

Announcements

The 33rd World No-Tobacco Day — May 31, 2020

Tobacco use poses an enormous threat to public health worldwide, killing more than eight million people every year (1). In 1987, the World Health Assembly of the World Health Organization (WHO) designated April 7, 1988 as World No-Tobacco Day (WNTD) (2) to encourage all persons worldwide who smoke or chew tobacco to quit for at least 24 hours. Extensive press coverage of this event stimulated and identified a range of policy and health education activities linked to the event, and the specific theme was “Tobacco or Health: Choose Health” (3). The second WNTD was held on May 31, 1989 and emphasized the theme “Women and Tobacco—The Female Smoker: At Added Risk” (4). From then on, May 31 has been recognized as WNTD and gradually became a year-long campaign beginning on that day. This day aims to discourage tobacco users from consuming tobacco and to encourage governments, communities, groups, and individuals to become aware of the problem and take appropriate action.

The WNTD theme changes every year, and for the 33rd WNTD arriving on May 31, 2020, the theme of this year’s WNTD will be “The secret’s out — if your product killed 8 million people each year, you’d also target a new generation.” In China, Healthy China 2030 targeted “reducing the smoking prevalence of people over 15-years-old to 20% by 2030”. Protecting new generations from tobacco use is a crucial link to achieve this goal, and although much progress has already been achieved, there is much more work to be done.

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Preplanned Studies

Tobacco Use and Exposure Among Secondary School Students — China, 2019

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Summary

What is already known about this topic?

Using the framework of the global youth tobacco survey (GYTS), China CDC conducted the first round of a national tobacco survey among junior high school (JHS) students in 2014, indicating that 17.9% and 5.9% of respondents were experimental and current cigarette smokers, respectively.

What is added by this report?

China CDC implemented a second round of the survey in 2019 and included senior high school (SHS) and vocational senior high school (VSHS) students. Experimental and current cigarette use was much higher among VSHS (30.3%, 14.7%) and SHS (21.6%, 5.6%) students than in JHS students (12.9%, 3.9%). Minors being able to buy cigarettes without refusal, tobacco advertisements and promotions on movies, TV, and at retail outlets, parents smoking, and teacher smoking in school were also widely prevalent.

What are the implications for public health practice?

Despite positive changes from 2014 to 2019, the external factors compelling teenagers to smoke were extensive. The priority for tobacco control among secondary school students should be strengthening the implementation of existing laws and regulations and developing targeted policies and measures for VSHS.

Using the framework of the global youth tobacco survey (GYTS), China CDC conducted the first round of tobacco survey among junior high school (JHS) students with a nationally and provincially representative sample in 2014 (2014 youth survey). A three-stage stratified cluster random sampling design was used in the survey. The selection of survey points (districts and counties) from each provincial-level administrative division (PLAD) of the mainland of China in the first stage and JHSs from each survey

point in the second stage were implemented using a proportionate to population size sampling scheme (PPS), and students were randomly sampled in the third stage. The data was collected by students answering paper-based questionnaires, and 155,117 respondents were analyzed in total (total (1)). To continuously provide evidence for policy-making and evaluation, China CDC implemented the second round of the epidemiological survey in 2019, in which the senior high school (SHS) and vocational senior high school (VSHS) students were included for the first time (2019 teenager survey). In this study, we report selected main findings of the 2019 teenager survey as relevant to cigarette smoking, availability, tobacco advertisements and promotion, and smoking exposure.

A method of multistage stratified cluster random sampling was also applied in the 2019 teenager survey. First, 5 districts (for urban areas) and 5 counties (for rural areas) were selected in each PLAD of the mainland of China by PPS. Second, 3 JHSs, 2 SHSs, and 1 VSHS in each participating district/county were also selected using the PPS method. Both private and public schools were included in the original sampling frame and each school must have had more than 40 students otherwise it would be excluded. Third, one class in each grade of a selected school was randomly identified and all the students in the class were investigated. The sampling was carried out by the China CDC in coordination with local health and education authorities.

Standardized paper-based questionnaires were distributed to students by trained investigators during school hours and centrally but independently completed by students with no teachers present. The quality controllers checked the completeness of all finished questionnaires. The provincial supervisors randomly selected 5% of respondents in each district or county and re-investigated using parts of the questionnaire to examine the accuracy. The subsequent data entry was completed by a professional company, and the entry quality (<5/10,000 error rate) was guaranteed by sampling checks. The data were further processed by accounting for missing data, outlier values, and logic mistakes for final utilization.

