Preplanned Studies

Utilization of Smoking Cessation Support Among Adults — 18 PLADs, China, 2020

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Summary

What is already known about this topic?

In 2018, unassisted smoking cessation (USC) was the predominant method for quitting smoking among Chinese adult smokers, accounting for 90.1% of cases. The utilization of professional smoking cessation support was comparatively low in this population.

What is added by this report?

In 2020, the prevalence of USC methods increased to 93.1%. Concurrently, there was a slight increase in the utilization of pharmaceuticals (from 4.6% in 2018 to 5.5% in 2020) and counseling and quit line services (from 3.2% in 2018 to 7.5% in 2020). On the other hand, the use of e-cigarettes as a cessation aid decreased from 14.9% in 2018 to 9.8% in 2020. Smokers aged 15–24 years old were more likely to rely on pharmaceutical interventions (7.9%), and less likely to choose USC methods (79.0%).

What are the implications for public health practice?

The promotion of professional cessation support is essential for enhancing smoking cessation rates.

Smoking cessation is a crucial strategy in achieving the goal of a smoking prevalence rate below 20% as outlined in the Healthy China initiative (2019–2030)(*1*–*2*). However, in 2018, the proportion of current smokers in China who attempted to quit within the past 12 months was only 19.8%, significantly lower than the global average of 40% (*3*–*4*). Various smoking cessation support methods have been developed in China, such as smoking cessation medications, nicotine replacement therapy (NRT), smoking cessation clinics, traditional Chinese medicine therapies, and the quit smoking hotline (quit line) (*3*). Yet, limited studies have focused on the utilization of smoking cessation support in China. This study is the first to provide a comprehensive overview of smoking cessation and the utilization of smoking cessation support in China using the most recent data from the 2020 National Adult Tobacco Survey (NATS). The results indicate that while utilization of professional cessation support has increased, unassisted smoking cessation (USC) remains the primary method. Thus, there remains a pressing need to implement more effective policies to promote professional cessation support.

The 2020 NATS is a cross-sectional survey that is provincially representative of adults aged 15 years and older in all 31 provincial-level administrative divisions (PLADs). A five-stage stratified cluster random sampling method was employed for each PLAD. In the first stage, five surveillance points (consisting of five districts for urban areas and five counties for rural areas) were selected from each PLAD using the probability proportional to size (PPS) sampling method. During the second stage, three subdistricts (referred to as "Jiedao" in Chinese) or townships were chosen from each surveillance point utilizing the PPS method. In the third stage, two communities or villages were selected from each subdistrict or township using the PPS method. In the fourth stage, 120 households were randomly chosen from each community or village. Finally, in the fifth stage, one person was randomly selected from each household to potentially complete the investigation as a participant.

In the 2020 NATS, a customized electronic survey system was employed. Strict data collection and quality control procedures were implemented throughout the research process. China CDC provided training for all investigators and quality control reviewers before initiating the study. A three-tiered quality control structure was established, consisting of county-level reviewers, provincial-level supervisors, and national-level staff. Informed consent was obtained from each participant before they were instructed to complete the questionnaire.

In this study, 18 PLADs across 7 regions in China were proportionally selected based on population size, including Tianjin and Shanxi from northern China; Heilongjiang and Liaoning from northeastern China;

Shanghai, Zhejiang, Anhui, and Fujian from eastern China; Henan and Hunan from central China; Guangdong and Guangxi from southern China; Guizhou, Yunnan, and Xizang (Tibet) from southwestern China; and Gansu, Ningxia, and Xinjiang from northwestern China. A total of 140,400 respondents participated in the survey.

Survey quality was assessed for each investigator, with issues identified in the corresponding questionnaires through several indicators. These indicators included household size (the proportion of one- and two-person families in a surveillance point being double or more than that of the PLAD), time taken by each respondent (with over 50% of smokers, ex-smokers, and never-smokers taking less than 8, 7, and 6 minutes, respectively), and the number of surveys conducted per day (the mean number of respondents exceeded 20 daily). All responses demonstrating poor survey quality were excluded from analysis. Ultimately, a dataset of 99,092 respondents was used for the final nationwide estimation.

