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Perceptions about the health effects of smoking and passive smoking among Victorian adults, 2003-2007

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ABSTRACT

From March 1, 2006, Commonwealth Government legislation mandated that graphic health warnings were to appear on all tobacco products imported and manufactured for retail sale in Australia. Since this time Australian smokers have been exposed to two series of graphic health warnings on cigarette packs depicting a range of illnesses associated with smoking and passive smoking, most recently Series B. Additionally in 2007, legislation was introduced in Victoria banning smoking in the indoor areas of all hospitality venues. This report examines Victorian smokers' spontaneous and prompted recall of a range of health effects depicted in the graphic health warnings, and also examines Victorians beliefs about the illnesses caused by exposure to passive smoke, from 2003 to 2007. In 2007, there was a significant increase in the salience of a range of smoking related illnesses amongst smokers, primarily from the Series B graphic health warnings, which would have entered circulation in November 2006 as Series A was phased out. Lung cancer (Series B) was the most frequently spontaneously identified smoking related illness (50%), and spontaneous recall of this illness increased from 2006 (42%). Thirty-four per cent of Victorian smokers spontaneously identified heart disease/heart attack (Series B) as smoking caused illness, which was a trend towards an increase from 2003 (25%). Stroke/vascular disease (Series B) was spontaneously identified as a smoking related illness by 14% of smokers in 2007 and this was a significant increase from 2006 (8%). Top of mind awareness of eye problems increased significantly amongst smokers to 8%, from 3% in 2006, while spontaneous recall of pregnancy complications as smoking related illness showed a trend towards an increase from 0.3% in 2006 to 2% in 2007. Despite increases in spontaneous awareness of smoking related illness depicted in Series B, smokers still showed very low levels of top of mind awareness for a number of serious smoking related illnesses, including mouth cancer (12%), throat cancer (11%), and gangrene (6%). The lack of increase in the Series A graphic health warnings following a period of non-exposure suggests that the impact of these warnings on top of mind awareness appears to stabilise or dissipate after a period of non-exposure. The proportion of Victorians who accept the link between passive smoking and a range of illnesses, including asthma (Series A), SIDS (Series A), and pneumonia in children (Series A), increased significantly between 2006 and 2007, which is in contrast to the findings for the other Series A graphic health warnings and may be in part due to the introduction of the smoking bans in hospitality venues and other media or public health activity surrounding this.

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INTRODUCTION

Previous research has consistently demonstrated that smokers possess low levels of awareness of the full range of health effects resulting from smoking. Findings from the 2006 Victorian Smoking and Health population survey suggested that less than half (42%) of smokers were able to spontaneously recall lung cancer as a smoking caused illness, while only one in three smokers were able to spontaneously identify heart disease as a smoking caused illness.[1] These low awareness levels significantly undermine the ability of smokers to make informed decisions about their smoking and their health. A range of public health interventions introduced over the past few years have been designed to increase smokers' awareness of the multiple and significant health consequences of smoking, and to increase awareness of the harms of secondhand smoke (SHS).

From March 1, 2006, Commonwealth Government legislation mandated that graphic health warnings were to appear on all tobacco products imported and manufactured for retail sale in Australia. Since this time, Australian smokers have been exposed to two series of graphic health warnings on cigarette packs depicting a range of illnesses associated with smoking. In 2006 and 2007 a number of anti-smoking campaigns were run which reinforced some of the health effects depicted in the graphic health warnings including 'Amputation', 'Mouth Cancer', 'Carotid' and 'Voice Within', in addition to the range of television campaigns run by Quit Victoria over this period. In addition to this, new laws were implemented in Victoria on July 1, 2007, which imposed a complete ban on smoking in indoor areas of all licensed venues (including pubs, bars, nightclubs and gambling venues), and in outdoor areas at these venues if the outdoor area has a roof in place and walls that cover more than 75% of the total notional wall area.[2] A television campaign shortly after the introduction of these laws followed, highlighting the toxic nature of SHS particularly for children.

Graphic health warnings

Previous research has established that graphic health warnings on cigarette packets are an effective way to communicate health risk information to smokers.[3] As such, the Australian graphic health warnings were intended to increase the salience of smoking-related health concerns, while also contributing to the rising unacceptability of smoking for both social and health reasons.[4] Combining graphic images with detailed explanatory messages, each of the new warnings highlights a particular health effect of tobacco consumption, with several of the warnings referring to multiple smoking-related illnesses. Selection of the final set of fourteen warnings followed recommendations that were the result of extensive focus testing of a proposed set of seventeen warnings.[5] The fourteen health warnings were separated into two sets of seven, which are intended to be rotated annually, with an intermediate transition period in which any of the warnings may appear.[4]

The first set of warnings (Series A), introduced in March 2006, consisted of the following health warnings: "Smoking causes peripheral vascular disease" (refers to both gangrene and blood circulation problems); "Smoking causes emphysema"; "Smoking causes mouth and throat cancer"; "Smoking clogs your arteries"; "Don't let children breathe your smoke" (mentions pneumonia, middle ear infections, asthma attacks and SIDS); "Smoking – A leading cause of death" and "Quitting will improve your health." Series B warnings were introduced into circulation in November, 2006 and included the following warnings: "Smoking harms unborn babies" (refers to miscarriage, complications during birth and low birth weight); "Smoking causes blindness"; "Smoking causes lung cancer"; "Smoking causes heart disease"; "Smoking doubles your risk of stroke"; "Smoking is addictive" and "Tobacco smoke is toxic".

Although the Series A warnings were due to begin appearing on cigarette packets from March 1, 2006, an audit on the number of cigarette packets carrying a graphic health warning indicated that it took until September 2006 for there to be a widespread presence of the Series A warnings.[6] Furthermore, although warnings from either Series A or Series B could appear on cigarette packets during the transition period between November 2006 and March 2007, research also indicated that very few packets in December 2006 were carrying Series B warnings.[7] Therefore, smokers in 2006 were mostly exposed to the health information that appeared on the graphic health warnings from Series A, with more extensive saturation of the Series B warnings occurring from March 2007. The health information provided in each of the fourteen warnings is detailed in Appendix A.[8]

Recent research suggests that these warnings are not only being noticed but are being actively used by smokers as a quitting aide.[9] In 2006, graphic health warnings were cited by 19% of ex-smokers as helping them to make the decision to quit smoking, 23% said that the graphic health warnings had helped them while they were trying to quit, and 27% cited graphic health warnings as helping them to stay quit.[9]

Campaigns

Designed to augment the impact of the new health warnings, an extensive media campaign was run in Victoria throughout 2006. Resulting from the collaboration of several state-based tobacco control organisations, this media campaign centred around two television commercials. The first commercial, "Amputation", highlighted information from the "Smoking causes peripheral vascular disease" health warning, and that gangrene is a serious side effect of peripheral vascular disease. The second commercial, "Mouth Cancer", highlighted information from the "Smoking causes mouth and throat cancer" health warning.

In 2007 a range of media campaigns were aired to highlight the health effects of smoking, including 'Mouth Cancer' and 'Amputation'. Two further ads were developed to highlight information from the graphic health warning "Smoking doubles your risk of stroke": 'Carotid' and 'Voice within' emphasised the link between smoking and stroke using two different creative approaches. 'Carotid' used a graphic approach, showing a piece of plaque being removed from a carotid artery during surgery, while 'Voice within' used a narrative approach to illustrate the effects of stroke on a family.

Closely following the implementation of the smoking bans in the indoor areas of hospitality venues across Victoria, the 'Smokefree homes and cars' campaign was aired from August to September in 2007 to highlight the harmful effects of SHS particularly to young children, and to encourage Victorians to make their homes and cars smokefree.

Since 2003, the Centre for Behavioural Research in Cancer has collected data to examine Victorian adults' perceptions about the health effects of smoking. This report details the extent to which Victorian adults in 2007 were aware of the illnesses caused by smoking and SHS. It also examines trends in awareness levels since 2003 and explores the potential impact of the introduction of graphic health warnings and exposure to a range of anti-smoking campaigns on awareness levels over this period.

METHOD

The data presented in this report are from telephone surveys of randomly sampled Victorian adults (aged 18 years and over) conducted in November and December of 2003 (N=3001), 2004 (N=2998), 2005 (N=2999), 2006 (N=2996) and 2007 (N=3001). These annual population surveys are

commissioned by the Centre for Behavioural Research in Cancer (CBRC) and are conducted by a market research company that interviews a representative sample of Victorians by telephone each year. The questions, designed by CBRC, are asked in an eight to sixteen minute interview conducted on weekends and weeknights.

A number of items in these surveys targeted smokers' perceptions about the health effects of smoking. Understanding of the illnesses caused by smoking was assessed using both a spontaneous recall question and a prompted recall question. Smokers were initially asked if they believed that there are any illnesses caused by smoking, and then if they agreed or disagreed that the dangers of smoking have been exaggerated. The spontaneous recall item then asked those smokers who believed that there are illnesses caused by smoking, "which illnesses do you think are caused by smoking?" and smokers named as many, or as few, illnesses as they could think of. The percentage of smokers who identified each illness (out of all smokers) is reported. This spontaneous recall item indicates the health information that would be most saliently available to smokers when making decisions about their smoking behaviour[10]. Therefore, in this report we will refer to the illnesses spontaneously recalled or identified by smokers as indicating their top of mind awareness of the health effects of smoking.

In the prompted recall item, the interviewer read aloud a list of health problems that included "some that doctors believe are caused by smoking, and others which they don't believe are caused by smoking." Smokers were asked to state whether they believed that "yes - [smoking] can cause", "maybe", "no – cannot cause" or "don't know/can't say," for each illness. The percentage of smokers who believed that each illness could be caused by smoking (out of all smokers) is reported. This prompted recall item provides an indication of the extent to which smokers believe information about the health effects of smoking, and we will therefore refer to the results of this item as representing smokers' level of belief, acceptance or agreement with a particular health effect of smoking.

