Brief Report

Increased smoker recognition of a national quitline number following introduction of improved pack warnings: ITC Project New Zealand

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Abstract

Introduction: We examined how recognition of a national quitline number changed after new health warnings were required on tobacco packaging in New Zealand (NZ).

Methods: The NZ arm of the International Tobacco Control Policy Evaluation Survey (ITC Project) is a cohort study that surveyed smokers in two waves (N = 1,376 and N = 923). Wave 1 respondents were exposed to text-based warnings with a quitline number but no wording to indicate that it was the "Quitline" number. Wave 2 respondents were exposed to pictorial health warnings (PHWs) that included the word "Quitline" beside the number as well as a cessation message featuring the Quitline number and repeating the word "Quitline."

Results: The introduction of the new PHWs was associated with a 24 absolute percentage point between-wave increase in Quitline number recognition (from 37% to 61%, $p < .001$). Recognition increased from a minority of respondents to a majority for all age groups, genders, deprivation levels (using small area and individual measures), financial stress (two measures), and ethnic groups (e.g., the level for Maori in Wave 2: 62%, Pacific peoples: 61%, and European/other: 62%). There was also an equalizing effect on previous differences in Quitline recognition by gender, ethnic group, and for both deprivation measures.

Discussion: This study provides some evidence for the value of clearly identifying quitline numbers on tobacco packaging as part of PHWs. While this finding is consistent with previously published studies, the finding that this intervention appeared to benefit all sociodemographic groups is novel.

Introduction

It has been argued that governments should introduce health warnings on tobacco products to inform consumers of the risks they face and to protect them from harms caused by tobacco (Chapman & Liberman, 2005). Other than the policy development process, these warnings cost tax payers nothing yet have the potential to reach smokers each time they take a cigarette from a pack. Furthermore, Article 11 of the Framework Convention for Tobacco Control outlines minimum criteria health warning labels should meet (World Health Organization, 2003). The evidence base concerning pictorial health warnings (PHWs) continues to grow and indicates that these stimulate reactions in smokers that are prospectively predictive of cessation activity (Borland, Wilson, et al., 2009; Borland, Yong, et al., 2009; Fong, Hammond, & Hitchman, 2009).

Some governments have begun requiring that health warnings include quitting helpline (quitline) telephone numbers. This applies to all warning labels used in some countries (e.g., Australia, Brazil, New Zealand [NZ], Singapore, and Uruguay) but to only warning labels featuring cessation themes in others (e.g., the European Union, the United Kingdom, and Romania; Physicians for a Smoke-free Canada, 2009).

There is some evidence that including quitline numbers in health warnings on tobacco packaging stimulates increased calls to quitlines. This was first reported in 2002 in the Netherlands when inclusion of a quitline number in a text-based health warning was linked to a marked increase in calls to the quitline (Willemsen, Simons, & Zeeman, 2002). Data from the United Kingdom also indicate that callers to the national "Stop Smoking Helpline" cited text-based warnings as the second most important source of quitline information (Department of Health [United Kingdom], 2006). NZ data suggest that call levels

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increased and more first-time callers reported obtaining the quitline number from the pack after the new PHWs were introduced (Li & Grigg, 2009). Similarly, Australian evidence suggests that the new PHWs were associated with increased calls; this effect was independent of antismoking advertising (as measured by target audience rating points; Miller, Hill, Quester, & Hiller, 2009). For two of these countries (Australia and NZ but not the Netherlands and United Kingdom), the introduction of the new warnings was supported by thematically similar television advertising campaigns. However, we are not aware of any previous research that has investigated the effectiveness of different ways of displaying quitline numbers on cigarette packs and other tobacco product packaging.

