

Public support for tobacco endgame policies in South Korea: Findings from the 2020 International Tobacco Control Korea Survey

Heewon Kang ^{1,2} Wonjeong Yoon ³ Hong Gwan Seo,^{4,5} Sungkyu Lee ⁶,
Sujin Lim ⁷ Gil-yong Kim ⁷ Su Young Kim,⁷ Steve S Xu ⁸ Mi Yan,⁸
Anne C K Quah ⁸ Janet Chung-Hall ⁸ Lorraine V Craig ⁸,
Coral E Gartner ² Geoffrey T Fong,^{8,9} Sung-il Cho ^{1,3}

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For numbered affiliations see end of article.

Correspondence to

Professor Sung-il Cho,
Department of Public Health
Sciences, Seoul National
University Graduate School of
Public Health, Seoul 08826,
Korea (the Republic of);
persontime@hotmail.com

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ABSTRACT

Background Strong public support can increase the likelihood of adopting tobacco control policies. We assessed support for six commercial tobacco endgame policies in South Korea: limiting the nicotine in cigarettes, banning all additives in cigarettes, restricting the number of places where cigarettes are sold, and banning the manufacture and sales of cigarettes (unconditionally, with the provision of cessation support and with alternative tobacco products available).

Methods Data were obtained from 4740 adults who completed the 2020 International Tobacco Control Korea Survey. Participants were categorised based on their nicotine use: (1) did not use any products, (2) vaped and/or used heated tobacco products (HTPs) but did not smoke cigarettes, (3) smoked cigarettes only and (4) smoked cigarettes and vaped and/or used HTPs. Attitudes towards the policies were classified as supportive, undecided or opposed. Weighted multinomial logistic regression models assessed support levels according to nicotine use.

Results Support was highest for limiting the nicotine content in cigarettes (68.4%; 95% CI 64.6% to 72.3%) and restricting the number of retailers (68.1%; 95% CI 64.5% to 71.7%), and lowest for banning cigarette sales if alternative products are made available (45.0%; 95% CI 40.9% to 49.1%). People who did not use any products were most likely to support endgame policies, except for banning cigarette sales with alternatives available. The proportion of undecided participants exceeded 10% (range 13%–25%) for all policies.

Conclusion There is a strong public support for tobacco endgame policies in South Korea. Further research should prioritise the development of strategies to ensure the effective implementation of highly supported policies.

WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ The number of countries and subnational jurisdictions implementing or considering the implementation of commercial tobacco endgame policies is increasing.
- ⇒ Strong public support may motivate policymakers to consider the implementation of new tobacco control policies, including endgame measures.
- ⇒ Evidence of public support for endgame policies is lacking in high-income Asian countries with high smoking prevalence, such as South Korea.

WHAT THIS STUDY ADDS

- ⇒ Limiting the nicotine content in cigarettes received support from >60% of all participants, while other endgame policies received substantially less support (30.4%–58.2%) among people who used at least one nicotine product.
- ⇒ Restricting the number of retailers received the highest support (76.8%) among participants who did not use any products. However, more than half of those who smoked cigarettes exclusively opposed this policy.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ Policymakers may consider limiting the nicotine content of cigarettes as a feasible endgame policy option in South Korea.
- ⇒ Other factors influencing public policy-making, including potential effectiveness, unintended consequences and legal feasibility, should be studied.

INTRODUCTION

Tobacco smoking continues to be the leading cause of preventable disease burden despite regional and global efforts to reduce prevalence.¹ To accelerate the reduction of cigarette smoking prevalence to near-zero levels, a range of policy options collectively known as ‘tobacco endgame’ policies have been proposed. Unlike conventional demand-reduction MPOWER measures which exert downward pressure on smoking without a defined end or timeline, tobacco endgame policies focus more on reducing availability, attractiveness and addictiveness of

tobacco products with the aim to reduce the prevalence of smoking to less than 5% within a defined time frame. These measures include mandating a very low nicotine content (VLNC) standard for cigarettes, establishing product standards to reduce the appeal of smoked tobacco products, limiting the availability of tobacco products through restrictions on density, type and/or location of retailers, and phasing out of commercial cigarette sales, such as through a tobacco-free generation law.^{2,3}

Policymakers may be more likely to consider and adopt new tobacco control policies that are strongly



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Table 1 2020 ITC Korea Survey measures of endgame policy support

Endgame policy	Question
Limit nicotine	If you could get nicotine in products other than cigarettes, would you support or oppose a law that reduces the amount of nicotine in cigarettes, to make them less addictive?
Ban additives	This next set of items is about possible laws that could be used to control tobacco products and tobacco companies. Would you support or oppose a law that bans all additives, including flavourings, in cigarettes?
Restrict retailers	The following measures have been suggested to reduce smoking. Please tell us what you think about each suggestion. Would you support or oppose a law that restricts the number of places where cigarettes could be sold?
Ban cigarette manufacture and sales	This next set of items is about possible laws that could be used to control tobacco products and tobacco companies. Would you support or oppose a law that totally bans the manufacture and sale of cigarette and other tobacco products within 10 years?
Ban cigarette manufacture and sales with cessation support	This next set of items is about possible laws that could be used to control tobacco products and tobacco companies. Would you support or oppose a law that totally bans cigarettes and other smoked tobacco within 10 years, if the government provides assistance to help smokers quit?
Ban cigarette manufacture and sales with alternative products available	If you could get nicotine in products other than cigarettes, would you support or oppose a law that bans sales of cigarettes, but makes alternative forms of tobacco available?