In the study, smokers were identified using the following questions to determine their smoking status: "Do you currently smoke every day, occasionally, or not at all?" and "In the past, have you smoked every day, occasionally, or not at all?". Respondents who currently smoke were categorized as current smokers, while those who previously smoked but no longer use tobacco were classified as ex-smokers. The study inquired about the utilization of smoking cessation support among current smokers who attempted to quit within the past 12 months and ex-smokers who quit within the same timeframe. The types of smoking cessation support examined included professional smoking cessation support (pharmaceuticals, such as smoking cessation medications or NRT, counseling, and quit lines, such as smoking cessation clinics or quit lines), e-cigarettes, USC, and other support methods (traditional Chinese medicine therapies, such as acupuncture or Chinese herbs, smokeless tobacco, etc.).

The overall smoking cessation rate was calculated, and participants were categorized based on gender, age, ethnicity, education level, occupation, annual household income, residential region, and e-cigarette use. All statistical analyses and figures were conducted using SAS (version 9.4; SAS Institute, Inc. Cary, NC, USA) and R (version 4.2.1; R Core Team, Vienna, Austria). Estimates were weighted by multiplying the base weight according to the complex design, non-response weight, and post-stratification weight. The Rao-Scott chi-square test was utilized for bivariate analysis, and a two-sided *P*-value of <0.05 was considered statistically significant. Missing data were imputed using the random forest algorithm. Additionally, the use of smoking cessation support reported in the 2020 NATS was compared to that in the 2018 Global Adult Tobacco Survey (GATS)-China, adhering to the same definitions of relevant concepts (*3*).

In 2020, the smoking cessation rate in China was 19.1% (18.8% for males and 25.9% for females), with higher rates observed among smokers aged 65 and older (37.1%), of Han ethnicity (19.8%), in the retired population (40.2%), those with an annual household income of ≥100,000 CNY (30.2%), eastern China residents (30.3%), and non-e-cigarette users (20.2%). Moreover, significant differences in smoking cessation rates among males were found across ethnicity (*P*=0.006), household income level (*P*=0.009), and e-cigarette use (*P*<0.001); however, no significant differences were observed in females (Supplementary Table S1, available in https://weekly.chinacdc.cn/).

In 2020, 20.2% of former smokers (20.7% for males and 10.6% for females) reported quitting smoking within the previous 12 months. A high proportion of this population consisted of occupational managers and professionals (56.7%), individuals with an annual household income of 50,000–99,999 CNY (25.9%), residents of eastern China (26.2%), and e-cigarette users (38.2%). Moreover, 34.7% of current smokers attempted to cease smoking within the prior 12 months. This was particularly true for smokers aged 15–24 years (60.2%) and those residing in northern China (44.5%) (Supplementary Table S2, available in https://weekly.chinacdc.cn/).

In 2020, 93.1% of smokers who reported smoking cessation in the past 12 months utilized USC. Among these individuals, USC was used by 96.7% of ex-smokers and 91.7% of current smokers. USC was notably more prevalent compared to other smoking cessation aids. From 2018 to 2020, usage of counseling and quit lines for smoking cessation increased from 3.2% to 7.5%, while e-cigarette use decreased from 14.9% to 9.8%. Among current smokers, the proportion that utilized counseling and quit lines rose from 3.2% in 2018 to 9.1% in 2020, while the proportion that employed e-cigarettes declined from 16.2% in 2018 to 12.0% in 2020 (Figure 1A).