Questions included primary information (school, grade, class and individual), cigarette use, addiction, cessation, e-cigarette, secondhand smoke exposure, tobacco availability, price, tobacco advertisements and promotion, smoking cognition and attitude, and

tobacco control propaganda. Experimental smokers (ES) were those who had smoked cigarettes in the past including those who may have taken only one or two puffs. Current smokers (CS) were those who had smoked a cigarette at least one day in the past 30 days.

Weighting strategies based on a complex sampling design were applied to parameter estimation (2). Point values and 95% confidence intervals (CI) for each parameter were calculated and reported in this study. The difference of values with no overlap in CI is identified to be statistically significant between subgroups. All analyses were done with SAS (version 9.4; SAS Institute, Inc. Cary, NC, USA).

A total of 288,192 students participated in the survey, including 147,270 JHS students, 106,432 SHS students, and 34,490 VSHS students. The overall response rate was 94.8%.

ES prevalence rate among secondary school students was 17.9%, with 12.9%, 21.6%, and 30.3% for JHS, SHS, and VSHS students, respectively, and higher rates in male students (17.9%, 33.6%, and 43.2%) than in female students (7.2%, 10.2%, and 14.0%), respectively. The overall CS prevalence rate was 5.9% and the highest was observed among VSHS students (14.7%), and then SHS (5.6%) and JHS (3.9%) students with higher rates in male students (23.3%, 10.0%, and 5.8%) than in female students (3.7%, 1.4%, and 1.8%). For both ES and CS, the prevalence rates were higher in rural areas than in urban areas for JHS and SHS mainly among male students; VSHS showed no statistical differences. Significant regional disparities were present between schools for both ES and CS. High ES and CS were mainly from PLADs of the Southwest (Tibet, Yunnan, and Guizhou), as well as Hunan and Qinghai for JHS and SHS. Comparatively, the ES and CS prevalence rates were higher in the Southwest (Yunnan and Guizhou) and the North (Heilongjiang, Inner Mongolia) for VSHS. (Table 1, Figure 1)

Overall, among students who had experienced the following scenarios in the 30 days before the date of investigation, 76.5% of CS from JHS reported that they had not been rejected for attempting to buy cigarettes as minors under the age of 18 years, which was lower than those from SHS (87.6%) and VSHS (87.6%). The proportion of CS buying cigarettes by stick was 16.2%, 8.8%, and 3.7% for JHS, SHS, and VSHS, respectively, and was much higher in rural than in urban areas. Approximately 2.8% of VSHS students reported they had even been offered free tobacco

TABLE 1. Experimental and current cigarette use among secondary high school students in China, 2019.

