Perceptions of tobacco health warnings in China compared with picture and text-only health warnings from other countries: an experimental study

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ABSTRACT

Objective To assess the perceived effectiveness of cigarette health warnings in China, compared with picture and text-only warnings from other countries.

Method 1169 individuals (adult smokers, adult nonsmokers and youth) from four Chinese cities (Beijing, Shanghai, Kunming and Yinchuan) viewed 10 health warnings on cigarette packages, which included (a) the current Chinese text warnings covering 30% of the front/back of the pack (introduced October 2008); (b) the former Chinese text warning located on the side of the pack; (c) four picture warnings covering 50% of the front/back of the pack from Canada (lung cancer), Singapore (mouth disease), Hong Kong (gangrene) and European Union (clogged arteries); and (d) the same four warnings without the picture. Participants rated and ranked the 10 warnings on dimensions including how effective each would be in motivating smokers to quit and in convincing youth not to start smoking.

Results Both Chinese warnings were consistently rated as least effective, with the new Chinese warning rated only slightly higher than the old warning. The picture warnings were consistently ranked or rated as most effective, with the text-only versions in the middle. Results were consistent across subject group, city and sex.

Conclusions (1) Picture warnings are rated as much more effective than the same warnings without pictures. (2) The revised health warnings in China, introduced in October 2008, are only marginally more effective than the previous warning and far less effective than even text warnings from other countries. These results, coupled with population-based evaluation studies, suggest that pictorial warnings would significantly increase the impact of health warnings in China.

Health warnings on tobacco packages constitute an important method to inform and educate the public about the harms of tobacco use.[1] Health warnings are the focus of Article 11 of the World Health Organization's Framework Convention on Tobacco Control (FCTC), the world's first health treaty, which, as of August 2010, has been ratified by 171 countries inhabited by more than 85% of the world's population. Article 11 states that warnings shall be no less than 30% of the front and back of the package. There must be multiple versions of the warnings, which must be rotated, and packs must display information about product constituents. In addition to the minimum requirements, the FCTC recommends that health warnings cover at least 50% of the package, include pictures and a distinctive border to make the warning more prominent, and that they appear at the top of the package; these recommendations were incorporated in the Article 11 Guidelines, which were adopted at the Third Conference of the Parties in November 2008.[2]

China ratified the FCTC in October 2005 and has slowly begun to take steps towards implementing the FCTC in this country of over 300 million smokers. Until October 2008, China's text-only health warning was very small and located on the side of the pack, rather than on the front or back. There was just one message: "smoking may harm your health".

In October 2008, China implemented an enhancement of its health warning. The old and new health warnings are shown in figure 1. The new health warning had the following characteristics: (1) The health warning occupied 30% of both the front and back, although there were no design elements that set apart the health warning from the rest of the package design; (2) the warning appeared at the bottom rather than at the top of the package; (3) the health warning consists of two very general messages, rather than including information about the specific harms of smoking: "smoking is harmful to your health" and "quit[ting] smoking reduces health risk"; (4) the rotation consists only of a slight change in the second message: "quit[ting] smoking early is good for your health"; the first message remains identical on all packages; and (5) the two-message health warning on the back of all packages is identical to the front but is printed entirely in English (the English warnings included a grammatical error; the verbatim text is corrected above).

Although evaluation studies from the International Tobacco Control Policy Evaluation Project (the ITC Project) have demonstrated the effectiveness of picture warnings relative to text warnings at the population level,[1 3–8] the survey methods used in those evaluation studies have not allowed a more fine-grained and comparative evaluation at the level of the individual warning. Different methods — in particular, experimental studies — are best suited to determine the relative effectiveness of specific and individual warnings. In one such example by Peters *et al*,[9] smokers and nonsmokers in the USA were exposed to either Canadian pictorial health warnings or the U.S. text-only health warnings. Peters *et al* found that the Canadian pictorial warnings elicited significantly greater negative affect and were viewed for

Figure 1 The old (before October 2008) health warning and the new (October 2008) health warning on cigarette packages in China.

a significantly longer time than were the U.S. warnings. Such experimental studies are necessary to examine the impact of specific features of warnings, which would be beneficial for the design of warnings in countries that are in the planning stages.

The objective of this study was to compare the perceptions of Chinese individuals among three groups — adult smokers, adult nonsmokers and youth — of both the new and the old Chinese health warnings as contrasted with four health warnings from other countries/jurisdictions: Hong Kong, Singapore, Canada and the European Union (EU) — in their original form with pictures and in a revised form in which the text of the warning was identical but with the picture removed. Participants rated and ranked the 10 health warnings on a number of important dimensions directly related to public health goals, including perceived effectiveness in motivating smokers to quit and in convincing youth not to start smoking. To test for regional differences, the study was conducted in four cities: Beijing, Shanghai, Kunming and Yinchuan. The study was conducted in January–February 2009. Reports from all four cities indicated that at the time of the study the new warnings had totally or nearly totally replaced the old warnings.

METHOD

Participants and study design

The participants were 1169 individuals, who participated in the study during January–February 2009. The study design was a city (four: Beijing, Shanghai, Kunming, Yinchuan)×sex (two)× participant group (three: adult smokers, adult nonsmokers, youth (13–17 years old)). Table 1 presents the study design and the number of participants in each of the cells. Table 2 presents descriptive statistics of two participant groups: adult smokers and youth. Reactions to the current health warnings by adult smokers point to their lack of impact: only 28% to 46% reported noticing the warnings "often" or "very often" and only 9% to 13% reported that the warnings made them think about the health risks of smoking "often" or "very often".

The participants were recruited by local neighbourhood leaders and/or by staff at the local Center for Disease Control (CDC) in each city, who conducted the recruitment at neighbourhood association offices (Ju Wei Hui) and at local schools across a broad number of street districts (Jie Dao) throughout each city.

Table 1 Study design and number of participants

	Adult smoker		Adult nonsmoker		Youth (13–17 years)		
City	Male	Female	Male	Female	Male	Female	Total
Beijing	55	40	39	47	51	45	277
Kunming	50	50	46	50	50	50	296
Shanghai	51	52	47	50	50	50	300
Yinchuan	50	48	48	50	50	50	296
Totals	206	190	180	197	201	195	1169

Stimulus materials

Ten images of Chinese health warnings were created, including the old Chinese health warning (located on the side of the pack) and the new Chinese health warning (30% on the front of the pack). We created high-quality images of one health warning from each of four countries with picture warnings (Canada, lung cancer; Singapore, mouth disease; Hong Kong, gangrene; EU, clogged arteries). We translated the text into Chinese. For each of the four picture warnings, we created text-only versions by removing the picture.

Using digital image software, each constructed warning was placed on the image of a cigarette pack so that the resulting image was consistent with the Article 11 Guidelines: they occupied 50% of the top part of the package and each was set apart by a thick black box surrounding the warning. Each of the 10 images (old and new Chinese warnings and the eight constructed warnings) was placed on the cigarette pack of the same brand (Chunghwa) to maintain consistency.

The 10 images were assigned a random number from 1 to 10 to identify each warning to the respondent for the rating and ranking tasks. An image of each pack with that identifying number was printed on photographic paper, so that the size of the pack image was about 57×90 mm, nearly identical to the real pack size of about 55×88 mm.

The full set of 10 images is presented in figure 2.

Measures

Prelabel task questionnaire

Each respondent completed a short questionnaire that asked about demographic characteristics (eg, age, sex) and about various attitudes and opinions about smoking. Respondents who were smokers completed additional items that asked about their smoking history and current smoking (eg, cigarettes per day), using standard wording from the ITC surveys in China (see http://www.itcproject.org/research/surveys/itcchina).

Translation task

The translation task was designed to assess whether the Chinese respondents could understand the back warnings, which, as indicated above, appeared entirely in English. The first sentence was the top message of the new Chinese health warning: "Smoking is harmful to your health". The second sentence was one of the two variations of the bottom message: "Quit smoking early is good for your health" (this ungrammatical English sentence was reproduced verbatim from the text of the warning). The translation task was presented before exposure to any of the health warnings described below, so there was no previous exposure that could have prompted the answers to this translation task.

Label rating task

Each participant rated each of the 10 health warnings on two dimensions: (a) how effective each label would be in motivating smokers to quit and how effective each label would be in convincing youth not to start smoking. They did so on a five-point scale, where 5=" extremely effective", 4="very effective", 3="somewhat effective", 2="a little bit effective", and 1="not at all effective" (there were additional rating tasks, eg, emotional reactions and ratings of realism, but the analyses involving those variables are not reported in this paper).

Table 2 Descriptive statistics for adult smokers and for youth

Adult smokers					
Characteristic	**Beijing (n=95)**	**Shanghai (n=103)**	**Kunming (n=100)**	**Yinchuan (n=98)**	**Statistical test**
Age					
18–29	63%	60%	49%	48%	$\chi^2(9)=11.6$ p=0.24
30–39	13%	13%	22%	20%	
40–49	12%	17%	14%	20%	
50+	13%	10%	15%	11%	
Household income/month					
<3000 yuan	44%	36%	48%	43%	$\chi^2(9)=17.8$ p=0.038
3000–6999 yuan	35%	29%	29%	28%	
7000+ yuan	12%	15%	6%	4%	
No Answer	9%	20%	17%	25%	
Daily smokers	83%	79%	79%	78%	$\chi^2(3)=1.1$ p=0.78
Cigarettes per day, mean (SD)	12.5 (7.9)	12.1 (8.1)	11.1 (8.3)	10.4 (8.2)	F(3,387)=1.3 p=0.29
Ever tried to quit	61%	52%	61%	63%	$\chi^2(3)=2.9$ p=0.41
Time to first cigarette					
<5 min	26%	22%	22%	18%	$\chi^2(9)=4.6$ p=0.87
5–30 min	33%	27%	35%	30%	
31–60 min	15%	21%	18%	21%	
>60 min	25%	30%	25%	31%	
Self-rating of addiction to cigarettes: % somewhat or very addicted	87%	77%	86%	84%	$\chi^2(3)=4.9$ p=0.18
How often noticed warning labels: % often or very often	32%	46%	38%	28%	$\chi^2(3)=8.2$ p=0.04
How often warning labels make you think about the health risks of smoking: % a lot	9%	11%	12%	13%	$\chi^2(3)=0.8$ p=0.86

Youth					
Characteristic	**Beijing (N=96)**	**Shanghai (N=100)**	**Kunming (N=100)**	**Yinchuan (N=100)**	**Statistical test**
Age, mean (SD)	15.4 (0.6)	14.5 (1.3)	14.9 (1.9)	15.7 (1.0)	F(3,392)=17.4 p<0.0001
Smoking status					
Never smoked	98%	90%	79%	85%	Nondaily versus daily:
Former smoker	2%	9%	11%	10%	$\chi^2(3)=5.9$ p=0.12
Nondaily smoker	0%	1%	5%	4%	
Daily smoker	0%	0%	5%	1%	

Label ranking task

Each participant rank ordered each of the 10 health warnings on effectiveness on four dimensions: (a) motivating smokers to quit, (b) convincing youth not to start smoking, (c) informing the public about the harms of smoking, and (d) showing that the Chinese government is serious about reducing smoking.