For both males and females, the utilization of smoking cessation support increased from 2018 to 2020 in terms of pharmaceuticals, counseling, and quit

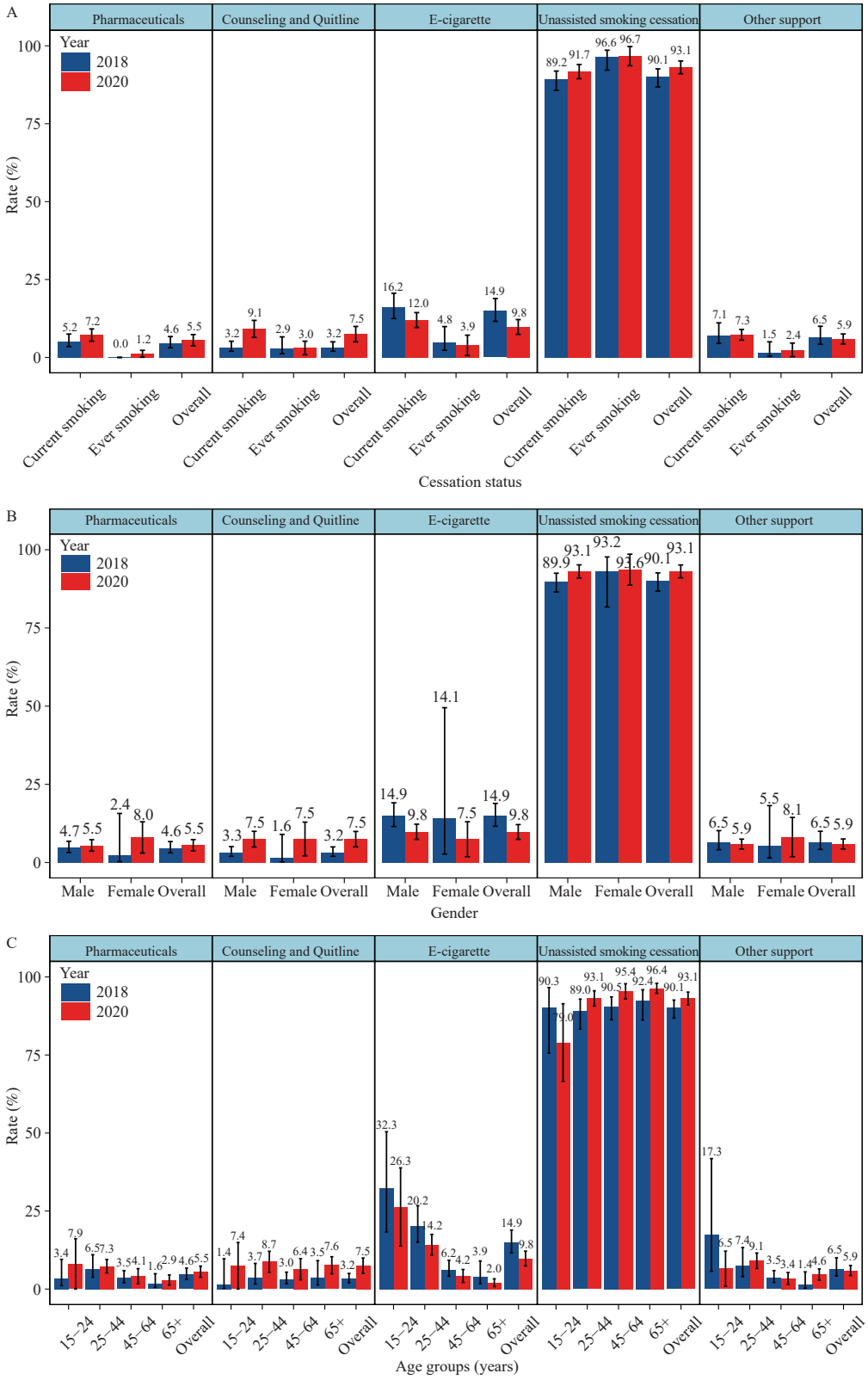

FIGURE 1. Cessation support utilization among current smokers who attempted to quit and recent ex-smokers, stratified by smoking status, gender and age group, in the past 12 months across 18 provincial-level administrative divisions of China, 2018–2020. (A) Cessation support utilization by smoking status. (B) Cessation support utilization by gender. (C) Cessation support utilization by age group.

lines. However, e-cigarette use decreased during the same period. Moreover, men increased their use of USC, while females exhibited a more substantial increase in quitting through other aids (Figure 1B). Additionally, e-cigarette use decreased across all age groups from 2018 to 2020, while pharmaceuticals, counseling, and quit line usage increased. Furthermore, younger individuals were more inclined to use e-cigarettes for smoking cessation. USC usage only decreased in the 15–24-year-old age group, while it increased in other age categories (Figure 1C).