Non-smokers' and smokers' beliefs about the illnesses caused by exposure to SHS were also assessed using a prompted recall item. Respondents were initially asked if they believed that there are any illnesses caused by passive smoking and if they agreed or disagreed that the dangers of passive smoking have been exaggerated. Those who believed that there are illnesses caused by passive smoking were then read aloud a list of health problems that included "some that are believed to be caused by passive smoking, and others that may not be caused by passive smoking." The percentage of respondents who believed that each illness could be caused by passive smoking (out of all respondents) is reported.

The standard tobacco use question[11] was used to determine smoking status. In this report, smoking status is presented in two ways. The first way categorises respondents as *daily smokers* (smoke any tobacco products at least daily), *weekly smokers* (smoke tobacco products at least weekly, but not daily), or *less-than-weekly smokers*. The second way of categorising smoking status distinguishes between respondents who are *current smokers* of tobacco products (all daily, weekly and less-than-weekly smokers) and those who are currently *non-smokers* (including former smokers and those who have never smoked).

We also collected information about respondents' demographic characteristics, including their sex, age, education level and socio-economic status. The Socio-Economic Index for Areas (SEIFA), developed by the Australian Bureau of Statistics (ABS), was used as our measure of socio-economic status. The SEIFA indices classify respondents into socio-economic groups based on 2006 Census data of the area in which they live.[12] In this report, the Index of Socio-Economic Disadvantage (one of five SEIFA indices) was used, which is based on respondents' residential postcodes. This index ranks areas on a continuum of low to high disadvantage, taking into consideration characteristics that may impact on the socio-economic conditions of the area, such as income, education, occupation and housing (for example). For the purpose of analysis we have grouped respondents into quintiles, and then devised three groups based on these quintiles:

1. the first group, "low SES" (1st and 2nd quintiles) comprises people who live in areas with a SEIFA score in the bottom 40% of Victoria's distribution (this represents a higher level of disadvantage relative to the other two groups);
2. the second group, "mid SES" (2nd and 3rd quintiles) includes people whose SEIFA score lies between 41% and 80% of the distribution;
3. the third group, "high SES" (5th quintile) includes those whose SEIFA score is 81% or above (reflecting the lowest level of disadvantage relative to the other groups).[12]

The proportion of respondents from the 2007 population telephone survey sample (N=3001) who were classified into each SEIFA group differed only slightly from the proportion of the Victorian population that falls into each SEIFA group.[12] In 2007, 32.6% of the telephone survey sample were classified into the "low SES" group (quintiles 1&2), compared with 36.1% of the Victorian population; 40.3% of the survey sample were classified into the "mid SES" group (quintiles 3&4), compared with 38.3% of the Victorian population; 27.0% of the survey sample were classified into the "high SES" group (quintile 5), compared with 25.6% of the Victorian population.

Statistical analysis

A comparison of the sample socio-demographic characteristics with the Australian Bureau of Statistics (ABS) Census data for the Victorian population[13] revealed that women and older people were over-represented in the telephone survey samples. To adjust for this, the data from all years were weighted by age and sex according to ABS 2001 final estimates of the Victorian population, from the 2001 Census.[13]

First, a series of analyses explored changes in spontaneous recall of smoking related illness according to smoking frequency (see Table 3) and over time (Table 4). A second series of analyses explored the impact of sex, age, education level and socio-economic status on respondents' spontaneous recall of smoking-related illnesses in 2007, and whether there had been changes in spontaneous recall amongst any of these demographic sub-groups over time (see Table B1 in Appendix B). Additionally, a final set of analyses explored whether there had been any significant changes from 2006 to 2007, overall and amongst sub-groups, to examine any changes in spontaneous recall following the introduction of the Series B graphic health warnings. The results of these analyses are presented for each of the illnesses that are featured in the graphic health warnings on cigarette packets.

Next, a series of analyses explored changes in prompted recall of smoking related illness according to smoking frequency (see Table 5) and over time (Table 6). A second series of analysis explored the impact of sex, age, education level and socio-economic status on respondents' prompted recall of smoking-related illnesses in 2007, and whether there had been changes in prompted recall amongst any of these demographic sub-groups over time (see Table B2 in Appendix B). Additionally, a final set of analyses explored whether there had been any significant changes from 2006 to 2007, overall and amongst sub-groups, to examine any changes in prompted recall following the introduction of the Series B graphic health warnings. The results of these analyses are presented for each of the illnesses that are featured in the graphic health warnings on cigarette packets.

A final series of analyses explored the effect of smoking status (see Table 11), sex, age, education level and socio-economic status (see Table B3 in Appendix B) on respondents' beliefs about passive smoking-related illnesses. These analyses also explored whether there had been any changes in smokers' beliefs about the illnesses caused by passive smoking over time (Table 12), and the extent to which changes over time differed within demographic subgroups (see Table B3 in Appendix B).

To report the data, descriptive techniques such as percentages have been used. When testing for the significance of relationships between demographic variables and knowledge of illnesses, bivariate logistic regression analyses were initially used. Logistic regression analyses were also used to examine the changes in knowledge over time. For ease of reading, details of these statistical tests are not included in the report. Where relationships between variables are reported, the p-value was less than 0.01. This indicates that the probability of obtaining a result at least as big as the one observed, assuming that there is no relationship, is less than or equal to 1 in 100. Where trends towards a relationship between variables are reported, the p-value was less than or equal to 0.05, indicating that the probability of obtaining a result at least as big as the one observed, assuming that there is no relationship, is less than 1 in 20.

RESULTS

In 2007, 88% of current smokers believed that there are illnesses caused by smoking, with 7% not believing that smoking causes any illnesses and 5% indicating that they didn't know. The belief that smoking causes illnesses did not differ significantly across daily (87%), weekly (94%) or less than weekly smokers (95%). Just over 70% of smokers in 2007 did not believe the dangers of smoking have been exaggerated, while 22% thought they had been exaggerated. Less-than-weekly smokers were more likely to disagree that the dangers of smoking have been exaggerated, compared with daily smokers (87% and 68%, respectively).

Table 1:
Smokers' perceptions about the health effects of smoking, by smoking frequency, 2007

	Total smokers (N=573) %	Daily smoker (n=471) %	Weekly smoker (n=47) %	Less-than-weekly smoker (n=55) %
Believe illnesses are caused by smoking				
Yes	88.3	87.1	93.9	94.5
No	6.9	8.0	3.7	0.0
Don't know / Can't say	4.7	4.9	2.4	5.5
Believe the dangers of smoking are exaggerated				
Disagree	71.0	68.1	82.0	86.7
Neither agree / disagree	2.3	2.1	0.0	5.4
Agree	21.5	24.1	15.1	4.0
Don't know / Can't say	5.3	5.7	2.8	3.9

As indicated in Table 2, the extent to which smokers believe that there are illnesses caused by smoking has not significantly changed across the years 2003 (90%) to 2007 (88%), however there was a trend toward a decline in this belief between 2006 (92%) and 2007. The proportion of smokers who *disagreed* that the dangers of smoking have been exaggerated remained stable across the years 2003 (75%) to 2007 (71%), and there was no significant difference between 2006 (78%) and 2007.

Table 2:

Smokers' perceptions about the health effects of smoking: Changes over time

	2003 (N=524) %	2004 (N=638) %	2005 (N=594) %	2006 (N=589) %	2007 (N=573) %
Believe illnesses are caused by smoking					
Yes	89.9	90.9	92.6	92.1	88.3
No	6.6	5.3	3.6	5.2	6.9
Don't know / Can't say	3.5	3.8	3.8	2.7	4.7
Believe the dangers of smoking are exaggerated					
Disagree	74.8	74.3	75.9	77.8	71.0
Neither agree / disagree	2.9	1.1	3.4	1.6	2.3
Agree	20.3	22.9	17.5	19.0	21.5
Don't know / Can't say	2.0	1.6	3.3	1.6	5.3

Spontaneous recall of the illnesses caused by smoking

In 2007, the illnesses that smokers most frequently spontaneously associated with smoking were lung cancer (50%), unspecified 'cancer' (37%), emphysema (34%), and heart disease/attack (34%). Stroke/vascular disease was identified by 14% of smokers, while circulation problems/blood problems, and mouth/oral cancer were both spontaneously associated with smoking by 12%, and throat cancer was identified by a further 11%. Under 10% of smokers spontaneously identified bronchitis/difficulty breathing (8%), eye problems (8%), gangrene (6%), asthma (6%) or pregnancy complications (including miscarriage) (2%) as illnesses caused by smoking.

'Smoking causes lung cancer' (Series B)

In 2007, lung cancer was the most frequent spontaneously identified smoking related illness (50%). Between 2003 and 2007 there was a significant linear decline in the proportion of smokers spontaneously identifying lung cancer as caused by smoking. However there was a significant increase between 2006 and 2007, from 42% to 50% respectively (Table 4). In 2007, those living in areas of lowest *dis*advantage (high SES) were more likely to spontaneously identify lung cancer as caused by smoking compared with those living in areas of high *dis*advantage (low SES), and tended to be identified by those in the high SES group more so than by those in mid SES groups. Despite this, between 2003 and 2007 there was a significant increase in the frequency that lung cancer was spontaneously identified by those in the low SES and mid SES groups (Appendix B1).

'Smoking causes Emphysema' (Series A)

In 2007, over one-third of smokers (34%) spontaneously identified emphysema as an illness caused by smoking, no overall change since 2003, however this represented a significant decline between 2006 (43%) and 2007. In 2007, those aged 18-29 years were less likely to have mentioned emphysema as being caused by smoking, compared to those aged 30-49 years (25% and 39% respectively). Spontaneous identification of emphysema in 2007 was not related to respondent's sex, smoking frequency or socio-economic status.

