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Russia SimSmoke: the long-term effects of tobacco control policies on smoking prevalence and smoking-attributable deaths in Russia

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Abstract

Background—Russia has high smoking rates and weak tobacco control policies. A simulation model is used to examine the effect of tobacco control policies on past and future smoking prevalence and premature mortality in Russia.

Methods—The Russia model was developed using the *SimSmoke* tobacco control model previously developed for the USA and other nations. The model inputs population size, birth, death and smoking rates specific to Russia. It assesses, individually and in combination, the effect of seven types of policies consistent with the WHO Framework Convention on Tobacco Control (FCTC): taxes, smoke-free air, mass media campaign, advertising bans, warning labels, cessation treatment and youth access policies. Outcomes are smoking prevalence and the number of smoking-attributable deaths by age and gender from 2009 to 2055.

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Contributors

DTL: designed and wrote initial paper. GYM: helped write the first draft and subsequent drafts, and provided information. AK: helped write the first draft and subsequent drafts, and provided information. AH: helped write the first draft and subsequent drafts, and helped formulate the model. AMN: helped write the first draft and subsequent drafts, and provided information. HR: helped write the first draft and subsequent drafts, and provided information. IB: helped edit drafts and provided information. RO: helped edit drafts and provided information. SAB: provided important information in developing the model and helped edit the paper.

Competing interests

None.

Provenance and peer review

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Data sharing statement

We use publicly available data from the Russian Global Adult Tobacco Survey, and population statistics provided through the Russian Government.

Results—Increasing cigarette taxes to 70% of retail price, stronger smoke-free air laws, a high-intensity media campaign and comprehensive treatment policies are each potent policies to reduce smoking prevalence and smoking-attributable premature deaths in Russia. With the stronger set of policies, the model estimates that, relative to the status quo trend, smoking prevalence can be reduced by as much as 30% by 2020, with a 50% reduction projected by 2055. This translates into 2 684 994 male and 1 011 985 female premature deaths averted from 2015–2055.

Conclusions—*SimSmoke* results highlight the relative contribution of policies to reducing the tobacco health burden in Russia. Significant inroads to reducing smoking prevalence and premature mortality can be achieved through strengthening tobacco control policies in line with FCTC recommendations.

INTRODUCTION

Globally, it is estimated that each year 5 million deaths are attributable to smoking, with trends driving an increase to 10 million deaths per year by the 2030 s.[1] In response, WHO has set out the Framework Convention for Tobacco Control (FCTC),[2] and the MPOWER Report[3] has defined a set of demand-reducing policies that are consistent with the FCTC. Substantial evidence indicates that higher cigarette taxes, smoke-free air laws, marketing bans, media campaigns and cessation treatment policy can markedly reduce adult smoking rates.[45]

In Russia, 14% of all deaths, or about 300 000 deaths each year, are attributed to tobacco smoking.[6] Male smoking prevalence (60%) is the highest in the European region, and female smoking prevalence increased from 10% to 21% during the last 15 years.[78] Since ratification of the FCTC in June 2008, the Russian Federation has adopted stronger smoke-free air laws and advertising restrictions, implemented stronger health warnings, and initiated a tobacco control campaign. However, much remains to be done in order to meet the FCTC requirements. The document ‘Conception of policy implementation directed against tobacco use for the period 2010–2015’ was developed as a first step toward FCTC implementation in Russia.[9]

Most studies have examined the effect of only one or at most two tobacco control policies,[10] because the ability to distinguish their effects on smoking rates is limited. Simulation models combine information from different sources to examine how the effects of public policies evolve over time.[1112] Models examining the effect of tobacco control policies have been developed by Mendez and Warner,[13] Tengs *et al*,[14] Ahmad,[15] and Levy *et al*.[1216] The *SimSmoke* model of Levy *et al* simultaneously considers a broader array of public policies than other models[17] and has been validated for many countries.[18–24]

In order to examine the effect of tobacco control policies on past and future smoking rates in Russia, a modified version of *SimSmoke*, called *Russia SimSmoke*, has been developed for the Russian Federation. Using data from Russia on population size, birth, death and smoking rates, *SimSmoke* predicts smoking prevalence and the number of smoking-attributable deaths (SADs) by age and gender in the absence of policy change. The model also shows effects of recent policies implemented in Russia and a strong set of additional policies consistent with meeting all the FCTC requirements.

