SimSmoke Model Evaluation of the Effect of Tobacco Control Policies in Korea: The Unknown Success Story

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Objectives. We evaluated the effect of strict tobacco control policies, implemented beginning in 1995 in the Republic of Korea, on smoking prevalence and deaths.

Methods. SimSmoke is a simulation model of the effect of tobacco control policies over time on smoking initiation and cessation. It uses standard attribution methods to estimate lives saved as a result of new policies. After validating the model against smoking prevalence, we used it to determine the Korean policies' effect on smoking prevalence.

Results. The model predicted smoking prevalence accurately between 1995 and 2006. We estimated that 70% of the 24% relative reduction in smoking rates over that period was attributable to tobacco control policies, mainly tax increases and a strong media campaign, and that the policies will prolong 104812 male lives by the year 2027.

Conclusions. Our results document Korea's success in reducing smoking prevalence and prolonging lives, which may serve as an example for other Asian nations. Further improvements may be possible with higher taxes and more comprehensive smoke-free laws, cessation policies, advertising restrictions, and health warnings. (*Am J Public Health.* 2010;100:1267–1273. doi:10.2105/AJPH.2009.166900)

Many Asian nations have smoking prevalence rates among males of at least 50%, leading to a large share of the world's 5 million deaths attributable to smoking each year.[1] Worldwide, annual tobacco-related mortality is expected to increase to 10 million by 2030,[1] with an increasing share of those deaths in Asia, unless effective tobacco control measures are implemented.

Most Asian nations have signed the Framework Convention for Tobacco Control, developed through the World Health Organization. This pact advocates high cigarette taxes, smoke-free indoor air laws, cessation treatment coverage, advertising bans, health warnings, and a well-organized media campaign. Thailand has implemented many of the suggested policies and has shown remarkable success in reducing male and female smoking rates.[2] Success in other Asian nations has not been documented.

As recently as 1995, 67% of males smoked in the Republic of Korea.[3] Taxes were increased gradually in the late 1990s, and some of the funds were allocated to tobacco control. The framework was ratified by Korea in May 2005. By the end of 2006, Korea had substantially increased the tax rate on cigarettes, implemented a strong antismoking campaign, strengthened clean air laws and health warnings, and made cessation treatments more accessible.[3] No previous study evaluated the effect of these policies.

When more than 1 policy is implemented, it is difficult for empirical studies to distinguish each policy's effects.[4] Simulation models combine information from diverse sources to examine the effects of different policies over time.[4,5] To determine these effects in Korea, we adopted the SimSmoke tobacco control policy model,[4,6–8] which simultaneously considers a broader array of public policies than do other smoking models.[9–14] The model has accurately explained trends in smoking rates for the United States as a whole and for several states,[7,15–17] as well as for other nations.[2]

We used Korean data to develop a SimSmoke model for that country. We used the model to estimate the effect of individual and combined tobacco control policies implemented between 1995 and 2006 on male smoking prevalence and deaths.

METHODS

SimSmoke has population, smoking, smoking-attributable death, and policy modules.[4,7,8] We chose 1995 for the baseline year in our Korea SimSmoke model because the requisite data were available for that year and trends could be established before major policy changes occurred.

SimSmoke Model

The model uses a discrete-time, first-order Markov process to project population forward through births and deaths. We obtained population data by age and gender from the 1995 Korean Census.[18] Fertility rates for 2001 and morality rates for 2005 came from the Korea National Statistical Office. We compared our model's predictions with projections by the Korea Census and found that the estimates were similar through 2027.

We divided population in the baseline year into current, never, and former smokers. We estimated smoking prevalence from the health behavior survey of the Korea National Health and Nutrition Examination Survey (KNHANES).[19] This survey is conducted in households every 3 years and uses stratified, multistage probability sampling. The 1995 survey interviewed 2383 males aged 15 to 69 years and had a 93.5% response rate. Respondents were asked whether they currently smoked, smoked in the past, or never smoked and were categorized for our model as current (daily or nondaily), former, or never smokers.