Table 3:

Smokers' spontaneous recall of the illnesses caused by smoking, by smoking frequency, 2007

	Total smokers (N=573) %	Daily smoker (n=471) %	Weekly smoker (n=47) %	Less-than-weekly smoker (n=55) %
Emphysema[a]	**34.3**	**33.9**	**42.7**	**30.7**
"Cancer"	36.6	36.0	48.9	30.9
Lung cancer[b]	**49.6**	**47.1**	**52.6**	**68.9**
Heart disease/attack[b]	**34.3**	**33.0**	**39.1**	**41.3**
Bronchitis/difficulty breathing	7.9	9.0	2.8	3.2
Mouth / oral cancer[a]	**11.9**	**11.8**	**8.8**	**14.8**
Gangrene[a]	**5.8**	**5.8**	**8.0**	**4.3**
Circulation problems / blood problems	12.3	12.5	13.0	10.1
Asthma	5.8	4.8	9.7	10.3
Throat cancer[a]	**11.0**	**10.9**	**11.7**	**11.0**
Stroke / vascular disease[b]	**13.8**	**13.9**	**15.7**	**11.8**
Eye problems[b]	**7.6**	**7.3**	**14.6**	**4.1**
Pregnancy complications (incl. miscarriage)[b]	**1.5**	**1.3**	**0.0**	**4.7**
No illnesses caused	0.2	0.2	0.0	0.0
Don't know / Can't say	2.0	2.5	0.0	0.0

Note. Illnesses in bold are among those mentioned in the graphic health warnings for tobacco products.
[a] = these illnesses were the main focus of graphic health warnings from Series A.
[b] = these illnesses were the main focus of graphic health warnings from Series B.

'Smoking causes heart disease'/'Smoking clogs your arteries' (Series A & Series B)

In 2007, over one-third (34%) of smokers mentioned heart disease/heart attack as a cause of smoking, a trend toward a significant increase since 2003, but no change between the years 2006 (30%) and 2007. Spontaneous identification of heart disease/attack in 2007 was not related to respondent's sex, age, smoking frequency or socio-economic status. However, there was a significant increase in the identification of this disease among males between 2003 and 2007 (Appendix B1).

'Smoking causes mouth and throat cancer ' (Series A)

In 2007, mouth cancer was mentioned spontaneously by 12% of smokers, unchanged since 2006, but a significant linear increase since 2003 (3%). Those aged 30-49 years tended to be more likely to spontaneously mention mouth cancer as caused by smoking compared to those aged 50 years and over (15% and 7% respectively), with identification of mouth cancer significantly increasing across 2003 and 2007 for this 30-49 year age group. There was also a trend toward an increase across this time for the younger and older age groups. Smokers living in areas of low *dis*advantage (high SES) were more likely to mention mouth cancer as caused by smoking than those living in areas of relatively high *dis*advantage (low SES and mid SES) (24% compared with 10% and 9% respectively). However among those in the highest *dis*advantaged groups (Low

SES), there was a significant increase between 2003 and 2007 in the frequency of mouth cancer being mentioned spontaneously as well as a trend toward a significant increase among the mid SES groups. Identification of mouth cancer also significantly increased over this time for those in the high SES group. Spontaneous identification of mouth cancer in 2007 was not related to respondent's sex, however there was a significant increase from 2003 to 2007 for males and females, and among daily smokers (Appendix B1).

Throat cancer was mentioned spontaneously by 11% of smokers in 2007, a trend toward a significant increase since 2003 but no difference between 2006 and 2007. Respondents living in areas of low disadvantage (high SES) tended to report throat cancer more frequently than those living in areas of moderate *dis*advantage (mid SES) (18% compared with 9%), but not differently to those living in areas of high *dis*advantage (low SES). Respondents in the less disadvantaged group also tended to identify throat cancer more over the 2003 to 2007 period. There were no other demographic differences in the spontaneous recall of throat cancer as caused by smoking, however there was a significant increase in throat cancer being identified by daily smokers between 2003 and 2007.

'Smoking causes peripheral vascular disease' (Gangrene) (Series A).

In 2007, 6% of smokers spontaneously identified gangrene as being caused by smoking. This was an overall significant increase since 2005 (1%), however also represented a significant decline from 2006 (12%). In 2007, respondents living in areas of high *dis*advantage (SEIFA 1& 2) tended to mention gangrene as a disease caused by smoking more often than those living in areas of low *dis*advantage (SEIFA 5) (9% compared with 2%, respectively). Across the period 2003 to 2007 there were significant increases in the frequency of gangrene being spontaneously identified by males and females, across all age groups and education levels, as well as socio-economic groups (Appendix B1).

'Smoking doubles your risk of stroke' (Series B)

Stroke/vascular disease was spontaneously identified by 14% of smokers in 2007, a significant increase overall since 2003 (8%), and a significant increase from 2006 (8%) (Table 4). There were no significant differences found in 2007 between demographic groups and the frequency of spontaneous recall of stoke/vascular disease as caused by smoking. However there was a significant increase in the frequency of stroke being spontaneously recalled by smokers living in areas of high disadvantage (low SES) between 2003 and 2007, among females, and among those with a tertiary education (Appendix B1).

'Smoking causes blindness' (Series B)

In 2007, 8% of smokers spontaneously mentioned eye problems as a smoking related illness. This represented a significant increase since 2006 (3%) and a trend toward a significant increase across 2003 to 2007. In 2007, smokers aged 18-29 years and 30-49 years tended to be more likely to mention eye problems spontaneously than were those aged 50 years or more (9% and 9% compared with 3%, respectively). Those living in areas of high disadvantage (low SES) were less likely to mention eye problems as a smoking related illness than those living in areas of moderate disadvantage (mid SES) (4% compared with 12%). Across 2003 to 2007, there was a significant increase in eye problems being spontaneously identified among 30-49 year olds, as well as those in the mid SES group (Appendix B1).

'Smoking harms unborn babies' (Series B)

The spontaneous recall of 'pregnancy complications' as being caused by smoking did not significantly change across the years 2003 to 2007. However, there was a trend toward a significant increase between 2006 and 2007, from 0.3% to 2% (Table 4). Spontaneous identification of pregnancy complications in 2007 was not related to respondent's sex, age, socio-economic status or smoking frequency.

Table 4:

Smokers' spontaneous recall of the illnesses caused by smoking: Changes over time

	2003 (N=524) %	2004 (N=638) %	2005 (N=594) %	2006[1] (N=589) %	2007[2] (N=573) %
Emphysema[a]	**39.1**	**34.2**	**34.9**	**42.8***	**34.3**
"Cancer"	18.1	39.0	33.7	42.6^	36.6*
Lung cancer[b]	**66.0**	**48.9**	**54.5**	**41.6***	**49.6****
Heart disease/attack[b]	**25.2**	**31.8**	**34.7**	**29.6**	**34.3^**
Bronchitis/difficulty breathing	9.5	17.6	11.3	15.7**	7.9
Mouth / oral cancer[a]	**3.4**	**7.0**	**5.1**	**12.0**	**11.9****
Gangrene (peripheral vascular disease)[a]	***n/a***	***n/a***	**0.6**	**11.9****	**5.8****
Circulation problems / blood problems	4.3	10.9	11.4	11.1	12.3**
Asthma	7.2	12.0	6.7	11.1**	5.8
Throat cancer[a]	**5.6**	**11.8**	**15.0**	**10.7**	**11.0^**
Stroke / vascular disease[b]	**7.7**	**7.3**	**8.5**	**7.5****	**13.8****
Eye problems[b]	**3.2**	**5.2**	**7.2**	**3.2****	**7.6^**
Pregnancy complications (incl. miscarriage)[b]	**0.1**	**1.5**	**0.5**	**0.3^**	**1.5**

Note. Illness in bold are among those mentioned in the new graphic health warnings for tobacco products. No data was available for spontaneous recall of "gangrene" in 2003 or 2004.
[a] = these illnesses were the main focus of graphic health warnings from Series A.
[b] = these illnesses were the main focus of graphic health warnings from Series B.
[1] Significant differences in this column relates to comparisons between 2006 and 2007
[2] Significance differences in this column refers to linear trends over time
^ Trend toward significance, at p<=.05
* Significant at p<=.01
**Significant at p<=.001

Prompted recall of the illnesses caused by smoking

'Smoking causes lung cancer' (Series B)

In 2007, 85% of smokers agreed, when prompted, that smoking causes lung cancer (Table 6), a significant decline since 2003 (93%), and a trend toward a significant decline since 2006 (89%). Older respondents (aged 50 years or more) tended to be less likely to agree that smoking causes lung cancer compared with those aged 30-49 years (78% compared with 86%, respectively). There was no difference between the two younger age groups, as well as no differences between males and females, socio-economic groups or frequency in smoking (Appendix B2).

'*Smoking causes emphysema' (Series A)*

In 2007, 83% of smokers agreed, when prompted, that smoking causes emphysema, a trend toward a significant decline since 2006, but little change since 2003 (Table 6). Agreement that smoking causes emphysema was not related to respondents' sex, age, socio-economic status or smoking frequency.

Table 5:
Smokers' prompted recall of the illnesses caused by smoking, by smoking frequency, 2007

	Total smokers (N = 574) %	Daily smoker (n = 472) %	Weekly smoker (n = 47) %	Less-than-weekly smoker (n = 55) %
Lung cancer[b]	**84.6**	**82.9**	**93.9**	**90.6**
Emphysema[a]	**82.6**	**81.1**	**92.1**	**87.2**
Throat cancer[a]	**82.5**	**80.5**	**93.9**	**90.6**
Mouth / oral cancer[a]	**80.6**	**78.5**	**90.2**	**90.6**
Heart disease[b]	**78.9**	**76.4**	**92.1**	**89.1**
Larynx cancer	74.7	72.6	83.3	85.6
Stroke[b]	**75.4**	**73.4**	**86.7**	**83.3**
Oesophageal cancer	70.7	68.7	79.5	81.4
Gangrene[a]	**60.2**	**57.7**	**73.7**	**70.3**
Stomach cancer	45.2	42.1	54.1	63.8
Miscarriage[b]	**40.7**	**36.1**	**59.1**	**64.0**
Blindness[b]	**50.6**	**47.8**	**67.7**	**60.0**
Pancreatic cancer	34.1	30.7	54.1	46.0
Kidney cancer	31.4	28.7	51.1	38.4
Bladder cancer	26.2	24.0	40.8	32.5
Cervical cancer in women	24.9	22.5	34.0	38.0
Hepatitis C[c]	5.1	4.6	7.7	6.9

Note. Illnesses in bold are among those mentioned in the new graphic health warnings for tobacco products.
[a] = these illnesses were the main focus of graphic health warnings from Series A.
[b] = these illnesses were the main focus of graphic health warnings from Series B.
[c] Hepatitis C is not caused by smoking.

