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Tobacco imagery in popular films in China from 2001 to 2020: a declining trend

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ABSTRACT

Background Exposure to tobacco imagery in films can result in tobacco use among adolescents and young adults. Efforts have been made to limit tobacco imagery in films in China. Our study investigates the level and trend of tobacco imagery in popular films in China from 2001 to 2020.

Methods The running time of the 20 top-grossing films in China annually from 2001 to 2020 was divided into 5 min intervals, and those containing tobacco imagery were coded for the following aspects: country of origin, presence of warning, presence of minors and the presence of tobacco brands.

Results We coded 9423 five-minute intervals across 400 films. Tobacco imagery occurred in 1344 intervals across 239 films. There was a declining trend in the proportion of films ($r=-0.515$, $p=0.022$) and the proportion of intervals ($r=-0.004$, $p<0.001$) with tobacco imagery over time. None of the films with tobacco imagery contained a warning for their audience against smoking. Chinese films contained more tobacco imagery than international films, and tobacco imagery related to minors and tobacco brands were present despite regulations.

Conclusion Tobacco imagery remains in films in China. The relevant authorities and film producers should ban films with tobacco imagery in China; for example, they should ban films with tobacco imagery from participating in awards, add warnings to films with tobacco imagery and give films containing tobacco imagery a default 'R' classification.

INTRODUCTION

Tobacco use is one of the largest avoidable causes of death and disability around the world, as it results in over 8 million deaths every year.¹ In China, there were more than 300 million smokers,² with roughly more than 2.3 million deaths attributed to tobacco use in 2019.³

Tobacco use is affected by many social and cultural factors,⁴ which means that attitudes towards tobacco use may differ across countries and societies.⁵ In China, tobacco use is acceptable because it takes an important role in social activities and is even seen as social currency.⁶ As a media tool, tobacco imagery in films can influence the audience's desire for tobacco,⁷ and this effect is even more pronounced among young people. A systematic review and meta-analysis reported that higher exposure to tobacco imagery in films was associated significantly with increased risk of trying smoking (relative risk=1.93, 95% CI 1.66 to 2.25).⁸ Exposure to tobacco imagery in films has

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Tobacco imagery is present in films in many countries. Although great efforts are being made to reduce tobacco imagery in films in China, to date, no studies have reported the levels and trends of tobacco imagery in popular films in China.

WHAT THIS STUDY ADDS

⇒ This paper reports four main findings: (1) there are declining trends in tobacco imagery in films in China between 2001 and 2020 regarding the proportion of films and the proportion of intervals, (2) none of the films with tobacco imagery in this study provided warnings about smoking, (3) Chinese films contain more tobacco imagery than international films, and (4) and tobacco imagery related to minors and tobacco brands were present in films despite regulations.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This study's findings suggest that further and continued efforts must be made to limit tobacco imagery in films in China; specifically, its particular insights (listed above) offer directions for policymakers (eg, warnings need to be added to all films with tobacco imagery). Future research can measure exposure to tobacco imagery in Chinese adolescents and young adults and explore the correlation and mechanism between tobacco imagery in films and smoking behaviours among youth.

also been identified as a cause of smoking in adolescents and young adults.^{8–10} Many governments and relevant industry groups have introduced policies to limit tobacco imagery in films. For example, a tobacco-free film rule was implemented from 2012 in India.¹¹ In America, all major film companies must abide by policies to reduce tobacco depictions in youth-rated movies.¹² In China, a year after ratifying the WHO Framework Convention on Tobacco Control in 2005,¹³ the National Radio and Television Administration of China (NRTA) issued a rule on film screenplay registration and film administration,¹⁴ which requires that 'excessive' tobacco imagery in films be cut or modified. In 2011, the NRTA issued a notice strictly limiting on-screen tobacco imagery in films and television drama, which replaced the 2009 notice that was limited to television drama only.¹⁵ It forbade the



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display of tobacco brands, tobacco imagery with minors present, and restricted instances of tobacco imagery. In the same year, the Chinese Association on Tobacco Control awarded the first satirical award 'dirty ashtray award' to limit tobacco imagery in films.¹⁶