METHODS

Basic model

SimSmoke includes population, smoking and SAD models, and separate policy modules.[12,16,21] The simulation model begins in a baseline year with the population divided into smokers, never smokers, and previous smokers by age and gender. The Russia model starts in 2009 because it was before major policy changes and the large-scale Global Adult Tobacco Survey (GATS) was available.[8] Applying a discrete time, first-order Markov process, population growth evolves through births and deaths, and smoking rates evolve through smoking initiation, cessation, and relapse rates. Smoking rates shift due to changes in tobacco control policies. SADs are estimated using smoking rates and relative smoking risks. Further detail on the model is provided in the online supplementary report.

Population model

Population, fertility and mortality data by gender and 5-year age group for 2009 were obtained from Official Statistics of the State.[25] The effects of international net migration are low and were not incorporated into the model.

Smoking model

In *SimSmoke*, individuals are classified as never smokers from birth until they initiate smoking or die, from current to former smoker through cessation, and from former to current smoker through relapse. The extent of relapse depends on the number of years since quitting.

The prevalence of current and former smokers is based on the 2009 GATS.[8] Due to empirical challenges in measuring initiation and cessation and in order to ensure stability of the model, initiation rates at each age are measured as the difference between the smoking rate at that age year and the rate at the previous age year. In 2009, smoking rates reached a maximum of 70% for males for the 28-year age group and 41% for females for the 21–24-year age group. From GATS, 32.1% of current and former (<12 months) smokers had made an attempt to quit in the last 12 months, and 11.2% were successful in quitting, implying a 3.5% (0.32.×0.11) cessation rate. A 50% and 40% relapse rate was applied to the first year cessation rate for ages 28–65 years and 65 years and above, respectively, reflecting the higher success of quitting rates of those at later ages when the smoker often quits for health reasons.[26] Because data were not available for Russia, US relapse rates by years quit[26,27] were applied to former smokers after the first year.

Smoking-attributable deaths

SADs are determined by excess smoking risks of current and former smokers.[28] Death rates were first calculated by age, gender and smoking categories (never, current and 6 former smoker groups) using data on death rates, smoking rates and relative risks. The number of smokers at each age is multiplied by the difference between mortality risk of current or former smokers and never smokers to obtain the SADs. The results are summed over smoking groups for all ages to obtain the number of premature SADs.

Perlman and Bobak[29] have obtained relative mortality risks of smoking for post-transition Russia similar to those of the USA.[30] Consequently, relative risk estimates of 2.1 from the US Cancer Prevention Study II were used. Relative risks declined at the observed US rate for former smokers.[30]

Policy effects

The policy parameters are based on reviews of past policy evaluation studies and the advice of an expert panel, and are adjusted to reflect characteristics of a middle-income nation. Policies and effect sizes are summarised in table 1. Policy effect sizes are in terms of percent reductions applied to smoking prevalence in the year in which a policy is implemented and, unless otherwise specified, applied to initiation and cessation rates in future years if the policy is sustained. In the absence of synergies, the effects of a second policy are reduced by 1, the effect of the first policy.

In the model, the effect of a policy on smoking prevalence in a particular nation depends on its initial level (eg, the incremental effect of a complete worksite-law ban is less when a nation already has a partial worksite ban). Because policy levels and all changes in policy affect the future path of smoking prevalence in *SimSmoke*, policy levels are tracked from 2009 to the most recent date (2013) and sustained up to 2055 (‘status quo’). The level of a policy is based on information in the MPOWER report.[3] Beginning in 2015, a stronger set of policies that are consistent with FCTC is expected to be in effect. Effects of such policies through 2015 and up to 2055 are analysed in isolation or in combination.