'Smoking causes mouth and throat cancer' (Series A)

In 2007, 81% of smokers agreed, when prompted, that smoking can cause mouth cancer, little change since 2004 (79%) and no real change since 2006 (83%). Daily smokers tended to be less likely than less than weekly smokers to agree that mouth cancer can be caused by smoking (79% compared with 91%, respectively), while younger smokers (aged 18-29 years and 30-49 years) were significantly more likely to agree than older smokers (50 years +) (85% and 83%, compared to 72%, respectively). Smokers living in areas of low disadvantage (high SES) also tended to be more likely to agree than those living in areas of high disadvantage (low SES) (87% and 76% respectively).

In 2007, 83% of smokers agreed, when prompted, that smoking causes throat cancer, a trend toward a significant linear decline since 2004 (86%) (Table 6). Daily smokers tended to agree that smoking causes throat cancer less often than weekly smokers (81% compared with 94%, respectively). Smokers aged 50 years and over were significantly less likely to agree that smoking causes throat cancer than those aged 30-49 years (74% compared with 85%, respectively) and also tended to agree less often than smokers aged 18-29 years (86%).

Table 6:

Smokers' prompted recall of illnesses caused by smoking: Changes over time

	2003 (N=524) %	2004 (N=638) %	2005 (N=594) %	2006[1] (N=589) %	2007[2] (N=573) %
Lung cancer[b]	**93.2**	***n/a***	***n/a***	**88.5^**	**84.6****
Emphysema[a]	**88.8**	**82.8**	**84.5**	**86.9^**	**82.6**
Throat cancer[a]	***n/a***	**86.4**	**87.2**	**85.8**	**82.5^**
Mouth / oral cancer[a]	***n/a***	**79.1**	**78.4**	**82.5**	**80.6**
Heart disease[b]	**84.4**	**81.8**	**83.2**	**82.0**	**78.9^**
Larynx cancer	*n/a*	77.4	79.0	73.9	74.7
Stroke[b]	***n/a***	***n/a***	**76.4**	**73.3**	**75.4**
Oesophageal cancer	*n/a*	74.0	73.7	71.8	70.7
Gangrene[a]	***n/a***	***n/a***	**27.5**	**67.4^**	**60.2****
Stomach cancer	*n/a*	47.8	44.2	46.3	45.2
Miscarriage[b]	**48.7**	***n/a***	**47.5**	**42.3**	**40.7***
Blindness[b]	***n/a***	***n/a***	***n/a***	**39.7****	**50.6****
Pancreatic cancer	*n/a*	29.6	30.0	29.1	34.1
Kidney cancer	*n/a*	28.2	26.6	27.2	31.4
Bladder cancer	*n/a*	20.7	26.0	25.9	26.2^
Cervical cancer in women	30.8	23.7	22.9	23.1	24.9
Hepatitis C[c]	4.8	5.9	6.5	6.2	5.1

Note. Illnesses in bold are among those mentioned in the new graphic health warnings for tobacco products.
n/a = respondents were not prompted about their knowledge of these illnesses in these years.
[a] = these illnesses were the main focus of graphic health warnings from Series A.
[b] = these illnesses were the main focus of graphic health warnings from Series B.
[1] Significant differences in this column relates to comparisons between 2006 and 2007
[2] Significance differences in this column refers to linear trends over time
[c] Hepatitis C is not caused by smoking.
^ Trend toward significance, at p<=.05
* Significant at p<=.01
**Significant at p<=.001

'Smoking causes heart disease/attack'

Over three-quarters (79%) of smokers agreed, when prompted, that smoking can cause heart disease/attack, a trend toward a significant difference since 2003 (84%) but not significantly different to 2006 (82%). Daily smokers tended to be less likely than weekly and 'less than weekly' smokers to agree that smoking causes heart disease/attack (76% compared with 92% and 89%,

respectively) (Table 5). Older respondents (aged 50 years +) were also less likely to agree than those aged 18-29 years (70% compared with 85%, respectively) and tended to be less likely to agree than those aged 30-49 years (80%). Those smokers living in areas of low disadvantage (high SES) tended to be more likely to agree that smoking causes heart disease/attack than those living in areas of high disadvantage (low SES) (85% compared with 75%, respectively).

'Smoking doubles your risk of stroke' (Series B)

In 2007, three-quarters (75%) of smokers agreed, when prompted, that smoking can cause stroke, similar to 2006 (73%). Smokers aged either 18-29 years or 30-49 years were both significantly more likely to agree that stoke can be caused by smoking than those aged 50 years or more (81% and 78% compared with 64%, respectively).

'Smoking causes blindness' (Series B)

The number of smokers who agreed, when prompted, that smoking can cause blindness increased significantly between 2006 (40%) and 2007 (51%). There was a trend toward daily smokers being less likely to agree that smoking can cause blindness than weekly smokers (48% and 68%, respectively), and older (50 years +) smokers being less likely to agree compared with younger smokers (18-29 years) (36% and 60% respectively).

'Smoking causes gangrene' (Series A)

Between 2005 and 2007, the proportion of smokers who agreed, when prompted, that smoking can cause gangrene significantly increased, from 28% to 60% respectively. However, there was a trend toward a significant decline from 2006 (67%) to 2007. Daily smokers tended to be less likely to agree that smoking can cause gangrene (58%) than weekly smokers (75%), while there was a significant difference in agreement between those aged 18-29 years and those aged 30-49 years, compared with those aged 50 years or more (66% and 63% compared with 49%, respectively). Prompted recall of gangrene as caused by smoking was not associated with respondent's sex or socio-economic status.

'Smoking harms unborn babies' (Series B)

In 2007, 41% of smokers agreed, when prompted, that smoking can cause miscarriage, representing a significant decline across the years since 2003 (49%), but no change since 2006 (42%). Daily smokers were less likely than weekly and 'less than weekly' smokers to agree that smoking can cause miscarriage, (36% compared to 59% and 64%, respectively), while men were more likely than women to do so (46% and 35% respectively). Between 2006 and 2007, there was a significant decline in the number of female smokers who believed smoking can cause miscarriage (from 47% to 35%). Older smokers (aged 50 years +) were also less likely to agree, than smokers aged 18-29 years and 30-49 years (25% compared with 54% and 42%, respectively), while there was a trend toward a significant difference between the two younger age groups. Smokers who were living in areas of high disadvantage were significantly less likely to agree that smoking can cause miscarriage (31%) than smokers living in areas of relative lower disadvantage (mid SES, 43%; high SES, 56%), while there was a trend toward a significant difference between the latter two groups.

Non-smokers' and smokers' beliefs about the illnesses caused by second-hand smoke (SHS): prompted recall

In 2007, 79% of all respondents believed that there are illnesses caused by passive smoking, with an additional 9% reporting they did not believe this (Table 9). Non-smokers (83%) were significantly more likely to believe that passive smoking causes illnesses than were current smokers (64%). As indicated in Table 10, the extent to which Victorian adults believe that passive smoking causes illnesses has not changed significantly over the past four years.

Three-quarters (75%) of all respondents in 2007 *dis*agreed that the dangers of passive smoking have been exaggerated, with a further 19% agreeing they have been exaggerated (Table 9). Non-smokers were significantly more likely to disagree that the dangers of passive smoking have been exaggerated (80%) than were current smokers (54%). As indicated by Table 10, the proportion of respondents who believe the dangers of passive smoking are exaggerated had not changed significantly across the years 2004 to 2007.

Table 9:

Non-smokers' and smokers' perceptions about the health effects of SHS, 2007

	Total Sample (N=3002) %	Smokers[a] (n=573) %	Non-smokers[b] (n=2429) %
Believe illnesses caused by *passive* smoking			
Yes	79.4	64.1	83.1
No	8.6	17.0	6.7
Don't know / Can't say	11.9	18.9	10.3
Believe the dangers of *passive* smoking are exaggerated			
Disagree	74.6	54.1	79.5
Neither agree / disagree	1.1	1.4	1.0
Agree	19.3	38.0	14.9
Don't know / Can't say / Refused	5.0	6.6	4.6

[a] Includes daily, weekly and less-than-weekly smokers.
[b] Includes former smokers and never smokers.

Table 10:

Non-smokers' and smokers' perceptions about the health effects of SHS: Changes over time

	2004 (N=2998) %	2005 (N=2999) %	2006 (N=2996) %	2007 (N=3001) %
Believe illnesses are caused by *passive* smoking				
Yes	80.2	80.1	79.0	79.4
No	7.6	6.5	8.0	8.6
Don't know / Can't say	12.2	13.4	13.0	11.6
Believe the dangers of *passive* smoking are exaggerated				
Disagree	77.2	77.4	79.4	74.6
Neither agree / disagree	2.0	2.3	1.1	1.1
Agree	16.5	16.2	15.9	19.3
Don't know / Can't say	4.3	4.1	3.7	5.0

One of the graphic health warnings on tobacco products specifically focuses on the health effects of passive smoking. 'Don't let children breath your smoke' (Series A) states that children who are exposed to passive smoke have an increased risk for experiencing pneumonia, middle ear infections and asthma attacks. It also states that babies exposed to passive smoke are at greater risk of SIDS. Next we focus on the level of agreement that passive smoking causes these diseases.