ITC, International Tobacco Control.

supported by the public. Studies of public support can provide insights for developing effective implementation and communication strategies.⁴ Ongoing monitoring of public support remains valuable after policy implementation, particularly for new policies that have not been widely adopted, underscoring the importance of obtaining baseline estimates. Support for public policies, including tobacco control measures,⁵ often increases after their implementation. Previous studies have suggested that increased support following implementation is associated with perceived effectiveness of the policy and its alignment with prevailing social norms.^{6,7} Increased postimplementation support can also contribute to sustained policy efforts and encourage other countries to adopt similar policies.

South Korea has been implementing comprehensive tobacco control policies since 1995. Key tobacco control policies in South Korea include a complete smoking ban in the indoor areas of restaurants (phased in from 2012 to 2015), an 80% increase in cigarette prices in 2015, and the introduction of graphic health warnings on cigarette packs in 2016. Evidence related to smoke-free policies indicates that an increase or high levels of support were identified both before⁸ and after⁹ the policy introduction. Limited progress has been made in banning tobacco advertising; while tobacco advertising is banned from mass media and the internet, it is allowed in retail outlets, print publications (magazines and newspapers) and on international aircrafts/ships.

In 2022, cigarettes held the highest prevalence at 17.7% (men: 30.0%, women: 5.0%), followed by heated tobacco products (HTPs) at 5.9% (men: 9.2%, women: 2.4%) and e-cigarettes at 3.5% (men: 5.6%, women: 1.3%).¹⁰ Due to the lack of significant manufacturers/distributors/retailers, the use of other products like oral tobacco and cigar would be low. The current national health promotion plan, Health Plan 2030 (HP2030),^{11,12} aims to reduce nicotine use to 29% among men and 6% among women by 2030 (goal for cigarette smoking: 25% for men and 4% for women).^{13,14} While some progress has been made based on the previous and current HP plans, the need to meet HP2030 targets and address the persistent disease burden resulting from smoking calls for the implementation of endgame policies to bring an end to the tobacco epidemic in South Korea.

The South Korean government has yet to adopt a tobacco endgame goal. However, discussions regarding a South Korean tobacco endgame are gaining momentum both within government and among tobacco control academics. In May 2019, the

Korean Ministry of Health and Welfare mentioned the tobacco endgame in a national tobacco control plan.^{15,16} Recent studies have suggested several factors may support progressing a tobacco endgame in South Korea: securing strong political and public support, advocacy activities and implementing tobacco industry regulations.^{15,17}

Understanding disparities in attitudes among people with different nicotine use status helps policymakers to develop tailored and more effective health policies.^{18,19} In particular, the views of people who smoke tobacco should be closely monitored in the context of tobacco endgame policies. Most endgame goals and policies aim to greatly restrict public access to tobacco products. Hence, people who use such products would be most affected. Endgame policies that have the greatest support among people who smoke may represent the ‘lowest hanging fruit’ for policymakers to implement.

In this study, we provide baseline estimates of support among the South Korean population for six tobacco endgame policies: (1) limiting the nicotine content in cigarettes, (2) banning all additives in cigarettes, (3) restricting the number of places where cigarettes can be sold, (4) unconditionally banning the manufacture and sales of cigarettes, (5) banning the manufacture and sales of cigarettes with the provision of cessation support and (6) banning the manufacture and sales of cigarettes with alternative products being made available. Additionally, we assessed the level of support for endgame policies according to nicotine use status of the participants. The associations between support for each tobacco endgame policy and participant characteristics (sex, age, education, income, family smoking and support towards stronger tobacco control policies) were also examined.