Changes in price are translated into changes in smoking prevalence through an equation dependent on price elasticities.[31] While price elasticities have been extensively studied,[32] Ross *et al*[33] report that the few demand studies for Russia indicate price elasticities in the range −0.1 to −0.2. The model uses a measure of average price based on data from the Euromonitor; retail value of cigarettes was divided by retail volume to obtain the average nominal price. Following standard practice, the nominal cigarette price index was then deflated by the consumer price index to obtain inflation-adjusted cigarette prices. The MPOWER Reports[3] indicate that in 2009, about 37% of the price is taxed, of which 21.5% is excise taxes (specific and ad valorem) and the 15.3% is the value added tax (VAT). The excise tax rate increased to 28% by 2012. Future price changes directly reflect excise tax increases in the model.

Smoke-free air laws are applied to (1) worksites, (2) restaurants, (3) pubs and bars and (4) other public places. For each of the bans, the effects depend on enforcement and publicity. The level of publicity is based on the level of tobacco control campaigns. According to MPOWER reports,[3] Russia had a smoking ban in healthcare facilities, educational facilities and theatres and cinemas. The laws were categorised as a weak worksite law, no bans in bars or restaurants, but a ban in other public places. Since about 35% of workers who work indoors are still exposed to smoke in the workplace (GATS), enforcement is set to a level 1 on a 10-point scale.

SimSmoke considers three levels of campaigns: high, medium and low, based on the level of tobacco control campaign expenditures. Campaign intensity begins at low levels in 2009 and increases to medium levels in 2012.

Marketing includes bans on advertising, promotion and sponsorship in the MPOWER report and categorises marketing bans into four levels: (1) no policy, (2) weak advertising ban, (3) total advertising ban and (4) comprehensive marketing ban. The 'On Advertising' law prohibits advertising on the radio, television, in cinemas, in print media, in public transport and on billboards.[3] Russia is denoted as having a total advertising ban since 2009. Since data from GATS indicates that most Russians have seen advertisements,[8] the enforcement level is set at 1 on a 10-point scale.

MPOWER designates 4 levels for health warnings: no policy, weak (<30% of the principal display area of the pack), moderate (covers at least 30% of the display area), and strong (covers at least 50% of the display area and includes seven pack warning criteria). A weak warning was in effect through 2009. At the end of 2009, health warnings increased to 30% of the front of packages, considered a moderate warning.[8] A strong warning is scheduled for 2013.

The cessation treatment module has four primary subpolicies: pharmacotherapy availability, financial coverage of treatments, quit lines and brief interventions. The first subpolicy corresponds to the MPOWER classification regarding availability of nicotine replacement treatment (NRT) and non-nicotine replacement therapy. The provision of cessation treatments is considered in primary care facilities, hospitals, health professional offices, community and other. Brief interventions would involve, at minimum, a brief intervention by healthcare providers to advise and assist in cessation, and more advanced forms would involve follow-up, training of the providers, and reminder systems. Russia has NRT available in a pharmacy without prescription and Varencline with prescription.[3] Information from Russian Federation staff indicates that coverage has only been provided in some primary care facilities. A quitline was established in 2010, and the brief intervention index was set to 20% based on the GATS.[8]

Youth access policy reflects enforcement, publicity, self-service and vending machine bans, and is categorised as strong, moderate or low. In Russia, youth access is considered at a low level.

Model outcomes

The primary outcomes are smoking prevalence and SADs from 2009 to 2055. We consider the effect of policies implemented since 2009. The model predicts outcomes for tobacco control policies for the status quo where future policies are held constant at their 2013 level and a strong set of policies (in 2015) considered in isolation and in combination and maintained over time. An exception is cigarette excise taxes, which are scheduled to increase from 28% of the retail price of cigarettes in 2014, 40% in 2015, 60% in 2020 and to 70% in 2025 (maintained through 2055). The change in smoking prevalence is calculated in percentage terms relative to the status quo in a particular year. For SADs, deaths averted are

calculated as the difference between the number of deaths under the new policy (from a strong set of comprehensive policies) and the number of deaths under the status quo.

RESULTS

The estimates of smoking prevalence (age 15 years and above) in Russia under the status quo and under varying policy scenarios are shown in tables 2 and 3 for males and females, respectively. The total number of projected SADs for a specific year, and the cumulative total for 2015 through 2055 are shown in table 4.