Asthma

In 2007, 71% of respondents agreed, when prompted, that asthma can be caused by passive smoking, no real change since 2004 (70%), however a significant increase from 2006 (67%). Non-smokers were significantly more likely than smokers to agree that passive smoking causes asthma (74% compared with 56%, respectively), while those aged 30-49 years were more likely to agree (75%) than those aged 18-29 years (69%) or 50 years and over (67%). Females (75%) were more likely to agree that passive smoking causes asthma than were males (66%), while those living in areas of low disadvantage (high SES) were more likely to agree with this than those living in areas of high disadvantage (low SES) (75% compared with 68%, respectively), and tended to agree more so than those living in areas of moderate disadvantage (mid SES) (70%).

Pneumonia in children

In 2007, 37% of respondents agreed, when prompted, that second-hand smoke can cause pneumonia in children, representing a significant linear increase since 2005 (33%), and significant increase since 2006 (33%). Non-smokers tended to be more likely than smokers to agree with this (38% compared with 33%, respectively), while females (40%) were more likely than males (33%) to do so. Respondents aged 30-49 years were also more likely than those aged 50 years or more to agree that pneumonia in children can be caused by exposure to second-hand smoke.

Table 11:

Non-smokers' and smokers' prompted recall of the illnesses caused by SHS, 2007

	Total Sample (N=3002) %	Smokers[a] (n=573) %	Non-smokers[b] (n=2429) %
Lung cancer	72.7	55.1	76.9
Asthma[a]	**70.7**	**55.5**	**74.3**
Emphysema	66.3	52.8	69.5
Heart disease	60.9	48.5	63.8
Bronchitis	62.0	49.7	65.0
Pneumonia in children[a]	**36.9**	**32.6**	**37.9**
SIDS[a]	**35.8**	**30.4**	**37.0**
Miscarriage[b]	**34.6**	**26.2**	**36.6**
Cervical cancer	19.9	15.7	20.8
Middle ear infections in children[a]	**13.1**	**13.1**	**13.1**

Note. Illnesses in bold are among those mentioned in the new graphic health warnings for tobacco products.
[a] Includes daily, weekly and less-than-weekly smokers.
[b] Includes former smokers and never smokers.

SIDS

In 2007, 36% of respondents agreed, when prompted, that SIDS can be caused by exposure to second-hand smoke, a significant linear increase since 2004 (30%) and a significant increase from 2006 (31%). Non-smokers were more likely to agree with this than were smokers (37% compared with 30%, respectively), while females were also more likely to agree than were males. Those aged 30-49 years were more likely to agree that SIDS can be caused by exposure to second hand smoke (45%) than were both younger (18-29 years) (36%) and older (50 years or older) respondents (26%). There was also a significant difference between the younger and older age groups.

Middle ear infections in children

In 2007, 13% of respondents agreed, when prompted, that second hand smoke exposure can cause middle ear infections in children, which represented a significant linear increase across the years since 2005 (12%), but a significant decline from 2006 (16%). There was no difference in levels of agreement between smokers and non-smokers, males and females, or socio-economic groups. However, those aged 30-49 years were more likely to believe this than older smokers (aged 50 years and over) (15% compared with 11%, respectively), while younger participants (18-29 years) tended to believe this more so (15%) than older smokers.

Table 12:

Non-smokers' and smokers' prompted recall of the illnesses caused by SHS: Changes over time

	2004 (N=2998) %	2005 (N=2999) %	2006[1] (N=2996) %	2007[2] (N=3002) %
Lung cancer	73.2	71.4	71.1	72.7
Asthma[a]	**69.5**	**68.7**	**67.2***	**70.7**
Emphysema	65.1	65.4	64.8	66.3
Heart disease	59.9	57.8	57.1*	60.9
Bronchitis	61.0	58.4	56.4**	62.0
Pneumonia in children[a]	***n/a***	**32.7**	**32.8****	**36.9****
SIDS[a]	**30.4**	**29.5**	**30.9****	**35.8****
Miscarriage[b]	**29.6**	**30.3**	**30.6****	**34.6****
Cervical cancer	16.5	18.7	19.9	19.8**
Middle ear infections in children[a]	***n/a***	**11.8**	**15.6***	**13.1****

[a]Series A graphic health warnings
[b]Series B graphic health warnings
[1] Significant differences in this column relates to comparisons between 2006 and 2007
[2] Significance differences in this column refers to linear trends over time
^ Trend toward significance, at p<=.05
* Significant at p<=.01
**Significant at p<=.001

DISCUSSION

A number of public health interventions introduced since 2006, including graphic health warnings and television campaigns designed to augment these warnings, have meant that Victorian smokers have been exposed to a rotating stream of information about the multiple and significant health consequences of smoking. At the time of this survey in 2007, smokers would have been exposed to the Series B graphic health warnings for at least 7 months, as Series B entered circulation in November 2006, and would have completely replaced the Series A graphic health warnings by March 2007. The dangers of exposure to SHS was also a focus of public health activity in 2007, with the introduction of smoking bans in indoor areas of hospitality venues across Victoria in July 2007, and the airing of the 'Smokefree homes and cars' television campaign. Illnesses resulting from exposure to SHS are also featured in both Series A and Series B of the graphic health warnings.

Whilst overall beliefs about the link between smoking and illness, including those illnesses depicted by the graphic health warnings, have not changed dramatically over the past few years, in 2007 there were increases in top of mind awareness of a variety of illnesses associated with smoking primarily from the Series B of graphic health warnings. In 2007, 88% of all smokers believed that smoking can cause illnesses, and this is not significantly different from 2003 (90%), though there was a trend toward a decline from 2006 (92%). The proportion of smokers who disagreed that the dangers of smoking have been exaggerated remained stable from previous years (75% in 2003 to 71% in 2007).

Series A warnings

In 2007, smokers did not show any increase in spontaneous awareness of the illnesses featured in the Series A graphic health warnings, but had shown significant increases in awareness of these illnesses in 2006 compared to previous years. Of the Series A graphic health warnings, emphysema was most likely to be spontaneously identified as smoking related illness (34%) which was a significant decline in spontaneous recall from 2006 (43%) and no different to 2003 (39%). Top of mind awareness of mouth/oral cancer (12%) increased significantly from 2003 (3%) but was not different to spontaneous recall in 2006 (12%). Top of mind awareness of throat cancer (11%) showed a trend toward a significant increase from 2003 (6%) but did not change from 2006 (11%). Smoker's spontaneous awareness of gangrene as smoking related illness was 6% in 2007, an increase from 2005 (1%), but was a significant decrease from 2006 (12%).

There was no increase and some evidence of a decline in smokers' acceptance of the link between smoking and those illnesses depicted by the Series A graphic health warnings. In 2007, 83% smokers agreed when prompted, that smoking causes emphysema, which was not significantly different from previous years. Eighty-three per cent of smokers agreed that smoking causes throat cancer, a trend towards a significant decline since 2004 (86%). Eighty-one per cent of smokers believed that smoking causes mouth/oral cancer, and this has remained fairly stable since 2004. In 2007, 60% of smokers agreed that smoking causes gangrene, and while this was a significant increase from 2005 (26%), it was also a significant decline from 2006 (67%).

Smokers' spontaneous and prompted recall of the majority of the health effects depicted in Series A graphic health warnings have remained stable or have declined since 2006. Previous research

conducted following saturation of the Series A graphic health warnings in 2006[1], demonstrated an immediate increase in top of mind awareness amongst smokers of the range illnesses depicted in this series, in comparison to smokers' spontaneous recall of the same illnesses in 2005. As the Series A graphic health warnings would have been out of circulation for at least seven months at the time of this survey, this would suggest that the ability of graphic health warnings to increase the salience of smoking related illnesses amongst smokers is likely to stabilise or decline after a period of non-exposure.

Series B warnings

In 2007, lung cancer was the most frequent spontaneously identified smoking related illness (50%), and this increased significantly from 2006 (42%). Just over one-third of smokers (34%) spontaneously identified heart disease/heart attack as a smoking related illness, which was not significantly different to spontaneous awareness in 2006 (30%), but was a trend toward a significant increase from 2003 (25%). Stroke/vascular disease was spontaneously identified as a smoking related illness by 14% of smokers in 2007 and this was a significant increase from 2006 (8%). Top of mind awareness of eye problems increased significantly amongst smokers to 8%, from 3% in 2006. Spontaneous recall of pregnancy complications as smoking related illness showed a trend towards an increase from 0.3% in 2006 to 2% in 2007.

Eighty-five per cent of smokers agreed when prompted that smoking causes lung cancer, which was a significant decline from 2003 (93%) and a trend toward a decline from 2006 (89%). Over three-quarters (79%) of smokers believed that smoking can cause heart disease/attack, which was a trend toward a significant decline since 2003 (84%), but no different to 2006 (82%). Three-quarters (75%) of smokers accepted that smoking can cause stroke, which remained fairly stable from 2006 (73%). In 2007, there was a significant increase in the proportion of smokers who agreed that smoking causes blindness (51%), up from 40% in 2006. Forty-one per cent of smokers agreed when prompted that smoking can cause miscarriage, which did not represent a significant increase from 2006 (42%).

Overall, the warnings do not appear to have significantly influenced beliefs about the link between smoking and illness, however there is already a high level of acceptance of the link between smoking and many of the illnesses featured in the graphic health warnings, which stands in contrast to the much lower levels of top of mind awareness for these same illnesses. The period of exposure to the Series B graphic health warnings has been associated with a significant increase in smokers' top of mind awareness of the smoking related illnesses depicted in the series, with the exception of heart disease/attack. It is the information that is salient or top of mind that is most likely to be used by smokers in making decisions about their health[10]. Repeated exposure to these health warnings should result in the link between smoking and a range of illnesses being more consciously available to smokers when they are weighing up decisions about their smoking and their health. With recent research finding that 19% of ex-smokers cited health warnings as helping them decide to quit, just under a quarter (23%) stating the graphic health warnings helped them while they were quitting, and over a quarter (27%) stating that they helped them to stay quit[9], it suggests the graphic health warnings have the potential to assist smokers at all phases of the quitting experience, most likely by increasing the salience of the many serious health consequences of smoking and thereby increasing their motivation to become and remain a non-smoker.