PHWs were phased in from early 2008 in NZ and were compulsory on all displayed stock from August 2008. Prior to this change, cigarette packs included the national Quitline telephone number on the pack but did not identify it as the "Quitline" number. Instead, there was a rather unclear instruction under the text-only warning stating "For more information, call . . ." (beside a phone number). The new PHWs included the word "Quitline" next to the telephone number in a small text box on the picture, and the number is also provided as part of a specific smoking cessation message ("You CAN quit smoking. Call Quitline 0800 778 778, or talk to a quit smoking provider") below the picture (Ministry of Health, 2008). However, the cessation message featuring Quitline information appears only on the back of the pack. Photographs of the old and new warnings are available in an online presentation (p3; Li, Wilson, Hoek, Weerasekera, & Edwards, 2010).

Prior to the introduction of PHWs in 2008, a 2004 survey found that only 30% of current smokers associated this telephone number with the Quitline or quitting support (Waa, Gillespie, & Afzal, 2004). The introduction of PHWs in NZ enabled an investigation of whether the more prominent, identifiable, and contextually appropriate display of a quitline number promoted increased recognition of the number among a national cohort of smokers.

Methods

The International Tobacco Control Policy Evaluation Survey Project

The International Tobacco Control Policy Evaluation Survey (ITC Project) is a multicountry series of cohort studies on tobacco use epidemiology and tobacco control policy evaluation (Fong et al., 2006). The NZ arm of the ITC Project survey differs somewhat from other ITC samples as the smokers involved are New Zealand Health Survey (NZHS) participants. NZHS respondents were selected by a complex sample design, which included systematic boosted sampling of the Māori, Pacific, and Asian populations. The overall response rate was 67.9%; details of the NZHS methods are outlined in an online report (Wilson, 2009).

Participants

The NZHS sample provided a sample of 2,438 adult smokers who were 18+ years and indicated that they were willing to participate in further research when invited at the end of the NZHS interview (this represented 85.2% of the adult smokers in the NZHS). Out of these potential respondents, a total of 1,376 completed a telephone questionnaire, giving a response rate of 56.4%. But when considering the NZHS response rate and willingness to further participate, then the overall response rate is reduced further to 32.6% (for details see Wilson, 2009). Between-wave attrition of 32.9% occurred, resulting in 923 respondents in Wave 2.

Procedures

Data collection was carried out using a computer-assisted telephone survey between March 2007 and February 2008, usually 3–4 months after the NZHS interview. Wave 2 was conducted between March 2008 and February 2009. The study protocol was approved by the Multi-Region Ethics Committee in NZ (MEC/06/07/071) and by the Office of Research Ethics, University of Waterloo, Canada (ORE #13547). An independent study estimating the extent to which the new PHWs were in circulation was undertaken by a research team member (JL), who ran a surveillance system for tobacco packaging in major outlets involving observers in six main cities. This study involved monthly examination of retail displays in supermarkets, superettes, dairies, and petrol stations (average of 3,654 packs per month examined for 11 months from December 2007). The findings revealed some minimal circulation of packs with the new PHWs during the end of Wave 1 (0.1% in December 2007 rising to 7.7% in February 2008). During wave 2, the levels rose from 23.9% in March 2008 to 63.6% in May and 99.5% in September.

Measures

The key question added to the NZ questionnaire was "On the outside of tobacco packets there is a 0800 telephone number. What organization or service do you get if you call it?" Response options were not prompted. Other sociodemographic questions were asked in the NZHS (see Table 2), but most of the smoking-related questions were sourced from the Wave 4 ITC 4-country survey.

An online *Methods Report* outlines ITC measures (Wilson, 2009); key variables included in the analyses reported in this paper included ethnicity, deprivation, and financial stress. Respondents' ethnicity was prioritized, and all those with Māori or both Māori and other ethnic affiliations were classified as Māori; all those with Pacific or both Pacific and other ethnic affiliations were classified as Pacific (unless Māori affiliation was also reported), etc. The European grouping includes other (non-Māori, non-Pacific, and non-Asian) ethnic groups. Deprivation level was based on an NZ-specific deprivation index for small areas (NZDep2006) and on an individual measure of deprivation (NZiDep) also designed for NZ (Wilson). We considered two measures of financial stress that are correlated with each other (and with the small area deprivation measure; Wilson) but involve significant conceptual differences (Siahpush, Yong, Borland, Reid, & Hammond, 2009). The first question was ". . . because of a shortage of money, were you unable to pay any important bills on time, such as electricity, telephone or rent bills?" The second question was "In the last six months, have you spent money on cigarettes that you knew would be better spent on household essentials like food?"