SimSmoke distinguishes former smokers by years since quitting. Because the 1995 survey did not ask when former smokers quit, we used 1998 KNHANES data (n=4101)[20] to distinguish the percentage of former smokers by years since quitting. Because the 1998 KNHANES first asked whether respondents currently smoked and then asked whether at least 100 cigarettes were smoked during their lifetime, we used the 1998 data to better estimate established smokers: we multiplied the 1995 prevalence rates by the ratio of current smokers meeting the 100 cigarettes threshold in 1998 to the ratio of all males who stated they were current smokers in 1998. Because the 1995 KNHANES only surveyed individuals through age 69 years, we used the 1998 KNHANES data to estimate smokers aged 70 years and older, after adjusting by the ratio of the 1995 to 1998 smoking rate for participants aged 60 to 69 years. We calculated prevalence rates by single age from a 5-age moving average.

Each successive year in SimSmoke, never smokers may become smokers through initiation, smokers may become ex-smokers through cessation, and former smokers may return to smoking through relapse. In the absence of policy changes, initiation, cessation, and relapse follow a first-order Markov process. Because cessation rates are unstable among people of younger ages, we measured initiation rates as the net of cessation from the difference between the 1995 smoking prevalence at a particular age and the 1995 prevalence at the previous age. We compared prevalence data in 1995 by age to determine that initiation occurred through age 24 years in our model.

We assessed 1-year cessation rates from age 24 years in the 1998 KNHANES data by determining the number of male smokers who were smokers 1 year ago and had quit at the time of the survey as a percentage of males who were smokers 1 year ago. We then applied a relapse rate of 50% to capture the potential relapse of those who had quit for less than 1 year.[21] Because the cessation rates were subject to a high degree of sampling variation, we compared the smoking prevalence by age for 1995 and 1998. Cessation rates yielded greater declines in prevalence in the model than in the survey data, and we therefore adjusted them slightly downward to prerelapse rates of 3% until age 39 years and 6% thereafter. Because the requisite data were not available for Korea, we used US relapse rates distinguished by years since quitting.[22–25]

We estimated separate mortality rates for never, current, and ex-smokers (distinguished by years since quitting) from our data on death rates and smoking rates and estimates of relative risks for smokers and ex-smokers. An average relative mortality risk for smoking of 1.55 was obtained from 2 studies in Korea.[26,27] For ex-smokers, relative risks were assumed to decline with years since quitting at the rate observed in the United States.[25,28] The number of smokers and ex-smokers at each age was then multiplied by their respective death rates minus the death rate of never smokers (the excess mortality risk attributable to smoking) to obtain smoking-attributable deaths.

Tobacco Control Policies

In SimSmoke, policies alter the trajectories of smoking prevalence. A newly implemented policy directly reduces smoking prevalence in the first year, followed by a continued reduction in future initiation and an increase in future cessation rates as long as the policy is in effect. When more than 1 policy is in effect, the model assumes constant proportional reductions, such that $(1+PR_i)*(1+PR_j)$ for the percentage reductions (PR) from policies i and j. The policy effect parameters in the model are based on thorough reviews of the literature[29–34] and the advice of an expert panel. Policies and their effect sizes are summarized in Table 1.

Our SimSmoke model tracked the effect of policies in place between 1995 and 2006. Information on policies was provided by tobacco control staff in Korea and a recent report.[3] Korea's tobacco control policies are described in Table 2.

