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Culturally specific health-related features on cigarette packs sold in China

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ABSTRACT

Background China is the country with the highest burden of tobacco-caused disease. We characterised the extent to which cigarette pack marketing features (eg, imagery, text, pack color) could potentially mislead consumers by suggesting products are healthy.

Methods We used two methods: group concept mapping and content analysis. First, we used a group concept mapping approach to generate and sort Chinese consumer responses to an open-ended prompt asking what marketing features suggest a product is 'healthy' or 'good for you'. Second, based on the concept mapping results, we developed a codebook of health-related features on cigarette packs that were relevant to the unique cultural context of product marketing in China. Two trained coders who were native Chinese speakers double-coded a sample of 1023 cigarette packs purchased in 2013 (wave 1) and 2017 (wave 2). We examined differences in the presence of features overall and over time.

Results Overall, 83.5% (n=854) of Chinese cigarette packs in our sample contained at least one 'healthy' or 'good for you' feature, and the presence of health-related features on packs remained constant between wave 1 (83.5%, n=354) and wave 2 (83.5%, n=500; p=1.00). Across both waves, the most common categories of culturally specific health features present related to recycling symbols, rare animal imagery, bright colours (eg, bright yellow) and botanical imagery (eg, bamboo, mint).

Conclusion Health-related features on cigarette packs sold in China are common. Enhanced policies to address tobacco packaging, labelling and branding could support and facilitate a reduction in the high tobacco burden in China.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ China has the highest burden of tobacco-caused morbidity and mortality in the world, and cigarette pack marketing, including the use of misleading health-related appeals (eg, light colours) has been associated with lower perceived harm of cigarette use which might contribute to persistently high rates of smoking in China.

⇒ Little research has characterised features of cigarette packs sold in China, particularly the use of culturally specific imagery, colours and claims that could suggest products are 'healthy' or 'good for you'.

WHAT THIS STUDY ADDS

⇒ We used a concept mapping approach to develop a codebook of culturally specific health features (eg, imagery of rare animals) that was applied to 1023 cigarette packs purchased in China during 2013 and 2017.

⇒ Approximately 8 out 10 cigarette packs in the study sample contained at least one culturally specific health feature (eg, botanics, rare animals, bright colours), suggesting this is a common marketing tactic employed by Chinese tobacco companies.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Findings from this study can inform tobacco control policy interventions in China, including expansion of current tobacco packaging and labelling requirements and other restrictions on branding (including plain packaging) that could help reduce smoking.

INTRODUCTION

In 2018, 26.6% of Chinese adults used tobacco (approximately 300 million current smokers).[1 2] Marketing activities by the tobacco industry account in part for the high rate of tobacco use.[3 4] Studies from China suggest that exposures to tobacco marketing activities are associated with higher levels of tobacco consumption,[5] and increased rates of smoking susceptibility and initiation among young people.[5 6]

In 2015, China updated the *National Advertising Law* to restrict tobacco marketing activities in all public places and on mass media (eg, radio, billboards, television).[7] However, few regulations address marketing and labelling on the cigarette pack itself. Tobacco companies are required to include a text-only health warning label that covers 35% of the front and back panels of the packs.[8] Furthermore, the use of misleading terms on cigarette packs that may convey lower harm (eg, 'mild', 'low tar', 'environmental protection') are prohibited, and tobacco companies must include component information (eg, numeric tar yields) on packs.[8] As advertising on other media platforms becomes more restricted, the pack remains an important advertising medium to appeal to consumers.[9]

The imagery, colours and text included on a cigarette pack can influence consumers' smoking-related perceptions and behaviour.[10–12] For example, tobacco companies have historically used descriptive terms such as 'silver', 'organic' or 'blue',[13–17] as well as lighter pack colours (eg, light blue, silver) to connote that a particular brand is a 'lighter' brand

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variant.[18 19] Cigarette packs that include these types of text or colour appeals have been associated with reduced smoking-related risk perceptions.[19–21]

In the context of China, little evidence is available to characterise the extent to which cigarette pack marketing contains imagery, colours and text that could potentially mislead consumers and suggest products are lower risk. There is some evidence that cigarette companies in China use culturally specific imagery (eg, cranes, waterfall scenes, 'double happiness' imagery used to celebrate weddings[22]) and text (eg, poems) on cigarette packs that may not be used in other countries.[5] However, the extent to which these features and others could signal that a product is healthy or somehow good for the consumer is unknown.

