This is the author's version of an article from the following conference:

An Exploration of the Need for Segmentation in Anti-smoking Campaigns

Abstract:

Objective: To identify different segments in the anti-smoking target market.

Methodology: Changes in smoking status (current-, ex- or never-smoker) in different behavioural and demographic segments are compared using data from four Australian National Health Surveys.

Findings: Anti-smoking campaigns in Australia have employed a single, fear appeal message strategy to reduce smoking prevalence in the community. This paper shows that the campaigns have been associated with continued success in helping smokers to quit, especially female smokers. They have not had the same impact helping young people avoid taking the habit up. In particular, there has been a sustained increase in the odds that a young female has taken up smoking.

Conclusion: Smoking prevalence will only be eliminated when the different needs of smokers and young, potential smokers, and males and females are recognised and appropriately differentiated campaigns are developed, targeting each of these segments separately.

Keywords: tobacco, smoking, segmentation, prevalence, demographics
Introduction

The damage caused by tobacco smoking worldwide has been widely discussed in the literature for more than 50 years. Doll and Hill established the link between tobacco smoking and cancer in 1950 (Doll and Hill 1950). The United States Surgeon General declared tobacco smoking the single most important cause of preventable morbidity and mortality in his country, first in 1957 and regularly since then (USDHHS 1957, 1989, 2000). Both the Doll and the U.S Surgeon General's findings have been regularly updated and confirmed in other countries ever since. Calculations of the cost of smoking to the community are approached from a number of different perspectives. Epidemiologists concluded that cigarettes bring on early death in as many as 50 percent of their lifelong users (Lopez, Collishaw et al. 1994; Peto, Lopez et al. 1994). Peto, Darby et al. (2000) calculated that a global toll of 10 million deaths in the decades 1950 to 2000 could be directly attributable to tobacco smoking. In Australia, it has been estimated that nearly 20,000 people die each year from smoking-related diseases (English, Holman et al. 1995).

Economists have attempted to estimate the losses in productive capacity and other social costs to the community resulting from tobacco smoking. These losses are of the order of millions of quality-adjusted-life-years and many millions of dollars (Collins and Lapsley 1996; 1999a; 1999b; 2001; Single, Robson et al. 1998; Chaloupka and Warner 1999). An analysis of smokers' self-reports of expenditure on tobacco products in 1998-1999 amounted to approximately A$4 million, and it has been suggested that this might be an underestimate by as much as 40 percent (de Meyrick and Yusuf 2006). Regardless of the approach taken, there seems to be general agreement that the cost is enormous.

Lopez, Collishaw et al. (1994) showed that tobacco smoking prevalence is a reliable predictor of tobacco-related illness and mortality. They used data from a large number of countries to show that smoking prevalence follows a four-stage trajectory, with a corresponding trajectory for tobacco-related deaths, lagged by approximately 30 years. The trajectory resembles a typical product lifecycle with an introductory, growth, maturity, and decline stage (Levitt 1965). Australia, along with the United Kingdom, United States, Western Europe, and Canada, is shown to be well advanced in the fourth or decline stage. Corrao, Guindon et al. (2000) suggest that any country can use this model to identify their position on the trajectory and then implement the strategies used by the stage four countries to reduce the time-scale of their trajectory. The end-point is the complete cessation of smoking in the population and hence elimination of the damage caused by smoking.

There are two approaches. The coercive approach attempts to force a change in behaviour through a change in the law, for example by restricting the opportunities to buy and consume cigarettes. The persuasive approach attempts to influence behaviour through persuasion. Most responses to tobacco smoking include elements of both approaches and are justified on the basis of the morbidity and mortality associated with tobacco smoking. Many of the policy-makers and government officials directing the development and execution of persuasive campaigns often claim to be applying social marketing principles. Social marketing aims to utilise marketing's ability to influence
consumer behaviour not to engage in a marketing transaction but rather to change target groups' behaviours in ways that benefits the community's welfare (Andreasen 2002; 2006).

**Market segmentation**

Consumer behaviour studies suggest that success in influencing consumers' behaviour is moderated by subjective, psychological factors such as perception and interpretation. The response to a particular stimulus might be quite different for different individuals and in different situations. Potentially then, to ensure maximum effectiveness, the marketer should craft individually tailored marketing strategies for each of the individuals in the target audience, taking into account their different characteristics and situations. This would preclude the use of efficient, large-scale mass production facilities producing large quantities of low cost, standard products, bulk distribution networks, standard pricing, and communication of a standard message through mass media. An optimum position must be found between complete standardisation and complete individual customisation. This intermediate position is market segmentation.