We set the cigarette price per pack in the model in 2006 as WON 2500, which is equivalent to US$2.58 in 2006 dollars (converted at WON 970/US$). We determined price changes between 1995 and 2006 from a cigarette price index deflated by the consumer price index, both obtained from the

TABLE 1—Tobacco Control Policies and Effect Sizes for Korea SimSmoke Model

Policy	Description	Effect[a]
Taxation effect,[b] by age group	Cigarette price index, taxes measured in absolute terms	
15–17 y		−0.4
18–24 y		−0.3
25–34 y		−0.2
≥35 y		−0.1
	Clean air	
Worksites, %		
Total ban	No smoking anywhere on site	6.0
Partial ban	Smoking limited to nonventilated common area	2.0
Restaurants, %		
Total ban	No smoking anywhere in any indoor restaurants	1.0
Partial ban	Ban in all restaurants except in designated areas	0.5
Total bans in other places, %	Ban in 3 of 4 (malls, retail stores, public transport, and elevators)	1.0
Mass media campaigns, %		
High publicity intensity	Campaign publicized heavily on TV (≥2 months of the year) and at least some other media	6
Medium publicity intensity	Campaign publicized sporadically on TV and in at least some other media, plus a local program	3.2
Low publicity intensity	Campaign publicized only sporadically in newspaper, on billboards, or in other media	1.2
Cessation treatment, %	Complete reimbursement of pharmacological and behavioral treatments, quit lines, and brief interventions	2.6 (prevalence), 50 (cessation rate)

[a]Unless otherwise specified, the same effect is applied as a percentage reduction in the prevalence and initiation rate and a percentage increase in the cessation rate, and the same effect is applied to all ages and both genders. The effects are relative to the absence of any policy.
[b]Effects on price elasticity.

TABLE 2—Tobacco Control Policies in the Republic of Korea: 1995–2006

Policy[a]	1995	1998	1999	2000	2001	2002	2003	2004	2005	2006
Inflation-adjusted price,[b] $	1.51	1.63	1.85	1.81	1.95	2.16	2.11	2.04	2.52	2.47
Media campaign publicity intensity	Low	Low	Low	Medium	Medium	Medium	Medium	Medium	Medium	High
Clean air laws,[c] %										
Separate smoking areas in worksites	0	0	0	0	0	0	0.5	0.5	0.5	0.5
Separate smoking areas in restaurants	0	0	0	0	0	0	0.75	0.75	0.75	0.75
Smoking bans in other public places	0.5	0.5	0.5	0.5	0.5	50	1	1	1	1
Advertising restrictions	Low level	Low level	Low level	Low level	Low level	Low level	Low level	Low level	Low level	Low level
Health warnings	Low level	Low level	Low level	Low level	Low level	Low level	Low level	Low level	Low level	Low level
Cessation treatment										
Coverage by national health insurance	None	None	None	None	None	None	None	None	None	Weak
Physician interventions	None	None	None	None	None	None	None	None	None	None
Quit line	None	None	None	None	None	None	None	None	None	Present

[a]Policies in effect in June of a given year.
[b]In 2006 US dollars (approximately WON 970/$).
[c]Indexed to 1.

Korea National Statistical Office.[35] The price index is a weighted index of leading brands. Price affects smoking prevalence through participation elasticities. Because results of demand studies for Korea were similar to those of the United States,[36–38] we used the price elasticities from the US model in our model for Korea.

In 1995, Korea had a low-intensity antitobacco media campaign with few other programs. A more comprehensive program was implemented in 2000, with expenditures increased to WON 1.6 billion (US $2.3 million in 2006 dollars). We categorized this as a medium-intensity campaign. In late 2005, campaigns were targeted to high-risk groups and diversified to additional media, and expenditures were increased to WON 6 billion (US $6.3 million in 2006 dollars). We categorized this as a high-intensity campaign. Data from the 2005 KNHANES indicated that more than 90% of all Korean adults younger than 70 years were aware of the media campaigns. In Korea, most smokers now know about the dangers of smoking.[39] For our model, we used the effect size for media campaigns from the US model.