Discussion

The findings of this study demonstrated that the smoking cessation rates for males and females were 18.8% and 25.9%, respectively. The various methods utilized for smoking cessation, such as the use of USC, pharmaceutical interventions, counseling and quit line services, and e-cigarettes, contributed to cessation rates of 93.1%, 5.5%, 7.5%, and 9.8%, respectively. It was observed that a majority of smokers did not pursue external professional support for cessation, and younger smokers exhibited a higher likelihood of quitting through the use of e-cigarettes.

The smoking cessation rate among male smokers employed as managers and professionals (23.9%) was substantially greater than that of their female counterparts (3.9%). This discrepancy may be attributable to the limited sample size of the female subpopulation. Additionally, female smokers in a predominantly male-oriented society may experience increased work pressure and exhibit a reduced inclination to stop smoking compared to male smokers.

The smoking cessation rates among smokers aged 15 years and older were found to be comparable between 2018 and 2020 (*3*). Female and older smokers demonstrated a higher likelihood of quitting smoking. These findings are in alignment with the results from a study conducted in 1998 and 2003 (*5*); however, they do not concur with the International Tobacco Control (ITC) China Survey conducted between 2006 and 2009 (*6*). As such, additional research is warranted to further investigate smoking cessation efforts in China.

The primary method for smoking cessation is USC (*3*,*7*), which may be attributed to several factors. First, smokers in China have limited access to cessation clinics. Due to the high cost of smoking cessation pharmaceuticals and their exclusion from the social security system (*8*), smokers are less likely to seek help from healthcare professionals. Second, there may be a lack of awareness regarding available smoking cessation support in China, resulting in many smokers being unaware of how to access professional assistance. Third, the severe coronavirus disease 2019 epidemic in 2020 may have further restricted access to smoking cessation support and contributed to an increase in smokers (*9*).

In comparison to 2018, a greater number of smokers who encountered difficulties in quitting smoking sought assistance from smoking cessation clinics and hotlines in 2020, while the usage of e-cigarettes for cessation decreased. This trend may suggest an increased concern for professional support in smoking cessation and a preference for avoiding less effective cessation strategies (*10*). Additionally, changes in the use of smoking cessation support appeared to be similar between males and females; however, differences were observed across various age groups. Younger individuals demonstrated the highest usage of e-cigarettes and were more likely to utilize these devices as a cessation aid (*10*).

The study was subject to at least two limitations. First, the smoking cessation status was solely based on self-reported data from participants, which could introduce information bias and potential changes in smoking cessation status over time. Second, due to the repeated attempts by numerous smokers to access smoking cessation support, the definitive impact of such support on cessation outcomes could not be determined.

In conclusion, although progress has been made in smoking cessation efforts in China, there is a need for more effective policies to encourage smokers to quit and increase access to professional cessation support. Furthermore, the high prevalence of e-cigarette use as a smoking cessation aid among young adults warrants increased attention.

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SUPPLEMENTARY TABLE S1. Sociodemographic characteristics of former and current smokers in the 18 provincial-level administrative divisions of China, 2020.

