

The new EU cigarette health warnings benefit smokers who want to quit the habit: results from the Dutch Continuous Survey of Smoking Habits

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Background: As of September 2004, all European Union countries are required to have new health warnings on cigarette packs. This study examined the self-perceived impact of these warnings on the attractiveness of cigarettes, smokers' motivation to quit and smoking behaviour. **Methods:** This was a cross-sectional study comprising 3937 Dutch adult smokers. **Results:** Of smokers, 14% became less inclined to purchase cigarettes because of the new warnings, 31.8% said they prefer to purchase a pack without the new warnings, 17.9% reported that warnings increased their motivated to quit and 10.3% said they smoked less. A strong dose-response relationship was observed between these effects and intention to quit. **Conclusions:** The new warnings made cigarette packs less attractive, especially to smokers who already intended to stop smoking.

Keywords: health warnings, smoking cessation

Cigarette smoking is an important cause of premature mortality and disability in Europe. One strategy to try to reduce tobacco use is tougher warnings on cigarette packets. According to Directive 2001/37/EC of the European Commission, as of 30 September 2002, the front of cigarette packets in European Union (EU) countries were required to have one of two health warnings, covering 30% of the surface. The back of the packet must contain 14 different health warnings, covering 40% of the surface. An important question is whether and how these tougher text warnings impact on smokers. Empirical evidence to date is derived from (mostly qualitative) research examining the response of various target groups to warning labels.¹⁻⁴ The only study of the real-time introduction of new health warnings was carried out in Poland, showing increases in awareness and reductions in self-reported consumption.⁵ An Australian study showed an initial impact on self-reported tobacco consumption and health knowledge and beliefs.⁶

In May 2002, 4 months sooner than required, the new health warnings came into effect in The Netherlands. The object of our study was to examine the self-reported effect of these warnings on the attractiveness of cigarettes, on smokers' motivation to quit and on smoking behaviour, and to determine whether these effects differed for subgroups of smokers.

Methods

Data and study population

We used the Continuous Survey of Smoking Habits (CSSH) carried out by TNS NIPO. The CSSH is an omnibus Internet survey in which each week ~800 households are randomly selected from a database of >50 000 households. From each household, a maximum of two people are interviewed. Questions about the new health messages were included in the CSSH in the months April to December 2002, and in the months April, May and June 2003. Manufacturers had to put the warnings on packets from 1 May 2002. However, it was 1 month before smokers were actually able to purchase packets containing the new warnings. Therefore, respondents who

were interviewed in April and May 2002 were excluded. The CSSH makes use of proxy interviews (another member of the household answers the questions) when the person who is selected for the interview is not available. For the study, all proxy interviews were excluded (2480 of a total sample of 15 134 respondents). Hence, the sample for this study consisted of 12 654 respondents.

Measures

Smoking status was measured with the question 'Do you (ever) smoke?' (yes/no). We asked smokers if they had noticed 'recent changes' to the health warnings on packets of cigarettes. For those interviewed in 2003, this was rephrased 'in the past 12 months'. Four outcome measures were put to smokers who answered 'yes'. Two items measuring changes in the appeal or attractiveness of cigarettes: 'Are you less inclined or more inclined to purchase cigarettes that contain the new warnings?'; 'If, when buying cigarettes from a shop or a vending machine, you were able to choose between a pack with or without the new warnings, which one would you buy?'; one item measuring changes in motivation to quit smoking: 'Did the new health warnings make you more or less motivated to quit smoking?'; and one item measuring changes in self-reported smoking: 'Are you smoking (somewhat) less or (somewhat) more as a result of the new warnings or are you still smoking the same amount?'. In addition, the following smokers' characteristics were measured: age; gender; educational level; number of cigarettes per day; number of quit attempts in the past; intention ('Do you intend to quit smoking in the future?': within 1 month/between 1 month and 6 months/between 6 months and 1 year/yes, but not within 1 year/don't know/never); self-efficacy expectation ('Imagine that you quit smoking. Do you expect you will be able to refrain from smoking in every situation that may occur?';⁷ measured on a 5-point scale from certainly yes to certainly no); and nicotine dependency ('How long after you wake up do you light your first cigarette?').⁸

Analyses

Data were analysed using SPSS 11.0 for Windows. Sample data were weighted to match known population characteristics (as used by the Statistics Netherlands, CBS): gender, age, family size, province, municipality size, educational qualifications and occupation. All analyses were conducted with weighted

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Table 1 Univariate association between smokers' characteristics and outcome measures (observed percentages; $n = 3318$)