Smoking prevalence and smoking-attributable deaths under the status quo

Russia SimSmoke predicts smoking rates from the period 2009 to 2015 under status quo policies. Since 2009, inflation-adjusted prices increased by about 3%, quitlines were implemented, media campaigns were intensified and health warnings were strengthened and scheduled to be further strengthened in 2013. *SimSmoke* predicts that male smoking rates will decrease from 58.6% in 2009 to 51.8% in 2015, an 11.6% (relative) decrease. Between 2009 and 2015, female smoking rates fall from 20.7% to 19.9%, a 4% decrease.

The effect of policies implemented between 2009 and 2013

The effect of policies implemented through 2009 and tracking up to 2055 were estimated by comparing trends with the policies implemented through 2013 to the counterfactual with policies set in the model to their 2009 levels. If the policies implemented since 2009 (including health warnings to be implemented in 2013) had not been implemented, *SimSmoke* predicts that smoking rates in 2013 would have been about 8% higher for males and females than the smoking rate with the policies actually implemented (57.3% vs 52.7% for males and 21.6% vs 19.8% for females in 2013). Thus, smoking rates would have decreased slightly for males (by about 2%) and increased for females (by about 4%) in the absence of policy. In the absence of the policies implemented since 2009, an additional 1 398 686 (1 012 698 males and 385 989 females) premature deaths due to smoking by the year 2055 are estimated. Much of the gain is due to health warnings, which alone are predicted to reduce rates by about 4.5% by 2013 and by 8% (and averting 900 000 premature deaths) by 2055.

Role of policies implemented in 2015 in reducing future smoking prevalence and deaths

If tobacco control policies remain unchanged from their 2015 levels, as in the status quo scenario, male adult smoking is projected to decrease in absolute terms by 3.5 percentage points (a 6.6% relative decline) from 52.7% to 49.2% between 2013 and 2020, and by 12.0 percentage points (23% relative) to 39.6% over a 40-year projection to 2055. In the status quo scenario, female adult smoking, at 19.9% in 2015, is projected to stay relatively constant in the following 5 years, and to decrease by 0.4% (2% relative) to 19.5% by 2055.

Relative to the status quo scenario, increasing excise taxes to 70% of the current price is projected to reduce smoking prevalence by 23% by 2050. Youth smoking prevalence declines at a greater rate as a result of excise tax increases than adult prevalence in the model. With the excise taxes increased in steps from 2015 to 2025, 188 524 male lives and

99 326 female lives are projected to be saved in the year 2055. Summing the effects over years from 2015 through 2055, 782 372 male and 307 853 female deaths are projected to be averted by 2055. The effects of taxes on deaths are delayed because the effects of cessation on death rates are relatively slow to develop, and because the greatest tax effects are on youth prevalence before SADs occur.

Comprehensive smoke-free air laws, with a complete ban on smoking in worksites, bars, restaurant and other public places along with strong enforcement, are predicted to reduce male and female smoking prevalence by 9% relative to the status quo scenario in 2015 and by 12% by the year 2055. For a well-funded and publicised campaign that is sustained over time, the model predicts about a 5% immediate reduction in smoking prevalence by 2020, increasing to 7% by 2055 for males and females. A comprehensive marketing ban with strong enforcement is predicted to yield a 6% immediate reduction in smoking prevalence, increasing to about a 9% reduction by 2055. A cumulative total of 733 330 lives are predicted to be saved between 2015 and 2055. Comprehensive cessation treatment policies are projected to reduce smoking prevalence by about 5% by 2020 relative to the status quo, growing to a 7% reduction by 2055 and to avert 668 367 SADs by 2055. Because youth access laws only affect a small percent of the population (those under 18 years of age), they have small immediate effects, but their effects grow over time. With their enforcement, *SimSmoke* predicts an immediate 0.1% relative reduction in the smoking rate, increasing to 3% by 2055. Youth access policies reduce SADs by only 2240 even in the year 2055, because smoking affects mortality largely after age 40 years. By 2055, youth access laws are projected to avert 24 318 deaths.