The current study used a combination of group concept mapping and content analysis to (1) identify packaging features that convey a product is 'healthy' or 'good for you' among a sample of Chinese consumers and (2) code a collection of cigarette packs sold across China for identified features. Given the significant role of the cigarette pack as a marketing tool, this study can elaborate on the presence of potentially misleading health features on cigarette packs sold in China.

METHODS

This study is part of the larger Tobacco Pack Surveillance System (TPackSS) project (https://globaltobaccocontrol.org/tpackss/), which purchases unique tobacco packs sold in low-income and middle-income countries and monitors compliance with health warning label requirements.[23] Data have been published on warning label compliance[24] and the presence of different marketing appeals (eg, reduced harm imagery, feminine appeals, flavour appeals).[25–28]

Study sample

We examined 1023 cigarette packs purchased in China through TPackSS. Only packs legally sold in China, defined as having the required mainland Chinese government warning label, were included; 168 packs were excluded because they were illicit packs from other countries or special regions, like Hong Kong. Packs were purchased in 2013 (wave 1, n=424) and 2017 (wave 2, n=599) from 5 of the 10 most populous cities in China: Beijing, Chengdu, Guangzhou, Kunming and Shanghai. A sampling frame of neighbourhoods by socioeconomic strata (low, medium and high) was created based on census and property value data. We then purposively selected four neighbourhoods within each stratum that were diverse in terms of geographic location around the city. Data collectors visited 12 neighbourhoods within each city for a total of 60 neighbourhoods across China.

Data collectors followed the same standardised protocol to systematically purchase tobacco packs. A detailed explanation of data collector training and the TPackSS methodology can be found in the study by Smith *et al*.[23] Tobacco packs were purchased from preselected vendor types popular in China, including supermarkets, convenience stores, tobacco shops and stalls. Vendor selection was based on national surveillance data on sources of tobacco purchases and key informant input. The first vendor data collectors visited served as the index vendor for all other stores. Data collectors purchased all unique packs from this venue and took a photo of the front panel of each pack to create an image archive. Teams then visited up to five vendors in each of the remaining neighbourhoods and purchased any new packs not already present in the archive. The image archive was regularly updated with each new round of purchases. Overall, packs were considered unique if they had at least one exterior difference in branded pack design (eg, pack size, brand name presentation, colours).

Codebook development

Group concept mapping

We used a group concept mapping approach to develop an overall conceptual framework from which an initial codebook for health-related features on cigarette packs that was relevant to the unique cultural context of product marketing in China was extracted and subsequently applied. Concept mapping allowed us to crowd-source information on what product marketing features might signal a product is 'healthy' or 'good for you' directly from a sample of adult Chinese consumers.

Briefly, group concept mapping is a mixed-methods, structured framework approach to generate, organise and value statements from a sample of participants around a specific construct, like 'health'.[29 30] To facilitate mapping data collection and analysis, we used groupwisdom, a web-based platform designed specifically for group concept mapping studies. The method involves three phases of data collection: brainstorming, sorting and rating. We recruited a convenience sample of 106 adults (aged 18–65 years) in China through the survey panel platform, NetEase. All participants lived in urban areas (packs were collected in urban areas), and we recruited a sufficient sample of smokers: 47.2% of participants (n=50) currently smoked. During the brainstorming phase, participants were asked to provide as many unique statements as possible to complete the following prompt: *When I am shopping for a product, something specific on the packaging or advertising that makes me think the product is healthy or good for me is…* Our prompt was intentionally broad to capture a wide range of ideas about products and/or their corresponding advertising. In addition, the term 'healthy' and phrase 'good for me' were meant to work together to assist participants in identifying specific features that would indicate a product is healthy or good for the individual using the product.