Postlabel task questionnaire

All respondents answered two questions. The first was: "Do you think that cigarette packages should have more health information than they do now, less information, or about the same amount as they do now?" The response categories were "less health information", "about the same" and "more health

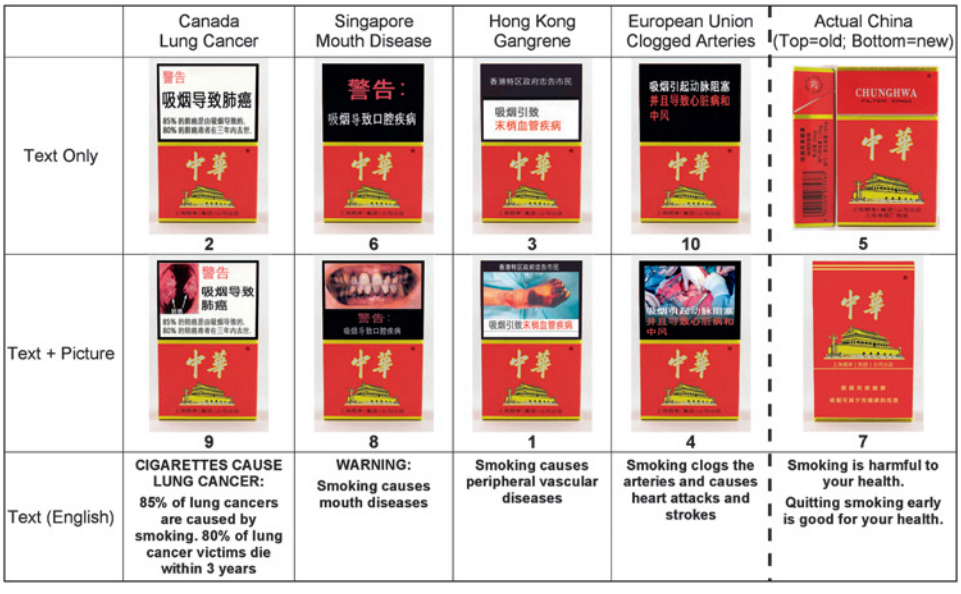

Figure 2 Images of health warnings used in the study, including Old and New Chinese health warnings. Note: numbers below each image are the random order numbers assigned to each of the images.

information". The second was "Do you think that the government should include pictures as part of the health warning on cigarette packs?" The response categories were "yes" or "no".

Procedure

Participants were recruited by local CDC staff in each of the four cities. They participated in small groups at locations such as conference rooms and neighbourhood schools. Upon arrival at the experimental session, participants were placed at a desk or table at sufficient distance from other participants so that their responses could remain confidential. The experimenter (a trained staff member of the local CDC) read the instructions from a written script for each part of the experiment. All experimental sessions across all four cities used the same script.

After the prelabel task questionnaire and translation task were completed, the experimenter called attention to the envelope on each participant's desk or table position. Inside the envelope were the 10 photo cards of the health warnings, randomly numbered 1 to 10 as shown above in figure 2. The experimenter conducted the label ranking task, the label rating task, and the postlabel task questionnaire. The experimenter then verbally debriefed the respondents and gave them a written feedback sheet. Finally, each participant was given 20 yuan in compensation for their participation.

The study protocol and all experimental materials, including the photo images and the questionnaires, were cleared for ethics by the Institutional Review Board of the China National CDC and by the Human Research Ethics Committee at the University of Waterloo.

Data analysis

Descriptive statistics were conducted on the demographic variables, and differences were tested via χ^2 analyses. The rating data were analysed by a mixed-model analysis of variance, with post hoc contrasts conducted to test for differences between individual warnings. Pearson correlation coefficients were computed to examine the degree of consistency between the rating and ranking tasks. All analyses were conducted using SAS V.9.1.

RESULTS

Ratings of warning effectiveness

Figure 3 presents the mean effectiveness ratings across all respondents for each of 10 health warnings on the dimension of motivating smokers to quit. The four picture warnings are presented in upward diagonal striped bars; the four text warnings from non-Chinese countries are in solid bars; the two China warnings (the old warning and the new warning) are in downward diagonal striped bars.

There was a substantial difference across the 10 warnings in mean effectiveness, $F(9,10\,278)=785.32$, $p<0.0001$. A difference between the means of any two labels of 0.10 scale point is significant at the 0.05 level, a difference between the means of any two labels of 0.13 scale points is significant at the 0.01 level, and a difference of 0.17 scale points is significant at the 0.001 level.

Looking first at the broad categories of warnings, all four of the picture warnings were rated highest on effectiveness in motivating smokers to quit, followed by a large gap of about 0.5 scale point by the four non-Chinese text warnings ($p<0.0001$), followed by another large gap of 0.6 scale point between the text warnings and the two Chinese warnings ($p<0.0001$).

Looking within the picture warnings, the Canadian lung cancer warning received the highest rating, followed by the Singapore mouth disease warning, the Hong Kong gangrene warning and the EU clogged arteries warning. All differences between adjacent warnings were significant at the 0.05 level. Among the text warnings, the Canadian lung cancer warning had the highest rating, followed by the EU clogged arteries warning, the Hong Kong gangrene warning and the Singapore mouth disease warning. Finally, the new Chinese warning was significantly more highly rated than the old warning ($p<0.05$), but much lower in ratings than the lowest-rated text-only warning from the other countries ($p<0.0001$).

Figure 4 presents the mean effectiveness ratings on the dimension of convincing youth not to start smoking. The identical pattern of results was found. The exact ordinality of the 10 warnings was replicated with the only exception that the

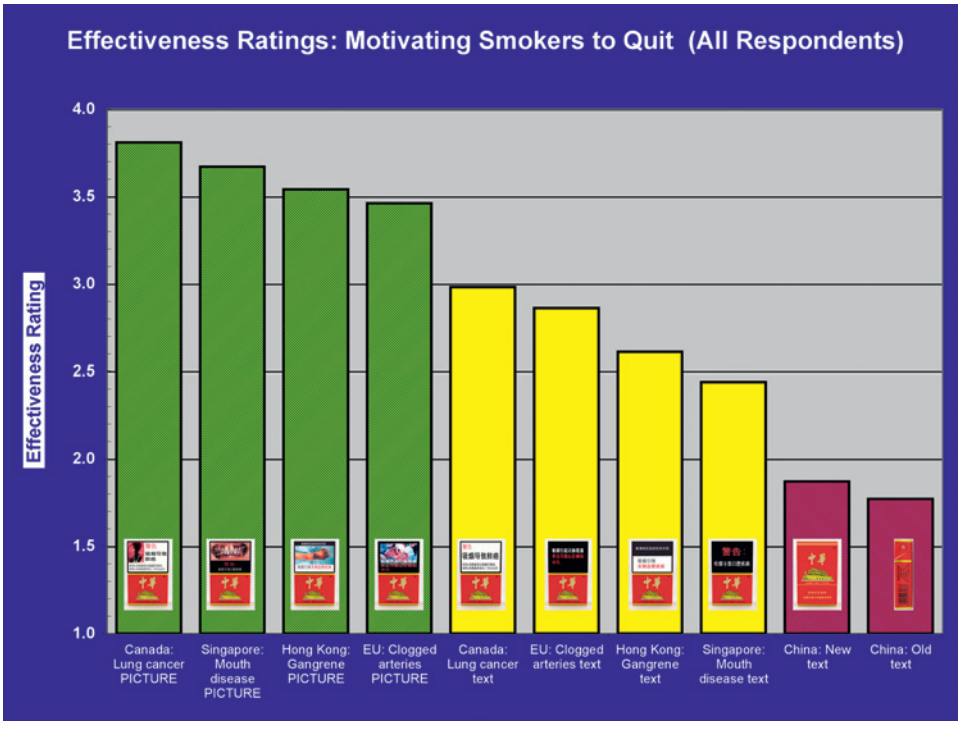

Figure 3 Mean effectiveness ratings of each health warning: "How effective would each label be in motivating smokers to quit?" (All Respondents).