Despite the increases in top of mind awareness of a range of illness depicted in Series B health warnings amongst smokers in 2007, awareness of the link between smoking and many of these illnesses remain alarmingly low. Just over three in ten smokers (34%) are able to identify heart disease/attack as a smoking related illness, less than one in six smokers (14%) identified stroke/vascular disease as a smoking caused illness, and just over one in ten smokers (11%) were able to identify throat cancer as an illness caused by smoking. Less than one in 10 smokers were able to spontaneously identify bronchitis/difficulty breathing (8%), eye problems (8%), gangrene (6%), asthma (6%) or pregnancy complications (including miscarriage) (2%) as illnesses caused by smoking. Despite the increases in awareness following the introduction of the graphic health warnings, there is substantial scope for increasing the salience of the link between smoking and many of these diseases. While the graphic health warnings have proven effective in increasing the salience of the link between smoking and a range of serious illnesses during their initial period of circulation, it remains to be seen whether the same warnings when viewed for a second time will have the same impact. In March 2008, the Series A graphic health warnings would have reached saturation for the second time, and findings from the 2008 Smoking and Health survey should give some indication of the extent of wear out or desensitisation that may occur with repeated exposure to the same warnings. If wear out is marked, a number of actions could be taken to strengthen the impact of the warnings including: more frequent rotation of the warnings; inclusion of new, and updates of existing warnings as research develops; and increasing the size of the warnings on the packs.

Passive smoking

There have been a number of recent public health interventions aimed at reducing exposure to SHS and educating Victorians about the potential harms of regular or prolonged exposure to SHS. The smoking bans in indoor areas of hospitality venues across Victoria in July 2007 was later augmented by the 'Smokefree homes and cars' television campaign in August 2007, which focussed in particular on the harms of SHS for children, and encouraged Victorians to make their homes and cars smokefree. Additionally, Series A graphic health warnings emphasised the association between passive smoking and asthma with the warning "Don't let children breathe your smoke", which highlighted pneumonia in children, SIDS, and middle ear infections, while Series B graphic health warnings, which began circulation in late 2006, focussed on the effect of passive smoking on pregnancy complications (including the link to miscarriage).

In 2007, there was no real increase in overall beliefs about the ability of passive smoking to cause illness from 2004, with 79% of all respondents believing that there are illnesses caused by passive smoking and 75% of respondents disagreeing that the dangers of passive smoking have been exaggerated. However, there were significant increases from 2006 to 2007 in beliefs about a range of illnesses associated with passive smoking, including those highlighted in both Series A and Series B. There was an increase in the proportion of Victorians (includes both smokers and non-smokers) who believed that passive smoking causes asthma (from 67% in 2006 to 71% in 2007), pneumonia in children (33% in 2006 to 37% in 2007), SIDS (from 31% in 2006 to 36% in 2007), and miscarriage (31% in 2006 to 35% in 2007). There were also increases in the proportion of Victorians who believed that passive smoking causes heart disease (from 57% in 2006 to 61% in 2007), and bronchitis (from 56% in 2006 to 62% in 2007). However, there was a significant drop in the proportion of Victorians who believed that passive smoking causes middle ear infections in children (from 16% in 2006 to 13% in 2007).

It is difficult to delineate the key drivers of this increased acceptance of the link between passive smoking and a range of illnesses, as there has been wide-ranging public health activity in this

area in the past two years. The smoking bans in hospitality venues highlighted the toxicity of SHS, as did the associated 'Smokefree homes and cars' television campaign, though they did not necessarily highlight the illnesses which might result from exposure to SHS. In 2007, Victorians showed increasing acceptance of a range of illnesses caused by passive smoking which were depicted by the Series A graphic health warnings, despite a period of non-exposure to this information. It is worth noting that questions regarding beliefs about illnesses caused by SHS were asked of non-smokers also, and non-smokers are unlikely to have been exposed regularly to the graphic health warnings. It is therefore likely that these increases are a result of a combination of influences including societal, media and environmental factors. Results from the 2008 survey should help to further explicate this finding.

Impact of campaigns

It is difficult to delineate the impact of the television campaigns designed to augment the graphic health warnings, from the impact of graphic health warnings themselves. However, a second airing of the Mouth Cancer and the Gangrene campaigns in March to April 2007 does not seem to have had any impact on the spontaneous or prompted recall of these illnesses in October to December 2007, when fieldwork for this survey was conducted. The campaigns highlighting the link between smoking and stroke (Carotid and Voice Within), were aired for the first time in September 2007, and this coincided with the rotation of the Series B health warnings, which included the warning 'Smoking doubles your risk of stroke'. Top of mind awareness of stroke as a smoking related illness increased significantly from 8% in 2006 to 14% in 2007, and this was especially evident for the low SES group (quintiles 1&2) who showed increased spontaneous awareness of stroke from 6% in 2006 to 17% in 2007. It may be the case that the campaigns are able to strengthen the impact of the graphic health warnings, particularly for those who are not active health information consumers. The ability of the television campaigns to increase top of mind awareness of smoking related illnesses is likely to be subject to the same recall decay process following a period of non-exposure, as is evident with recall of the Series A graphic health warnings. It is also likely that the impact of a television campaign when aired for the first time is likely to be substantially greater than when it is aired on subsequent occasions. Both of these factors, amongst others, may be responsible for the findings described here, and results of the 2008 Smoking and Health survey may assist in elucidating further any independent impact of television campaigns.

Summary

The graphic health warnings introduced in 2006 have been successful in increasing the salience of a range of smoking related illnesses amongst smokers. Exposure to the Series B graphic health warnings throughout 2007 resulted in increased top of mind awareness of lung cancer (50%), stroke/vascular disease (14%), eye problems (8%), and pregnancy complications (2%) amongst smokers, compared with spontaneous recall of these illnesses in 2006. The lack of increase in the Series A graphic health warnings following a period of non-exposure suggests that the impact of these warnings on top of mind awareness appears to stabilise or dissipate after a period of non-exposure. The proportion of Victorians who accept the link between passive smoking and a range of illnesses, including asthma, SIDS, and pneumonia in children, increased significantly between 2006 and 2007, which is in contrast to the findings for the other Series A graphic health warnings and may be in part due to the introduction of the smoking bans in hospitality venues and other media or public health activity surrounding this.

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APPENDIX A

Note. Illnesses in bold are among those that were either spontaneously recalled by respondents or were included in the list of illnesses used to prompt recall.

SERIES A

Smoking causes peripheral vascular disease: "Smoking damages your blood vessels, which can prevent **blood circulation**, particularly to your legs or feet. This can result in blood clots, infection, **gangrene**, even amputation."

Smoking causes emphysema: "**Emphysema** is a disease where the air sacs in the lungs are gradually destroyed, making it hard to breathe. Sufferers describe it as a living, breathing hell. Nearly all emphysema is caused by tobacco smoking."

Smoking causes mouth and throat cancer: "Smoking is the major cause of **cancers affecting the mouth and throat**. These cancers can result in extensive surgery, problems in eating and swallowing, speech problems and permanent disfigurement."

Smoking clogs your arteries: "Smoking narrows your arteries, causing them to become clogged, and can lead to **heart attack**, **stroke**, peripheral vascular disease, **gangrene** of the feet and impotence."

Don't let children breathe your smoke: "Children exposed to passive smoking experience more serious illnesses such as **pneumonia**, **middle ear infections** and **asthma** attacks. Babies exposed to passive smoking are at greater risk of **SIDS** (Sudden Infant Death Syndrome)."

Smoking – A leading cause of death: "Smoking causes more deaths than murder, illegal drugs, motor vehicle accidents and alcohol combined. Smokers not only live shorter lives, they also live more years with disabling health problems."

Quitting will improve your health: "Quitting smoking at any age benefits your health and fitness. Quitting reduces your risk of developing diseases such as **cancer**, **heart attack** and **stroke**. In the case of heart attack, the risk is halved one year after quitting."

SERIES B

Smoking harms unborn babies: "Smoking during pregnancy reduces the flow of blood in the placenta and limits the oxygen and nutrients that reach the growing baby. This increases the risk of **miscarriage**, stillbirth, premature birth, complications during birth or the baby having a smaller brain and body."

Smoking causes blindness: "Smoking causes irreversible **damage** to the back of the eye. This is known as macular degeneration. Central vision is lost, blindness may follow."

Smoking causes lung cancer: "9 out of 10 **lung cancer**s are caused by smoking. Every cigarette you smoke increases your risk of lung cancer. Most people who get lung cancer, die from it."

Smoking causes heart disease: "Smoking narrows the arteries to your heart, causing them to become blocked. This can cause **heart attack**s and death. Smoking can double your risk of dying from a heart attack."

Smoking doubles your risk of stroke: "Smoking narrows the arteries to your brain, causing them to become blocked. This causes a **stroke** that can result in permanent paralysis, inability to speak, disability or death."

Smoking is addictive: "When you smoke you inhale the drug nicotine. In a short time you can find it difficult to control how much you smoke or to quit smoking. Many people don't realise they are dependent on nicotine until they try to quit. Even lifelong smokers can and do quit."

Tobacco smoke is toxic: "Tobacco smoke is a complex mixture of toxic chemicals such as nitrosamines and benzopyrenes (which contribute directly to the formation of cancer in smokers) and carbon monoxide (which reduces the ability of blood to carry oxygen). These harmful substances can reach your brain, heart and other organs within 10 seconds of the first puff."