Overall, participants generated 160 unique statements in response to the prompt. The statements were then translated into English and two researchers—one a native Chinese speaker (YC) and one a native English speaker (LC)—reviewed the statements in Chinese and English, respectively, to verify that the response was relevant to the prompt and to remove any duplicate statements. An example of a response that was considered irrelevant to the prompt was 'yes'; an example of duplicate responses included 'bright colours', 'bright colours such as yellow and green' and 'the overall colour tone should be bright', where 'bright colours' was retained because it was the most complete and least complex. After review, 61 statements were retained (online supplemental table 1).

We then asked the 106 participants who completed the brainstorming phase to complete the sorting and rating phases. Typically, fewer participants are expected during the sorting and rating phases given the time commitment required to complete the tasks. During sorting, participants (n=28) sorted or grouped statements into piles based on perceived similarity using as many piles as they wished, with the only restriction being that all piles were required to have at least two statements. Directly following sorting, participants (n=28) completed the rating activity, reviewing each statement and rating how strongly they agreed (1=strongly disagree; 7=strongly agree) that the 'specific packaging or advertising feature described in the statement suggests a product is healthy or good for you'. The sorting and rating activities were independent. Valid responses were 27 and 28 for the

sorting and rating activities, respectively. One participant sorted all statements into their own individual pile and these data were removed from the analysis; however, the participant's rating data were valid (ie, no 'straight-lining') and retained.

Next, we conducted multidimensional scaling on a 61×61 similarity matrix, which contained the aggregated sort data from the 27 participants. A two-dimensional point map was plotted showing the proximity of sorted statements to one another, based on the frequency the statements were sorted together by participants. This analysis resulted in an appropriate goodness-of-fit value (stress=0.26), comparable to results of meta-analyses of other concept mapping studies.[31] Then, hierarchical cluster analysis was conducted using the statement location on the point map as input. The analysis applied Ward's algorithm for determining cluster membership of the statements to derive a series of 'cluster' map 'solutions' that partitioned the proximity data into non-overlapping statement groupings or clusters. An initial set of cluster solutions was identified, ranging from four to nine clusters, which were determined to be the most appropriate to review and reach consensus on the final model. Each cluster-map solution in this set was reviewed against the criteria of 'interpretability' and 'parsimony' to ensure the concept map with the least number of clusters with a unique meaning was preserved.[32 33] Our final cluster-map included seven unique clusters that bounded the 61 statements. Online supplemental table 1 lists the clusters and corresponding statements, and the average rating score for each cluster (average across statements) and each statement (average across participants). As a final sensitivity analysis, we tested for differences in the average cluster rating score by participant smoking status and found no statistically significant differences ($p<0.05$).

Statement review process

We asked (1) experts on Chinese culture and (2) tobacco control researchers/coauthors to review the final, seven-cluster concept map and statements to validate whether the cluster categories and statements were (1) culturally relevant and (2) relevant to tobacco products and tobacco marketing. To verify cultural relevance, two authors (YC and ZD) grounded in Chinese culture reviewed the conceptual framework and spoke with a convenience sample of seven Chinese colleagues about the cluster categories and statements. To verify tobacco control relevance, three coauthors (KW, JEC and KCS) reviewed the statements to identify which of the 61 statements were most relevant to current and historic tobacco marketing practices.