In 1995, nonsmoking areas were designated in large buildings, theaters, stores, hospitals, schools, and public transportation. Worksites and restaurants were considered to have no effective restrictions; restrictions for other public places were considered to be at half strength. In 2003, some worksites and most restaurants were required to have smoke-free areas, which our model designated as a partial ban. Smoking was then also banned in schools and in other public places, including malls and shopping areas, arenas and lecture halls, public transport, elevators, and theaters. Since 2003, worksite laws pertaining to designated areas were considered to be at 50% strength, restaurants at 75% strength, and other public places at full strength. Because the percentage of the workforce employed in agriculture was low in both the United States and the Republic of Korea (2% and 6%, respectively) and the Korean unemployment rate (4%) was slightly less than the US rate,[40] we used the US model's effect sizes for clean air restrictions.

For cessation treatment policies, SimSmoke[41,42] considered the effects of financial coverage of cessation treatments, mandated brief interventions delivered by a health care provider, and quit lines. Beginning in 2005, the Korean government offered smoking cessation counseling and treatment services at no cost at public health centers, but fewer than 2% of smokers used these services in the first half year after implementation, and treatments were not otherwise covered by national health insurance. For 2006, our SimSmoke model designated the financial coverage for tobacco control as 50% effective. Physicians do not generally provide brief interventions. A quit line was established in 2006, but it had not been advertised or coordinated with the cessation clinics. We used effect sizes for cessation treatment policy from the US model in our model.

Advertising of tobacco has been restricted but is still allowed at point of sale, as insertions in magazines, and in sponsorships. These restrictions have not substantively changed since 1995. Health warnings on cigarette packages were introduced in Korea in 1976. Beginning in 2006, larger warning labels were required on the front and back of packages. The warnings were still not bold or graphic,[34,43,44] and studies in Korea indicate that they had very limited or no effect.[45,46] Because advertising restrictions and health warnings have not significantly changed, our model considered them to have no effect on smoking trends since 1995.

Bans on sales to minors were better enforced starting in 2003, but the policies were still very weak, and the effects of even strong enforcement on adult smoking prevalence can be considered negligible for at least 10 years following implementation.[47] Consequently, access policies for youths were not considered.

Validation and Policy Attribution

To validate the Korea SimSmoke model, we compared the prevalence rates by age and gender as predicted by the model with estimates generated from data collected by the 1998, 2001, and 2005 KNHANES and by the large-scale Social Statistical Survey (SSS) in 1995, 1999, 2003, and 2006. Because we were concerned with trends and with changes in trends corresponding to policy changes, we focused on percentage changes in prevalence rates.

To consider the effect of all policies implemented since 1995, we set policies through 2006 at their 1995 levels. The difference between smoking prevalence rates with polices at their 1995 level and smoking prevalence with all policies in place yielded the net effect of policies implemented since 1995. To distinguish the effect of single policies, we compared rates with only that policy implemented to rates with all other policies kept at their 1995 level. Because the effect of the policies individually implemented did not sum to the effect of the policies when combined, we calculated the effect attributed to each individual policy relative to the summed effect of policies individually implemented. To ascertain the effect of policies on smoking-attributable deaths through the year 2027, we subtracted the number of deaths with policies implemented through 2006 from the number of deaths with policies kept at their 1995 levels.

RESULTS

The results for model validation are shown in Table 3 and Figure 1. For male smoking prevalence (ages 20 years and older), the Korea SimSmoke model predicted well from 1995 through 2006. As shown in Figure 1, the model predicted a larger decline in smoking prevalence than was found in the KNHANES data but a smaller decline than in the SSS data. For 1995 to 2005, our model predicted a decline of 19.7% (from 62.1% to 49.9%); KNHANES's comparable estimate was 18.4%. For 1995 to 2006, our model predicted a decline of 23.7% (from 62.1% to 47.4%); the estimate from SSS data was 28.2%.

Our model predicted larger declines than did the KNHANES data for 1995 to 1998 (–3.2% versus –2.1%) and 1998 to 2001 (–7.0% versus –3.0%) and a smaller decline for 2001 to 2005 (–10.9% versus –14.9%). However, our model predicted relatively larger reductions in 1998 to 2001 than in 1995 to 1998 and in 2001 to 2005 versus 1998 to 2001, corresponding to when stronger policies were implemented. We observed similar patterns in the SSS data when we compared the effects for 1995 to 1999 and 1999 to 2006 (not shown).