APPENDIX B

Table B1: Smokers' spontaneous recall of the smoking-related features in the graphic health warnings for tobacco products: Changes over time, by demographics, 2003-2007

		Lung cancer					Emphysema					Circulation/blood problems					Mouth/Oral cancer					Heart Disease				
		2003	2004	2005	2006	2007[2]	2003	2004	2005	2006[1]	2007[2]	2003	2004	2005	2006[1]	2007[2]	2003	2004	2005	2006[1]	2007[2]	2003	2004	2005	2006[1]	2007[2]
Sex																										
Males	(n=265-	64.9	50.9	54.4	41.0^	51.1**	35.5	31.4	33.2	41.8^	32.8	4.6	12.4	12.2	9.7	14.3*	3.1	7.8	5.4	11.3	12.6**	23.2	31.2	33.3	28.3^	37.3*
Females	(n=259-	67.1	46.4	54.6	42.3	47.8**	42.7	37.6	36.9	44.1	36.0	4.0	9.2	10.6	12.8	10.0*	3.8	6.0	4.8	12.8	11.0**	27.2	32.5	36.3	31.2	31.0
Age																										
18-29 y/o	(n=170-	70.5	53.4	56.5	43.0	44.3**	26.4	25.7	30.6	37.4^	24.6	1.4	8.5	6.6	11.3	5.8*	5.8	10.1	10.2	16.9	10.4^	26.2	32.8	36.0	29.5	38.1
30-49 y/o	(n=247-	66.4	48.5	57.0	43.0^	53.0^	48.2	41.3	39.4	46.5	38.8	6.3	11.9	14.9	11.5	15.8	2.8	5.2	2.6	11.1	14.9**	26.1	33.1	38.3	31.9	34.6
50 + y/o	(n=107-	57.9	43.2	46.7	36.7	48.1	38.1	34.0	31.6	43.2	35.1	4.2	12.5	10.9	10.0	12.1	1.1	5.6	3.3	6.5	7.2^	21.7	27.9	25.6	25.1	29.8
Education																										
Yr 11 or less	(n=170-	66.5	51.9	44.5	36.0	44.5**	37.8	36.3	33.3	42.1	32.6	4.6	7.0	11.7	11.0	13.0*	2.8	4.8	3.4	6.6	9.4*	20.9	24.0	28.0	17.6*	31.3
Yr 12/tertiary	(n=197-	60.9	44.9	59.0	41.1	48.7^	36.1	26.5	38.1	39.8	33.3	2.7	10.4	9.6	10.2	8.0	3.6	9.0	6.1	10.0	7.6	25.2	32.2	34.7	31.1	33.8
Tertiary	(n=151-	72.7	51.0	60.5	48.4	56.2	44.4	42.7	32.3	47.7^	37.2	6.1	17.0	14.1	12.6	16.7	3.9	6.9	5.8	20.4	19.6**	29.8	41.0	43.6	40.0	38.2
SEIFA																										
Group 1 & 2	(n=210-	63.3	50.2	50.0	38.0	43.5**	39.2	36.2	32.1	41.9	35.4	3.9	8.6	8.8	8.5	9.8	1.8	4.7	5.4	11.3	9.9**	21.4	28.1	30.2	25.4	33.1^
Group 3 & 4	(n=216-	65.6	46.4	58.5	36.5*	49.8**	35.3	32.7	37.9	41.9	34.2	4.3	12.0	9.6	13.0	14.2*	4.3	7.2	4.4	11.8	8.9^	26.9	29.1	36.8	31.9	36.0^
Group 5	(n=93-133)	72.4	51.3	54.2	55.2	63.6	47.6	33.1	33.7	46.0^	32.1	3.9	13.5	21.9	11.7	13.7	4.5	10.9	6.3	13.8	24.0*	28.1	43.5	39.4	33.6	33.3*

		Gangrene			Stroke					Eye problems					Pregnancy complications					Unspecified 'cancer'				
		2005	2006[1]	2007[2]	200	2004	2005	2006[1]	2007[2]	2003	2004	2005	2006[1]	007[2]	2003	2004	2005	2006[1]	2007[2]	2003	2004	2005	2006[1]	2007[2]
Sex																								
Males	(n=265-	0.5	13.2*	6.6**	10.2	6.0	8.1	7.3	11.8	2.5	5.3	7.4	3.6^	7.6	0.0	1.4	0.5	0.0	1.2	16.5	37.7	33.2	45.3^	35.8**
Females	(n=259-	0.6	10.4^	5.0**	5.1	8.8	9.0	7.7*	16.2**	3.8	5.1	6.9	2.7^	7.6	0.3	1.6	0.5	0.6	2.0	19.8	40.5	34.3	39.6	37.4**
Age grp																								
18-29 y/o	(n=170-	0.0	11.2	6.9**	7.3	6.5	7.1	5.8^	13.6	6.6	5.4	7.5	5.6	9.0	0.0	1.9	0.0	0.0	0.9	24.8	45.2	41.4	47.6	54.6**
30-49 y/o	(n=247-	1.2	14.1*	6.9**	9.1	6.6	10.5	6.2**	15.4^	1.4	4.8	8.7	1.8**	9.1*	0.3	1.2	0.9	0.6	2.6	16.6	40.0	34.8	44.9	36.9**
50 + y/o	(n=107-	0.0	8.2^	2.4*	5.0	9.5	6.2	12.9	10.9	1.8	5.6	3.5	2.6	3.1	0.0	1.4	0.4	0.0	0.0	11.2	28.7	21.0	30.5^	17.1
Education																								
Yr 11 or less	(n=170-	0.4	7.7	3.9**	9.6	4.3	6.3	7.5	10.5	1.9	4.9	5.2	2.2^	6.7	0.0	0.3	0.5	1.0	0.5	14.0	30.7	35.6	44.1*	31.0**
Yr 12/tertiary	(n=197-	0.0	11.2^	5.8**	6.5	8.3	9.5	6.2^	11.7	4.5	4.1	8.6	5.0	7.3*	0.0	2.9	0.0	0.0	2.9	20.9	42.2	32.2	42.1	44.2**
Tertiary	(n=151-	1.7	17.1^	7.9**	7.3	9.8	9.9	9.4*	19.9**	2.9	7.4	7.4	1.6*	8.9	0.5	1.1	1.5	0.0	1.1	19.0	45.6	34.3	42.2	33.6^
SEIFA																								
Group 1 & 2	(n=210-	1.1	10.7	8.9**	8.7	4.5	6.1	5.5**	16.9*	2.8	4.6	7.0	1.9	3.9	0.0	0.2	1.0	0.4	1.0	17.0	32.4	36.7	45.2^	33.4**
Group 3 & 4	(n=216-	0.0	13.5**	4.6**	7.0	8.5	9.7	9.0	12.1	4.0	4.9	5.8	3.9*	11.6*	0.3	1.6	0.3	0.4	2.3^	17.6	39.4	29.2	44.1	41.6**
Group 5	(n=93-133)	0.8	11.8^	1.8*	7.4	9.7	10.3	8.9	11.1	2.3	7.0	10.9	4.4	6.3	0.0	3.9	0.0	0.0	0.9	21.8	51.0	38.6	35.8	31.8

		Throat cancer				
		2003	2004	2005	2006	2007
Sex						
Males	(n=265-	4.6	12.6	17.0	10.3	12.1
Females	(n=259-	6.7	10.9	12.8	11.2	9.7
Age grp						
18-29 y/o	(n=170-	5.2	14.1	19.2	10.6	12.8
30-49 y/o	(n=247-	6.8	10.8	15.7	13.0	12.0
50 + y/o	(n=107-	3.6	10.4	8.0	6.1	6.9
Education						
Yr 11 or less	(n=170-	5.5	11.0	11.0	10.1	6.6
Yr 12/tertiary	(n=197-	2.3	12.3	17.5	9.1	11.3
Tertiary	(n=151-	10.0	12.4	16.4	13.7	15.4
SEIFA						
Group 1 & 2	(211-259)	7.1	8.9	9.5	6.6	10.2
Group 3 & 4	(216-256)	4.6	13.1	20.7	9.1	9.0
Group 5	(93-132)	4.3	15.2	13.5	16.1	17.7^

[1] Significant differences in this column relates to comparisons between 2006 and 2007
[2] Significance differences in this column refers to linear trends over time
^ Trend toward significance, at p<=.05
*Significant at p<=.01
**Significant at p<=.001

Table B2: Smokers' prompted recall of the smoking-related features in the graphic health warnings for tobacco products: Changes over time, by demographics, 2003-2007

		Lung cancer			Emphysema					Throat cancer				Mouth/Oral cancer				Stroke		
		2003	2006[1]	2007[2]	2003	2004	2005	2006[1]	2007[2]	2004	2005	2006[1]	2007[2]	2004	2005	2006[1]	2007[2]	2005	2006[1]	2007[2]
Sex																				
Males	(n=265-344)	93.2	88.3	85.9*	85.3	80.9	81.5	86.6	83.5	86.9	86.0	85.3	83.6	78.1	74.9	81.3	81.0	74.4	71.9	76.1
Females	(n=259-294)	93.2	88.8	83.1**	92.3	84.9	87.9	87.4	81.6*	85.9	88.5	86.4	81.3	80.1	82.4	83.9	80.2	78.8	74.9	74.6
Age																				
18-29 y/o	(n=170-191)	98.9	90.7	87.0**	85.9	81.8	84.9	83.3	79.8	92.7	94.0	88.7	85.9^	84.1	84.9	87.3	85.0	79.0	78.7	81.0
30-49 y/o	(n=247-286)	93.2	91.7^	86.4^	91.5	87.5	87.6	90.8^	85.2	90.1	91.0	89.3	85.0^	82.3	81.0	85.0	82.7	80.9	76.6	78.3
50 + y/o	(n=107-156)	84.2	78.7	78.2	87.1	76.1	77.6	84.2	80.2	71.6	70.0	74.3	74.1	66.5	64.4	70.1	71.9	63.7	58.2	63.7
Education																				
Yr 11 or less	(n=170-220)	93.4	86.4	81.3**	89.2	79.7	84.4	86.8	81.9	81.9	80.8	83.7	78.8	71.9	72.2	79.5	74.9	74.9	69.5	68.8
Yr 12/tertiary	(n=197-253)	90.4	88.2	85.4	87.5	84.3	84.3	85.4	84.9	87.4	88.8	84.2	82.1	81.5	82.9	80.3	82.5	78.0	70.4	77.1
Tertiary	(n=151-175)	96.5	91.7	87.1*	89.9	84.3	86.2	89.2^	80.7	90.9	93.9	90.8	87.1	84.8	80.0	89.2	84.7	76.8	81.8	80.5
SEIFA																				
Group 1 & 2	(n=210-259)	92.4	88.1	82.3*	88.7	81.4	83.2	88.2^	80.6	85.8	85.4	86.5	79.9	53.0	73.5	82.3	76.2	74.5	72.4	74.2
Group 3 & 4	(n=216-256)	93.2	86.3	84.7*	88.2	80.4	85.2	83.2	83.8	83.0	87.7	83.5	83.7	76.4	80.5	79.8	82.5	79.3	69.0	74.6
Group 5	(n=93-133)	94.7	93.3	90.2	90.0	89.5	85.5	91.5	85.0	93.9	89.4	88.5	86.5	77.1	84.0	87.1	87.1	73.3	84.1	81.0