Market segmentation is defined by McDonald and Dunbar (1998) as;

> Market segmentation is the process of splitting customers, or potential customers, within a market into different groups, or segments, within which customers have the same, or similar requirements satisfied by a distinct marketing mix.

The pioneer of market segmentation, Wendell Smith (1956), observed a lack of homogeneity in the products offered for sale by individual suppliers and speculated that this was not the result of a deliberate strategy on the part of the marketers as much as a reflection of “diversity of supply” due to different equipment and methods employed by suppliers, variability in production methods and other supply-side effects. Diversity in demand originated from “different customs, desire for variety, or desire for exclusiveness or... from basic differences in user needs” (1956:4).

Smith proposed two strategies to deal with these differences in demand; convergence and divergence. A convergence strategy effectively ignores the differences in demand and makes one, undifferentiated offer to the market. A divergence strategy, recognises the differences among consumers and emphasises “the precision with which a firm's products can satisfy the requirements of one or more distinguishable market segments” (1956:4).

A market segment is a relatively homogeneous group of consumers within the larger, more heterogeneous market. The key factor linking the members of the segment is a commonality of needs that is expressed as a common response to a particular stimulus. The process of linking customer needs and marketing strategies can be illustrated by comparing three different definitions of a market segment:

1. Customer groups with different characteristics, needs or behaviour (Kotler, Adam et al. 2006:217)
2 Individual, groups or organisations with one or more similar characteristics that cause them to have similar product needs (Pride, Elliott et al. 2006):115
3 A relatively homogeneous group of customers who are likely to respond to a marketing mix in a similar way (Quester, McGuiggan et al. 2001):142

The first definition focuses on the identification of differences to group potential or current customers. The second applies this knowledge to the development of a product strategy. The third applies the knowledge of the target segment’s characteristics to the development of appropriate product, price, distribution and communication strategies.

What is the right amount of customisation? How finely should the marketer differentiate between consumers, how many segments should the marketer identify in a market? McDonald and Dunbar five Rules for segmentation and most textbooks include a similar list, designed to help the marketer recognise the optimum segmentation strategy (see for example (Cravens 1997; McDonald and Dunbar 1998; Perreault and McCarthy 2000; Quester, McGuiggan et al. 2001)

In essence, a strategy is an effective one if it generates segments with the following characteristics:

1. Homogeneous: all the members of the segment share a particular, identified characteristic which is not present or is different in all people not in the segment.
2. Substantial: there are sufficient people in the segment to warrant development of a unique marketing mix for them.
3. Operational: the identified characteristics should be able to be used as a guide to generate a marketing mix that will appeal to the members of the segment more effectively than it will appeal to those not in the segment.

Other characteristics that are sometimes mentioned are of a purely practical nature, such as the need for the members of the segment to be accessible both in the sense that the marketer can communicate their message to them and that the segment members have practical access to the product. In the absence of such accessibility, a marketing exchange cannot take place.

Australian anti-smoking campaigns have adopted a standard message strategy in most major campaigns. It can be paraphrased as “Do not smoke, it has dire medical consequences”.

Current anti-smoking campaigns

Appendix I shows a current ad placed in major national colour magazines. The ad shows a still from the television commercial running at the same time and reproduces key points from the commercial’s audio track. There is a similar campaign featuring close-up photos of a woman’s mouth hideously disfigured by cancer. Note the strong, unambiguous language backing up the graphic image: “Every day, two Australian smokers have a limb, or part of a limb, amputated because of damage caused by...”
smoking.” The campaign is clearly directed at current smokers and appears to be intended to shock them into quitting.

Policy initiatives such as the increasing restrictions on the sale and consumption of tobacco products are also justified on the basis of the medical and consequent economic costs that tobacco smoking inflicts on the smoker and the community.

**Smoking prevalence**

The simplest and most common measure of smoking prevalence is the percentage of the population currently smoking. It is important to examine the determinants of smoking prevalence at any particular time if we are to make forecasts of likely trends in prevalence in future that are based on anything more than simple extrapolation of recent trends.