Based on this review, we retained all 7 cluster categories but reduced the 61 statements into 15 statements related to

Table 1 Definitions of study codebook by 'healthy' or 'good for me' appeals category and associated pack feature codes

Appeal category*	Appeal category definition	Pack feature	Pack feature definition
China symbolism and traditional medication	Imagery and text related to traditional medicines or cultural symbols in China.	**Rare animals**	Imagery or text associated with an expensive or rare animal in Chinese culture (eg, golden monkey, crane, panda).
		Herbs	Imagery or text associated with natural herbs (eg, ginseng, cordyceps sinensis).
Fresh elements	Imagery, colour, ingredients that are natural or found in nature.	**Botanics**	Imagery associated with non-tobacco leaf plants (eg, flowers, vanes, leaves, bamboo, mint leaf).
		Clean colours	Background colours on the cigarette pack that are either white or pale light blue alone or in combination with one other very pale colour that is plain (ie, not saturated and bright).
		Natural colours	Background colours on the cigarette pack that are green, green-blue and/or green-yellow with low darkness (ie, more white tint with no black tint).
		Fruit	Imagery or text associated with fruit.
		Aquatic	Imagery of aquatic and/or seascape elements (eg, oceans, rivers, water drop, ice, beach).
		Skyscape	Imagery of blue sky, white clouds, sunshine or other sky-related weather.
		Landscape	Imagery of mountains, farms, prairies and other large outdoor natural settings (excludes beaches).
Familiarity and youth lifestyle	Recognisable, comforting imagery and text that evokes youth, fitness and being down-to-earth.	**Sports**	Imagery or text associated with sports (eg, football).
Product materials	Imagery or text indicating product costs more to produce or is environmentally friendly.	**Recycling**	Recycling symbol or signs (eg, green dot symbol, 'tidy man', three arrows, green leaf).
Energetic	Energetic, vibrant colours and images.	**Bright colours**	Background colours on the cigarette pack that are yellow, orange, red or green with high saturation and brightness.
Health and marketing claims	Imagery or text to convince people that the product is good for physical/mental health.	**Positive description**	Text that describes a positive taste or feeling associated with product use (eg, fresh, cool, crisp, refreshing).
Quality certification	Imagery indicating a brand is following quality standards or received a quality certification.	**Tar**	Text and/or numbers that explicitly state or describe the tar level in the cigarettes (eg, 'low tar', <6 mg of tar).
		Quality standard	Imagery of quality certification signs that ensure a product is of high quality (eg, quick response code linked to a website to verify the authenticity of the pack or the quality of the tobacco; certified organic tobacco certification symbol).

*The category names were obtained from the group concept mapping process. The original category name corresponds to a cluster of 2 or more of the original 61 statements (see online supplemental table 1). We present the original category name to maintain the integrity of the concept mapping process from which our pack feature codes were derived. Codes that were not culturally relevant or used in the tobacco marketing history were excluded. For instance, although 'healthy looking models or characters' was an example of youth-lifestyle concept but was not relevant because tobacco control researchers determined the likelihood this type of imagery would appear on cigarette packs was low.