Studies on popular films in other countries have demonstrated that tobacco imagery is very common.¹²⁻¹⁷⁻¹⁹ For example, using a 5 min coding method, tobacco imagery occurred in 8% of 5 min intervals across 41% of the most commercially successful films from 2009 to 2017 in the UK.¹⁸ Among the 595 top-grossing films in America from 2010 to 2018, 48% included tobacco imagery¹²; 79% of all youth-rated popular Mexican films in Mexico and Argentina from 2004 to 2012 contained tobacco imagery.¹⁹ Yet, the number of tobacco imagery in films had different trends over time in various countries. A study of tobacco imagery in popular UK films showed a declining trend over time ($r = -0.789$, $p < 0.01$) over the past three decades.¹⁸ Yet, the trend remained stable for top-grossing films in America from 2010 (45%) to 2018 (46%).¹² In China, the Chinese Association on Tobacco Control has monitored smoking imagery in top 30 popular Chinese films since 2007. Of the 30 most popular Chinese films in 2020, 60% contained tobacco imagery.²⁰ However, the Chinese Association on Tobacco Control did not monitor tobacco imagery in international films released in China despite their large market share in the country. The level of tobacco imagery in international films shown in China and how effectively the government and other non-profit organisations managed to limit tobacco imagery in such films remain unknown. Hence, this study ascertains the level and trend of tobacco imagery in popular films in China from 2001 to 2020.

METHODS

Selection of films

A descriptive study design was employed. According to the data provided by Boxofficecn,²¹ we included the 20 top-grossing films in Mainland China (without any political consideration, hereafter all referred to as China) annually between 2001 and 2020. Their general information, including running time and original country of each film, was obtained from Douban.²² Films whose original country was not China were categorised as international films. We obtained the video resource of each film through internet platforms such as iQIYI and Tencent Video, and restricted general information on each film consistent with Douban.

Coding method

Data were entered into the online platform WenJuanXing as the films were viewed. Every film was coded and analysed using the 5-min interval method, which has been widely used in studies of a variety of audiovisual media.¹⁷⁻¹⁸⁻²³ We coded the tobacco imagery in each 5 min interval. Any time less than 5 min at the end of the film was not coded. Tobacco imagery included the following categories:

- ▶ Actual tobacco use: the consumption of any tobacco product (cigarettes, cigars, pipes, electronic cigarettes or others) on screen by any character.
- ▶ Tobacco paraphernalia: the on-screen presence of tobacco or related materials (such as cigarette packets, matches, lighters, ashtrays).
- ▶ Inferred tobacco use: the presence of a verbal or non-verbal inference (such as a comment on smoking or a smoky atmosphere).
- ▶ Tobacco imagery: any of the aforementioned aspects.

If tobacco imagery was present in an interval, we also recorded whether there was a warning such as 'smoking is harmful to your health' and whether this tobacco imagery was related to minors, that is, the smoker was a minor, or a minor was present when an adult smoked. The presence of tobacco brands was also recorded. Brand appearances were defined as the occurrence of branded tobacco products or related advertisements and logos.

For coding purposes, multiple instances of tobacco imagery in the same 5 min interval were considered to be a single event, while instances that spanned consecutive 5 min intervals were coded as separate events. If more than one category occurred in an interval, the prioritising framework was actual tobacco use, tobacco paraphernalia and inferred tobacco use. The coders were coauthors and volunteers, and all films were double coded by two coders independently. After 40 film coding exercises for every coder, we found that the reliability of coding each film was above 85%. To avoid missing data, the data of each film used for analysis were the union set of the two coders' data.

Data analysis

Data were analysed using basic descriptive procedures, comparison between groups and regression analysis in Microsoft Office Excel 2019 and IBM SPSS V.22.0. The proportion of films with tobacco imagery was calculated by dividing the number of films containing tobacco imagery by 20 (the total number of films included in each year). The proportion of intervals with tobacco imagery was calculated by dividing the sum of tobacco intervals in each film by the number of included films. The χ^2 test was used to compare the prevalence of tobacco imagery in films and in intervals across years. General linear regression analysis was used for temporal trend analysis. All tests were two sided and the test level was $\alpha = 0.05$.

RESULTS

Films included

The 400 films totalled 785.3 hours (47 115 min), with a mean of 117 min (SD=22 min) and a range of 75–200 min. There were 9423 five-minute intervals in the films, with a mean of 23.6 intervals per film, ranging from 15 to 40. Of the 400 films, 203 were produced wholly or mainly by Chinese companies, 178 were produced wholly or mainly by American companies and 19 were wholly or mainly produced by others. Detailed information on these films can be found in online supplemental table S1. The 20 most popular films accounted for 47%–96.2% of each year's gross Chinese cinema box office, with a median of 67.1%.