Characteristic (age in median)	Total						Urban						Rural					
	Experimental smokers		Current smokers		Experimental smokers		Current smokers		Experimental smokers		Current smokers		Experimental smokers		Current smokers			
	N	% (95% CI)*	N	% (95% CI)	N	% (95% CI)	N	% (95% CI)	N	% (95% CI)	N	% (95% CI)	N	% (95% CI)	N	% (95% CI)		
Both																		
Overall (15 years old)	282,421	17.9(17.1–18.8)	286,455	5.9(5.5–6.4)	150,421	15.1(14.0–16.3)	152,302	5.0(4.2–5.8)	132,000	19.7(18.5–20.9)	134,153	6.5(5.9–7.2)						
Junior high school (14 years old)	144,566	12.9(12.0–13.9)	146,451	3.9(3.4–4.4)	76,178	9.0(8.1–9.9)	77,006	2.3(1.9–2.6)	68,388	15.2(13.9–16.6)	69,445	4.8(4.1–5.6)						
Senior high school (16 years old)	104,342	21.6(20.4–22.8)	105,868	5.6(5.1–6.1)	56,908	17.7(16.4–19.0)	57,679	4.1(3.5–4.7)	47,434	23.9(22.3–25.6)	48,189	6.4(5.7–7.1)						
Vocational senior high school (17 years old)	33,513	30.3(27.7–32.9)	34,136	14.7(12.7–16.6)	17,335	29.6(25.1–34.2)	17,617	14.5(10.8–18.1)	16,178	30.9(28.1–33.6)	16,519	14.8(12.9–16.7)						
Males																		
Overall (15 years old)	141,568	26.0(24.8–27.3)	143,985	9.6(8.8–10.4)	75,581	21.5(19.8–23.2)	76,724	8.0(6.7–9.3)	65,987	28.9(27.1–30.6)	67,261	10.6(9.6–11.6)						
Junior high school (14 years old)	74,766	17.9(16.6–19.2)	75,897	5.8(5.0–6.5)	39,501	12.1(10.9–13.4)	40,006	3.2(2.7–3.8)	35,265	21.2(19.3–23.1)	35,891	7.2(6.1–8.4)						
Senior high school (16 years old)	49,306	33.6(31.9–35.2)	50,233	10.0(9.1–10.8)	27,153	26.5(24.5–28.4)	27,636	7.1(6.1–8.1)	22,153	37.7(35.6–39.9)	22,597	11.6(10.4–12.8)						
Vocational senior high school (17 years old)	17,496	43.2(39.7–46.6)	17,855	23.3(20.3–26.3)	8,927	41.5(35.4–47.5)	9,082	22.7(17.3–28.2)	8,569	44.7(41.1–48.4)	8,773	23.8(20.9–26.7)						
Females																		
Overall (15 years old)	140,853	9.1(8.5–9.7)	142,470	1.9(1.7–2.1)	74,840	8.1(7.5–8.7)	75,578	1.6(1.4–1.9)	66,013	9.7(8.8–10.6)	66,892	2.1(1.8–2.4)						
Junior high school (14 years old)	69,800	7.2(6.5–7.9)	70,554	1.8(1.5–2.1)	36,677	5.3(4.7–5.9)	37,000	1.1(0.9–1.3)	33,123	8.3(7.3–9.4)	33,554	2.1(1.7–2.6)						
Senior high school (16 years old)	55,036	10.2(9.4–11.0)	55,635	1.4(1.1–1.6)	29,755	9.3(8.4–10.1)	30,043	1.2(1.0–1.4)	25,281	10.7(9.5–12.0)	25,592	1.4(1.1–1.8)						
Vocational senior high school (16 years old)	16,017	14.0(12.3–15.7)	16,281	3.7(2.9–4.4)	8,408	14.6(12.1–17.2)	8,535	4.0(2.8–5.2)	7,609	13.4(11.2–15.6)	7,746	3.4(2.5–4.2)						

*Abbreviation: CI=confidence intervals.

products by the tobacco industry, which was higher than in JHS and SHS students (2.0%) and higher in male students than in female students. Approximately 48.9% and 46.7% of respondents from JHS and VSHS, respectively, reported they had seen advertisements and promotions at retail outlets, which was higher than those from SHS (42.0%). Nearly a quarter of respondents had seen tobacco advertisements and promotions on the internet with the highest being VSHS students (27.7%), and the differences between genders and between urban-rural areas only appeared in JHS students. The proportions of respondents having seen smoking scenes on movies, TV, or videos were 69.5%, 72.9%, and 77.4% among students from JHS, SHS, and VSHS, respectively (Table 2). In addition, over half of the students reported that at least one of their parents is a smoker, and this was higher in rural areas than in urban areas for JHS and SHS. About half of SHS and VSHS students and 42.6% of JHS students had seen a teacher smoke in school. The proportions were higher in male students than in female students, and higher in rural areas than in urban areas. (Table 2)

DISCUSSION

The health hazards due to starting to smoke at an early stage of life is higher than starting later in life (3).

Most adult smokers smoked their first cigarette before 18 years of age, which makes it hard to quit once they get addicted and thereby leads to an increase in lifetime smoking (4–5). Developing continued monitoring of tobacco use and strengthening tobacco control in children and adolescents would be greatly beneficial to reducing the number of smokers.

Compared with the 2014 youth survey, the prevalence rates of ES and CS among JHS students in 2019 decreased by 27.9% (17.9% *vs.* 12.9%) and 33.9% (5.9% *vs.* 3.9%), respectively. Globally, the prevalence rate of CS among JHS students in China is lower than in 45 GYTS countries (6.8% in median), and close to Mongolia (3.9%) and Bahamas (3.8%) (6).

The reported rate of having seen smoking scenes on movies, TV, or videos has decreased by 14.1% (80.9% *vs.* 69.5%) from 2014 to 2019. Other indicators related to cigarette availability and advertisements on the internet have declined but no statistical significance was observed besides the reported rate of having seen marketing activities at retail outlets having increased by 17.8% (41.5% *vs.* 48.9%).