METHODS

Data source and participants

Data were obtained from the 2020 (Wave 1) International Tobacco Control Korea Project (ITC Korea) Survey. The ITC Korea Survey aimed to assess the effectiveness of current and potential future tobacco control policies and describe nicotine product use patterns in South Korea. Nicotine product use in this context encompasses cigarettes, HTPs and e-cigarettes, which are the primary tobacco/nicotine products used in South Korea. Rakuten Insight’s online panel served as the sampling frame for the ITC Korea Survey. Eligible participants were individuals aged

Table 2 Characteristics of study sample, overall and by nicotine use status (unweighted)

Characteristic	Nicotine use status				
	Total	Did not use any products	Vaped and/or used HTPs, but did not smoke cigarettes	Smoked cigarettes only	Smoked cigarettes and vaped and/or used HTPs
	N (%)	N (%)	N (%)	N (%)	N (%)
Total	4740 (100.0)	724 (15.3)	253 (5.3)	1899 (40.1)	1864 (39.3)
Sex					
Male	3457 (72.9)	276 (38.1)	179 (70.8)	1592 (83.8)	1410 (75.6)
Female	1283 (27.1)	448 (61.9)	74 (29.3)	308 (16.2)	454 (24.4)
Age group					
19–29 years	734 (15.5)	168 (23.2)	55 (21.7)	222 (11.7)	289 (15.5)
30–39 years	1279 (27.0)	167 (23.1)	84 (33.2)	418 (22.0)	610 (32.7)
40–59 years	2300 (48.5)	306 (42.3)	105 (41.5)	1034 (54.5)	855 (45.9)
60+ years	427 (9.0)	83 (11.5)	9 (3.6)	225 (11.9)	110 (5.9)
Education level					
<High school	55 (1.2)	18 (2.5)	5 (2.0)	21 (1.1)	11 (0.6)
High school to some university	990 (20.8)	211 (29.1)	51 (20.2)	461 (24.3)	261 (14.0)
≥University	3679 (77.6)	487 (67.3)	195 (77.1)	1412 (74.4)	1585 (85.0)
Missing	22 (0.5)	8 (1.1)	2 (0.8)	5 (0.3)	7 (0.4)
Annual household income (in million KRW)					
<30	1610 (34.0)	348 (48.1)	77 (30.4)	731 (38.5)	454 (24.4)
[30, 75)	2637 (55.6)	309 (42.7)	138 (54.6)	981 (51.7)	1209 (64.9)
≥75	381 (8.0)	35 (4.8)	31 (12.3)	137 (7.2)	178 (9.6)
Missing	112 (2.4)	32 (4.4)	7 (2.8)	50 (2.6)	23 (1.2)
% of smoking family members					
Living alone	772 (16.3)	103 (14.2)	38 (15.0)	338 (17.8)	293 (15.7)
<50	1611 (34.0)	511 (70.6)	86 (34.0)	549 (28.9)	465 (25.0)
≥50	2204 (46.5)	80 (11.1)	119 (47.0)	963 (50.7)	1042 (55.9)
Missing	153 (3.2)	30 (4.1)	10 (4.0)	49 (2.6)	64 (3.4)
Support for stronger tobacco control policies	1147 (24.2)	338 (46.7)	66 (26.1)	360 (19.0)	383 (20.6)

HTP, heated tobacco products; KRW, Korean Won.

19 and older who were included in one of six subgroups: those who exclusively used cigarettes, e-cigarettes or HTPs, those who used both cigarettes and HTPs, those who used both cigarettes and e-cigarettes, and those who did not use any nicotine products (including those who have never used nicotine products and have not smoked at least weekly within the last 2 years). Participants were recruited based on prevalence estimates' quotas. Additional quotas for age, sex and geographical regions were applied to specific user groups. The survey was administered online through a web survey platform, with 15.2% of eligible individuals completing it. Further details of the 2020 ITC Korea Survey are provided elsewhere.^{20 21}

All 4740 individuals who participated in the 2020 ITC Korea survey were included in this study. Participants were categorised according to their nicotine use status (online supplemental table S1 and figure S1): (1) did not use any products, (2) vaped and/or used HTPs but did not smoke cigarettes, (3) smoked cigarettes only and (4) smoked cigarettes and vaped and/or used HTPs.

Measures

The outcome variable is support for policies designed to achieve an endgame for the tobacco epidemic. The survey questions for each endgame policy are provided in table 1. The response options for these questions were as follows: 'strongly support', 'support', 'oppose', 'strongly oppose', 'refused' or 'don't know'. 'Strongly support' and 'support' responses were considered to indicate support of policies, whereas 'oppose' and 'strongly

oppose' responses were considered to indicate opposition. 'Refused' and 'don't know' responses were classified as undecided/no-position expressed.

The survey questions, originally in English, were translated into Korean by professional translators following the research team's specifications. The Korean team then reviewed and ensured the translated questionnaire's accuracy and clarity to match the research team's intent.^{20 21} Survey questions in both languages are available on the ITC Project website: <https://itcproject.org/surveys/republic-korea/kra1-cohort3/>.

The main independent variable in this study was nicotine use status. Covariates were selected based on previous literature measuring public support for tobacco endgame policies,^{22 23} and include sex, age, education level and annual household income. Additionally, we considered the percentage of family members who smoke (living alone, <50%, ≥50%) to determine the norm regarding smoking within one's family. Support of government efforts to reduce smoking-related harms was also considered to assess the general attitude towards tobacco control efforts.