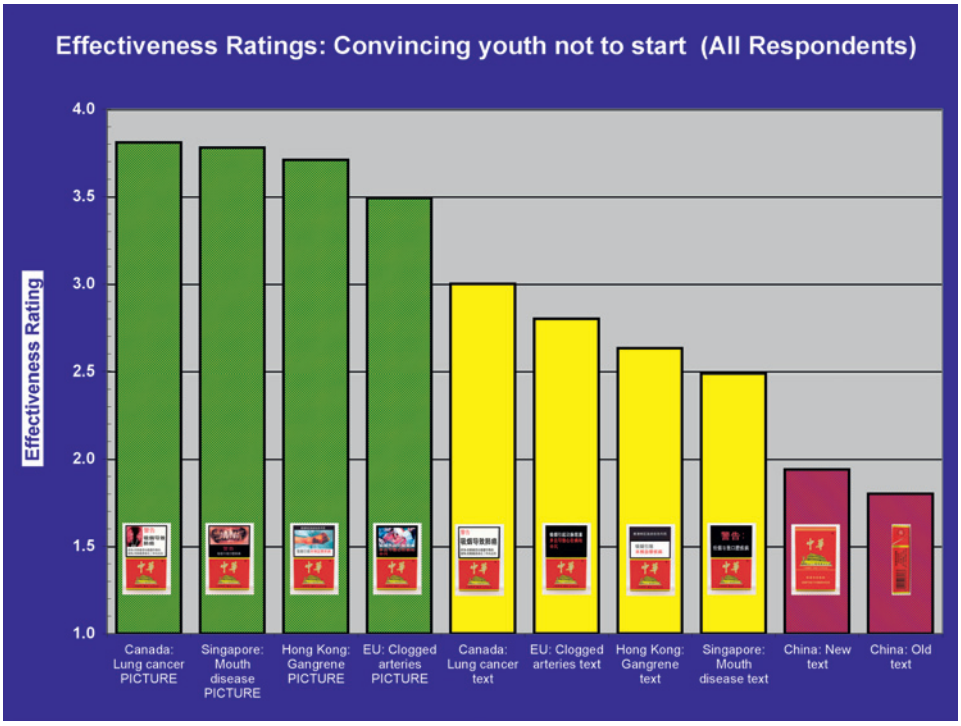

Figure 4 Mean effectiveness ratings of each health warning: "How effective would each label be in convincing youth not to start smoking?" (All respondents).

Canadian lung cancer and Singapore mouth disease picture warnings did not differ significantly at the 0.05 level.

We conducted mixed model ANOVAs to determine whether these ratings varied as a function of the factors in the study design. The results were essentially the same for the ratings for motivating smokers to quit and for convincing youth not to start: (a) there was no difference by city, subject group (smokers, nonsmokers, youth) or sex; (b) there was an enormous effect of warning ($p<0.0001$) and (c) there were significant interactions for warning×city ($p<0.0001$) and for warning×participant group ($p<0.0001$) and warning×sex ($p=0.017$). The interactions were due almost entirely to variations in the effectiveness ratings among the four pictorial warnings or among the four non-Chinese text warnings rather than due to variation in city, participant group, and sex across the broader categories of pictorial warnings versus text-only warnings. In no subgroup (sex, city, or participant group) did the basic ordering change: the four pictorial warnings were always rated as much more effective than the four non-Chinese text warnings, which in turn were always rated as much more effective than the two Chinese warnings. The two China warnings were always the lowest rated of the 10 warnings.

Because the sample sizes were high, small mean differences can yield statistical significance. To provide some indication of the effect sizes — which are independent of sample size — associated with key comparisons of the new Chinese warning and the other warnings, we computed the Cohen's d for the difference between the new Chinese warning and (a) the lowest-rated foreign text warning and (b) between the new Chinese warning and the lowest-rated foreign picture+text warning. For ratings of effectiveness for whether the warning motivated smokers to quit, the difference between the new Chinese warning and the lowest rated foreign text warning (Singapore mouth disease) was associated with $d=0.47$, close to the benchmark of 0.5, for a "moderate" effect size and the difference between the new Chinese warning and the lowest rated foreign text+picture warning (EU clogged arteries) was associated with $d=1.36$, way above the benchmark of 0.8 for a "high" effect size. The Cohen's d for the same two differences on convincing youth not to start smoking were very similar: 0.45 and 1.27, respectively. All other comparisons between the new Chinese warning and any other text or text+picture warning would yield an even higher effect size. These effect size computations demonstrate the pronounced differences in perceived effectiveness between the new Chinese warnings and any of the foreign alternatives, especially those with graphic images.

Ranking of label effectiveness

The ranking task replicated the findings of the rating task. There were two dimensions on which participants both ranked and rated the 10 labels. Figure 5 presents the mean rankings for effectiveness in motivating smokers to quit, which shows the near identical pattern of results presented in figure 3 for mean ratings.

The chart of mean rankings for effectiveness in convincing youth not to start smoking is presented in figure 6. Although there were some differences in ordering within the four picture warnings (eg, the Singapore mouth disease warning was the highest ranked warning), compared with the mean ratings presented in figure 4, the strong three-level ordering of the warnings was found again. For the mean rankings, the gap between the China warnings and the other text-only warnings was more pronounced than it was for the mean ratings.

The similarity of the ranking and rating tasks was quantified by computing the within-subject correlation between ranking and rating for each respondent. For motivating smokers to quit, the mean correlation between ranking and rating was 0.732; for convincing youth not to start smoking, it was 0.704.

As an illustration of the uniformity of the difference between the picture warnings and the new China warnings, 59% of all participants ranked the Singapore picture warning as the most effective or the second most effective warning for convincing youth not to start smoking. In contrast, 81% of all participants ranked the new China warning as either the least effective or the second least effective warning.

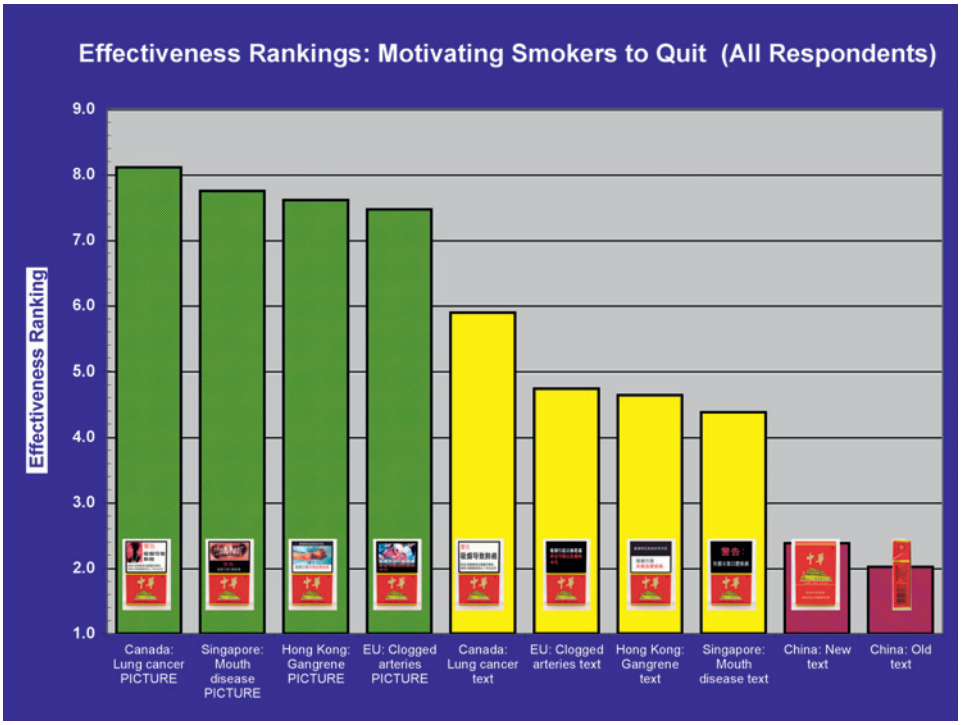

Figure 5 Mean ranking of health warnings on "How effective would each label be in motivating smokers to quit?" (All Respondents).

Figure 7 presents the mean rankings of the warnings on how effective the labels were for informing the public of the dangers of smoking. Figure 8 presents the mean rankings of the warnings on effectiveness for showing that the Chinese government is serious about reducing smoking. For both of these measures, the same three-level findings were replicated, although there was a very slight difference in ranking within the levels.

Opinions about what the Chinese warnings should include

At the end of the study session, participants were asked for their opinions about what the Chinese warnings should include. Nearly three-quarters of participants (74.4%) stated that cigarette packages should have more health information. Only 6.0% said that cigarette packages should have less health information, and 19.6% said that cigarette packages should have "about the same". The opinion that cigarette packages should have more health information was higher in Kunming (77.7%), Yinchuan (76.0%), and Shanghai (75.5%), than it was in Beijing (67.6%) (each comparison with Beijing: $p<0.035$). It was highest among youth (81.5%), followed by adult nonsmokers (77.5%) and lowest among adult smokers (64.2%). Youth and nonsmokers did not differ from each other, but both were, as expected,

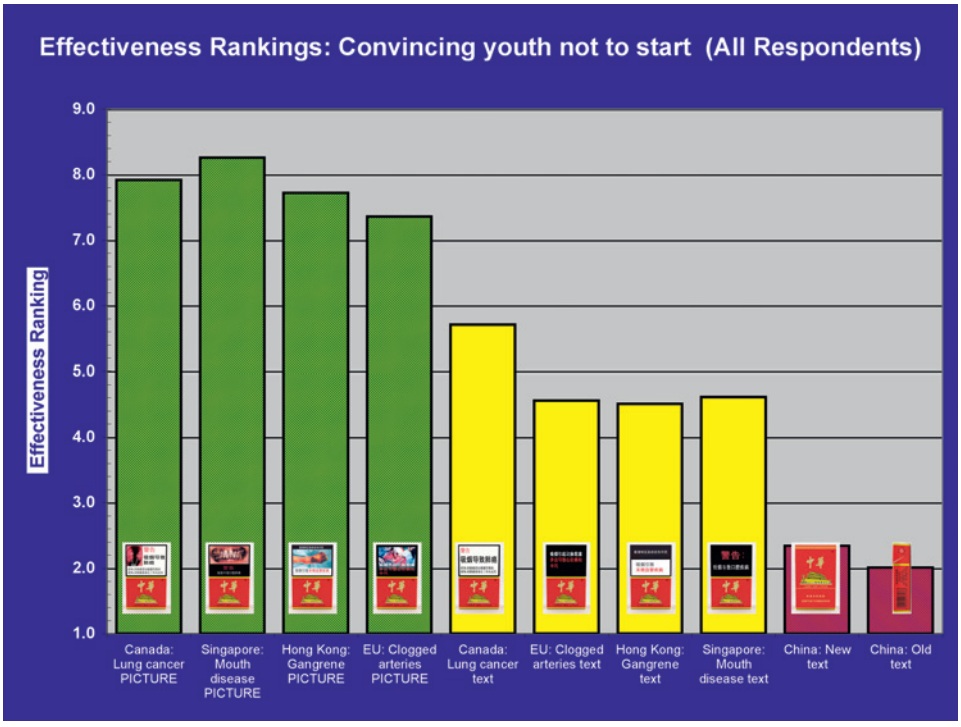

Figure 6 Mean ranking of health warnings on "How effective would each label be in convincing youth not to start smoking?" (All Respondents).