For 1995 to 2005, our model predicted a slightly larger relative decline than did the KNHANES data for respondents aged 20 to 29, 30 to 39, and 40 to 49 years and a smaller decline for persons aged 50 to 59 years, 60 to 69 years, and 70 years and older. A pattern of increasing declines as age increased from 30 years appeared in both KNHANES data and our model. The SSS data showed larger reductions than our model for all age groups except 40 to 49 years.

Role of Policies in Reducing Smoking Prevalence and Deaths

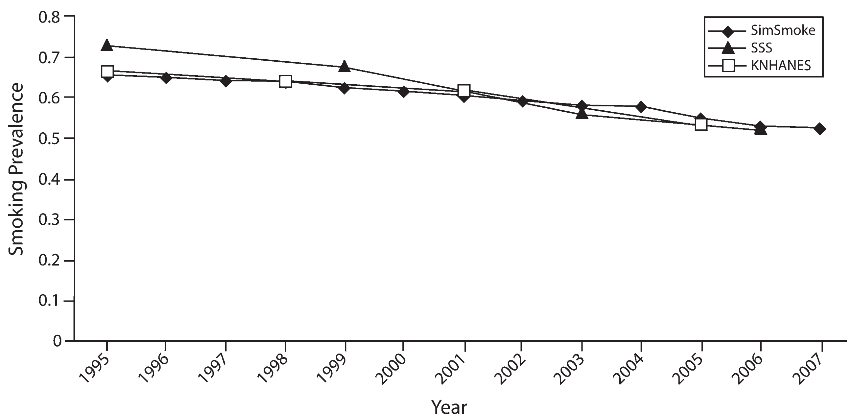
Table 4 shows the effect of policies on trends in male smoking prevalence between 1995 and 2006. With policy changes, smoking rates declined from 62.1% in 1995 to 47.4% in 2006, a 23.7% relative reduction. When we set policies at their 1995 level, the model predicted that smoking prevalence among males would have fallen from 62.1% in 1995 to 57.1% in 2006, an 8.0% reduction relative to the smoking prevalence with actual policies in place. Our model predicted that the male smoking prevalence in 2006 was 17.0% lower (i.e., [47.4 – 57.1] / 57.1) for males than it would have been in the absence of the policy changes; this is 72% of the 23.7% total reduction predicted by the model between 1995 and 2006. This reduction was accounted for by the change in trends following policy changes in 2000 and in 2005.

The increase in the inflation-adjusted price of cigarettes (Table 2) was commensurate with tax increases of WON170 in 1996, WON100 in 1999, WON140 in 2001, and WON500 in 2005. If only price changes were in effect, our model predicted that male smoking prevalence would fall by 9.8% more than if no policy

TABLE 3—Declines in Male Smoking Prevalence by Age in SimSmoke Model Predictions and Survey Data: Republic of Korea, 1995–2006

	Korea SimSmoke Model Predicted Declines					KNHANES Actual Declines[a]				SSS Actual Declines,[b]
Age Group	1995–1998, %	1998–200, %1	2001–2005, %	1995–2005, %	1995–2006, %	1995–1998, %	1998–2001, %	2001–2005, %	1995–2005, %	1995–2006, %
20–29 y	–3.20	–7.50	–9.80	–19.30	–22.30	–1.20	–3.60	–14.50	–18.50	–30.40
30–39 y	+2.50	–5.60	–11.60	–14.50	–19.40	–1.00	–0.80	–10.40	–12.10	–20.00
40–49 y	–5.40	–6.60	–8.80	–19.40	–22.60	–4.40	+4.40	–15.60	–15.70	–21.80
50–59 y	–8.60	–7.20	–9.20	–23.00	–27.00	–5.70	–7.10	–14.60	–25.20	–29.50
60–69 y	–7.10	–6.00	–11.60	–22.80	–27.40	+3.20	–10.80	–22.70	–28.80	–40.00
≥70 y	–3.40	–9.80	–17.10	–27.80	–31.80	–2.00	–33.30	–16.80	–45.60	–47.90
≥20 y	–3.30	–7.10	–11.00	–20.10	–24.10	–2.10	–3.00	–14.10	–18.40	–28.20

KNHANES = Korea National Health and Nutrition Examination Survey; SSS = Social Statistical Survey.
[a]Survey years: 1995, 1998, 2001, 2005.
[b]Survey years: 1995 and 2006.