These declines may be partially explained by the great tobacco control efforts in China to protect children and adolescents in recent years using measures such as strengthening health education, banning tobacco advertisements, and prohibiting tobacco use

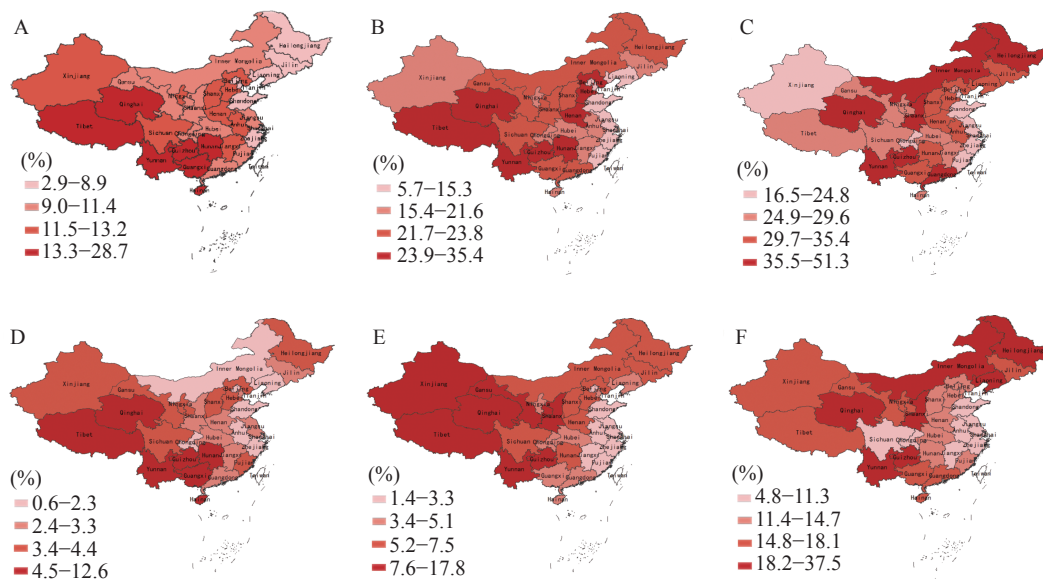


FIGURE 1. Regional disparities in the proportion of experimental smoker and current smoker among secondary school students in China, 2019. (A) Proportion of experimental smoker (junior high school students); (B) Proportion of experimental smoker (senior high school students); (C) Proportion of experimental smoker (vocational senior high school students); (D) Proportion of current smoker (junior high school students); (E) Proportion of current smoker (senior high school students); (F) Proportion of current smoker (vocational senior high school students).

TABLE 2. Cigarette availability, advertisements and promotion, and smoking exposure among secondary high school students in China, 2019.