	Change in inclination to buy cigarette pack with new warnings (less/more inclined)			Preference for buying pack with/without new warning			Self-reported change in motivation to quit (higher/lower motivation)			Self-reported change in smoking behaviour (smoking more or less)		
	Less	Neutral	More	Without	Neutral	With	Higher	Neutral	Lower	Less	Neutral	More
Gender												
Male	10.6	87.8	1.6	26.8	70.7	2.5	16.9	76.3	6.8	9.5	89.7	0.6
Female	17.7	81.6	0.7	37.1	60.9	2.0	18.9	76.0	5.1	11.2	88.2	0.7
	$\chi^2(2) = 39.3; P < 0.001$			$\chi^2(2) = 40.5; P < 0.001$			$\chi^2(2) = 5.9; NS$			$\chi^2(2) = 2.4; NS$		
Age (years)												
< 30	14.1	83.0	3.0	33.1	64.3	2.7	18.3	77.5	4.1	8.0	91.1	0.9
30–39	12.2	87.0	0.8	30.7	67.4	1.9	17.4	77.9	4.7	7.5	91.6	0.9
40–49	11.8	87.5	0.6	31.0	67.4	1.5	15.8	76.9	7.4	9.4	90.3	0.3
> 49	17.7	81.6	0.6	32.5	64.5	3.0	19.8	72.9	7.4	15.6	83.8	0.6
	$\chi^2(6) = 41.1; P < 0.001$			$\chi^2(6) = 7.4; NS$			$\chi^2(6) = 18.0; P < 0.01$			$\chi^2(6) = 43.6; P < 0.001$		
Education												
Low	12.2	86.6	1.2	28.5	68.8	2.7	15.8	75.7	8.5	10.9	88.5	0.6
Medium	14.4	84.6	1.3	31.0	66.1	2.0	19.4	75.7	4.9	10.2	88.7	1.1
High	16.2	82.8	1.0	35.5	62.3	2.1	18.3	77.4	4.3	10.0	89.9	0.1
	$\chi^2(4) = 6.7; NS$			$\chi^2(4) = 12.6; P < 0.05$			$\chi^2(4) = 22.9; P < 0.001$			$\chi^2(4) = 8.8; NS$		
Number of cigarettes per day												
< 11	17.6	81.4	0.9	31.5	65.5	3.0	22.1	73.1	4.8	14.3	85.4	0.3
11–20	12.0	86.5	1.6	31.2	66.8	1.9	16.1	78.2	5.7	8.1	91.0	0.9
21–30	12.0	87.8	0.2	34.8	63.8	1.4	13.0	78.5	8.5	6.1	93.3	0.6
> 30	9.9	86.8	3.3	29.1	68.7	2.2	15.4	76.4	8.2	10.4	87.9	1.6
	$\chi^2(6) = 35.2; P < 0.001$			$\chi^2(6) = 8.16; NS$			$\chi^2(6) = 35.0; P < 0.001$			$\chi^2(6) = 43.7; P < 0.001$		
Time to first cigarette in the morning												
> 60 min	18.6	1.1	0.2	32.2	65.8	2.0	22.3	72.9	4.8	13.8	86.0	0.2
30–60 min	13.4	84.9	1.7	33.2	64.5	2.4	19.4	76.7	3.9	10.6	88.4	1.0
6–30 min	12.4	86.5	1.1	31.7	66.2	2.2	16.1	78.1	5.8	9.4	90.2	0.4
< 5 min	10.0	87.2	2.8	29.6	67.4	3.0	12.2	76.8	11.1	5.8	92.1	2.1
	$\chi^2(6) = 44.1; P < 0.001$			$\chi^2(6) = 3.0; NS$			$\chi^2(6) = 51.4; P < 0.001$			$\chi^2(6) = 43.2; P < 0.001$		
Self-efficacy												
Low	14.1	84.7	1.2	34.8	63.4	1.8	16.8	75.9	7.3	9.2	90.1	0.7
Moderate	13.1	85.6	1.4	29.2	68.7	2.0	16.0	78.8	5.2	9.9	89.0	1.1
High	14.7	84.3	1.0	30.7	66.5	2.9	20.2	74.6	5.2	11.7	87.9	0.3
	$\chi^2(4) = 1.5; NS$			$\chi^2(4) = 11.3; P < 0.05$			$\chi^2(4) = 12.9; P < 0.05$			$\chi^2(4) = 9.7; P < 0.05$		
Number of past quit attempts												
0	10.0	88.6	1.4	29.9	68.5	1.6	13.1	80.0	6.9	7.4	91.9	0.6
1–3	14.8	84.1	1.1	33.4	64.3	2.3	18.8	75.6	5.6	10.3	89.2	0.5
> 3	17.8	79.3	0.8	32.3	64.4	3.4	24.7	70.3	5.0	15.4	83.5	1.1
	$\chi^2(4) = 39.7; P < 0.001$			$\chi^2(4) = 11.5; P < 0.05$			$\chi^2(4) = 45.6; P < 0.001$			$\chi^2(4) = 35.2; P < 0.001$		
Quit intention												
Never	6.3	92.0	1.7	27.0	70.5	2.4	6.0	78.8	15.2	5.1	94.2	0.7
Don't know	11.5	87.6	0.9	28.8	70.2	1.0	12.5	81.8	5.7	7.7	91.7	0.6

Table 1 (continued)