Weighting and statistical analyses

To maximize the value of the cohort structure, we focused on respondents who participated in both survey waves and calculated a paired matched odds ratio (i.e., as in Table 1). We also present results that were weighted given the sampling design (e.g., boosted

Table 1. Reported recognition of the Quitline number by New Zealand smokers in two survey waves with Wave 2 after improved pack warnings

Responses (unprompted)	Wave 1 (W1)[a] ($N = 923$)		Wave 2 (W2)[a] ($N = 923$)		Absolute change (%) between waves (W2–W1)	Odds ratio[b] for increased recognition between waves
	n	%	*n*	%		
1 = "Quitline/quitting support"	340	36.8	562	60.9	+24.1	3.31 (95% *CI* = 2.63–4.21; $p < .001$)
2 = "Helpline"	37	4.0	27	2.9	−1.1	—
3 = "Information on smoking"	38	4.1	5	0.5	−3.6	—
4 = "Product complaints"	5	0.5	1	0.1	−0.4	—
5 = "Tobacco company"	18	1.9	13	1.4	−0.5	—
6 = Don't know	430	46.6	260	28.2	−18.4	—
All options: 2–6	583	63.2	361	39.1	−24.1	1.0 referent

Note. [a]Based on just those who responded to both W1 and W2 (unweighted results).
[b]Using paired matched odds ratio with exact McNemar significance probability.

sampling of three ethnic groups in the NZHS) and nonresponse for the NZHS and ITC Project survey. A full description of the weighting process is detailed in online reports (Clark, 2008, 2009).

Bivariate analyses included various socioeconomic status measures covering small area deprivation (NZDep2006), individual deprivation (NZiDep), and financial stress (Wilson, 2009). All analyses were conducted in Stata (version 10, StataCorp, College Station, TX), and all the presented results were weighted and adjusted for the complex sample design of the NZHS to make the sample representative of all NZ smokers.

Results

When considering the sample interviewed in both waves, the introduction of PHWs with the Quitline number was associated with a marked increase in reported recognition of the Quitline number (Table 1). That is, there was a 24.1% absolute increase from 36.8% to 60.9% (matched odds ratio of 3.31, 95% *CI* = 2.63–4.21). There were concomitant reductions in other interpretations, including the less precise answer of "helpline" and inaccurate answers of "information on smoking," "product complaints," and "tobacco company." Weighted results were very similar with a 25.0 percentage point increase (Table 2; matched odds ratio as per the comparison in Table 1 of 3.41, 95% *CI* = 2.71–4.32).

The weighted data in Table 2 also reveal a between-wave shift from minority to majority recognition of the Quitline number by smokers of all age groups, genders, and ethnic groups and by all measures of deprivation and financial stress. The absolute increase in recognition over the two waves was significantly lower in the oldest age group (compared with the youngest). The absolute increase was similar for Māori (25.1%) and Pacific (27.1%) but significantly higher for Asians (43.5%, $p = .005$) compared with 23.5% for European/other smokers. However, the Asian smoker population had much lower baseline recognition in Wave 1 compared with the other ethnic groups.

A majority of all five quintiles of socioeconomic deprivation using a small area measure (range 58.0%–65.5%) recognized the Quitline number in Wave 2. The increase between the waves was lowest in the most deprived quintile ($p < .001$), though this group had the highest level of recognition at baseline. For individual deprivation, the increase was highest in the second to least deprived grouping and lowest in the most deprived. For both types of deprivation, the most deprived had the highest level of recognition in Wave 1 and the lowest level of recognition at Wave 2 (though in the latter, the differences were not significantly different).