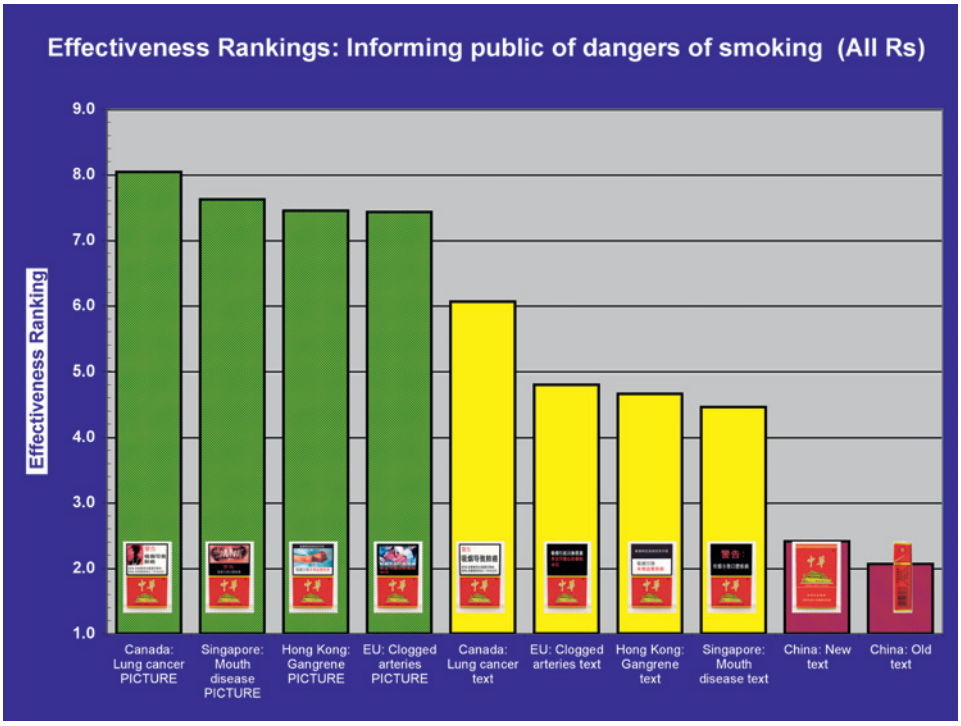

Figure 7 Mean ranking of health warnings on "How effective would each label be in informing the public about the harms of smoking?" (All Respondents).

significantly higher than adult smokers ($p<0.001$). However, it should be noted that even the majority of adult smokers wanted more health information on cigarette packages.

In addition, 80.7% of participants stated that warning labels should include pictures. This proportion was significantly higher among adult nonsmokers (86.1%) than it was among youth (78.9%) and adult smokers (77.4%); both comparisons with nonsmokers: $p<0.025$. It was higher in Kunming (87.2%) and Yinchuan (86.1%) than it was in Beijing (77.6%) and Shanghai (71.8%); Beijing and Shanghai did not differ significantly from each other, but both were significantly lower than Yinchuan and Kunming ($p<0.007$ for each comparison).

Prevalence of understanding the English warning messages

Table 3 presents the percentage of participants who correctly translated each of the two English phrases on the back of the cigarette pack. Of all adult smokers — the group that would be more likely to encounter these warnings — only 26.8% were able to correctly translate "smoking is harmful to your health" and only 10.1% could correctly translate "quit smoking early is

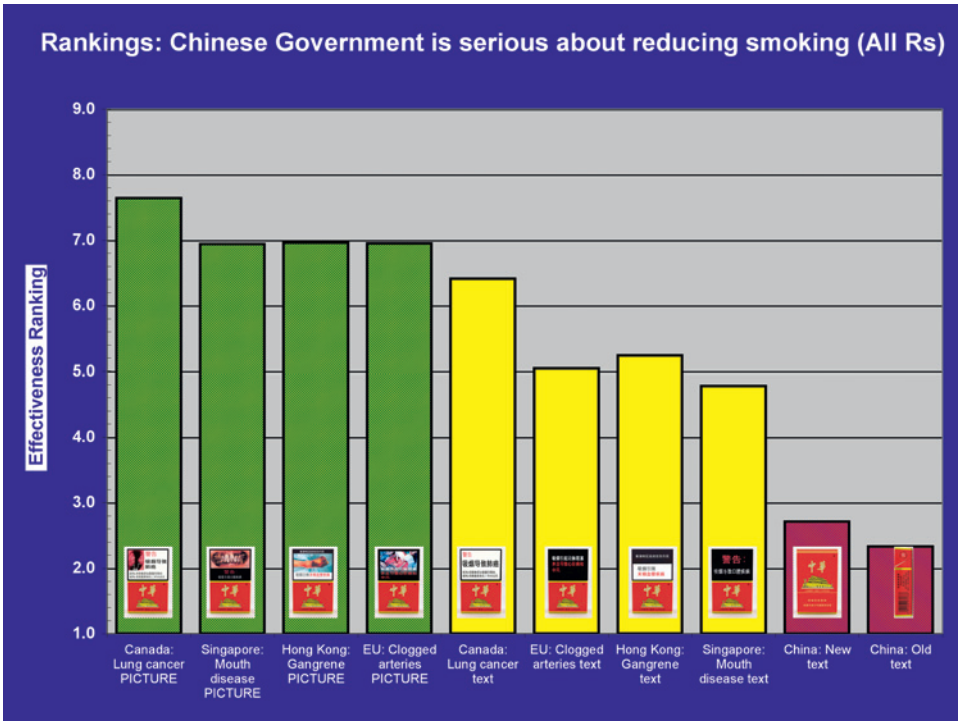

Figure 8 Mean ranking of health warnings on "How effective would each label be in showing that the Chinese Government is serious about reducing smoking?" (All Respondents).

Table 3 Percentage of participants who correctly translated each of the two English warnings by type of participant

Translation phrase	Adult smoker (n=396)	Adult nonsmoker (n=377)	Youth (n=396)	Total (n=1169)
"Smoking is harmful to your health".	26.8%	51.5%	90.4%	56.3%
"Quit smoking early is good for your health".	10.1%	24.7%	47.7%	27.5%

good for your health". As expected, youth were more likely to be able to translate these English phrases ($p<0.0001$), but fewer than half of youth (47.7%) were able to translate the second phrase.

DISCUSSION

The results of this experimental study across a diverse set of people in four Chinese cities strongly support two conclusions: that picture warnings are judged as being more effective than text-only warnings and that the new China health warnings are judged as less effective than text-only warnings being used by other countries. These strong findings were highly consistent across the three participant groups (adult smokers, adult nonsmokers and youth), city and sex, as well as across all dimensions on which the effectiveness was being judged.

The two conclusions were supported on dimensions that are at the heart of the main objective of health warnings: to communicate effectively about the dangers of smoking. Much work in health communication has demonstrated that messages are stronger to the extent that they can provide specific information about harm and that they do so in a vivid and engaging manner.[10 11] As of February 2010, 35 countries now employ pictorial warnings,[12] which depict a broad range of specific harms that are caused by smoking, including lung cancer, heart disease, stroke, mouth disease, chronic obstructive pulmonary diseases (COPD, such as emphysema) and impotence.[13] All of these adverse effects are well-documented by research, and some have been well-established for decades. As such, their inclusion on health warnings would be noncontroversial and important. Because knowledge of specific harms of smoking is low in China,[14] findings from the ITC Four Country Survey (Canada, USA, UK and Australia) showing that health warnings have a beneficial impact on increasing knowledge about the risks of smoking[3] and of smoke constituents[4 15] lead to the strong prediction that inclusion of such specific harms on health warnings would be an effective and low-cost method for increasing the knowledge of the Chinese public.

The findings make a compelling case that the Chinese health warnings introduced in October 2008 do not represent a significant enhancement. Both the old and the new warnings were consistently the lowest rated or ranked of the set of 10 warnings, and the new warning was only slightly stronger than the old warning, which had appeared on the side of the pack. The use of English for the warning on the back of the pack was shown to be ineffective at best: close to three-quarters of adult smokers could not translate one of the two sentences on the text-only warning, and close to 90% of them could not translate the other sentence. These findings support the principle that countries should not be presenting important health messages to their people in a foreign language.

The findings also indicate that the Chinese public wants their government to implement stronger health warnings. The vast majority wants more health information on cigarette packages, and an even greater proportion wants the health warnings to include pictures. This was true even among smokers. It should be noted that participants gave their responses to these two questions after seeing the picture warnings we had created for this study, so their opinions were shaped by having been exposed to concrete examples rather than by mere abstract concepts. It is also notable that participants in Kunming, located in the heart of the tobacco industry in China, were the highest among the four cities in their desire for the government to implement stronger health warnings.

Limitations

The experiment asked participants to give their opinions on the warnings after limited exposures, and thus the actual impact of the warnings if they were to appear on packs is not certain. Similar to this, the dependent measures were not actual risk perceptions, personal beliefs about smoking-related disease, quit intentions or smoking/quitting behaviour after having been exposed to real-world graphic warnings. Such a real-world experiment would be difficult or impossible to conduct. However, these findings of the superiority of pictorial warnings are convergent with findings from other experimental studies (eg, Peters *et al*[9]) and with population-based evaluations of warning labels from the ITC Project across a number of countries.[1 3–8]

This experiment was conducted in only urban areas and thus may not represent responses that would be obtained in rural areas. However, if literacy rate and knowledge of English are lower in rural China, then it is reasonable to expect that the main findings of the superiority of pictorial warnings and the low rates of comprehension of the English text would, if anything, be enhanced.