	Change in inclination to buy cigarette pack with new warnings (less/more inclined)			Preference for buying pack with/without new warning			Self-reported change in motivation to quit (higher/lower motivation)			Self-reported change in smoking behaviour (smoking more or less)		
	Less	Neutral	More	Without	Neutral	With	Higher	Neutral	Lower	Less	Neutral	More
> 1 year	11.4	87.0	1.6	34.9	62.9	2.2	18.8	77.4	3.8	7.6	91.2	1.2
> 6 month	15.8	83.8	0.4	34.4	63.8	1.9	28.6	69.1	2.3	12.5	87.2	0.4
> 1 month	25.8	72.4	1.9	41.4	54.0	4.7	36.6	59.8	3.7	18.0	81.4	0.6
< 1 month	31.5	67.7	0.8	37.1	55.2	7.7	34.4	63.2	2.4	28.2	71.4	0.4
	$\chi^2(10) = 137.9$; $P < 0.001$			$\chi^2(10) = 90.7$; $P < 0.001$			$\chi^2(10) = 278.5$; $P < 0.001$			$\chi^2(10) = 138.3$; $P < 0.001$		
Mean %	14.0	84.8	1.1	31.8	66.0	2.3	17.9	76.2	5.9	10.3	89.0	0.7

NS: not significant.

data. The results can be assumed to be representative of the Dutch population aged 15+ years. Cross-tabulations were used to examine the association between smokers' characteristics and outcomes. Because these univariate results could be affected by other smokers' characteristics, multivariate logistic regression analyses were also performed.

Results

Of all respondents, 3937 were occasional smokers (31.1%). Of these, 7.5% said they intended to stop smoking within 1 month, 9.7% between 1 and 6 months, 8.0% between 6 and 12 months, 15.0% sometime in the future but not within 1 year, 47.3% were undecided and 12.5% never wanted to quit.

Across the survey period, 3318 (84.3%) said they had noticed changes to the health warnings. This percentage was higher in the 3 months directly after the introduction (90%) compared with the months April to June of 2003 (81%) [$\chi^2(2) = 39.67$; $P < 0.001$].

Table 1 presents the results of the cross-tabulations. Of all smokers, 14% indicated they were less inclined to purchase cigarettes as a result of the new warnings; 31.8% said they prefer to buy packets without the new warnings; 17.9% reported that warnings made them more motivated to quit; and 10.3% said they smoked less because of the new warnings.

Women seem to perceive the new health warnings as less attractive than men, but they were not more motivated to nor report to smoke less. Smokers above the age of 49 years seem less willing to buy the new packets, seem more motivated to quit and report smoking less. Overall, nicotine-dependent smokers, both measured with the number of cigarettes and time to first cigarette, seem less affected by the health warnings. It is noteworthy that of smokers who say they never want to quit, 15.2% say they became even less motivated to ever quit.

A strong dose-response relationship was observed between quit intention and all four effect measures, i.e. the higher the intention the greater the impact of the warnings.

Multivariate analyses showed similar outcomes. Those intending to quit smoking within 1 month had an almost eight-fold higher chance of reporting that they smoke less because of the new warnings [odds ratio (OR) 7.89], independent of other variables. The other three outcome measures showed similar strong associations with intention. Interestingly, the two variables measuring the attractiveness of cigarette packs showed a weak but significant negative time effect (OR 0.96 and 0.97, respectively; $P < 0.05$), whereas the motivation to quit and the self-reported impact on smoking

behaviour became stronger with the passing of time (OR 1.09, $P < 0.001$; and OR 1.04, $P < 0.05$).

Discussion

The results show that any effects of the new health warnings must be sought first and foremost among smokers already intending to quit smoking. Strong dose-response associations were observed. This finding is in line with a recent Canadian study that found a strong positive correlation between smokers' intention to quit and whether smokers read, thought about and discussed the new Canadian warning labels.⁹

There was some evidence that the new labels cause reactance among smokers who do not want to quit smoking: more than 15% of unmotivated smokers said they became even less motivated to ever quit smoking because of the new warnings.

On average, 10% reported that the warnings had made them smoke less. A Canadian study conducted 9 months after the introduction of graphic warning labels reported that 19% of Canadian smokers said they smoke less because of the new labels.¹⁰ In our study, 18% of smokers reported a greater motivation to quit, whereas in the Canadian study 33% reported an increased likelihood of quitting. These differences between the European and the Canadian study might be explained by the fact that the Canadian graphic warnings are much harder hitting than the European text-only ones. Cigarette labels containing hard hitting colour pictures are expected to be introduced in EU countries also, following recent European Commission directives to this effect.

In line with the Canadian findings, we found little evidence for habituation or wear out of the impact of the new warnings. With the passing of time, more smokers said that the warnings made them more motivated to quit or made them smoke less. However, the negative appeal of the cigarette packs did significantly diminish over time. This might be explained by the fact that, contrary to the first months after the introduction, smokers in the later months of the study could no longer choose between packs with or without the new warnings.

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Key points

- This paper examined the self-perceived impact of the new EU health warnings on cigarette packs on smokers.
- The new health warnings made cigarette packs less attractive.
- Smokers who intended to quit smoking were most affected by the warnings.

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