Characteristic	Total						Male						Female					
	Ex-smoker		Current smoker		Rao-Scott, X^2	*P*	Ex-smoker		Current smoker		Rao-Scott, X^2	*P*	Ex-smoker		Current smoker		Rao-Scott, X^2	*P*
	Unweighted, *n*	Weighted, % (95% *CI*)	Unweighted, *n*	Weighted, % (95% *CI*)			Unweighted, *n*	Weighted, % (95% *CI*)	Unweighted, *n*	Weighted, % (95% *CI*)			Unweighted, *n*	Weighted, % (95% *CI*)	Unweighted, *n*	Weighted, % (95% *CI*)		
Total	5,903	19.1 (15.1−23.0)	22,675	80.9 (77.0−84.9)			5,498	18.8 (14.7−22.9)	21,615	81.2 (77.1−85.3)			405	25.9 (20.5−31.3)	1,060	74.1 (68.7−79.5)		
Age group (years)																		
15−24	43	5.0 (2.6−7.4)	543	95.0 (92.6−97.4)	117.53	<0.001	33	4.2 (2.1−6.3)	518	95.8 (93.7−97.9)	115.89	<0.001	10	19.6 (0.0−40.7)	25	80.4 (59.3−100.0)	9.27	0.026
25−44	610	10.7 (6.6−14.8)	6,155	89.3 (85.2−93.4)			566	10.5 (6.3−14.7)	5,978	89.5 (85.3−93.7)			44	17.9 (5.4−30.5)	177	82.1 (69.5−94.6)		
45−64	2,389	21.6 (15.9−27.4)	11,050	78.4 (72.6−84.1)			2,265	21.6 (15.6−27.5)	10,558	78.4 (72.5−84.4)			124	22.8 (17.8−27.8)	492	77.2 (72.2−82.2)		
65+	2,861	37.1 (34.0−40.3)	4,927	62.9 (59.7−66.0)			2,634	36.9 (33.7−40.2)	4,561	63.1 (59.8−66.3)			227	40.1 (32.8−47.5)	366	59.9 (52.5−67.2)		
Ethnicity																		
Han	5,271	19.8 (15.5−24.2)	19,558	80.2 (75.8−84.5)	7.29	0.007	4,901	19.6 (15.1−24.1)	18,607	80.4 (75.9−84.9)	7.43	0.006	370	26.2 (20.0−32.4)	951	73.8 (67.6−80.0)	0.17	0.679
Minority	632	13.8 (10.9−16.6)	3,117	86.2 (83.4−89.1)			597	13.4 (10.5−16.3)	3,008	86.6 (83.7−89.5)			35	24.1 (16.7−31.6)	109	75.9 (68.4−83.3)		
Education																		
Junior high school or below	4,393	18.3 (16.2−20.4)	16,323	81.7 (79.6−83.8)	1.30	0.523	4,057	18.0 (15.8−20.1)	15,455	82.0 (79.9−84.2)	1.54	0.463	336	26.1 (20.1−32.1)	868	73.9 (67.9−79.9)	2.42	0.298
High school	903	18.5 (14.1−22.8)	3,745	81.5 (77.2−85.9)			852	18.1 (13.6−22.7)	3,617	81.9 (77.3−86.4)			51	30.4 (19.8−40.9)	128	69.6 (59.1−80.2)		
Junior college or above	607	23.3 (8.5−38.2)	2,607	76.7 (61.8−91.5)			589	23.5 (8.3−38.6)	2,543	76.5 (61.4−91.7)			18	18.0 (6.7−29.2)	64	82.0 (70.8−93.3)		
Occupation																		
Managers and professionals	233	23.2 (8.5−38.0)	1,129	76.8 (62.0−91.5)	67.00	<0.001	230	23.9 (8.9−39.0)	1,103	76.1 (61.0−91.1)	68.74	<0.001	3	3.9 (0.0−10.7)	26	96.1 (89.3−100.0)	12.37	0.015
Commerce and service	2,844	17.2 (14.0−20.4)	13,066	82.8 (79.6−86.0)			2,703	17.0 (13.8−20.3)	12,560	83.0 (79.7−86.2)			141	23.7 (19.1−28.2)	506	76.3 (71.8−80.9)		
Unemployment	618	20.9 (17.8−24.1)	1,750	79.1 (75.9−82.2)			527	19.3 (16.1−22.5)	1,593	80.7 (77.5−83.9)			91	34.2 (20.5−48.0)	157	65.8 (52.0−79.5)		
Retired	1367	40.2 (29.9−50.5)	2,317	59.8 (49.5−70.1)			1,258	40.3 (29.4−51.3)	2,130	59.7 (48.7−70.6)			109	38.1 (29.3−46.9)	187	61.9 (53.1−70.7)		
Other	841	14.5 (11.8−17.2)	4,413	85.5 (82.8−88.2)			780	14.3 (11.6−17.0)	4,229	85.7 (83.0−88.4)			61	19.6 (4.7−34.6)	184	80.4 (65.4−95.3)		