Region	Variable	Total		Junior high school		Senior high school		Vocational senior high school	
		N	% (95% CI)	N	% (95% CI)	N	% (95% CI)	N	% (95% CI)
Both									
	Buying cigarettes as a minor without rejection*	9,108	83.3(82.0-84.6)	3,128	76.5(74.1-79.0)	3,152	87.6(86.0-89.2)	2,828	87.6(85.6-89.5)
	Buying cigarettes individually by stick†	11,087	9.2(7.3-11.1)	3,176	16.2(12.1-20.3)	4,243	8.8(6.7-10.8)	3,668	3.7(2.5-4.9)
	Tobacco advertisements and promotions at retail outlets§	69,554	46.4(45.3-47.5)	31,917	48.9(47.5-50.2)	26,415	42.0(40.3-43.6)	11,222	46.7(44.8-48.7)
	Tobacco advertisements and promotions on the internet¶	230,192	23.4(22.8-23.9)	111,308	23.2(22.6-23.9)	88,872	21.4(20.6-22.1)	30,012	27.7(26.5-28.9)
	Tobacco advertisements and promotions on movies, TV, or videos**	228,262	71.7(71.0-72.3)	116,417	69.5(68.8-70.2)	83,699	72.9(71.9-73.9)	28,146	77.4(75.8-78.9)
	Free tobacco products provided by tobacco industry††	287,881	2.1(2.0-2.3)	147,106	2.0(1.8-2.2)	106,328	2.1(1.9-2.2)	34,447	2.8(2.4-3.1)
	Parents smoke§§	288,126	54.2(53.2-55.1)	147,235	52.8(51.6-53.9)	106,409	54.4(53.2-55.6)	34,482	59.2(57.6-60.8)
	Teacher smokes in school¶¶	288,118	46.9(45.3-48.5)	147,224	42.6(40.9-44.2)	106,411	54.0(51.8-56.3)	34,483	49.6(46.1-53.1)
Males									
	Buying cigarettes as a minor without rejection*	7,658	83.0(81.6-84.4)	2,472	75.4(72.8-78.0)	2,718	87.3(85.6-88.9)	2,468	87.3(85.1-89.5)
	Buying cigarettes individually by stick†	9,462	9.0(7.2-10.9)	2,513	16.6(12.6-20.6)	3,718	9.1(6.9-11.2)	3,231	3.5(2.4-4.6)
	Tobacco advertisements and promotions at retail outlets§	39,289	45.2(44.1-46.4)	17,832	49.1(47.6-50.5)	14,554	38.8(37.2-40.4)	6,903	45.2(42.6-47.7)
	Tobacco advertisements and promotions on the internet¶	115,891	24.2(23.5-24.8)	57,588	24.0(23.3-24.8)	42,465	22.0(21.2-22.7)	15,838	28.2(26.4-30.0)
	Tobacco advertisements and promotions on movies, TV, or videos**	115,694	76.8(76.2-77.4)	60,825	74.1(73.3-74.9)	40,190	79.0(78.1-79.9)	14,679	83.0(81.5-84.4)
	Free tobacco products provided by tobacco industry††	145,064	2.7(2.5-2.9)	76,393	2.5(2.2-2.7)	50,570	2.7(2.4-2.9)	18,101	3.8(3.2-4.3)
	Parents smoke§§	145,206	53.9(53.0-54.9)	76,470	52.7(51.5-53.8)	50,610	53.8(52.4-55.1)	18,126	58.7(56.8-60.6)
	Teacher smokes in school¶¶	145,199	51.1(49.5-52.7)	76,461	45.9(44.1-47.6)	50,613	59.5(57.2-61.9)	18,125	55.7(51.9-59.5)
Females									
	Buying cigarettes as a minor without rejection*	1,450	85.2(82.3-88.1)	656	81.1(76.6-85.7)	434	89.6(85.1-94.1)	360	89.8(84.6-95.1)
	Buying cigarettes individually by stick†	1,625	10.3(7.1-13.4)	663	14.6(9.1-20.1)	525	6.4(3.6-9.2)	437	6.0(1.9-10.2)
	Tobacco advertisements and promotions at retail outlets§	30,265	48.0(46.5-49.5)	14,085	48.6(46.8-50.4)	11,861	46.2(43.7-48.6)	4,319	49.7(46.5-52.8)
	Tobacco advertisements and promotions on the internet¶	114,301	22.5(21.9-23.1)	53,720	22.3(21.6-23.0)	46,407	20.8(19.8-21.7)	14,174	27.0(25.5-28.6)
	Tobacco advertisements and promotions on movies, TV, or videos**	112,568	65.9(65.1-66.7)	55,592	64.2(63.4-65.1)	43,509	66.9(65.6-68.2)	13,467	70.3(68.4-72.2)
	Free tobacco products provided by tobacco industry††	142,817	1.5(1.3-1.6)	70,713	1.5(1.3-1.6)	55,758	1.4(1.3-1.6)	16,346	1.5(1.2-1.8)
	Parents smoke§§	142,920	54.5(53.4-55.5)	70,765	52.9(51.6-54.2)	55,799	55.0(53.8-56.3)	16,356	59.9(57.9-61.9)
	Teacher smokes in school¶¶	142,919	42.2(40.6-43.9)	70,763	38.7(37.1-40.4)	55,798	48.7(46.4-51.0)	16,358	41.8(37.9-45.6)

TABLE 2. (Continued)