Statistical analyses

Frequencies and unweighted percentages were calculated for sample characteristics. All other estimates were weighted to represent the Korean population, and geographical region was used as a stratification variable. Survey weights were calibrated to ensure representativeness across user groups concerning sex, age, geographical region and education. The levels of support

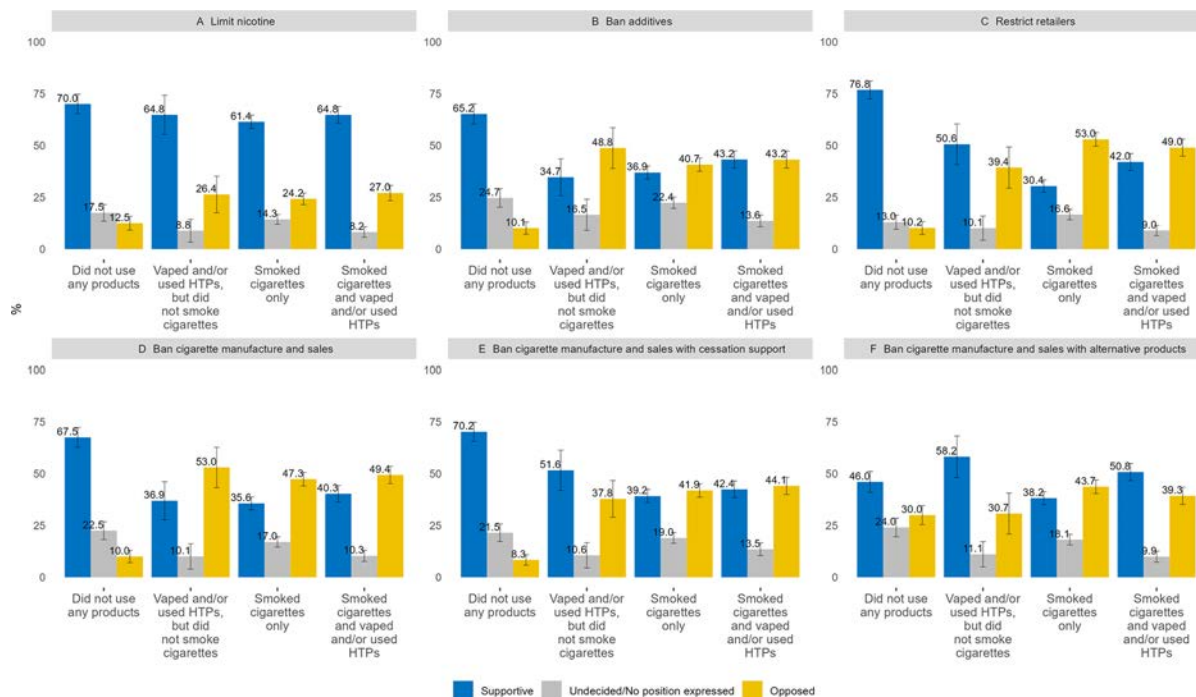


Figure 1 Levels of support for tobacco endgame policies by nicotine use status (weighted). Error bars indicate 95% CIs. HTPs, heated tobacco products.

for endgame policies are indicated by weighted percentages with 95% CIs.

We used weighted multinomial logistic regression to assess support for each tobacco endgame policy according to nicotine use status and other correlates. Unlike the descriptive analyses which included the whole sample (N=4740), only complete records were included in the regression analyses (N=4343). Online supplemental figure S1 shows the number of participants in each analysis stage. Attitudes (supportive, undecided/no-position expressed or opposed) towards each endgame policy were analysed in separate models, with the opposed group used as the reference. In the regression models, sex, age, education, household income, percentage of family members who smoke and support for stronger tobacco control efforts were included as covariates. Although age, education and household income were treated as categorical variables for descriptive purposes, they were treated as continuous variables in the regression models.

RESULTS

Table 2 shows the unweighted characteristics of the sample, overall and by nicotine use status. Among the sample of 4740 participants, people who smoked cigarettes only (n=1899, 40.1%) and people who smoked cigarettes and vape and/or use HTPs (n=1864, 39.3%) were the largest groups. The weighted nicotine use status, indicative of the nicotine use proportions in the South Korean population, is provided in online supplemental table S2. An analysis of the sociodemographic characteristics showed that the majority of participants were male (n=3457, 72.9%), had a university or higher education (n=3679, 77.6%) and had an annual household income of KRW30–KRW75 million (n=2637, 55.6%).

The weighted levels of support for each of the six endgame policies are provided in figure 1 and online supplemental table S2. Support was highest for limiting the nicotine content in cigarettes (68.4%, 95% CI 64.6% to 72.3%) and restricting the number of retail outlets where cigarettes can be sold (68.1%,

95% CI 64.5% to 71.7%). Support was lowest for a cigarette manufacture and sales ban with alternative products being made available (45.0%, 95% CI 40.9% to 49.1%).