For all the sociodemographic groups detailed in Table 2, the range in the prevalence of Quitline number recognition can be compared for the subpopulation with the lowest recognition levels to that with the highest recognition levels. This range declined between waves by gender (i.e., from 9.2 to 4.7 percentage points), by ethnic group (from 19.3 to 1.8), by small area deprivation quintile (from 17.8 to 7.5), and by individual deprivation level (from 12.0 to 6.6). But there was an actual increase in this range between waves by age group (i.e., from 16.5 to 20.3) and no significant change for financial stress (i.e., from 6.4 to 6.5).

Discussion

Main findings and interpretation

The new PHWs, which featured a more prominent and clearly identified quitline number, resulted in higher proportions (over 60%) of NZ smokers recognizing the number as the Quitline number. Even though the Quitline number appears on the back of packaging (a less prominent site) and in small font, the increase in recognition was large and statistically significant.

The high level of recognition at Wave 2 was similar by gender and across all ethnic groups and by level of deprivation. Although the increase in recognition was lower for one of the most deprived groups ($p < .001$), this increase was from a higher Wave 1 baseline. Therefore, this intervention can be generally considered to be of benefit to all sociodemographic groupings. It may also help equalize differences that previously existed, at least for gender, ethnic group, and both measures of deprivation (but not for age group in this study).

These findings are consistent with the international findings outlined in the Introduction section on the value of providing quitline numbers on packs. However, this study's before and after design and comparison of recognition within the same

Table 2. Reported recognition of the Quitline number by New Zealand smokers in two survey waves with Wave 2 after improved pack warnings by demographic and sociodemographic status (i.e., for the response in row 1 of Table 1 but with results weighted and adjusted for the complex sample design)

Demographic and sociodemographic variable	Quitline recognition in Wave 1 (W1; %) and 95% *CI*	Quitline recognition in Wave 2 (W2; %) and 95% *CI*	Absolute change (%) between waves (W2–W1)	Statistical significance of difference in change between waves compared with the referent group
Total ($N = 923$)	36.7 (32.4–40.9)	61.7 (57.5–65.9)	+25.0	—
Gender[a]				
Men ($n = 356$)	32.0 (25.8–38.2)	59.3 (52.8–65.8)	+27.3	Referent
Women ($n = 567$)	41.2 (35.6–46.9)	64.0 (58.6–69.5)	+22.8	$p = .122$
Age group (years)[a]				
18–24 ($n = 55$)	46.7 (31.7–61.7)	69.6 (56.1–83.1)	+22.9	Referent
25–34 ($n = 212$)	33.2 (25.1–41.4)	66.0 (57.6–74.4)	+32.8	$p = .156$
35–44 ($n = 243$)	30.2 (23.0–37.4)	58.1 (50.1–66.1)	+27.9	$p = .451$
45–54 ($n = 220$)	38.7 (30.0–47.4)	64.5 (55.7–73.2)	+25.8	$p = .658$
55+ ($n = 193$)	37.9 (29.6–46.2)	49.3 (40.9–57.8)	+11.4	$p = .030$
Ethnicity[b]				
European ($n = 465$)	38.2 (32.6–43.7)	61.7 (56.3–67.2)	+23.5	Referent
Māori ($n = 369$)	36.6 (29.9–43.2)	61.7 (54.7–68.8)	+25.1	$p = .592$
Pacific ($n = 49$)	33.5 (15.0–52.0)	60.6 (43.0–78.1)	+27.1	$p = .574$
Asian ($n = 40$)	18.9 (5.5–32.4)	62.4 (41.2–83.5)	+43.5	$p = .005$
Small area deprivation level (quintiles)[b]				
1 and 2 (least deprived; $n = 85$)	24.8 (13.2–36.3)	60.0 (45.9–74.1)	+35.2	Referent
3 and 4 ($n = 155$)	38.2 (28.1–48.3)	64.4 (54.0–74.8)	+26.2	$p = .143$
5 and 6 ($n = 169$)	33.7 (24.1–43.2)	61.1 (51.3–70.9)	+27.4	$p = .201$
7 and 8 ($n = 206$)	36.8 (28.2–45.5)	65.5 (57.2–73.9)	+28.7	$p = .274$
9 and 10 (most deprived; $n = 308$)	42.6 (34.7–50.5)	58.0 (50.4–65.5)	+15.4	$p < .001$
Individual deprivation NZiDep scores[b]				
0 (least deprived; $n = 450$)	37.9	60.7	+22.8	Referent
1 ($n = 170$)	31.0	65.1	+34.1	$p = .004$
2 ($n = 103$)	38.2	62.7	+24.5	$p = .712$
3–4 ($n = 120$)	34.1	63.0	+28.9	$p = .165$
5–8 (most deprived; $n = 80$)	43.0	56.4	+13.4	$p = .059$
1–8 (any deprivation) ($n = 473$)	35.3	62.7	+27.4	$p = .107$
Financial stress[b]				
Unable to pay any important bills on time				
No ($n = 864$)	36.5	61.9	+25.4	Referent
Yes ($n = 59$)	39.5	58.7	+19.2	$p = .287$
Not spending on household essentials				
No ($n = 704$)	35.5	61.2	+25.7	Referent
Yes ($n = 215$)	41.9	65.2	+23.3	$p = .478$