Region	Variable	Total		Junior high school		Senior high school		Vocational senior high school	
		N	% (95% CI)	N	% (95% CI)	N	% (95% CI)	N	% (95% CI)
Both									
	Buying cigarettes as a minor without rejection*	4,234	84.1(82.2-86.0)	1,203	75.9(72.6-79.2)	1,639	87.1(84.6-89.5)	1,392	86.8(84.0-89.6)
	Buying cigarettes individually by stick†	5,125	4.6(3.1-6.2)	1,214	10.7(7.4-13.9)	2,135	5.4(3.6-7.2)	1,776	2.0(0.7-3.3)
	Tobacco advertisements and promotions at retail outlets§	34,756	46.8(45.3-48.2)	15,534	49.4(47.8-51.0)	13,521	41.2(39.5-42.9)	5,701	48.0(44.9-51.2)
	Tobacco advertisements and promotions on the internet¶	124,054	22.7(22.0-23.4)	59,358	21.8(21.1-22.5)	49,053	20.3(19.5-21.2)	15,643	28.4(26.4-30.3)
	Tobacco advertisements and promotions on movies, TV, or videos**	120,185	69.5(68.5-70.4)	60,168	66.5(65.4-67.5)	45,489	70.3(69.3-71.4)	14,528	76.6(74.0-79.2)
	Free tobacco products provided by tobacco industry††	152,885	2.1(2.0-2.2)	77,228	1.9(1.8-2.1)	57,886	2.1(1.9-2.3)	17,771	2.7(2.1-3.3)
	Parents smoke§§	153,028	52.1(50.7-53.5)	77,304	49.8(48.2-51.4)	57,928	52.3(50.5-54.1)	17,796	58.8(56.7-60.9)
	Teacher smokes in school¶¶	153,025	37.7(35.4-40.0)	77,299	32.7(30.3-35.1)	57,931	45.4(42.1-48.7)	17,795	40.5(35.7-45.3)
Males									
	Buying cigarettes as a minor without rejection*	3,455	84.0(81.7-86.3)	913	74.8(70.8-78.9)	1,360	86.5(84.2-88.9)	1,182	86.8(83.4-90.1)
	Buying cigarettes individually by stick†	4,252	4.6(3.0-6.2)	919	11.8(8.4-15.3)	1,811	5.6(3.6-7.5)	1,522	1.9(0.5-3.3)
	Tobacco advertisements and promotions at retail outlets§	19,376	46.0(44.2-47.9)	8,592	48.9(47.0-50.8)	7,388	38.5(36.3-40.8)	3,396	48.3(44.0-52.6)
	Tobacco advertisements and promotions on the internet¶	62,298	24.0(23.0-25.0)	30,669	22.6(21.7-23.5)	23,535	21.3(20.4-22.2)	8,094	30.5(27.4-33.6)
	Tobacco advertisements and promotions on movies, TV, or videos**	61,055	75.2(74.2-76.2)	31,608	71.4(70.3-72.6)	22,000	77.1(76.0-78.2)	7,447	82.8(80.5-85.2)
	Free tobacco products provided by tobacco industry††	77,155	2.7(2.5-2.9)	40,179	2.4(2.1-2.6)	27,775	2.9(2.5-3.3)	9,201	3.6(2.6-4.6)
	Parents smoke§§	77,244	52.0(50.5-53.5)	40,227	49.9(48.1-51.8)	27,801	51.4(49.6-53.3)	9,216	58.7(55.7-61.6)
	Teacher smokes in school¶¶	77,241	41.7(39.2-44.2)	40,224	35.6(33.1-38.2)	27,802	50.3(46.6-53.9)	9,215	47.3(41.4-53.2)
Females									
	Buying cigarettes as a minor without rejection*	779	84.7(81.2-88.2)	290	79.5(74.9-84.1)	279	89.7(82.6-96.8)	210	87.2(78.5-95.9)
	Buying cigarettes individually by stick†	873	4.8(2.8-6.8)	295	6.9(3.3-10.5)	324	4.7(1.8-7.5)	254	2.9(0.1-5.7)
	Tobacco advertisements and promotions at retail outlets§	15,380	47.9(46.3-49.4)	6,942	50.1(48.3-51.8)	6,133	44.5(42.6-46.5)	2,305	47.4(43.8-51.1)
	Tobacco advertisements and promotions on the internet¶	61,756	21.3(20.4-22.1)	28,689	20.8(20.0-21.7)	25,518	19.4(18.3-20.5)	7,549	25.5(23.2-27.9)
	Tobacco advertisements and promotions on movies, TV, or videos**	59,130	62.9(61.9-64.0)	28,560	60.6(59.4-61.8)	23,489	63.6(62.3-64.9)	7,081	68.7(66.1-71.3)
	Free tobacco products provided by tobacco industry††	75,730	1.4(1.2-1.6)	37,049	1.4(1.2-1.6)	30,111	1.3(1.1-1.5)	8,570	1.5(1.0-2.0)
	Parents smoke§§	75,784	52.3(50.8-53.7)	37,077	49.7(48.2-51.2)	30,127	53.1(51.1-55.2)	8,580	58.9(56.4-61.5)
	Teacher smokes in school¶¶	75,784	33.2(30.9-35.4)	37,075	29.3(26.9-31.8)	30,129	40.7(37.5-43.9)	8,580	31.8(27.8-35.7)

TABLE 2. (Continued)