Levels of support differed by nicotine use status (figure 1). Participants who did not use any products were the most supportive group for all endgame policies, except for banning the manufacture and sale of cigarettes with alternative products being made available. Support among participants who did not use any products was highest for restricting the number of retailers (76.8%, 95% CI 72.5% to 81.2%) (figure 1C), followed by banning the manufacture and sale of cigarettes with support for smoking cessation (70.2%, 95% CI 65.6% to 74.8%) (figure 1E) and limiting the nicotine content in cigarettes (70.0%, 95% CI 65.3% to 74.8%) (figure 1A).

Opposition to each policy was in the minority across all subgroups except for two policies: the complete ban on cigarette sales without specifying cessation support or providing alternatives (figure 1D) and the restriction on retailers (figure 1C). About half of the participants who used at least one nicotine product were opposed to unconditionally banning the manufacture and sales of cigarettes (ranging from 47.3% among those who smoked cigarettes only to 53.0% among those who vaped and/or used HTPs). In this subgroup, there was a wider range in the percentage of those opposed to restricting the number of cigarette retailers (39.4% among those who vaped and/or used HTPs to 53.0% among those who smoked cigarettes only). For all policies considered, the proportion of undecided/no-position-expressed participants was highest among those who did not use any products (13.0% for restricting retailers to 24.7% for banning additives) and those who smoked cigarettes only (14.3% for limiting nicotine to 22.4% for banning additives), compared with other nicotine use groups (ranging from 8.2% to 16.5%).

The regression results (table 3) indicate that for attitudes towards limiting the nicotine content in cigarettes (model 1), participants who smoked and vaped and/or used HTPs had significantly lower odds of being undecided (OR 0.26, 95% CI 0.11 to 0.64), compared with

Table 3 Support for limiting nicotine, banning additives and restricting retailers, along with its correlates (weighted)

Variable	Support for endgame policies (REF=opposed)					
	Model 1: limit nicotine content		Model 2: ban additives		Model 3: restrict retailers	
	Supportive	Undecided/ no position expressed	Supportive	Undecided/ no position expressed	Supportive	Undecided/ no position expressed
	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)
Nicotine use status (REF=did not use any products)						
Vaped and/or used HTPs but did not smoke cigarettes	0.60 (0.30 to 1.22)	0.36 (0.12 to 1.09)	0.26 (0.12 to 0.55)	0.29 (0.11 to 0.71)	0.46 (0.21 to 0.99)	0.63 (0.21 to 1.89)
Smoked cigarettes only	0.76 (0.45 to 1.29)	0.44 (0.18 to 1.06)	0.36 (0.20 to 0.65)	0.34 (0.16 to 0.73)	0.19 (0.11 to 0.33)	0.54 (0.23 to 1.26)
Smoked cigarettes and vaped and/or used HTPs	0.67 (0.38 to 1.16)	0.26 (0.11 to 0.64)	0.53 (0.30 to 0.93)	0.30 (0.14 to 0.63)	0.43 (0.25 to 0.74)	0.44 (0.18 to 1.04)
Men (REF=women)	0.82 (0.46 to 1.45)	0.83 (0.36 to 1.93)	0.35 (0.19 to 0.64)	0.40 (0.19 to 0.85)	0.24 (0.13 to 0.42)	0.39 (0.15 to 0.97)
Age	0.98 (0.96 to 1.00)	0.99 (0.96 to 1.01)	1.03 (1.01 to 1.05)	1.04 (1.01 to 1.06)	1.03 (1.00 to 1.05)	1.02 (0.99 to 1.04)
Education	0.68 (0.46 to 1.01)	0.52 (0.27 to 0.98)	1.34 (0.81 to 2.20)	1.09 (0.59 to 2.02)	1.67 (1.02 to 2.75)	1.33 (0.71 to 2.49)
Household income (REF<KRW 30 million)						
[30, 75) million	1.48 (0.49 to 4.49)	1.64 (0.39 to 6.86)	2.43 (0.64 to 9.18)	2.51 (0.50 to 12.55)	3.25 (0.75 to 14.1)	3.83 (0.82 to 17.96)
≥75 million	2.10 (0.69 to 6.35)	2.65 (0.64 to 10.97)	1.67 (0.43 to 6.46)	1.73 (0.34 to 8.68)	1.77 (0.40 to 7.85)	2.24 (0.47 to 10.72)
% of smoking family members (REF≤50%)						
Living alone	0.60 (0.29 to 1.24)	1.02 (0.37 to 2.85)	1.12 (0.62 to 2.02)	1.73 (0.77 to 3.87)	0.67 (0.39 to 1.14)	0.81 (0.36 to 1.82)
≥50%	0.62 (0.35 to 1.10)	1.03 (0.41 to 2.61)	0.59 (0.31 to 1.12)	1.00 (0.44 to 2.26)	0.62 (0.32 to 1.18)	0.63 (0.28 to 1.44)
Support for stronger tobacco control efforts	1.95 (1.53 to 2.48)	1.33 (0.92 to 1.93)	2.73 (2.08 to 3.58)	1.85 (1.35 to 2.55)	3.23 (2.50 to 4.18)	2.31 (1.60 to 3.33)

All models adjusted for sex, age, educational, household income, % of smoking family members, support for stronger tobacco control efforts.