Note. KNHANES = Korean National Health and Nutrition Examination Survey; SSS = Social Statistical Survey.

FIGURE 1—SimSmoke model predictions versus KNHANES and SSS survey estimates of smoking prevalence among Korean men aged 20 years and older: KNHANES, 1995–2006.

change occurred by 2006. Stronger media campaigns, implemented in 2000 and 2005, were predicted to reduce prevalence by 5.9% more in 2006 than if no policy changes were implemented. Clean air policies and cessation treatment policies were predicted to have smaller effects, with a 1.7% and 0.6% reduction, respectively, in smoking prevalence. We also estimated the relative contribution of each policy: price increases accounted for a majority of the effect (54.4%), followed by media campaigns (32.9%), clean air laws (9.3%), and cessation treatment (3.4%).

Our SimSmoke model estimated that 23 531 deaths among Korean males were attributable to smoking in 1995. The number of smoking-attributable deaths increased over time, because younger cohorts had higher smoking rates. The model estimated that 36 503 males died prematurely in 2007 from smoking but that the number would have been 37 585 if no tobacco control policies had been implemented, a difference of nearly 854 lives in that year alone. The number of lives saved also grew over time, because the effect of policies increased and because the relative risk of former smokers declined with years since quitting. In 2017, 43 844 lives will be lost to smoking, according to our model, but the number of lives saved will increase to 2975. By 2027, our model predicted that the number of smoking-attributable deaths will increase to 50 692, but the number of male lives saved will increase to 8526. Summing over the years 1995 to 2027, our model estimated that approximately 104 812 lives would be saved as a result of tobacco control policies implemented in Korea between 1995 and 2006.

TABLE 4—Korea SimSmoke Model Predictions of Smoking Prevalence Among Men Aged 20 Years and Older, With and Without Tobacco Control Policies: 1995–2006

	Smoking Prevalence					
	Policies at 1995 Level, %	Actual Policies, %	Only Price Changes, %	Only Clean Air Laws, %	Only Media Campaigns, %	Only Cessation Treatment Policy, %
1995	62.10	62.10	62.10	62.10	62.10	62.10
1998	61.50	60.20	60.20	61.50	61.50	61.50
% Change 1995–1998	−1.10	−3.20	−3.20	−1.10	−1.10	−1.10
2001	59.60	56.00	56.60	59.60	59.00	59.60
% Change 1998–2001	−3.00	−7.00	−6.00	−3.00	−4.00	−3.00
2006	57.10	47.40	51.50	56.20	53.80	56.80
% Change 2001–2006	−4.20	−15.30	−8.90	−5.80	−8.90	−4.80
% Change 1995–2006	−8.00	−23.70	−17.10	−9.60	−13.50	−8.60
% Change in 2006 relative to policies maintained at 1995 level		−17.00	−9.80	−1.70	−5.90	−0.60
Contribution of policy to % change			54.40	9.30	32.90	3.40

DISCUSSION

We applied Korean data and modified parameter values to the established SimSmoke model, which distinguishes long-term trends in smoking prevalence attributable to initiation and cessation rates existing before implementation of tobacco control policies from deviations from those trends attributable to new policies.