		Gangrene			Miscarriage				Blindness		Heart Disease				
		2005	2006	2007[2]	2003	2005	2006[1]	2007[2]	2006	20072	2003	2004	2005	2006[1]	2007[2]
Sex															
Males	(n=265-344)	22.6	63.1	62.6**	51.4	49.3	38.5	46.0^	41.0	51.8*	86.1	81.1	82.8	80.6	80.5
Females	(n=259-294)	33.1	72.3**	57.5**	46.0	45.5	46.6*	34.7^	38.2	49.2*	82.7	82.5	83.7	83.6	77.1
Age grp															
18-29 y/o	(n=170-191)	15.0	72.6	66.0**	65.8	61.9	52.5	54.2*	52.5	59.5	89.8	88.5	88.2	85.0	85.3
30-49 y/o	(n=247-286)	36.1	71.3 ^	62.8**	49.9	50.8	44.1	41.5^	39.1	53.2**	87.4	86.0	87.8	85.9	79.7^
50 + y/o	(n=107-156)	26.7	51.3	48.8**	19.0	21.3	23.2	24.9	22.0	35.8^	69.0	65.3	67.1	69.6	70.4
Education															
Yr 11 or less	(n=170-220)	26.7	61.2	57.8**	37.0	45.5	37.1	30.9	32.0	49.1**	80.2	76.7	78.4	74.8	74.8
Yr 12/tertiary	(n=197-253)	25.9	68.4 ^	57.1**	50.2	46.1	42.6	48.2	41.8	48.7	82.7	81.9	85.1	81.9	80.0
Tertiary	(n=151-175)	31.4	72.6	66.5**	59.9	53.1	47.3	42.4**	44.8	54.5	91.0	88.2	87.4	89.9 ^	82.1^
SEIFA															
Group 1 & 2	(n=210-259)	26.9	64.7	58.6**	44.7	44.3	34.5	31.4*	40.8	45.9	84.2	82.4	79.5	77.8	74.8*
Group 3 & 4	(n=216-256)	28.2	67.3	59.7**	47.8	51.3	43.5	43.4	38.8	52.5*	82.9	76.1	85.9	81.5	80.5
Group 5	(n=93-133)	26.5	72.4	65.6**	59.0	46.0	53.4	55.7	41.8	57.2^	87.7	90.9	84.6	89.8	85.1

[1] Significant differences in this column relates to comparisons between 2006 and 2007
[2] Significance differences in this column refers to linear trends over time
^ Trend toward significance, at p<=.05
*Significant at p<=.01
**Significant at p<=.001

Table B3: Non-smokers' and smokers' prompted recall of illnesses caused by ETS: changes over time, by demographics, 2004-2007

		Lung cancer				Asthma				Emphysema				Heart disease				Bronchitis				Pneumonia in children		
		2004	2005	2006[1]	2007[2]	2004	2005	2006[1]	2007[2]	2004	2005	2006[1]	2007[2]	2004	2005	2006[1]	2007[2]	2004	2005	2006[1]	2007[2]	2005	2006	2007
Sex																								
Males	(n=1458-1460)	70.6	69.1	69.7	71.3	64.2	63.9	62.7	65.7	62.2	61.8	62.5	63.7	59.6	58.6	56.7^	61.1	55.6	53.4	53.6*	58.3	30.0	30.5	33.4^
Females	(n=1538-1541)	75.7	73.6	72.4	74.1	74.5	73.3	71.5^	75.4	67.8	68.8	66.9	68.8	60.2	57.0	57.6	60.7	66.2	63.2	59.1**	65.6	35.2	35.0*	40.2*
Age																								
18-29 y/o	(n=665-666)	80.0	76.6	73.9	69.5**	74.5	76.2	72.9	69.1^	64.3	64.3	62.3^	56.7*	63.3	63.0	58.1	59.3^	64.5	62.1	58.7	58.8^	39.9	36.8	37.6
30-49 y/o	(n=1186-1188)	75.7	73.4	72.5^	76.7	72.1	71.2	69.1**	75.1	67.7	67.0	65.1^	69.9	62.2	58.4	58.1^	62.7	62.0	60.8	57.8**	65.5	34.8	33.2**	40.2*
50 + y/o	(n=1145-1146)	66.7	66.3	68.0	70.4^	64.0	61.8	62.0^	67.0	62.7	64.3	65.9	68.2*	55.7	54.0	55.5^	59.8^	58.0	53.9	53.6**	60.4	26.4	30.1	33.2**
Education																								
Yr 11 or less	(n=742-843)	67.5	63.7	64.6	64.8	64.6	61.5	62.8	63.5	61.5	61.5	63.0	62.6	56.4	52.9	54.1	54.2	55.0	51.7	50.7	55.0	28.0	30.4	30.4
Yr 12/tertiary	(n=989-1144)	73.5	73.8	69.1^	73.4	68.1	71.0	65.7*	71.1	64.0	67.5	61.8	65.7	60.8	58.8	55.3*	62.0	60.8	59.8	55.3*	61.6	33.0	31.8^	37.0
Tertiary	(n=1068-1239)	77.7	75.5	77.8	77.1	74.9	72.4	72.1	75.0	68.9	66.6	69.3	69.1	62.0	61.0	61.3	64.0	65.9	62.5	61.7*	66.8	36.3	35.5*	40.9^
SEIFA																								
Group 1 & 2	(n=945-981)	72.1	68.6	67.3	70.3	67.8	67.9	65.1	67.8	64.5	63.5	63.4	63.8	58.3	56.7	55.4^	60.4	59.8	55.4	54.7^	59.3	34.3	32.9^	37.6
Group 3 & 4	(n=1182-1230)	73.0	71.7	72.0	71.7	69.4	68.7	68.5	70.3	64.4	66.0	64.0	66.0	59.6	56.6	57.5	60.3	60.6	60.8	56.5*	61.8	33.7	33.5	36.3
Group 5	(n=791-823)	74.9	74.1	74.0	77.1	71.8	69.8	67.4**	74.7	66.7	66.5	67.5	69.9	62.4	60.4	58.7	62.3	63.3	58.3	59.0*	65.8	28.8	31.8^	37.0**

		SIDS				MIscarriage				Cervical cancer				Ear infections		
		2004	2005	2006[1]	2007[2]	2004	2005	2006[1]	2007[2]	2004	2005	2006[1]	2007[2]	2005	2006[1]	2007[2]
Sex																
Males	(n=1458-1460)	22.9	19.3	22.8*	27.8**	29.8	29.9	29.2^	33.4	18.0	19.0	20.9	22.1*	10.6	16.1*	12.2
Females	(n=1538-1541)	37.4	39.2	38.5*	43.3*	29.4	30.7	32.0^	35.7**	15.0	18.5	19.0	17.7	12.9	15.1	13.9
Age grp																
18-29 y/o	(n=665-666)	32.8	34.4	36.6	35.6	42.9	47.5	41.6	40.2	23.7	29.1	26.0^	20.2	15.2	25.3**	14.7
30-49 y/o	(n=1186-1188)	38.7	37.2	36.3**	45.0*	32.3	31.7	32.2**	40.9**	15.7	16.4	19.8	20.3**	12.0	14.3	14.5
50 + y/o	(n=1145-1146)	20.3	18.6	22.0^	26.3**	19.0	18.9	22.6	24.8**	13.1	15.2	16.4	19.1**	9.5	11.2	10.7
Education																
Yr 11 or less	(n=742-843)	25.1	22.6	27.1	29.2^	23.4	24.2	26.2	27.1	16.2	19.2	22.0	20.9*	9.5	14.4	11.8**
Yr 12/tertiary	(n=989-1144)	30.9	30.3	30.6^	34.7	32.1	33.7	30.3*	36.8	17.5	19.8	19.6	21.5^	11.0	15.9^	12.3**
Tertiary	(n=1068-1239)	33.9	34.2	33.9**	40.8*	31.9	31.9	34.1	37.7**	15.7	17.4	18.8	17.9	14.3	16.0	14.5^
SEIFA																
Group 1 & 2	(n=945-981)	29.0	30.8	28.8*	34.8^	28.7	31.2	28.4	31.5	15.2	19.5	21.5	20.5*	12.7	14.7	12.6
Group 3 & 4	(n=1182-1230)	31.8	30.9	32.2*	37.3*	29.9	30.8	31.6*	37.6**	18.6	19.1	20.2	20.3	12.9	16.1	13.5
Group 5	(n=791-823)	30.2	25.2	30.9	34.5*	30.4	28.3	32.0	34.1^	15.1	16.8	17.9	18.5	8.8	15.4	13.1*

[1] Significant differences in this column relates to comparisons between 2006 and 2007
[2] Significance differences in this column refers to linear trends over time
^ Trend toward significance, at p<=.05
* Significant at p<=.01
**Significant at p<=.001