Boldface for aOR and 95% CIs indicate $p < 0.05$.

aOR, adjusted odds ratio; HTPs, heated tobacco products; KRW, Korean Won.

those who opposed. For restricting the number of retailers (model 3), participants who vaped and/or used HTPs but did not smoke (OR 0.46, 95% CI 0.21 to 0.99), smoked cigarettes only (OR 0.19, 95% CI 0.11 to 0.33), and smoked and vaped and/or used HTPs (OR 0.43, 95% CI 0.25 to 0.74) had lower odds of being supportive relative to being opposed.

For banning all additives in cigarettes (model 2, table 3), banning cigarette manufacture and sales unconditionally (model 4, table 4), and banning cigarette manufacture and sales with the provision of cessation support (model 5), all groups who used any combination of nicotine products had lower odds of being supportive or undecided, compared with those who opposed. Greater support for stronger governmental tobacco control efforts was associated with higher odds of supporting all six policies relative to opposing them.

DISCUSSION

We examined levels of public support among the South Korean population for six tobacco endgame policies. The majority expressed support for all endgame policies, except for banning cigarette manufacture and sales if alternative nicotine products are made available. The policies with the highest overall support were those aimed at limiting the nicotine content in cigarettes and restricting the number of retailers where cigarettes could be sold, which are two of the policies that were included in Aotearoa/New Zealand's Smokefree

Environments and Regulated Products (Smoked Tobacco) Amendment Bill.²⁴ The US Food and Drug Administration has also announced plans for a proposed rule to establish a maximum level of nicotine in cigarettes.²⁵ Participants who did not use any products reported the highest levels of support across all endgame policies, with the strongest support for restricting the number of places where cigarettes can be sold. People who supported stronger tobacco control efforts were also more likely to support endgame policies.

Support levels for limiting nicotine content in cigarettes, restricting retailer density and banning cigarette sales in South Korea were comparable to what has been reported in other countries,²⁶ suggesting that the support for endgame policies is robust even in different geographical contexts. However, support for banning all additives in cigarettes was substantially lower among the South Korean population (59.7% in this study compared with 69.2% from a systematic review).²⁶ Such lower support was also found among people who smoke. The difference in support may be attributed to the preference for flavour capsule cigarettes,²⁷ and substantial non-cigarette product use among the Korean population.

Our finding of high levels of support for limiting the nicotine content in cigarettes aligns with results from other countries.^{22 23 28} Importantly, the level of support for the VLNC policy was consistently high, regardless of nicotine use status. Thus, mandating a VLNC standard for cigarettes appears to be

Table 4 Support for banning the manufacture and sales of cigarettes, along with its correlates (weighted)

Variable	Support for endgame policies (REF=opposed)					
	Model 4: ban cigarette manufacture and sales		Model 5: ban cigarette manufacture and sales+quit support		Model 6: ban cigarette manufacture and sales+alternative product available	
	Supportive	Undecided/no position expressed	Supportive	Undecided/no position expressed	Supportive	Undecided/no position expressed
	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)
Nicotine use status (REF=did not use any products)						
Vaped and/or used HTPs but did not smoke cigarettes	0.27 (0.14 to 0.55)	0.17 (0.06 to 0.48)	0.36 (0.18 to 0.74)	0.19 (0.07 to 0.52)	0.96 (0.50 to 1.86)	0.52 (0.20 to 1.35)
Smoked cigarettes only	0.31 (0.18 to 0.53)	0.21 (0.09 to 0.48)	0.22 (0.12 to 0.41)	0.19 (0.08 to 0.43)	0.47 (0.30 to 0.75)	0.43 (0.22 to 0.85)
Smoked cigarettes and vaped and/or used HTPs	0.50 (0.30 to 0.85)	0.21 (0.10 to 0.47)	0.29 (0.17 to 0.50)	0.18 (0.09 to 0.39)	0.68 (0.42 to 1.10)	0.28 (0.14 to 0.59)
Men (REF=women)	0.44 (0.25 to 0.78)	0.50 (0.24 to 1.04)	0.54 (0.29 to 1.01)	0.55 (0.26 to 1.16)	1.38 (0.87 to 2.18)	1.10 (0.57 to 2.14)
Age	1.03 (1.01 to 1.06)	1.03 (1.01 to 1.06)	1.02 (1.00 to 1.05)	1.03 (1.00 to 1.06)	0.99 (0.97 to 1.00)	1.00 (0.98 to 1.02)
Education	1.17 (0.73 to 1.88)	0.90 (0.49 to 1.66)	1.09 (0.66 to 1.80)	0.95 (0.51 to 1.76)	0.64 (0.46 to 0.90)	0.55 (0.35 to 0.86)
Household income (REF<KRW 30 million)						
[30, 75) million	2.44 (0.65 to 9.13)	2.31 (0.48 to 11.07)	0.71 (0.38 to 1.32)	0.83 (0.28 to 2.44)	0.78 (0.34 to 1.81)	1.43 (0.47 to 4.35)
≥75 million	1.90 (0.51 to 7.15)	1.64 (0.34 to 7.87)	0.64 (0.34 to 1.18)	0.63 (0.22 to 1.85)	1.17 (0.51 to 2.69)	2.17 (0.72 to 6.60)
% of smoking family members (REF≤50%)						
Living alone	0.48 (0.25 to 0.93)	0.68 (0.30 to 1.53)	0.96 (0.44 to 2.01)	1.92 (0.79 to 4.64)	0.85 (0.50 to 1.46)	2.06 (0.97 to 4.38)
≥50%	0.45 (0.25 to 0.81)	1.14 (0.47 to 2.74)	0.71 (0.39 to 1.27)	1.82 (0.77 to 4.32)	0.94 (0.59 to 1.51)	1.02 (0.49 to 2.11)
Support for stronger tobacco control efforts	2.58 (1.98 to 3.35)	1.36 (1.03 to 1.80)	2.26 (1.70 to 3.00)	1.38 (1.00 to 1.89)	1.28 (1.04 to 1.58)	1.17 (0.85 to 1.61)
All models adjusted for sex, age, educational, household income, % of smoking family members, support for stronger tobacco control efforts						
Boldface for aOR and 95% CIs indicate p<0.05.						
aOR, adjusted odds ratio; HTPs, heated tobacco products; KRW, Korean Won.						