Region	Variable	Total			Junior high school			Senior high school			Vocational senior high school		
		N	% (95% CI)	N	% (95% CI)	N	% (95% CI)	N	% (95% CI)	N	% (95% CI)		
Both	Buying cigarettes as a minor without rejection*	4,874	82.9(81.2–84.6)	1,925	76.7(73.7–79.7)	1,513	87.8(85.7–89.8)	1,436	88.3(85.6–90.9)				
	Buying cigarettes individually by stick†	5,962	11.5(8.9–14.1)	1,962	17.8(12.6–23.0)	2,108	10.1(7.4–12.7)	1,892	5.2(3.5–7.0)				
	Tobacco advertisements and promotions at retail outlets§	34,798	46.2(44.6–47.7)	16,383	48.6(46.8–50.4)	12,894	42.3(40.1–44.6)	5,521	45.5(43.3–47.8)				
	Tobacco advertisements and promotions on the internet¶	106,138	23.8(23.0–24.6)	51,950	24.1(23.1–25.0)	39,819	22.0(20.9–23.1)	14,369	27.0(25.7–28.4)				
	Tobacco advertisements and promotions on movies, TV, or videos**	108,077	73.0(72.2–73.8)	56,249	71.2(70.3–72.1)	38,210	74.4(73.0–75.8)	13,618	78.1(76.3–79.9)				
	Free tobacco products provided by tobacco industry††	134,996	2.1(2.0–2.3)	69,878	2.0(1.8–2.3)	48,442	2.0(1.8–2.3)	16,676	2.8(2.4–3.3)				
	Parents smoke§§	135,098	55.4(54.2–56.7)	69,931	54.5(52.9–56.0)	48,481	55.6(54.1–57.2)	16,686	59.6(57.3–61.9)				
	Teacher smokes in school¶¶	135,093	52.6(50.7–54.5)	69,925	48.2(46.1–50.2)	48,480	59.0(56.2–61.8)	16,688	57.9(53.9–61.9)				
	Males												
	Buying cigarettes as a minor without rejection*	4,203	82.5(80.7–84.2)	1,559	75.6(72.5–78.7)	1,358	87.6(85.4–89.7)	1,286	87.8(85.0–90.7)				
	Buying cigarettes individually by stick†	5,210	11.2(8.7–13.8)	1,594	17.9(12.9–22.8)	1,907	10.3(7.5–13.1)	1,709	4.9(3.4–6.4)				
	Tobacco advertisements and promotions at retail outlets§	19,913	44.8(43.3–46.4)	9,240	49.1(47.3–51.0)	7,166	38.9(36.8–41.0)	3,507	42.3(39.8–44.7)				
	Tobacco advertisements and promotions on the internet¶	53,593	24.3(23.4–25.2)	26,919	24.9(23.8–25.9)	18,930	22.4(21.3–23.4)	7,744	25.9(24.4–27.5)				
Tobacco advertisements and promotions on movies, TV, or videos**	54,639	77.8(77.0–78.6)	29,217	75.6(74.5–76.7)	18,190	80.1(78.9–81.2)	7,232	83.1(81.4–84.7)					
Free tobacco products provided by tobacco industry††	67,909	2.7(2.4–3.0)	36,214	2.5(2.2–2.9)	22,795	2.6(2.2–2.9)	8,900	3.9(3.2–4.6)					
Parents smoke§§	67,962	55.1(53.9–56.3)	36,243	54.3(52.8–55.7)	22,809	55.2(53.4–57.0)	8,910	58.7(56.2–61.2)					
Teacher smokes in school¶¶	67,958	56.9(55.1–58.7)	36,237	51.7(49.6–53.9)	22,811	64.9(62.1–67.7)	8,910	63.4(59.5–67.3)					
Females													
Buying cigarettes as a minor without rejection*	671	85.5(81.5–89.5)	366	81.8(75.8–87.7)	155	89.6(83.7–95.4)	150	92.2(86.7–97.6)					
Buying cigarettes individually by stick†	752	13.3(8.5–18.1)	368	17.5(9.9–25.0)	201	7.5(3.3–11.6)	183	9.0(1.3–16.7)					
Tobacco advertisements and promotions at retail outlets§	14,885	48.1(45.9–50.2)	7,143	47.8(45.3–50.3)	5,728	47.0(43.4–50.5)	2,014	51.8(46.8–56.8)					
Tobacco advertisements and promotions on the internet¶	52,545	23.3(22.4–24.2)	25,031	23.2(22.1–24.2)	20,869	21.6(20.3–23.0)	6,625	28.4(26.4–30.4)					
Tobacco advertisements and promotions on movies, TV, or videos**	53,438	67.7(66.6–68.7)	27,032	66.2(65.1–67.3)	20,020	68.8(67.0–70.6)	6,386	71.8(69.0–74.5)					
Free tobacco products provided by tobacco industry††	67,087	1.5(1.4–1.6)	33,664	1.5(1.3–1.6)	25,647	1.5(1.3–1.8)	7,776	1.5(1.1–1.9)					
Parents smoke§§	67,136	55.8(54.4–57.3)	33,688	54.7(52.9–56.5)	25,672	56.1(54.5–57.7)	7,776	60.8(57.8–63.8)					
Teacher smokes in school¶¶	67,135	47.8(45.7–49.9)	33,688	44.1(42.0–46.2)	25,669	53.3(50.3–56.3)	7,778	50.9(45.7–56.1)					