Films with tobacco imagery

The proportion of films with tobacco imagery was 59.8% (95% CI 54.5% to 65%), and it varied from year to year. The proportion of films with tobacco imagery was highest in 2001 at 85%. The films with minimal tobacco imagery appeared in 2013 and 2017 at about 40%. Although there was no significant statistical difference between the proportions of all films with tobacco imagery in 2001 and 2020 ($\chi^2 = 2.133$, $p = 0.144$), a significant declining trend was observed. The proportion trend of films with tobacco imagery from 2001 to 2020 is shown in [figure 1](#) ($r = -0.515$, $p = 0.022$). There was a clear declining trend in all films from 2001 to 2013 before a period of fluctuation.

Intervals of films with tobacco imagery

Tobacco imagery was present in 14.3% of all intervals (95% CI 12.2% to 16.4%). Actual tobacco use occurred in 11.1% of intervals (95% CI 9.4% to 12.9%). Tobacco paraphernalia was

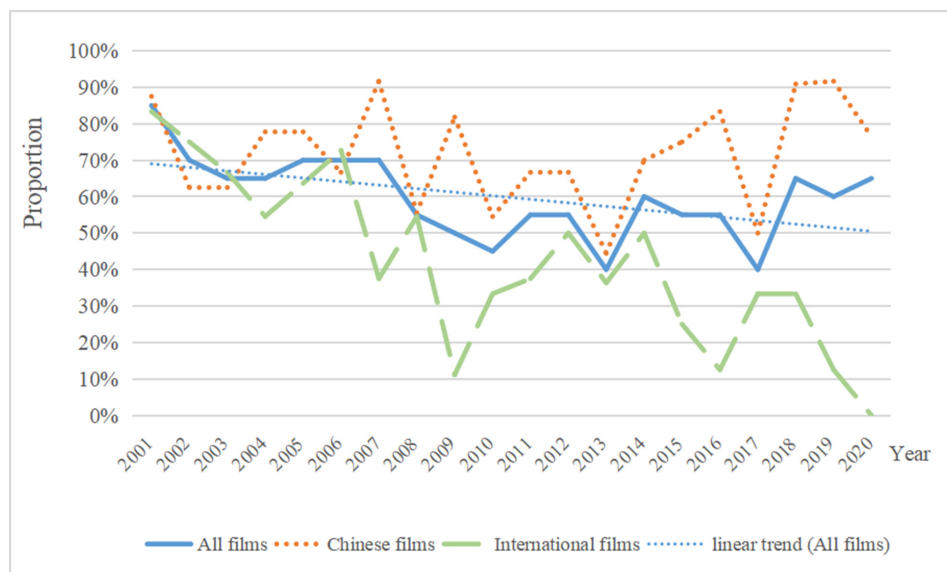


Figure 1 The proportion of films with tobacco imagery.

present in 2.6% of all intervals (95% CI 2.1% to 3%). Inferred tobacco use occurred in 0.6% of all tobacco intervals (95% CI 0.4% to 0.8%). As with the proportion of films with tobacco imagery, the proportion of intervals with tobacco imagery varied from year to year as well. The maximum was 20.8% in 2001, and the minimum was 6.5% in 2015. There was a significant difference of the proportion of intervals with tobacco imagery between 2001 (20.8%) and 2020 (15.8%) ($\chi^2=3.878$ $p=0.049$), and a significant downward trend between 2001 and 2020 ($r=-0.004$, $p<0.001$). The proportion of actual tobacco use was the highest, followed by the proportion of tobacco paraphernalia and the proportion of inferred tobacco use. **Figure 2** reveals the proportion of intervals with different tobacco imagery. The proportion of tobacco imagery in films showed a significant downward trend from 2001 to 2013, fluctuated from 2014 to 2017 and increased to a certain extent in the following 3 years.

Warnings about tobacco imagery

Although we tried to code the data of warnings on tobacco imagery, such as ‘smoking is harmful to health’ in films, none

of the films with tobacco imagery included a warning such as ‘smoking is harmful to health’.