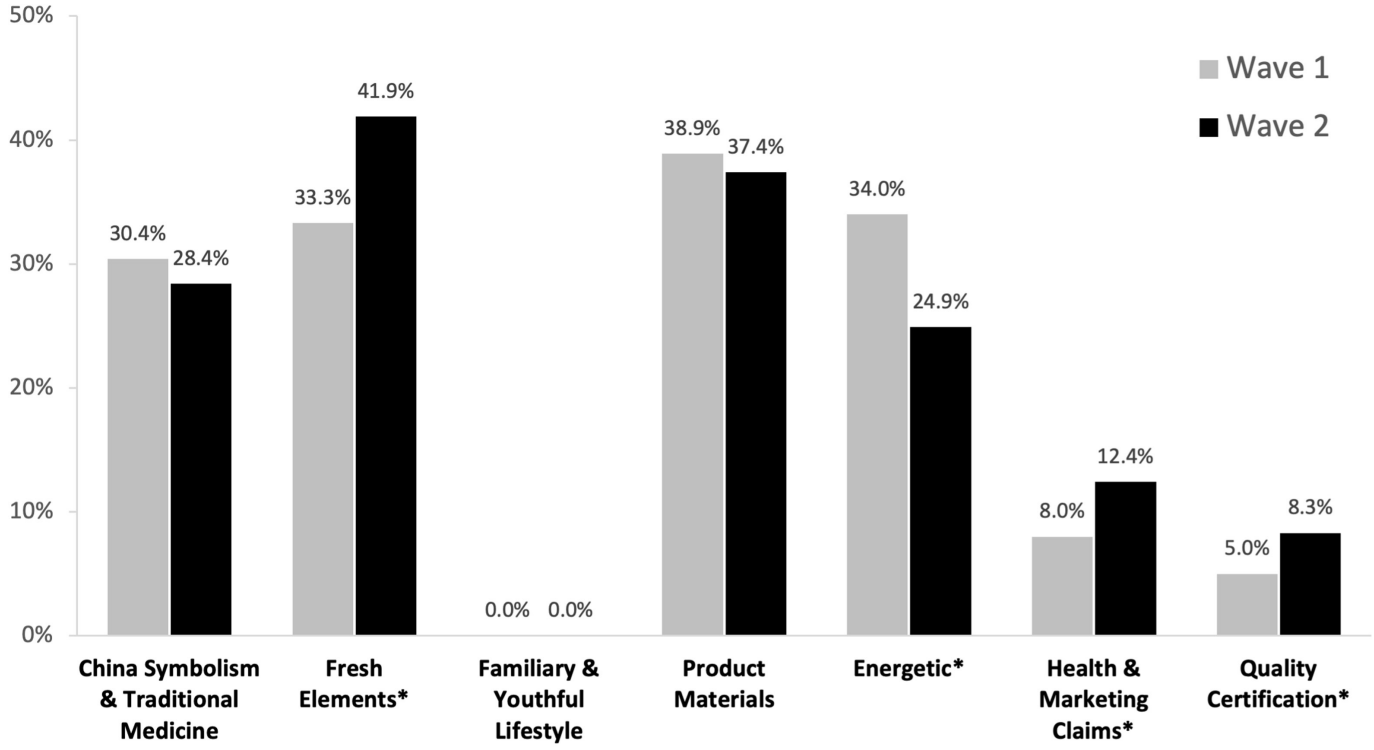

Figure 1 Proportion of cigarette packs purchased in China by 'healthy' or 'good for me' appeal category across wave 1 (2013, n=424 packs) and wave 2 (2017, n=599 packs). *Statistically significant differences between waves were found for fresh elements (p=0.005), energetic (p=0.002), health and marketing claims (p=0.300) and quality certification (p=0.045).

the larger categories. Many statements were removed because they represented general marketing tactics not specific enough to health and/or cigarette marketing according to experts (eg, 'delicate packaging', 'warm life scenes', 'place name', 'simple and memorable slogan'). Other statements that were more closely related to health, like 'healthy-looking models', 'fitness people' doing exercise activities or 'imagery of smiles' were also removed. Although this type of imagery has been used by the tobacco industry in cigarette advertising, the statements were removed because coauthors felt it was unlikely such imagery would appear on the cigarette pack itself. One tobacco-specific statement, 'Quit smoking language' was removed because it referred to legally required warning labels. Finally, some statements were combined into a single code. For example, 'botanical imagery', 'imagery of flowers', 'imagery of lawn/grass' and 'imagery of vegetables' were combined into the code Botanics. Final definitions of the broader appeal categories and the 15 specific pack feature codes are provided in table 1.

Coding for 'healthy' or 'good for me' features

Two trained coders (YC and ZD) who are native Chinese speakers separately coded the sample of 1023 cigarette packs using pack images available online (https://globaltobaccocontrol.org/tpackss/China). Any differences in coding were discussed between the coders first and then resolved by meeting with a reviewer (LC) who was not a Chinese speaker. The codebook was revised to reflect changes discussed and then systematically re-applied across the sample of packs. Overall, the coders had a moderate to almost perfect agreement across all codes (0.601–0.998). Because the colour of the pack in an online image may appear differently across computer screens, the two coders met in-person to review the physical cigarette packs and reconcile differences in colour coding.