Note. [a]Based on New Zealand Health Survey data with the age data collected a few months prior to the International Tobacco Control Policy Evaluation Survey Project.

[b]For further details, see the Methods section and an online *Methods Report* (Wilson, 2009).

cohort means that the findings are more robust than earlier studies. The consistent findings across studies strengthen the basis on which governments can develop regulations about tobacco packaging and the information this should feature.

Study strengths and limitations

Major strengths of this study were its nationally representative sample and the prospective cohort design. Recognition was assessed in the same group of subjects, avoiding the possibility of selection bias affecting the comparisons between waves. The risk of social desirability bias should have been reduced by the location of the question about recognition of the Quitline number within a comprehensive questionnaire. Furthermore, the question wording was framed, so it did not draw any particular attention to the change in the health warnings.

A potential weakness is that this study involved a sample that (due to nonparticipation in the NZHS and then in the two survey waves of the ITC Project) may have become less representative of the national population of smokers. It is therefore possible that the weighting process (although sophisticated) may not have fully adjusted for nonresponse bias, potentially affecting the generalizability of the findings to all NZ smokers. Furthermore, we can not exclude

the possibility that the estimate arising from Wave 2 may be biased upward as a result of some smokers looking "for the answer" on a nearby cigarette pack while answering the survey question on the telephone. In addition, a television advertising campaign that began in the middle of Wave 2 (June 2008) was thematically similar to one of the new PHWs (on oral cancer) and showed the Quitline number on television. Therefore, Wave 2 respondents could have been more likely to guess that the number on the pack was for the Quitline. Nevertheless, Wave 1 participants are also likely to have been exposed to regular television advertising that promoted quitting messages, including the Quitline number (Li & Grigg, 2009). Furthermore, accompanying media campaigns can be considered to be part of the "intervention package" that is appropriate when new PHWs are introduced. In contrast, the fact that there was some penetration of the new PHWs at the end of wave 1 (i.e., 7.7% in February 2008) and incomplete uptake at the start of wave 2 (i.e., 23.9% in March 2008) may have reduced the extent of differences that might otherwise have been evident.

Possible policy and research responses

These findings provide additional support for requiring all tobacco packages to display quitline numbers as part of health warning regulations (i.e., for countries with quitlines). Nevertheless, further research is still required to estimate the optimal size of the quitline number on tobacco packaging, particularly given the size of the pictorial image. In addition, research should also examine the optimal position of the quitline number (e.g., whether superimposed on the pictorial image and/or as a separate box of text on the main faces of the pack and/or the sides of the pack) and the value of including a Web site for the quitline service as well as the telephone number. Finally, research should also examine whether allocating more space to the health warning (e.g., as per the proposed 80% of the pack surface in Uruguay; Physicians for a Smoke-free Canada, 2009) increases recognition of a quitline number.

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Declaration of Interests

None declared.

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