TABLE S1. (Continued)

Characteristic	Total						Male						Female					
	Ex-smoker		Current smoker		Rao-Scott, X^2	*P*	Ex-smoker		Current smoker		Rao-Scott, X^2	*P*	Ex-smoker		Current smoker		Rao-Scott, X^2	*P*
	Unweighted, *n*	Weighted, % (95% *CI*)	Unweighted, *n*	Weighted, % (95% *CI*)			Unweighted, *n*	Weighted, % (95% *CI*)	Unweighted, *n*	Weighted, % (95% *CI*)			Unweighted, *n*	Weighted, % (95% *CI*)	Unweighted, *n*	Weighted, % (95% *CI*)		
Annual household income in CNY																		
<50,000	4,036	16.3 (14.3−18.3)	15,878	83.7 (81.7−85.7)	8.84	0.012	3,728	15.9 (13.9−17.9)	15,062	84.1 (82.1−86.1)	9.35	0.009	308	26.0 (21.0−31.0)	816	74.0 (69.0−79.0)	0.14	0.931
50,000−99,999	1,257	18.7 (16.4−21.0)	4,570	81.3 (79.0−83.6)			1,183	18.4 (16.1−20.8)	4,397	81.6 (79.2−83.9)			74	24.9 (12.4−37.3)	173	75.1 (62.7−87.6)		
≥100,000	610	30.2 (13.4−47.0)	2,227	69.8 (53.0−86.6)			587	30.3 (13.1−47.4)	2,156	69.7 (52.6−86.9)			23	28.1 (16.7−39.5)	71	71.9 (60.5−83.3)		
Region																		
Northern China	966	13.5 (9.6−17.4)	3,018	86.5 (82.6−90.4)	106.39	<0.001	833	13.0 (9.3−16.8)	2,739	87.0 (83.2−90.7)	118.50	<0.001	133	25.3 (18.1−32.5)	279	74.7 (67.5−81.9)	26.98	0.001
Northeastern China	436	13.6 (10.7−16.6)	2,824	86.4 (83.4−89.3)			359	13.1 (9.8−16.3)	2,505	86.9 (83.7−90.2)			77	17.4 (11.6−23.2)	319	82.6 (76.8−88.4)		
Eastern China	1,836	30.3 (21.6−39.0)	4,242	69.7 (61.0−78.4)			1,778	30.2 (21.4−39.0)	4,139	69.8 (61.0−78.6)			58	34.9 (21.7−48.1)	103	65.1 (51.9−78.3)		
Central China	629	16.2 (11.8−20.7)	2,432	83.8 (79.3−88.2)			618	16.2 (11.7−20.6)	2,370	83.8 (79.4−88.3)			11	19.5 (8.4−30.5)	62	80.5 (69.5−91.6)		
Southern China	559	14.6 (11.6−17.7)	2,522	85.4 (82.3−88.4)			515	13.8 (11.0−16.6)	2,467	86.2 (83.4−89.0)			44	45.8 (27.7−63.9)	55	54.2 (36.1−72.3)		
Southwestern China	783	14.2 (11.4−17.1)	3,962	85.8 (82.9−88.6)			731	13.7 (10.8−16.6)	3,802	86.3 (83.4−89.2)			52	24.8 (17.8−31.9)	160	75.2 (68.1−82.2)		
Northwestern China	694	13.8 (9.9−17.8)	3,675	86.2 (82.2−90.1)			664	13.5 (9.6−17.3)	3,593	86.5 (82.7−90.4)			30	29.8 (16.2−43.3)	82	70.2 (56.7−83.8)		
E-cigarette use																		
Yes	225	8.4 (6.2−10.5)	2,044	91.6 (89.5−93.8)	28.69	<0.001	201	7.9 (5.8−10.0)	1,960	92.1 (90.0−94.2)	30.34	<0.001	24	27.5 (14.5−40.4)	84	72.5 (59.6−85.5)	0.04	0.835
No	5,678	20.2 (15.9−24.5)	20,631	79.8 (75.5−84.1)			5,297	19.9 (15.5−24.4)	19,655	80.1 (75.6−84.5)			381	25.8 (19.9−31.7)	976	74.2 (68.3−80.1)		

Abbreviations: CNY=Chinese Yuan; *CI*=confidence interval.