Conclusions

In response to the tobacco epidemic in China, which caused an estimated 673 000 deaths in 2005,[16] China has made

What this paper adds

- Recent survey research and some experimental studies have demonstrated that including graphic pictures on health warnings on tobacco packaging is more effective in increasing thinking about the health risks of smoking and of motivating intentions to quit and actual quit attempts. These studies have almost exclusively been conducted in high-income countries.
- This is the first study to examine the potential impact of pictorial health warnings in China. Using an experimental design allowing the specific comparison of the same health warning with and without a graphic warning, the results demonstrated the superiority of pictorial health warnings; these results did not differ substantially across different cities, sex, smoking status and age group. Moreover, the inclusion of the old and new (October 2008) Chinese warnings allowed for an explicit comparison of the actual Chinese warnings against warnings from other countries. Both Chinese warnings were rated as lowest in effectiveness and the new warning was barely higher than the old warning in effectiveness. In all, the findings support the conclusion that the Chinese government's October 2008 enhancement of the warnings represents a minimal improvement over the old warnings and that pictorial warnings, such as those already introduced in 35 other countries, would represent a considerable improvement.

a commitment towards tobacco control in its ratification of the FCTC. Strong health warnings are the foundation of a comprehensive approach to tobacco control because the objective of health warnings is to inform the public about the harms of tobacco products, using methods that will increase the likelihood that smokers will be motivated to quit and youth will be less likely to take up smoking.

The findings of this experimental study add to the growing evidence on the superiority of picture warnings and highlight the importance of strong, pictorial warnings in a comprehensive tobacco control program. But this study also demonstrates how little progress has been made so far in China on health warnings.

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Contributors GTF led the conception and design of the study, the interpretation of the data analysis and drafted the article and its revisions. DH contributed to the conception and design, the interpretation of the data and revised drafts of the article. YJ contributed to the conception and design, the acquisition of data and reviewed drafts. QL contributed to the conception and design, to the acquisition of data and reviewed drafts. ACKQ contributed to the conception and design and reviewed drafts. PD led the analyses of the data and reviewed drafts. MY contributed to the analyses of the data and reviewed drafts. All authors reviewed and approved the final version of the article.

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中国烟盒健康警示与其他国家和地区图形和文字方式健康警示感知的实验性比较研究

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摘要

目的：比较中国卷烟健康警示和其他国家和地区的图形和文字方式健康警示，评估中国卷烟健康警示的效果。

方法：在4个中国城市（北京、上海、昆明和银川）选择1169名研究对象（成年吸烟者、成年非吸烟者和青少年），分别观看卷烟包装盒上的10组健康警示，其中包括：（a）当前中国的文字警示，占烟盒正/反面30%的面积（2008年10月采用）；（b）中国2008年10月前使用的位于烟盒侧面的文字警示；（c）4组图形方式烟盒健康警示，覆盖烟盒正/反面50%面积，包括加拿大的肺癌图片，新加坡的口腔疾病图片，香港的坏疽图片和欧盟的动脉阻塞图片；以及（d）同样4组警示但是去掉其中的图片仅保留文字。研究对象分别为10组警示评分、排序，具体指标包括每个警示促使吸烟者戒烟和防止青少年吸烟的效果如何。

结果：两种中国警示评分情况最差，新版警示仅略好于旧版。图形方式健康警示在排序和评分上普遍被认为是最有效的，而4种国外文字警示居中。结果在不同的研究对象、城市和性别之间都具有一致性。

结论：（1）根据评分，图形方式的警示远比同样的没有图形的警示更有效；（2）中国2008年采用的新版健康警示与此前的旧版相比有效性仅仅略有提高，但是仍远落后于其他国家和地区同类型的文字警示。结合以人群为基础的评价研究，本研究结果表明图形方式的警示可以显著提高中国健康警示的效果。烟草产品包装上的健康警示是向公众提供关于烟草使用危害宣传和教育的重要途径。[1]

健康警示是世界卫生组织《烟草控制框架公约》（以下简称《公约》）第11条的中心内容，该公约是世界上第一个卫生条约，到2010年8月为止，已在171个国家批准生效，覆盖全世界超过85%的人口。第11条规定警示至少要占包装正反面30%的面积，要有多个版本的警示进行轮换，包装上必须印有产品成分信息。除了这些基本要求外，《公约》还建议健康警示占据包装表面积的50%，要包括图片内容和明显的边界，以使得健康警示更加醒目，同时要把警示位置放在包装的上部。这些建议都涵盖在2008年11月第三次成员国大会通过的《世界卫生组织烟草控制框架公约第11条实施准则》当中。[2]

中国现有3亿多吸烟者。2005年10月中国正式批准了《公约》，并慢慢开始逐步履约。直到2008年10月，中国用的还是放在烟盒侧面的而不是正面的，很小的文字方式健康警示，内容仅一句话：“吸烟有害健康”。

2008年10月，中国对这个健康警示进行了改进。图1是新旧两版健康警示的对照。新版健康警示具有下列特征：（1）占据正反两面30%的面积，但是在设计上没有任何元素将健康警示与包装其它部分的设计区分开；（2）健康警示位于烟盒的下部而非上部；（3）健康警示内容包括两条非常笼统的信息：“吸烟有害健康（smoking is harmful to your health）”和“戒烟可减少对健康的危害（quit[ting] smoking early reduces health risk）”，而不是关于吸烟具体危害的信息；（4）信息轮换仅仅是对第二条信息内容稍加修改：“尽早戒烟有益健康”，第一条信息内容始终保持不变；（5）背面的两条信息和正面完全一样，但是全英文的（英文版警示当中有一个语法错误；上面的逐字翻译当中已作改正）。

尽管国际烟草控制政策评估项目（ITC项目）所做的评估研究已经展示了图形方式健康警示相对于文字警示在人群层面上的有效性[1 3-8]，但是这些评估研究所采用的方法都没有办法实现对单个健康警示之间的更加细微的比较。其它一些研究方法，特别是实验性研究尤其适合用于确定具体的单个健康警示的相对有效性。其中的一个例子就是Peters等人[9]开展的研究。在该研究中，将美国吸烟者和非吸烟者暴露于加拿大的图形方式健康警示或者美国的文字方式健康警示。Peters等人发现，加拿大图形方式健康警示引起了明显更大的负面反应，同时被注视时间也比美国健康警示显著增长。此类实验性研究对于检验健康警示具体特征的效果是很有必要的，这对于尚处于策划阶段的国家的健康警示设计工作将很有价值。

本次研究的目的旨在比较三组中国群体（成年吸烟者、成年非吸烟者和青少年）对中国新旧两版健康警示与四组来自其他国家和地区（香港、新加坡、加拿大和欧盟）的健康警示的感知，其中既包括原版警示，也包括仅保

图1.中国境内卷烟包装上旧的健康警示（2008年10月以前）和新的健康警示（2008年10月以后）

留了文字内容但去除了图片内容的健康警示。研究对象从一系列与公共卫生目的直接相关的重要方面，对10组健康警示进行了评分和排序，其中包括对促使吸烟者戒烟的认知有效性和防止青少年开始吸烟的认知有效性。为检验地区间差异，本次研究共纳入了四个城市：北京、上海、昆明和银川。本次研究开展的时间是2009年1月至2月。所有四城市的报告都显示，到研究开展时为止，旧版的健康警示已经全部或几乎全部被新版健康警示取代了。

方法

研究对象和研究设计

研究对象共1169人，参加研究的时间是2009年1月至2月。本次研究设计为：城市（4：北京、上海、昆明、银川）×性别（2）×研究对象人群（3：成人吸烟者、成人非吸烟者、青少年（13-17岁））。表1是此次研究的研究设计和各组的研究对象人数。表2是成年吸烟者和青少年两个研究对象人群的描述性数据。成年吸烟者对于现有健康警示的反应都提示这些警示缺乏影响力：仅28%到46%报告“经常”或者“非常频繁”地注意到这些警示，仅9%到13%报告这些警示“经常”或者“非常频繁”地让他们考虑吸烟的健康风险。

研究对象由每个城市当地居委会负责人和/或当地疾病预防控制中心（CDC）人员负责招募，招募过程在全市居委会和当地学校进行。

展示材料

我们制作了10组中文健康警示图片，包括旧版的中国健康警示（位于烟盒侧面）和新版中国健康警示（占烟盒正面面积30%）。我们从四个有图形方式烟盒健康警示的国家各选择一个图形方式健康警示制作了高清晰度健康警示图片（加拿大：肺癌；新加坡：口腔疾病；香港：坏疽；欧盟：动脉阻塞）。我们将其中的文字内容全部翻译成了中文。我们分别去掉了四组警示中的图片内容，制作了对应的纯文字版本。

我们使用电子图像软件将做好的健康警示放到一个烟盒包装图片里，使制成的图片与FCTC第11条实施准则一致：占据包装上部50%的面积，使用黑色粗线条边框与背景区分开。所有10组图片（新旧版本的中国健康警示和另外8组合成健康警示）都使用同一品牌（中华）的烟盒作为背景，以保持图像一致性。

10组图像随机分配1到10的编码，便于区分，供研究对象评分和排序。使用相片纸打印标号编码的烟盒图片。每幅烟盒图片尺寸约为57×90mm，同实际的烟盒尺寸（约55×88mm）几乎完全一样。

图2是所有10组图片。

测量方法

健康警示调查前问卷每位研究对象首先填写一份简短的问卷，问卷内容包括人口学特征信息（如年龄、性别等）和对于吸烟的各种态度和看法。吸烟者另外填写一些关于其吸烟史和当前吸烟情况（如每日吸烟量）的信息，问卷采用ITC中国调查的标准用语。（见http://www.itcproject.org/research/surveys/itcchina）。

翻译任务

设计翻译任务的目的是为了了解中国研究对象是否能够理解烟盒背面的健康警示。正如前面介绍的，烟盒背面的健康警示内容是全英文的。第一句是新版中国健康警示的第一条信息：“Smoking is harmful to your health”，第二句是烟盒包装健康警示的第二条信息：“Quit smoking early is good for your health”（这句有语法错误的信息与中国使用的健康警示原文一致）。翻译任务被安排在研究对象接触上述各健康警示之前，这样一来，研究对象就不会得到任何翻译答案提示。