an endgame policy that is acceptable to the South Korean public, including those who smoke. Previous randomised controlled trials indicate that reducing nicotine levels in cigarettes is associated with a decrease in smoking and nicotine dependence, an increase in the number of quit attempts and improved cessation outcomes.^{29–31} Qualitative research with participants in a residential study for 5 days only given access to VLNC cigarettes found they did not compensate for the lower nicotine level but rather reduced their smoking and felt less addicted to the VLNC cigarettes and more able to quit.³²

We found that support for a ban on the manufacture and sale of cigarettes varied depending on the proposed conditions. More than two-thirds of the participants expressed support for a ban on manufacture and sales of cigarettes, regardless of whether the ban was implemented unconditionally or in conjunction with government-provided cessation support. However, only 45% of participants supported the idea of banning cigarettes while simultaneously offering alternative products, making it the only policy that did not receive majority support from the study participants. This was due to opposition from people who did not use any nicotine products and likely reflects concerns about youth vaping and HTP use.^{33 34} In contrast, among people who smoked or used other nicotine products, support for a cigarette

manufacture and sales ban increased in the contexts of smoking cessation support and alternative products being available.

Low support for banning cigarette sales with alternative products available suggests that endgame policies aimed at encouraging consumers to transition from cigarettes to non-cigarette products may not be practical in South Korea, as policymakers consider policies with low support to be less feasible despite the moderately higher support among people who smoke.³⁵ In South Korea, e-cigarettes and HTPs are marketed and advertised as cigarette substitutes. The regulations on e-cigarettes and HTPs are as stringent as those on cigarettes, because the law classifies all cigarettes, e-cigarettes and HTPs as ‘tobacco products’.³⁶ Considering the alignment with the current policy standards and the attitudes of the public, the successful adoption of endgame goals and policies in South Korea would benefit from encompassing all nicotine products (ie, cigarettes, e-cigarettes and HTPs). Notably, Finland has already established an endgame goal aimed at reducing the use of all nicotine-containing products to less than 5%³⁷ and Australian policymakers have announced policies intended to eliminate non-therapeutic use of nicotine in non-smoked products.³⁸

A substantial proportion of our participants were undecided or did not express a position about endgame policies. Across the considered endgame policies, the percentage of participants in the undecided/

no-position-expressed category ranged from 13% (restricting retailer numbers) to 25% (banning additives). The likelihood of expressing uncertainty about a policy was highest among those who did not use any nicotine products. Among those who used at least one nicotine product, those who smoked cigarettes only were most likely to be undecided about endgame policies. Although our data were limited in providing reasons for these attitudes, previous studies have suggested potential influencing factors, including a lack of understanding regarding policy implications or a perception of its irrelevance to their circumstances.³⁹ Further qualitative studies are needed to identify the reasons underlying different attitudes towards tobacco endgame policies.