SUPPLEMENTARY TABLE S2. Proportion of smoking cessation within the past 12 months among ex-smokers and proportion of attempted smoking cessation within the past 12 months among current smokers across 18 provincial-level administrative divisions in China, 2020.

Characteristic	Ex-smokers		Rao-Scott, X^2	*P*	Current smokers		Rao-Scott, X^2	*P*
	Unweighted, *n*	Weighted, % (95% *CI*)			Unweighted, *n*	Weighted, % (95% *CI*)		
Total	843	20.2 (13.7−26.7)			2,951	34.7 (30.8−38.7)		
Gender								
Male	792	20.7 (14.0−27.4)	11.02	0.001	2,811	34.8 (30.7−38.8)	0.02	0.900
Female	51	10.6 (5.4−15.8)			140	34.1 (24.7−43.5)		
Age group (years)								
15−24	16	39.7 (15.4−64.0)	6.87	0.076	100	60.2 (50.2−70.1)	48.65	<0.001
25−44	153	21.8 (10.2−33.4)			930	37.1 (30.5−43.6)		
45−64	375	25.3 (10.1−40.5)			1,371	29.6 (26.3−33.0)		
65+	299	10.1 (8.5−11.8)			550	30.4 (27.0−33.8)		
Ethnicity								
Han	750	20.6 (13.6−27.6)	1.83	0.176	2,488	34.4 (30.1−38.7)	0.49	0.485
Minority	93	16.1 (11.6−20.7)			463	36.8 (30.6−43.1)		
Education								
Junior high school or below	605	19.0 (10.4−27.5)	3.41	0.182	1,975	33.7 (29.4−38.1)	1.28	0.527
High school	139	33.9 (12.7−55.1)			538	37.4 (33.5−41.3)		
Junior college or above	99	12.0 (0.1−23.9)			438	36.5 (26.6−46.4)		
Occupation								
Managers and professionals	34	56.7 (14.5−98.8)	21.02	<0.001	208	32.7 (20.0−45.5)	6.13	0.189
Commerce and service	455	16.4 (12.2−20.6)			1,621	34.7 (30.1−39.2)		
Unemployment	87	14.6 (10.9−18.3)			285	42.1 (34.6−49.7)		
Retired	117	7.6 (3.9−11.4)			258	26.1 (20.8−31.5)		
Other	150	31.7 (10.6−52.8)			579	35.3 (28.8−41.8)		
Annual household income in CNY								
<50,000	574	15.1 (13.1−17.1)	9.48	0.009	2,094	37.4 (33.2−41.6)	5.78	0.055
50,000−99,999	169	25.9 (8.8−43.0)			568	30.4 (23.2−37.5)		
≥100,000	100	25.5 (20.2−30.8)			289	30.0 (22.7−37.4)		
Region								
Northern China	109	15.0 (9.6−20.4)	68.15	<0.001	364	44.5 (28.5−60.5)	25.89	<0.001
Northeastern China	55	8.5 (2.9−14.0)			255	29.8 (18.5−41.1)		
Eastern China	266	26.2 (16.0−36.3)			452	23.7 (17.0−30.4)		
Central China	104	18.9 (14.9−23.0)			333	41.5 (35.5−47.5)		
Southern China	94	17.5 (13.5−21.5)			444	40.8 (35.4−46.2)		
Southwestern China	114	14.0 (10.0−18.0)			581	34.5 (28.3−40.8)		
Northwestern China	101	12.5 (8.7−16.4)			522	41.1 (35.1−47.2)		
E-cigarettes use								
Yes	66	38.2 (24.6−51.7)	5.18	0.023	473	37.2 (31.3−43.2)	1.21	0.272
No	777	19.4 (12.5−26.4)			2,478	34.2 (30.2−38.3)		

Abbreviation: CNY=Chinese Yuan; *CI*=confidence interval.