健康警示评分任务

每位研究对象针从两个方面对10组健康警示进行评分：（a）每种警示促使吸烟者戒烟的效果如何？（b）每种警示防止青少年吸烟的效果如何？研究对象使用5分等级进行评分，其中：5=极其有效，4=非常有效，3=有些效果，2=有点效果，1=完全无效（调查内容还涉及了其它的评分任务，如情绪反应和真实度评分，不在本文分析范围内）。

健康警示排序任务

每位研究对象从四个方面对10组健康警示进行排序：（a）促使吸烟者戒烟；（b）防止青少年开始吸烟；（c）向公众传达吸烟危害；（d）展示中国政府对于减少吸烟是严肃认真的。

表1. 研究设计及研究对象数量

	成年吸烟者		成年非吸烟者		青少年 (13-17 years)		
城市	男性	女性	男性	女性	男性	女性	合计
北京	55	40	39	47	51	45	277
昆明	50	50	46	50	50	50	296
上海	51	52	47	50	50	50	300
银川	50	48	48	50	50	50	296
合计	206	190	180	197	201	195	1169

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表2. 成年吸烟者和青少年的描述性统计结果

成年吸烟者

特征	北京 (n = 95)	上海 (n = 103)	昆明 (n = 100)	银川 (n = 98)	统计学检验
年龄					
18–29	63%	60%	49%	48%	$\chi^2(9) = 11.6$ p = 0.24
30–39	13%	13%	22%	20%	
40–49	12%	17%	14%	20%	
50+	13%	10%	15%	11%	
家庭月收入					
< 3000元	44%	36%	48%	43%	$\chi^2(9) = 17.8$ p = 0.038
3000–6999元	35%	29%	29%	28%	
7000+元	12%	15%	6%	4%	
无应答	9%	20%	17%	25%	
每日吸烟者	83%	79%	79%	78%	$\chi^2(3) = 1.1$ p = 0.78
每日吸烟量，均数（方差）	12.5 (7.9)	12.1 (8.1)	11.1 (8.3)	10.4 (8.2)	F(3,387) = 1.3 p = 0.29
曾经尝试戒烟	61%	52%	61%	63%	$\chi^2(3) = 2.9$ p = 0.41
早期吸第一支烟的时间					
< 5分钟	26%	22%	22%	18%	$\chi^2(9) = 4.6$ p = 0.87
5-30分钟	33%	27%	35%	30%	
31-60分钟	15%	21%	18%	21%	
> 60分钟	25%	30%	25%	31%	
对自己烟瘾的评价：报告“有一些”或“很大”的百分比	87%	77%	86%	84%	$\chi^2(3) = 4.9$ p = 0.18
吸烟已经在多大程度上损害了你的健康：报告“有些”或“很大”的百分比	34%	30%	51%	57%	$\chi^2(3) = 21.0$ p = 0.0001
你是否担心吸烟会损害你今后的健康：报告“有些”或“很大”的百分比	36%	40%	62%	63%	$\chi^2(3) = 24.6$ p < 0.0001
看到烟盒上的健康警语的频率：报告“经常”或“非常频繁”的百分比	32%	46%	38%	28%	$\chi^2(3) = 8.2$ p = 0.04
健康警语在多大程度上是你考虑到吸烟对健康的危害：报告“很大”的百分比	9%	11%	12%	13%	$\chi^2(3) = 0.8$ p = 0.86

青少年

特征	北京 (N=96)	上海 (N=100)	昆明 (N=100)	银川 (N=100)	统计学检验
年龄，均数（方差）	15.4 (0.6)	14.5 (1.3)	14.9 (1.9)	15.7 (1.0)	F(3,392) = 17.4 p < 0.0001
吸烟状态					
从未吸烟	98%	90%	79%	85%	Non-daily versus daily:
过去吸烟者	2%	9%	11%	10%	$\chi^2(3) = 5.9$ p = 0.12
偶尔吸烟者	0%	1%	5%	4%	
每日吸烟者	0%	0%	5%	1%	

图2 研究中使用的健康警示图片，包括中国新旧健康警示。注：每张图片下的数字是为其分配的随机序号。

健康警示调查后问卷

向所有研究对象询问两个问题，第一个是：“你认为烟盒上提示的健康信息的数量是应该更多，更少还是保持不变？”答案分类包括“更少”、“保持不变”和“更多”第二个问题是：“你认为政府应该将图片作为香烟包装上健康警示的一部分吗？”答案包括“是”和“否”。

调查过程

四个城市的当地CDC人员负责招募研究对象。研究对象以小组形式在会议室和居民区的学校等场所参加调查。当进入实验阶段时，研究对象被安排坐在桌前，彼此之间保持适当距离，以确保各自答案保密。实验员（一名受过训练的当地CDC人员）按照一份书面说明宣读每个实验部分的指示说明。四个城市所有的实验过程均采用同样的说明。

在完成健康警示调查前问卷和翻译任务后，实验员请每位研究对象拿起面前桌上的信封。信封内是10张健康警示的图片，这些图片按照图2所示方式，随机从1到10编号。实验员依次进行健康警示排序任务、健康警示评分任务和健康警示调查后问卷。然后实验员向研究对象做口头总结，并发给他们一份书面反馈表。最后，向每位研究对象发放20元钱，作为对其参与研究的补偿。

研究程序和所有实验材料，包括图片和问卷都经过了中国CDC伦理审查委员会和滑铁卢大学研究伦理办公室的伦理学审批。

数据分析

采用描述性统计分析研究对象的人口学特征，使用卡方检验分析差异。评分数据采用混合模型分析，采用事后比较检验单个健康警示之间的差异。计算Pearson相关系数以确定评分和排序之间的一致程度。所有分析过程均采用SAS V.9.1软件完成。

结果

健康警示有效性评分图3是所有研究对象对10组健康警示在促使吸烟者戒烟方面的有效性评分均值。上斜线柱代表的是4组图形方式的健康警示，实心柱代表的是4组非中国的文字健康警示，下斜线柱代表的是中国的2组健康警示（新旧两版警示）。

10组健康警示的有效性均值之间存在显著性差异（$F(9,10\ 278)=785.32$，$p<0.0001$）。任何两个健康警示均数之间0.10分的差异在0.05水平上有统计学意义，0.13分的差异在0.01水平上有意义，0.17分的差异在0.001水平上有意义。

我们首先观察各种警示大类，所有4组图形方式的健康警示在促进吸烟者戒烟方面的有效性得分最高，而后是4组非中国的文字方式警示，二者之间差距达约0.5分（$p<0.0001$），最后是2组中国的文字健康警示，与上一组之间差距高达0.6分（$p<0.0001$）。

对不同图形方式健康警示之间进行比较，加拿大肺癌警示得分最高，然后是新加坡的口腔疾病警示、香港的坏疽警示，最后是欧盟的动脉阻塞警示。相邻两个警示之间的差距均具有0.05级的显著性。在所有文字方式的健康警示中，加拿大肺癌警示得分最高，接着是欧盟的动脉阻塞警示、香港的坏疽警示，最后是新加坡的口腔疾病警示。最后，新版的中国健康警示得分显著高于旧版警示（$p<0.05$），但是得分都远远低于其他国家和地区得分最低的文字方式警示（$p<0.0001$）。

图4为在防止青少年吸烟方面有效性的评分均数。结果的基本模式完全一样。10组健康警示的评分完全重复了前面的顺序，其中，只是加拿大肺癌图形方式健康警示和新加坡口腔疾病图形方式警示之间的差异在0.05水平上不具有显著性。