We found that tobacco endgame policy support varied by nicotine use status. Except for mandating a VLNC standard in cigarettes, participants who used at least one nicotine product expressed lower support for all endgame policies, compared with those who did not use any nicotine products. Similar to previous studies,^{40–42} participants who smoked cigarettes, either with or without other products, were the least supportive of all endgame policies, with the exception of the ban on all additives. Previous studies have suggested that adopting tobacco endgame policies will be most feasible and publicly acceptable in settings with lower cigarette smoking prevalence.^{15 43} Where a substantial minority of the population continues to smoke, care will be needed to communicate the personal benefits of endgame policies for people who smoke, but also the benefits for vulnerable members of society, such as children. Public messaging that explains how these policies support people to quit smoking is needed.

This study had several limitations. First, we assessed support for endgame policies that were selected *a priori*. Future studies should consider examining additional endgame policies. Second, because there are very few jurisdictions where endgame policies have been implemented, participants may not have fully understood the policies or their anticipated outcomes. Further qualitative assessments are needed to develop a deeper understanding of the factors that influence support for endgame policies among the general public. Additionally, although experts translated and the Korean team validated the survey questions, there is a possibility the questions' scope about products was interpreted more broadly than intended. Terms such as cigarettes, smoked tobacco and other tobacco might have led to a broader interpretation given that similar regulations apply to all cigarettes, e-cigarettes and HTPs. Evidence from South Korea also suggests ambiguity in the terms used for each product.⁴⁴ The Korean government categorises e-cigarettes as liquid e-cigarettes and HTPs as cigarette-type e-cigarettes. Finally, our cross-sectional results indicate only a minority of the South Korean public oppose endgame policies. Policy support may rapidly increase or decrease in response to changes in nicotine use prevalence and related social norms and following policy implementation. Ongoing public education and policy advocacy could enhance public understanding and strengthen public support for these policies. Based on these baseline estimates, we recommend ongoing monitoring of support for endgame policies. Longitudinal evaluations that consider transitions between different nicotine products may provide additional insights.

In conclusion, our results demonstrate strong public support for tobacco endgame policies in this representative sample of the South Korean population, indicating that public acceptability is not likely to be a barrier to planning and adopting policies to achieve a tobacco endgame. Limiting the nicotine content in cigarettes received the most support regardless of nicotine use status, and restricting the number of places where cigarettes could be sold was strongly supported by people who did not use any products. These findings suggest that these endgame policies are feasible options for South Korea. Further research could explore the optimal order of implementing these policies. A policy brief in New Zealand suggested the

strategy of first limiting the nicotine content of cigarettes to reduce prevalence before reducing the availability of retailers to buffer resistance among retailers.⁴⁵

South Korea is progressively advancing towards the adoption of tobacco endgame goals and policies. We recommend the incorporation of endgame policies with high public support into the South Korean endgame plan which should be established with a near-zero prevalence goal. Assessment of the potential impact of endgame policies, and support from experts, advocates and stakeholders, will help increase the acceptability and effectiveness of endgame policies.

Author affiliations

¹Institute of Health and Environment, Seoul National University, Seoul, Korea (the Republic of)

²NHMC Centre of Research Excellence on Achieving the Tobacco Endgame, School of Public Health, The University of Queensland, Brisbane, Queensland, Australia

³Department of Public Health Sciences, Graduate School of Public Health, Seoul National University, Seoul, Korea (the Republic of)

⁴Department of Family Medicine, National Cancer Center, Goyang-si, Gyeonggi-do, Korea (the Republic of)

⁵Graduate School of Cancer Science and Policy, National Cancer Center, Goyang-si, Gyeonggi-do, Korea (the Republic of)

⁶Korea Center for Tobacco Control Research and Education, Seoul, Korea (the Republic of)

⁷National Tobacco Control Center, Korea Health Promotion Institute, Seoul, Korea (the Republic of)

⁸Department of Psychology, University of Waterloo, Waterloo, Ontario, Canada

⁹Ontario Institute for Cancer Research, Toronto, Ontario, Canada

Twitter Coral E Gartner @CoralGartner and Geoffrey T Fong @gfgong570

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Contributors HK designed the study, conducted all analyses and drafted the manuscript. MY and S-iC advised on the data analyses. All authors interpreted the findings, reviewed and approved the final version of the manuscript. S-iC is the guarantor for the study and manuscript.

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ORCID iDs

Heewon Kang <http://orcid.org/0000-0002-1519-5678>
 Wonjeong Yoon <http://orcid.org/0000-0002-9061-8458>
 Sungkyu Lee <http://orcid.org/0000-0002-6419-2086>
 Sujin Lim <http://orcid.org/0000-0002-3042-343X>
 Gil-yong Kim <http://orcid.org/0009-0001-0042-9689>
 Steve S Xu <http://orcid.org/0000-0001-9095-2870>
 Anne C K Quah <http://orcid.org/0000-0002-5303-8884>
 Janet Chung-Hall <http://orcid.org/0000-0002-9139-8100>
 Lorraine V Craig <http://orcid.org/0000-0001-5269-1817>
 Coral E Gartner <http://orcid.org/0000-0002-6651-8035>
 Sung-il Cho <http://orcid.org/0000-0003-4085-1494>

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