be able to detect any decline in prevalence over a one-year period only if that decline were larger than 2% points—a drop in relative terms that would be unprecedented in tobacco control history.

**Sample sizes required to detect various declines in prevalence**

At a starting daily prevalence of ...	... to detect, at alpha = 0.05 and power of 0.80, (two-sided test) a decline of ...			
	<b>2.0%</b>	<b>1.5%</b>	<b>1.0%</b>	<b>0.5%</b>
20%	6,039	10,844	24,641	99,519
17.5%	5,406	9,728	22,149	89,630

<http://www.stat.ubc.ca/~rollin/stats/ssize/b2.html>

Governments are understandably eager for information about the impact of plain packaging. Well-designed studies on changes in attitudes and beliefs will be highly instructive. But given the likely mode of effect of this policy, it is likely to be many years before an impact on the decline in prevalence can be accurately assessed.

While statistics can be misused for political purposes, the laws of mathematics can be changed for no man!