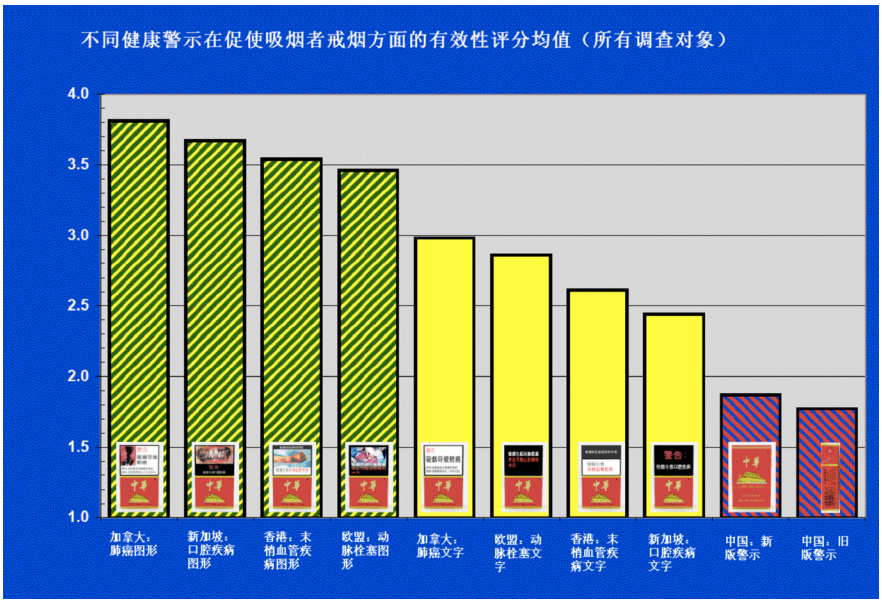

图3. 不同健康警示在促使吸烟者戒烟方面的有效性评分均值（所有调查对象）

Tobacco Control 2010;**19**(Suppl 2):i69-i77. doi:10.1136/tc.2010.036483

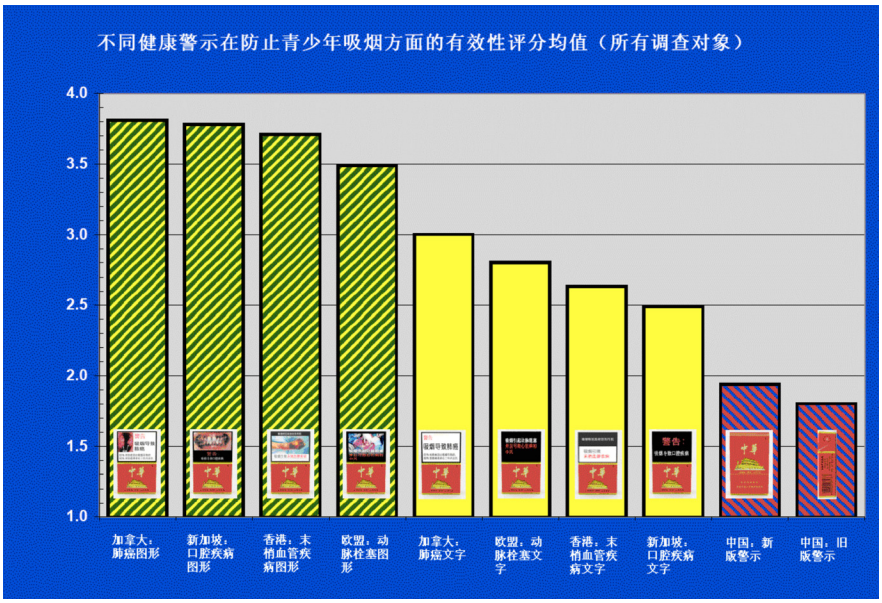

图4. 不同健康警示在防止青少年吸烟方面的有效性评分均值（所有调查对象）

我们采用混合模型方差分析确定评分变化是否符合研究设计当中因素的函数。结果对促使吸烟者戒烟和防止青少年吸烟基本上是一样的：（a）各城市之间、研究对象人群（吸烟者、非吸烟者、青少年）以及不同性别之间无差异；（b）警示具有很大的作用（$p<0.0001$）；（c）警示和城市（$p<0.0001$）、警示和对象人群（$p<0.0001$）以及警示×性别（$p=0.017$）之间具有显著的交互作用。这些交互作用存在的原因几乎完全是因为4组图形方式健康警示之间有效性评分的差异和四组非中国文字方式健康警示有效性评分之间的差异，而不是来自图形警示、文字警示大类之间的城市、对象人群或者性别差异。评分基本顺序在各亚组（性别、城市、对象人群）当中均未发生变化：4组图形警示有效性得分总是远高于4组非中国文字警示，而4组非中国文字警示得分也总是远高于2组中国警示。2组中国健康警示总是10组警示当中得分最低的。

由于样本规模大，即便很小的均数差异也可以产生统计学意义。为了展示新版中国警示和其它警示之间效应差别的大小（与样本规模无关），我们计算了（a）新版中国警示同得分最低的外国文字警示之间差异的Cohen's d值和（b）新版中国警示同得分最低的外国图形警示之间差异的Cohen's d值。对于健康警示是否促使吸烟者戒烟的有效性得分，新版中国警示和得分最低的外国文字警示（新加坡的口腔疾病警示）间的差异对应d=0.47，接近"中等"效应量的基准值"0.5"；而新版中国警示和得分最低的外国图形警示（欧盟的动脉阻塞警示）之间差异对应d=1.36，远高于"高"效应值的基准值"0.8"。针对防止青少年吸烟方面两组差异的Cohen's d值情况非常相似，分别是0.45和1.27。新版中国警示和其它任何文字或者图形方式健康警示之间的所有比较得出的效应量将更高。这些效应量计算结果表明新版中国警示同研究中使用的其它国外警示，特别是图形警示之间在有效性上存在着巨大的差异。

健康警示有效性排序

排序任务的结果与评分任务结果完全一样。研究对象从两个方面对10组警示进行了排序和评分。图5是健康警示促使吸烟者戒烟有效性的排序均值，可以看出其中的模式几乎与图3的评分均值完全一样。

图6为防止青少年吸烟的有效性的排序均值。尽管在4组图形方式健康警示的内部顺序上有些许差别，如新加坡口腔疾病警示排序最高，这与图4的评分均值有所差异，但是总体的警示三级顺序关系依然明显存在。中国警示和其它文字警示之间的排序均值差距甚至比评分均值的差距更为明显。

我们采用计算每位研究对象排序和评分的对象内相关性对排序和评分任务间的相似性进行了量化。在促进吸烟者戒烟方面，排序和评分间的相关性均值为0.732；在劝说青少年不开始吸烟方面为0.704。

作为图形警示和新版中国警示之间差异一致性的体现，59%的研究对象将新加坡图形警示排序为防止青少年吸烟最有效或者第二有效的警示。相较之下，81%的研究对象将新版中国警示排序为效果最差或者倒数第二差的健康警示。

图7是从健康警示向公众传达吸烟危害的有效性排序均值。图8是展示中国政府对于减少吸烟的认真态度的排序均值。尽管在某些级内存在细微的排序差异，对于这两个指标结果也出现了同样的三级分化。

关于中国烟盒健康警示应当包括哪些内容的观点

在研究过程结尾询问研究对象对于中国烟盒健康警示应当包含哪些内容的看法。将近四分之三的研究对象（74.4%）都表示烟盒上应当包括更多的健康信息。仅有6.0%说烟盒上应该减少健康信息，19.6%说烟盒上的信息量应当和现在"保持不变"。认为应该增加信息量的观点比例在昆明（77.7%）、银川（76.0%）和上海（75.5%）较高，在北京相对较低（67.6%）（各城市与北京比较：$p<0.035$）。同时，这一比例在青少年当中最高（81.5%），而后是成年非吸烟者（77.5%），在成年吸烟者当中最低（64.2%）。青少年和非吸烟者之间没有显著差异，与预期的一样，二者都比成年吸烟者显著更高（$p<0.001$）。然而，应当注意的是，大多数成年吸烟者仍然是希望增加烟盒上的健康信息的。

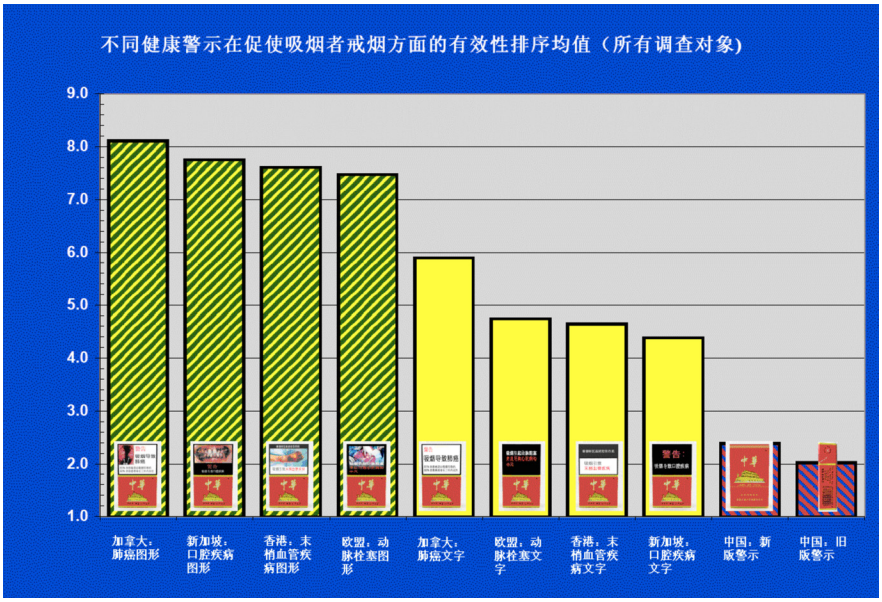

图5. 不同健康警示在促使吸烟者戒烟方面的有效性排序均值（所有调查对象）

此外，80.7%的研究对象表示烟盒健康警示应当包含图片内容。这一比例在成年非吸烟者（86.1%）当中显著高于青少年（78.9%）和成年吸烟者（77.4%），后两者与非吸烟者比较：p<0.025。这一比例在昆明（87.2%）和银川（86.1%）较高，在北京（77.6%）和上海（71.8%）相对较低；北京和上海之间不存在显著差异，但二者都显著低于银川和昆明（p<0.007）。

英文警示信息的理解率

表3是能够正确翻译烟盒背面两句英文警示信息的研究对象比例数据。在所有成年吸烟者（这一人群接触这些健康警示的可能性更大）当中，仅有26.8%能够正确翻译“smoking is harmful to your health”，仅10.1%能够正确翻译“quit smoking early is good for your health”。跟预期一样，青少年当中能够翻译这些英文信息的比例更大（p<0.0001），但是能够正确翻译第二句的青少年比例也不到一半（47.7%）。

讨论

本实验研究覆盖了四个中国城市多种类型人群，研究结果有力地支持了两个结论：第一，图形方式健康警示比文字方式警示更加有效；第二，新版的中国健康警示效果不如其他国家和地区的文字警示。这些有力结果在三个研究对象人群（成年吸烟者、成年非吸烟者和青少年），不同城市和性别，以及其他不同层面之间的有效性测定都具有很高的一致性。

就健康警示主要目的核心，即有效宣传吸烟危害而言，本研究的两个结论得到了支持。众多健康宣传实践都表明，如果信息能够采用形象的，非常吸引受众注意力的展示方式提供关于危害的具体的信息，其效果则更加有力。[10 11] 到2010年2月为止，一共有35个国家采用了图形方式的健康警示[12]，内容描绘了相当多的吸烟具体危害，包括肺癌、心脏病、中风、口腔疾病、慢性阻塞性肺病（慢阻肺，如肺气