The key determinants of prevalence at any particular time ($P_t$) can be shown as:

$$P_t = P_{t-1} + I_t - C_t$$

Where $P_{t-1}$ is prevalence in the previous period, $I_t$ is initiation (that is, people taking up smoking) in that period and $C_t$ is cessation (that is, people who successfully quit smoking) in that period. Prevalence will decline as long as $C$ exceeds $I$. If $I$ does not decline, the rate of decline in $P$ begins to decline. Logically, in the long term, $C$ cannot exceed $I$.

**Smoking initiation**


Other risk factors for the onset of tobacco smoking are less clear. Peer pressure is often cited as a factor but evidence is contradictory (Conrad, Flay et al., 1992; Johnson, Li et al., 2002). Nicotine is also known to be a powerfully addictive substance (Cinciripini, Hecht et al. 1997; Cameron 2000), so a smoker considering quitting is facing a very different choice from the adolescent tempted to take it up. It appears that despite these differences, the same message strategy is being used to address these quite different problems.

**Data and methodology**

This analysis used the simplest, most readily available data to explore whether different segments have responded differently to the same anti-smoking message, demographic data. It was mentioned above, that self-reported smoking data may not always be reliable, especially when surveys are conducted among different populations and in different circumstances. To address some of these problems, data for this analysis are
taken from four large, consecutive surveys conducted by the same research organisation, using consistent sampling and survey methodologies, and conducted in a similar context among comparable populations.

The principal data sources are the last four Australian National Health Surveys (NHS), that is, those conducted in 1989/90, 1995, 2001 and 2004/5. The National Health Survey, as the name suggests, is a survey conducted by the Australian Bureau of Statistics (ABS) approximately every five years, covering an increasing number of health-related issues across the Australian resident population. These issues include the current state of the respondent's health, their use of medical services and products, and aspects of their lifestyle which may have a bearing on their health – including exercise, consumption of alcohol and (since the 1990 survey) tobacco products.

While the sample size has changed between surveys, it is always large. Table 1 shows that sample sizes range from nearly 26,000 people to over 53,000.

<table>
<thead>
<tr>
<th>Survey Year</th>
<th>Sample Size</th>
<th>Sample 18 y.o. and over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>54,241</td>
<td>38,974</td>
</tr>
<tr>
<td>1995</td>
<td>53,828</td>
<td>39,110</td>
</tr>
<tr>
<td>2001</td>
<td>26,862</td>
<td>17,918</td>
</tr>
<tr>
<td>2005</td>
<td>25,906</td>
<td>19,501</td>
</tr>
</tbody>
</table>

Table 1 National Health Survey sample sizes (source: ABS catalogue no. 4363.0)

In all NHS surveys, questions relating to tobacco smoking are not asked of respondents under 18 years old. The first step was therefore to select respondents who were 18 or older at the time of the survey. The third column in Table 1 shows that, even when respondents under 18 are removed, sample sizes are still large. There were other adjustments necessary due to changes in the treatment of smoking status between surveys but these did not affect sample sizes or the integrity of the data.

Findings

Figure 1 shows the percentage of respondents reporting that they were smokers at the time of the survey.

Since the 1995 survey, prevalence has remained at approximately 24 percent. This represents a marked slowing in the rate of decline in smoking prevalence in Australia from those experienced earlier in stage 4 of the trajectory. Stability in the overall prevalence rate can obscure important changes in other aspects of smoking behaviour in the Australian population.

When comparing rates it is statistically preferable to use odds that a person will be in one of the categories rather than percentages (Menard 1995). Figure 2 shows the odds of belonging to one of the three smoking status groups – current smokers, ex-smokers or never-smoked – together with the 95 percent confidence intervals.
It can be seen from this figure that while there has been a decrease in the odds of a respondent being a current smoker, the odds of being an ex-smoker increased, suggesting that groups of respondents have moved from being current smokers to being ex-smokers: they have successfully quit smoking.

However, in recent surveys, the change in the odds of being an ex-smoker has been greater than the change in the odds of being a current smoker. If the level of smoking prevalence was only determined by the rate at which smokers were giving up, then the changes in odds would be expected to be of similar size and in opposite directions. The difference in figure 2 is explained by the changes in the odds of never having smoked. The odds of never having smoked remained unchanged in the first three surveys then lengthened significantly. It is now less likely that a respondent has never smoked.
These changes have not been uniform across different segments. Figures 3 and 4 show the trends in the odds separately for males and females.