Our model tracked male adult smoking prevalence accurately for 1995 to 2006. It predicted larger declines for the later years, corresponding to the implementation of stronger policies. The model's predictions, however, overestimated the decline between 1998 and 2001 and underestimated the decline between 2001 and 2006, when most policies were implemented, suggesting that more recent policies may have stronger effects than those predicted by the model. In particular, the model may have underestimated the effects of clean air restrictions and health warnings implemented since 2001. The model performed well in age group predictions, except for underestimating the extent of decline in smoking rates among persons older than 60 years.

In a calculation that separated preexisting trends from the effects of policies, the model estimated that the tobacco control policies enacted between 1995 and 2006 (11 years) led to a 17% relative decline in male smoking prevalence in those years. The results are comparable to the 25% decline attributed to tobacco control policies over a 15-year period by the Thailand SimSmoke model.[2]

Our model predicted the effects of specific policies implemented between 1995 and

2006. The model apportioned most of the prevalence reduction to price increases and media campaigns. The central role for price and media policies mirrored the well-validated results obtained for the US, California, and Arizona SimSmoke models.[4,7,15]

The model predicted that 104 812 male lives would be saved by 2027 by a decline in smoking prevalence attributable to tobacco control policies. We used a 1.55 relative mortality risk for smoking, which is below that of the United States and may be expected to increase over time as smoking duration increases and background risks decline.[48] If we used the US relative risk (2.4),[49–51] the number of lives expected to be saved would increase by approximately 80%. The estimates also did not include the deaths associated with secondhand smoke exposure, which may be especially significant in homes in light of the high male-to-female smoking ratio.

We focused on Korean males in the current study. We also developed a model for Korean females. That model predicted a decline of 18.4% (from 6.1% to 5.5%) between 1995 and 2006. The model estimated that 4213 females died prematurely from smoking in 1995, increasing to 4546 in 2002. The model predicted that 6815 female lives would be saved by 2027 as a result of tobacco control policies implemented between 1995 and 2006. However, the model for females did not predict as well as the model for males. The poorer performance may have been caused by high sampling error in surveys: smoking prevalence estimates even for the same year vary substantially between surveys. In addition, the model did not explicitly consider the effect of economic development and related changes in attitudes toward female smoking.

Our SimSmoke model for the Republic of Korea was complex and had limitations. The variation in smoking prevalence estimates from different surveys suggests the need for better surveillance data. We made important assumptions in developing the model, such as that initiation, cessation, and relapse rates were constant over time in the absence of policy change.

The policy parameters are subject to uncertainty. Previously we reported upper and lower bounds of 33% for the effect sizes for price, 25% for the effect of worksite smoke-free laws, 50% for the effect of smoke-free laws governing restaurants and other public places, and 50% for the effect of media campaigns.[17] Cessation treatment policies are estimated to have bounds of 50%.[29,52] Furthermore, our parameters for Korea were based primarily on studies of Western nations. Although studies of price often find larger effects for nations with middle and low incomes, much less evidence exists for other policies.[53] Research is also needed on how the effect of an individual policy may depend on the other policies in effect.[54]

Although our results indicated that Korea's tobacco control policies have already had a major impact, further gains may be realized by implementing stricter policies. Our Korea SimSmoke model predicted that increasing the cigarette tax by an additional WON 500 could reduce smoking prevalence by another 7% and that strict clean air laws, a comprehensive marketing ban, and a comprehensive cessation policies program could each reduce smoking rates by 7%. If these policies were combined, smoking prevalence would be predicted to decline by 25% from its current level.

The Republic of Korea might benefit from further strengthening its tobacco control policies, but results from our SimSmoke model show that past policies, especially tax increases and strong media campaigns, have already shown success in reducing smoking prevalence and saving lives. These achievements underscore the importance of tobacco control if Asian nations are to reduce the immense health burden caused by tobacco in coming years. ■

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Contributors

D. T. Levy and S.-i. Cho developed the model and wrote the first draft of the article. Y.-M. Kim, S. Park, and M.-K. Suh developed and analyzed data for the model and reviewed the article. S. Kam reviewed the article and advised on its development.

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Human Participant Protection

No protocol approval was required because the study used publicly available data.

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