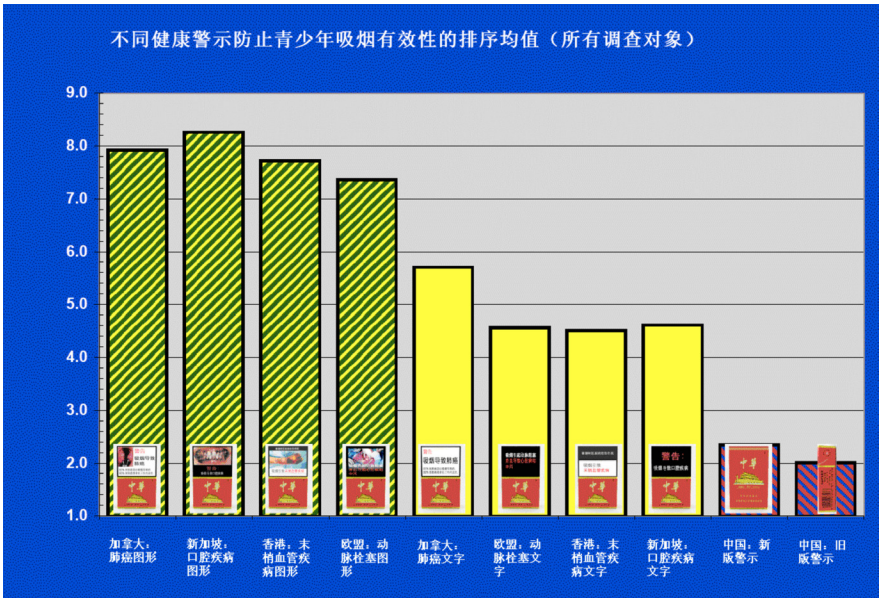

图6. 不同健康警示防止青少年吸烟有效性的排序均值（所有调查对象）

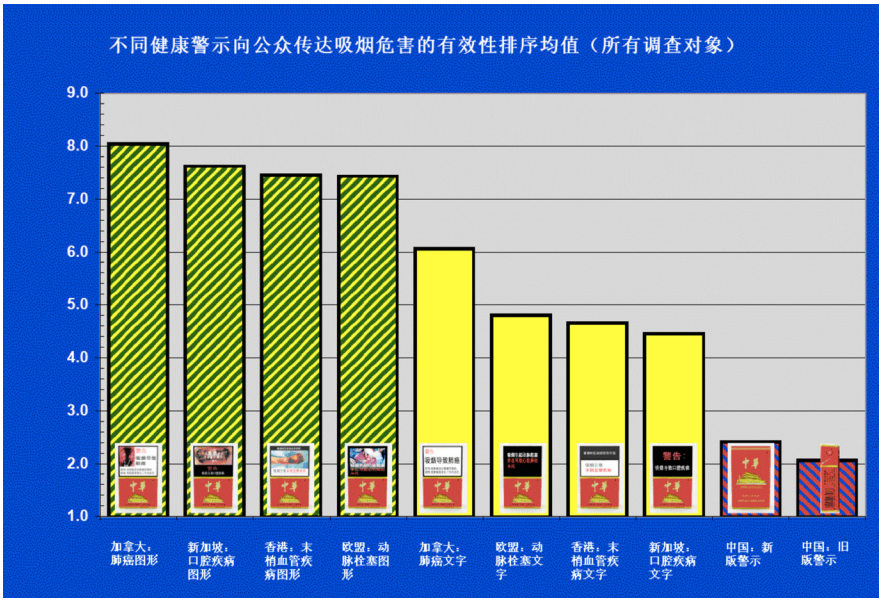

图7. 不同健康警示向公众传达吸烟危害的有效性排序均值（所有调查对象）

肿）和阳痿[13]。所有这些危害都已经得到了研究明确证实，其中有的已经得到世人公认多年，因此，将它们编排进健康警示是没有争议的，同时也具有十分重要的意义。由于中国关于吸烟具体危害的知识水平较低[14]，ITC四国调查（加拿大、美国、英国和澳大利亚）结果显示健康警示对提高吸烟健康危害的知识水平[3]和烟草烟雾成分知识水平[4 15]具有有益的影响，因此，我们可以得出一个有力的预测结论，即使用此类包含具体危害的健康警示将可以成为提高中国公众知识水平的一个有效且低成本的方法。

本次研究结果明确指出，中国2008年10月采用的健康警示并没有明显加强。无论是新版还是旧版中国烟盒健康警示，在10组警示中都无一例外地在排序和评分上垫底，其中新版中国警示的有效性仅仅比放在烟盒侧面的旧版警示略高一点点。在烟盒背面使用英文警示信息的做法被证明无效：将近四分之三的成年吸烟者无法翻译文字警示中的第一句信息，将近90%不能翻译第二句。这一结果支持了一个基本原则，即各国不应采用外语向本国国民展示重要的健康信息。

本次研究结果同时还显示，中国民众希望政府使用更加有力的健康警示。绝大多数人都希望在烟盒包装上增加更多的健康信息，同时甚至更多人还希望健康信息当中使用图片内容。——即便是在吸烟者当中亦如此！值得注意的一点是，研究对象是在看了我们为本研究制作的图形方式健康警示之后给出上述答案的，也就是说，他们的观点是基于实实在在的实例，而不是纯粹的抽象概念的。同时值得注意的是，昆明位于中国烟草产业的中心，却有四个城市当中最大比例的研究对象希望政府采取更加有力的健康警示。

局限性

本次实验在询问研究对象关于健康警示的看法前仅给予了有限的接触，因此对于健康警示出现在烟盒上时的实际影响并

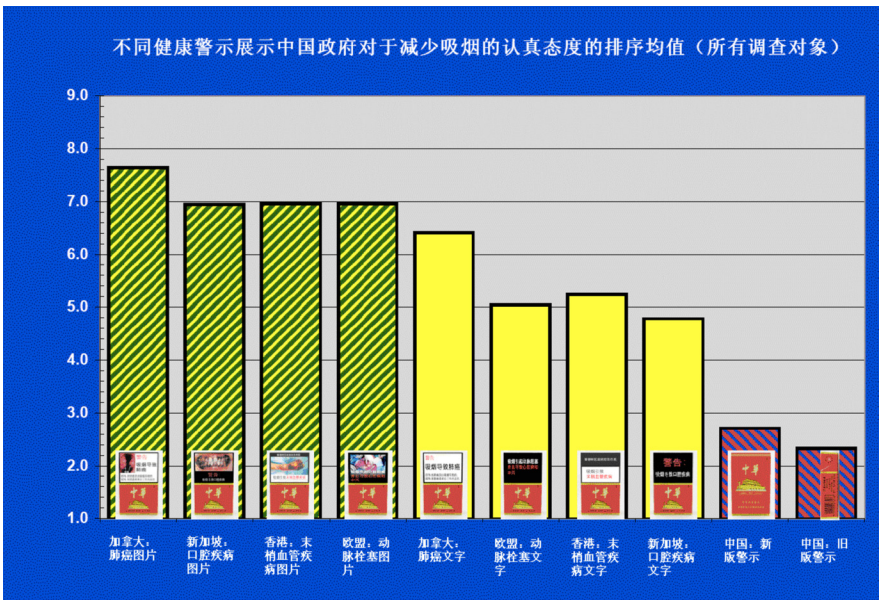

图8. 不同健康警示展示中国政府对于减少吸烟的认真态度的排序均值（所有调查对象）

表3. 不同调查对象中能正确翻译两句英文警示的百分比

翻译的语句	成年吸烟者 (n=396)	成年非吸烟者 (n=377)	青少年 (n=396)	合计 (n=1169)
“Smoking is harmful to your health.”（吸烟有害健康）	26.8%	51.5%	90.4%	56.3%
“Quit smoking early is good for your health.”（尽早戒烟有益健康）	10.1%	24.7%	47.7%	27.5%

研究贡献

- **近年来的调查研究和部分实验研究都指出，在健康警示中使用图片可以有效促使受众考虑吸烟健康风险，产生戒烟意图和实际戒烟行动。这些研究几乎无一例外的都是在高收入国家开展的。**
- **这是第一项探讨图形方式健康警示在中国可能的效果的研究。本研究采用实验设计，实现对同一健康警示加入和去掉图片内容后的具体比较，结果证实了图形方式健康警示的优越性。研究结果在不同的城市、性别、吸烟状况和年龄组之间没有显著差异。此外，对中国新版（2008年10月）和旧版健康警示的纳入使得我们可以将中国实际使用的健康警示与其他国家和地区的警示进行一个具体比较。中国的两个健康警示都在有效性方面得分最低，其中新版警示仅比旧版有效性得分略高一点点。总地来说，本次研究支持如下结论：中国政府2008年10月对旧版健康警示的升级仅仅起到了很小的提高作用，而图形方式健康警示，如已经在其他35个国家使用的警示可以带来显著的提高。**

不确定。同样，应变量指标也不是在接触现实中的图形方式健康警示后的实际风险认识和对吸烟相关疾病、戒烟意图和吸烟/戒烟行为的个人看法。那种现实世界的实验将非常困难或者根本不能实现。不过，本次研究对于图形方式健康警示优越性的结果却同其它实验研究结果（如Peters等人[9]）和多个国家的ITC项目健康警示人群评价结果是一致的。[1 3-8]

此次实验仅针对城市地区开展，因此结果可能不能代表农村地区的情况。但是，鉴于中国农村地区的识字率和英文知识水平更低，我们有理由预测对于图形方式健康警示优越性和英文警示信息理解率低这两个结论在农村地区不仅成立，而且还会更加显著。

结论

据估计，2005年中国烟草流行共导致673000例死亡，中国在批准FCTC时承诺开展烟草控制。有力的健康警示是全面控烟措施的基础之一，因为健康警示的目的就是为了向公众宣传烟草产品的危害，其采用的方法将提高吸烟者戒烟的可能性，降低青少年开始吸烟的几率。

本次实验研究的结果进一步增添了对于图形方式烟盒健康警示优越性的证据，强调了有力的图形警示在综合性烟草控制方案当中的重要性。不过同时此次研究也展示了到目前为止中国在健康警示方面进展甚微。

注：本文报道的部分结果仅在《中国健康教育》杂志上以中文形式发表过，索引如下：Jiang, Y., Fong, G.T., Li, Q., Hammond, D., Quah, A.C.K., Yang, Y., Driezen, P., & Yan, M. (2009). 2008年中国烟盒包装健康警示效果评估，中国健康教育（中文），25, 411-413, 430。

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贡献者：GTF领导了此次研究的构思和设计，数据分析解读和本文撰写与修改工作。DH为此次研究的构思和设计，数据解读和本文修改工作做出了重要贡献。YJ为此次研究的构思和设计，数据收集和本文审阅工作做出了重要贡献。QL为此次研究的构思和设计，数据收集和本文审阅工作做出了重要贡献。ACKQ为此次研究的构思和设计及本文审阅工作做出了重要贡献。PD领导数据分析和审阅本文。MY为此次研究的数据分析和本文审阅工作做出了重要贡献。所有作者都审阅并同意了本文的终稿。

来源与同行评价：未开展；已经外部同行评价。

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