![Smoking status - Males](image1)

**Figure 3** Trends in smoking status among males

![Smoking status - Females](image2)

**Figure 4** Trends in smoking status among females

In each survey, the odds of a female being a current smoker are smaller than the odds of a male being a smoker. The direction of changes is similar in both groups and similar to the pattern in the sample as a whole. In both groups, there is an initial improvement in the odds (that is, the odds became smaller) of being a current smoker followed by no significant changes.

Among both males and females, the odds of being an ex-smoker improved and in both groups, the odds of a respondent being an ex-smoker are now significantly greater than the odds of them being a current smoker, having previously been the other way around.
Among females, there was no change in the odds between the 1995 and 2000 surveys. The change in the odds of a female being a current smoker is almost entirely matched by the change in the odds of being a never smoker. Between the first and last surveys, there was a steady decline in the odds of being a never-smoker. This indicates that it was becoming less and less likely that a female is a never-smoker.

Among males there were significant changes in opposite directions. The overall improvement in the odds of being an ex-smoker has been noted earlier. The odds of a male being a never-smoker showed a steady, slight increase between the 1990 and 2000 surveys and then had deteriorated significantly by the 2005 survey. The deterioration in the odds of being a never-smoker and the improvement in the odds of being an ex-smoker reached the point where a male is approximately equally likely to be an ex-smoker or a never-smoker.

Conclusion

The continued application of a standard fear campaign strategy is no longer associated with a steady decline in smoking prevalence in Australia. The effectiveness of restating the message in increasingly intrusive and graphic detail and applying it in an undifferentiated way across the whole community appears to be waning.

The current campaigns appear to have succeeded in persuading current smokers to quit, especially females. It has not had the same success in persuading young people to avoid taking up the habit and thereby retain their never-smoked status, again, especially among females. In fact, the more intrusive, graphic campaigns seem to have coincided with a worsening of the situation — incidence and cessation rates are converging. People giving up smoking are being replaced by young people taking it up.

In the period covered by the first three surveys, there was no significant change in the proportion of young people taking up smoking. The overall percentage of never-smoked remained unchanged. In the most recent survey, the proportion of never-smokers decreased suggesting that the increased focus on communicating the strong medical reasons to quit smoking has not had the effect of helping young people avoid taking the habit up in the first place. There are important differences between males and females in their responses to these campaigns. Among females, there has been a steady lengthening of the odds of being a never-smoker. This suggests that the message strategy has not been effective in helping them avoid smoking and that a steadily increasing proportion of young women are taking up smoking. Among males, there was initially no change and then a significant lengthening in the odds of being a never-smoker, indicating that a greater proportion of young men are taking up smoking than previously.

Anti-smoking policy-makers and social marketers need to reconsider their segmentation strategy. The current campaign strategy is having a different effect among young, potential smokers and older smokers wanting to quit, and a different impact on males and females.
Segmenting the market at least into smokers and potential smokers, probably incorporating an age component and further segmenting these groups by gender will generate four more homogeneous targets. The four groups are very substantial, they contain at very least, hundreds of thousands of people. They are also accessible to major media and the distinctions are operational in that unique campaigns can be developed for each segment. Demographic segmentation therefore meets the criteria for effective segmentation as set out above. Targeting may be improved by incorporating other demographic data such as occupation and income.

Appendix 1. Anti-smoking magazine ad

Every working day two Australian smokers have a limp, a port of a limb, amputated because of damage caused by smoking.

How do cigarettes do such harm so far from your lungs?

Every time you inhale tobacco smoke, toxic chemicals enter your bloodstream. As they travel to every part of your body they make your arteries thick and collect dangerous fatty deposits.

When arteries become blocked, gangrene can set in, which always requires amputation.

The graphic health warnings now on cigarette packs mean you'll be reminded of diseases like gangrene every time you reach for a cigarette.

When you look at the warnings don't just see a gross picture, imagine the person who has that disease. And imagine being that person.

Most smokers want to quit and have tried again and again before. Find out how you can increase your chances of beating your nicotine addiction by talking to a QUITline advisor.

Call today on 13 QUIT (13 7848). The number is also on every cigarette pack. So until you do give up smoking I'll be in your pocket all day, every day.
References


Smith, W. R. (1956) "Product differentiation and market segmentation as alternative marketing strategies" Journal of Marketing 21(1): 3-8