Statistical analysis

We used χ^2 and Fisher's exact tests of association to examine differences in the presence of 'healthy' or 'good for you' features over time. Fisher's exact tests were used when cell sample size was <50. We also conducted a secondary exploratory analysis to understand patterns in the presence or absence of features across the 117 cigarette brands in our sample. Tests of association were two-sided ($p<0.05$).

RESULTS

Overall, 83.5% (854/1023) of Chinese cigarette packs in our sample contained at least one 'healthy' or 'good for me' feature, and the presence of these features on packs remained constant between wave 1 (83.5%, $n_{wave\ 1}$=354/424 packs) and wave 2 (83.5%, $n_{wave\ 2}$=500/599 packs; p=1.00). Approximately 90% of cigarette brands in the sample (n=105/117) included at least one brand variant with a health-related feature (online supplemental table 2).

Across both waves, the most common broad appeal categories present on packs were *product materials* (38.9%, $n_{wave\ 1}$=165; 37.4%, $n_{wave\ 2}$=224), *energetic* (34.0%, $n_{wave\ 1}$=144; 24.9%, $n_{wave\ 2}$=149), *fresh elements* (33.3%, $n_{wave\ 1}$=141; 41.9%, $n_{wave\ 2}$=251) and *China symbolism and traditional medicine* (30.4%, $n_{wave\ 1}$=129; 28.4%, $n_{wave\ 2}$=170) (figure 1). Presence of *fresh elements* features significantly increased over time (p=0.006), while the proportion of *energetic* features significantly decreased over time (p=0.002). The use of *quality certification*-related (p=0.045) and *health and marketing claims*-related (p=0.030) features increased significantly between waves but were generally present on a smaller proportion of cigarette packs.

Overall, recycling (38.0%, n_{total}=390), bright colours (28.6%, n_{total}=293) and rare animal (28.3%, n_{total}=290) were the most

Table 2 Proportion of cigarette packs (n=1023 packs) purchased in China by 'health' or 'good for me' features* by appeal category across wave 1 (2013) and wave 2 (2017)

	Total (n=1023 packs)	Wave 1 (2013) (n=424 packs)	Wave 2 (2017) (n=599 packs)	
	% (n)	% (n)	% (n)	P value
Chinese symbolism and traditional medicine				
Rare animals†‡	28.3% (290)	30.0% (127)	27.2% (163)	0.339
Herbs†‡	1.1% (11)	0.5% (2)	1.5% (9)	0.135
Fresh elements				
Botanics†	18.5% (189)	14.9% (63)	21.0% (126)	**0.014**
Clean colours†	9.6% (98)	8.5% (36)	10.4% (62)	0.334
Natural colours†	2.9% (30)	2.4% (10)	3.3% (20)	0.453
Fruit†‡	0.4% (4)	0.2% (1)	0.5% (3)	0.646
Aquatic†	3.4% (35)	1.2% (5)	5.0% (30)	**<0.001**
Skyscape†	9.8% (100)	9.2% (39)	10.2% (61)	0.669
Landscape†	9.8% (100)	8.3% (35)	10.9% (65)	0.200
Familiarity and youth lifestyle				
Sports†‡	0.0% (0)	0.0% (0)	0.0% (0)	–
Product materials				
Recycling†	38.0% (390)	38.9% (165)	37.4% (224)	0.647
Energetic				
Bright colours†	28.6% (293)	34.0% (144)	24.9% (149)	**0.002**
Health and marketing claims				
Positive description‡§	10.6% (108)	8.0% (34)	12.4% (74)	**0.030**
Quality certification				
Tar‡	5.3% (54)	4.7% (20)	5.7% (34)	0.571
Quality standards†¶	1.7% (17)	0.2% (1)	2.7% (16)	**0.002**
Features per pack (mean (SD))	(1.68 (1.22))	(1.61 (1.14))	(1.73 (1.27))	0.051

Bolded p values are significant at p<0.05.
*Appeal features are not mutually exclusive.
†Cigarette packs were coded for imagery or symbols related to this feature.
‡Cigarette packs were coded for text related to this feature.
§Positive description was defined as 'text that describes positive taste or feeling associated with product use'.
¶Quality standards include imagery that suggests a product was produced to a specific standard and include quick response codes and certified organic tobacco signs.