Comparison between Chinese and international films

There were 973/4548 (21.4%) of intervals in 148/203 (72.9%) of Chinese films containing tobacco imagery and 371/4875 (7.6%) of intervals in 91/197 of (46.2%) international films containing tobacco imagery. Chinese films were more likely than international films to have tobacco imagery in films ($\chi^2=29.666$, $p<0.001$) and in 5 min intervals ($\chi^2=365.564$, $p<0.001$). The detailed data are shown in online supplemental table S2.

Tobacco imagery related to minors

There were 49/400 (12.3%) films containing tobacco imagery related to minors over the past 20 years. It varied from year to year, ranging from 0/20 in 2014 to 6/20 (30%) in 2019. There was no obvious upward or downward trend over time. **Figure 3** reveals the number of films with tobacco imagery related to minors each year.

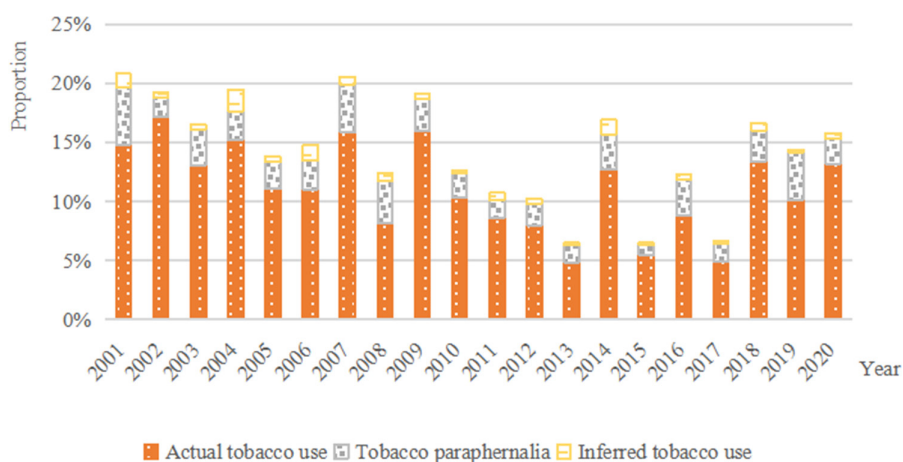


Figure 2 The proportion of intervals with tobacco imagery.

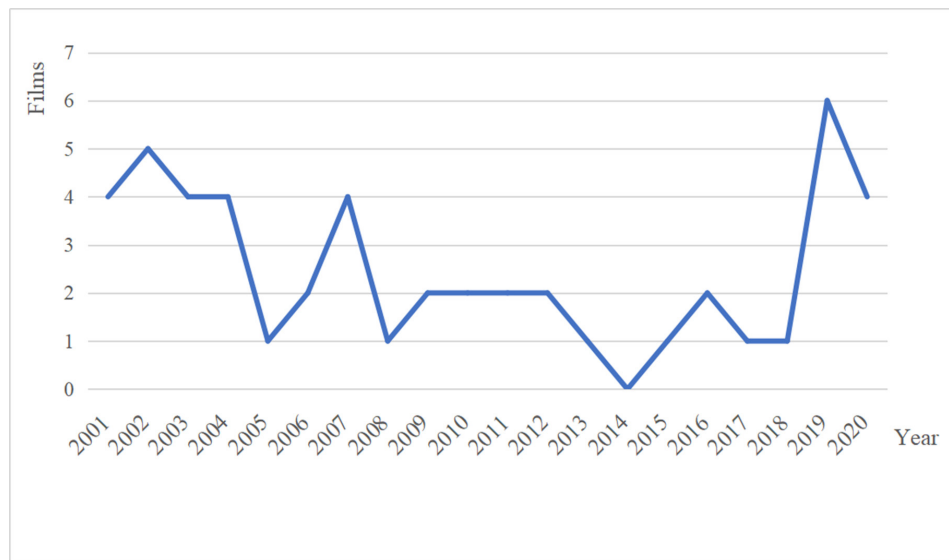


Figure 3 The number of films with tobacco imagery related to minors.

Tobacco brands in films

Tobacco brands typically appearing on tobacco packs or mentioned by film characters were present in 14/9423 (0.1%) intervals across 11/400 (2.8%) films, all of these films were Chinese films. Thirteen tobacco brands appeared, eight of which were Chinese brands. Hongta Mountain (Hong Ta Shan) was the only brand to appear in more than one film ($n=2$). Films containing tobacco brands are shown in online supplemental table S3.