* In the past 30 days before the date of investigation, current smokers had not experienced being refused due to age when buying cigarettes;

† In the past 30 days before the date of investigation, the current smokers had bought cigarettes individually by stick for themselves;

§ In the past 30 days before the date of investigation, students had seen tobacco advertisements and promotions at retail outlets;

¶ In the past 30 days before the date of investigation, the students had seen tobacco advertisements or video on the internet;

** In the past 30 days before the date of investigation, the students had seen smoking scenes on movies, TV, or videos;

†† The students have been offered free tobacco products by the tobacco industry;

§§ At least one of parents is smoker;

¶¶ The students had seen a teacher smoke in school during school hours.

Abbreviation: CI=confidence intervals.

inside secondary and primary schools (7–9). The improvement of social civilization and environmental hygiene may also possibly contribute to the reduction of tobacco use. In addition, the popularity of e-cigarettes might potentially make some cigarette smokers smoke e-cigarettes instead, which will be further analyzed in future research.

Despite positive changes in the past five years, the external factors compelling teenagers to smoke were extensive. First, although laws exist to prohibit selling tobacco product to minors in China, 76.5%, 87.6%, and 87.6% of CS from JHS, SHS, and VSHS, respectively, reported that they had not been rejected for being under 18 years old when buying cigarettes, indicating that relevant laws have not been well implemented. Second, the presence of buying cigarettes individually and getting free tobacco products from the tobacco industry indicated tobacco companies prefer to use a variety of strategies for promoting its products. Third, plenty of research revealed that tobacco advertisements and promotions are causally associated with the initiation and progression of tobacco use among children and adolescents (10). However, 48.9%, 42.0%, and 46.7% of respondents from JHS, SHS, and VSHS, respectively, reported they had seen tobacco advertisements and promotions at retail outlets, and nearly a quarter of respondents had seen them on the internet, which indicates that tobacco retail outlets and the internet should be the focus of regulations. Finally, our study showed that smoking scenes in movies, TV, or videos are widely prevalent.

Parents and teachers play an important role in the development of smoking habits for children and adolescents (4). Unfortunately, despite a slight decline, approximately half of the students in this study reported that at least one parent smokes and that teachers smoked in school. According to the “Opinions on further strengthening school smoking control” jointly launched by the Ministry of Education and the Ministry of Health in 2010, teachers are not allowed to smoke in school, especially in front of students. (7) The present study reflects a big gap in actual implementation.

In this study, we investigated SHS and VSHS students for the first time. The proportion of ES and CS among SHS and VSHS students is 1.9 and 2.21 folds of JHS, and it is 2.35 and 3.77 folds of JHS for VSHS. This disparity is more prominent in male students and urban areas. These results suggest that targeted measures of tobacco control are urgently

needed in senior high schools, especially to protect VSHS students.

A potential limitation is the self-reported design based on a paper-based questionnaire, which may probably cause mistakes in the process of data collection or potentially due to underreporting. However, the large sample size can make up for this disadvantage and this design can well maintain comparability with previous and other studies. Standardized and electronic survey systems, platform-based data management, and environmental nicotine detection should be considered for future surveys. In addition, the classification of urban-rural areas is roughly based on the naming of an area as “district (Qu)” and “county (Xian)” and is consistent with most studies in China.

In conclusion, there is a large decline in the ES and CS prevalence rates among JHS students from 2014–2019 in China. However, the tobacco control situation remains challenging with big regional disparities in the proportion of ES and CS, relatively easy access to cigarettes, high exposure to advertisements and promotions from tobacco industry, and inefficient policy implementation. Cigarette smoking in SHS, especially VSHS, is widely prevalent, suggesting the urgent need for targeted tobacco control measures.

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