common features present on cigarette packs (table 2). The presence of recycling and rare animal features remained stable over both waves, and the presence of bright colours decreased from wave 1 to wave 2 (p=0.002). The presence of aquatic (p<0.001), positive description (p=0.030) and quality standard (p=0.002) features significantly increased between the two waves. The presence of Botanics features also increased over time: 14.9% of packs in wave 1 ($n_{wave\ 1}$=63) contained botanical features vs 20% of packs in wave 2 ($n_{wave\ 2}$=126, p=0.014). No packs included sports-related features. The average number of features per pack increased from wave 1 (mean=1.61, range: 0–4) to wave 2 (mean=1.73, range: 0–6).

Figure 2 presents examples of 'healthy' or 'good for me' features. In general, there was some overlap between coded features. A supplementary analysis found that aquatic, skyscape and landscape imagery (all in the *fresh elements* category) were weakly to moderately correlated with each other (r^2=0.28–0.46; see correlation matrix heatmap in online supplemental figure 1). In addition, tar and clean colours (r^2=0.29), landscape and botanics (r^2=0.22) and positive description and natural colour (r^2=0.24) were weakly correlated.

DISCUSSION

Most cigarette packs sold in China in waves 1 (83.5%) and 2 (83.5%) contained at least one feature that could imply the product was 'healthy' or 'good for me', suggesting consistent use of culturally specific health-related features by tobacco companies across a comprehensive set of brands over the study time-period. Our findings align with prior research and document the presence of health-related features on Chinese cigarette packs like those used on cigarette packs sold in other countries (eg, lighter colours,[13 17] use of organic descriptors,[18] tar level descriptions[34]). Importantly, our study also documents the presence of unique health-related features specific to Chinese culture including imagery of rare animals, culturally specific herbs (eg, ginseng) or botanicals (eg, bamboo), bright colours and nature scenes (eg, landscapes), all of which have the potential to convey that a particular cigarette pack may be healthy to Chinese consumers. Given the tobacco industry's history of using pack branding to influence consumer harm perceptions, it is perhaps unsurprising that almost every pack reviewed in this study included at least one element that people would consider 'healthy' or 'good' for them.

The high prevalence and diverse range of health-related features on our sample of cigarette packs may reflect the limited restrictions on pack branding in China. Although current provisions restrict the use of explicit terms that could mislead consumers (eg, 'low tar', 'light'), these restrictions do not apply to imagery or other implicit text-based appeals that can shape people's health perceptions.[8] Results from this study suggest that tobacco companies selling cigarettes in China may also be taking advantage of limitations in the current law. For instance,

Figure 2 Examples of cigarette packs purchased in China across 'healthy' or 'good for me' appeal categories and features.* *Packs in each appeals category may have 'health'/'good for you' features from other categories. CTO, certified organic tobacco.

a notable number of packs included textual descriptions of tar content (eg, '<6 mg tar') beyond the required tar yield information and sensory expectations (eg, cool, refreshing, blue) that could imply 'low tar' or 'light' cigarettes to consumers,[35] but would not be explicitly prohibited under the law. Our findings also indicate that tobacco companies are using other, culturally specific health features not covered in the current restrictions that could be uniquely associated with health-related perceptions among consumers in China. For example, this study and others documented the presence of quick response (QR) codes on Chinese cigarette packs that link to online programmes verifying the authenticity or quality of the pack,[36] which can improve consumer perception of the safety of a consumer good, like cigarettes.[37 38]

The use of terms related to 'environmental protection' is also currently prohibited in China.[8] We found that over one-third (39%) of cigarette packs in our sample contained recycling imagery (eg, tidy man, recycling arrows), which could imply environmental protection and also signal a product may be 'healthy' or 'good for you'. Emerging evidence suggests the use of greenwashing appeals, like product recycling, may be employed by the tobacco industry to create a health halo around tobacco production that could symbolically transfer lower risk perceptions of product use to consumers.[39–41] A recent study found that the presence of pro-environment marketing on a US cigarette pack (Natural American Spirit), which included a three-arrow recycling symbol, decreased perceived harm of the pack versus a comparison pack (Pall Mall), which did not include pro-environment marketing but was matched on colour, description of tobacco strength and flavour and made by the same manufacturer.[42] These findings further reflect the limitations of the existing packaging and labelling restrictions in China and highlight how the continued use of the features documented in this study may mislead consumers about the smoking-related risks.