DISCUSSION

Coding tobacco imagery of the 20 top-grossing films each year in China from 2001 to 2020, our study found that tobacco imagery occurred in 14.3% of all intervals across 59.8% of all films. The proportion of films and the proportion of intervals with tobacco imagery varied from year to year. Both indexes showed a declining trend between 2001 and 2020. Comparing the proportion of films with tobacco imagery between China and other countries, it was higher in China (59.8%) compared with 41% in the UK and 48% in America. At the interval level, using the same 5 min interval coding method, tobacco imagery was also present in more intervals (14.3% in China, 8% in the UK). More attention must be paid to limiting tobacco imagery in films released in China.

The behaviour of film characters affects the behaviour of the audience, especially for adolescents and young adults. When tobacco imagery is present, a warning such as ‘smoking is harmful to your health’ could remind the audience not to smoke. Unfortunately, none of the films had such warnings. Adding the warning to films with tobacco imagery might be helpful to reduce the influence of tobacco use on audiences.

More tobacco imagery in Chinese films than that in international films may be directly due to the rating system of films in America, the UK and some other countries.^{12–17} As the target audience of international films is wider, the tobacco imagery in films is restricted during production. Inadequate implementation and enforcement of related policies may be an underlying cause of the high level of tobacco imagery in Chinese films.

Imagery in the media relevant to young people can influence their attitudes and behaviours.^{12–24} In the context of tobacco control actions, both the WHO and the NRTA have established

relevant national regulations and policies to clearly limit the exposure of tobacco imagery to minors. Our study found that from 2001 to 2020 (except for 2014), there were films with tobacco imagery related to minors every year. In 2019, there were six films with tobacco imagery with minors present. It is a notable aspect that requires more attention in the future.

The notice published in 2011 by NRTA required that no brand should appear in the films. Our study found that tobacco brands were still present even in films made after 2011. All 11 films with tobacco imagery were Chinese films. Although not quite rising to the level of direct advertising, possible indirect advertising is also worth the attention of the relevant regulatory authorities. Thus, the NRTA should pay more attention to the enforcement of the notice to limit tobacco brands in films, especially Chinese films.

To limit tobacco imagery in films in China, the relevant authorities should fully implement the notice issued by NRTA on strictly controlling smoking imagery in films, strengthening supervision and examination of films during the process of approval, production and before their release. Film producers should actively assume their social responsibilities and abide by the notice. Film-related industry associations should consider tobacco imagery in films as an indicator of merit and restrict films with tobacco imagery from participating in awards. A warning that smoking is harmful to one’s health can also help discourage tobacco use among audiences when the situation does require a tobacco imagery. In addition, giving films containing tobacco imagery a default ‘R’ classification may be another effective measure to reduce tobacco exposure to adolescents and young adults in China. Future research could measure exposure to tobacco imagery in Chinese adolescents and young adults and explore the correlation and mechanism between tobacco imagery in films and smoking behaviours among youth.

Limitation

This study was limited by coding resources to the 20 most popular films each year in China, but they were likely to reflect the prominent pattern of tobacco exposure in popular films in China as they represented 47.0%–96.2% (median 67.1%) of annual box office revenues. To code the occurrence of tobacco imagery in films and television works, different methods have

been adopted by previous authors. Coding scene changes as separate imagery in 1, 3 or 5 min intervals as well as other methods of continuous measurement have been employed to varying effectiveness.^{12 25 26} To code tobacco imagery in films in our study, we used the 5 min interval coding method to generate semiquantitative measures and used double coding to ensure the validity. This method is reliable and sensitive to relative changes in behaviour levels. However, it may also lead to both underestimation (if high-frequency appearances are concentrated in short period of time) and overestimation (if short appearances transition into two intervals).

CONCLUSION

Our study found that tobacco imagery was present in popular films in China from 2001 to 2020. There was no difference in the proportion of films with tobacco imagery between 2001 and 2020 but the proportion of intervals with tobacco imagery in 2020 was significantly lower compared with 2001. Both indexes showed a declining trend from 2001 to 2020. Chinese films contained more tobacco imagery than international films, while films with tobacco imagery related to minors and tobacco branding are still prevalent despite regulations. Continuous efforts are needed to limit tobacco imagery in films in China.

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Patient consent for publication Not applicable.

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