The presence of most of the health-related features examined in this study remained similar over time. However, there was a notable increase in the proportion of packs with botanic, aquatic and quality standard (eg, QR code) imagery, and an increase in the proportion of packs including positive descriptions of sensory expectancies associated with product use. The increased presence of these features suggests they may be particularly salient in shaping consumer perceptions of the 'healthiness' of cigarette packs. Future research should build on this study to examine Chinese consumer perceptions of the appeal of and perceived harm of cigarette packs that emphasise these specific features.

Results from this study can inform China's cigarette pack labelling and branding policies, which have not changed since 2007.[8] Our findings highlight important limitations in the current packaging and labelling standards that could be addressed and even expanded to include additional text and imagery that have the potential to mislead consumers. This study also points to the potential need for stronger pack branding standards in China. Many countries, like Australia and Thailand, have implemented plain and standardised packaging. Stronger tobacco packaging requirements, such as plain packaging, could help reduce the influence of health appealing features on cigarette packs sold in China.[43–47]

This study is subject to limitations. First, although we employed a comprehensive group concept mapping and expert review approach to develop our codebook, it may not reflect all relevant health-related features that may be included on cigarette packs in China. Furthermore, our prompt was intentionally

broad and not specifically framed around 'healthy' or 'good for me' features on cigarette packs which could have influenced participant responses. Second, we tested for differences in group concept mapping results by smoking status but cannot account for differences in other demographic characteristics (eg, gender, income) because this information was not collected. Third, packs were collected from the most populated cities in China and most popular vendor types; the sample may not reflect packs available in smaller cities, rural areas and less popular vendor types, which could influence our estimate of the proportion of unique packs with health-related features sold in China. Fourth, our data collection is intended to capture the breadth of packs available; the proportions presented are not weighted to reflect the relative market share of each brand or brand variant. Furthermore, our findings reflect trends for cigarettes and cannot be applied to other nicotine-containing products. In addition, we only examined cigarette packaging features in 2013 and 2017. It is possible that the presence of health-related features, specifically those associated with more recent advances in technology like QR codes, have changed or increased over time. Future studies should document recent trends in the presence of the features highlighted in this study on Chinese cigarette packs and experimentally investigate the influence of such features on smokers' and non-smokers' perceptions of (eg, perceived harm) and intentions to use a branded cigarette pack.

CONCLUSION

This study suggests that marketing features on Chinese cigarette packs that may suggest the product is 'healthy' or 'good for you' are common. The findings highlight the presence of health-related features that are known industry tactics to reduce harm perceptions (eg, light colours). We also document the presence of health-related features on cigarette packs that are specific to consumers in China (eg, rare animal imagery, herbs/botanical imagery). Currently, China aims to reduce smoking prevalence by 20% to meet its Healthy China 2030 goal.[48] Findings from this study can inform tobacco control policy interventions in China, including expansion of current tobacco packaging and labelling requirements and other restrictions on branding (including plain packaging) that could help reduce smoking.

Contributors Conceptualisation: LC, YC, KCS, KW and JEC; methodology: LC, YC, KCS, KW and JEC; software: SR, LC and YC; validation: LC, ZD and YC; formal analysis: ZD, YC and LC; writing—original draft preparation: YC, ZD and LC; writing—review and editing: LC, YC, ZD, SR, KW, JEC and KCS; visualisation: YC, ZD and LC. All authors have read and agreed to the published version of the manuscript.

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Patient consent for publication Not applicable.

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