The final scenario projects for a combination of all the policies above. The smoking prevalence in the first year is projected to drop by about 25% relative to status quo, and by 2055 is projected to drop by 50%. The model projects 61 622 and 19 125 fewer male and female (respectively) annual SADs relative to status quo policies by 2030 and 122 640 (83 702 male and 38 938 female) fewer annual SADs by 2055. Summing up the number of deaths averted from the years 2015 to 2055, 2 684 994 male and 1 011 985 female fewer premature deaths are projected.

DISCUSSION

Russia SimSmoke applies Russian population, smoking prevalence and policy data and modified parameter values to the established *SimSmoke* model. Since 2009, excise taxes have been increased, a quitline was implemented, tobacco control expenditures increased and health warnings strengthened in Russia. The model estimated that these policies alone will reduce smoking rates by 12.5% and avert 1.4 million premature deaths by 2055. However, while Russia has implemented some tobacco control policies in recent years, there is still scope to strengthen tobacco control policies consistent with the FCTC legally binding treaty. If all policies meet the FCTC requirements in 2015 and cigarette excise taxes are increased at 5-year intervals reaching 70% in 2025, smoking prevalence can be decreased by about 30% in the first 5 years, increasing to about 50% by 40 years.

Because of the natural progression of tobacco-related illnesses, early reductions in smoking prevalence have a relatively small impact on the number of SADs in the short-term. The relative impact of a comprehensive tobacco policy in 5 years is small compared to the potential impact after 40 years. Without the FCTC-mandated tobacco control policies implemented in 2015, an additional 3.7 million lives will be lost prematurely due to smoking by the year 2055 in Russia. Almost 25% (3.7/16,5) of the 16.5 million smoking-attributable deaths projected by *SimSmoke* will be averted by 2055 by implementing all FCTC policies. The model is meant to provide guidance to policy makers and show the substantial effect of not adopting FCTC-required demand-reducing policies, especially in a country with weak tobacco control policies. At the same time, the model shows that additional policies will be needed to further reduce smoking prevalence to acceptable levels. Additional policies may include those that limit the supply of tobacco products, such as limiting the sale of tobacco products to specific locations, and reducing tax avoidance and tax evasion.

Results from the model depend on the reliability of the data, estimated parameters and assumptions used in the model. Model predictions should be interpreted in a conservative manner bearing in mind the following limitations. While there is not sufficient survey data after 2009 to validate the Russia model, the predictions of smoking prevalence from the *SimSmoke* model have been validated against survey data for over 15 countries.[18–24]

The cessation rates are based on data from other countries and the relapse rates are from the USA[27] due to gaps in the Russian data. Better monitoring of cessation rates and the distribution of ex-smokers will help to gauge the impact of tobacco control policies. The initiation rates are based on prevalence rates of those aged 15–28 years in 2009, the year of the GATS survey. However, compared with earlier surveys, these rates appear to have grown considerably over the last 10 years. If female initiation continues to increase, the estimates of female smoking and SADs will be downward biased.

The estimated relative risks for total mortality of smokers is based on studies from the USA[30] and Russia.[29] The risks may be overstated for females, but may be expected to increase as those who have begun smoking at an earlier age reach age 50.[34] Notably, the projections also do not include the additional deaths averted due to reductions in second-hand smoke exposure.

The policy modules depend on estimated parameters. Knowledge of the different effects of each policy varies.[4] In previous work,[18,22,24] we have estimated that the effects of excise taxes can be expected to vary by about 25% around the estimates for taxes, but by 50% around the estimates for other policies (with an upper limit of 100% variation around cessation treatment and youth access policies). Better understanding of the interactive effects of policies is also needed.

The model indicates that the consequences of inaction are considerable; without the implementation of a stronger set of policies, smoking prevalence rates will remain relatively stable and smoking-attributable deaths among women will continue to rise in Russia. Increasing cigarette excise taxes, implementing a comprehensive smoke-free air policy and introducing a high-intensity media campaign are priority interventions indicated by the

model. Significant inroads to reducing smoking prevalence and premature mortality in Russia can be achieved through strengthening tobacco control policies in line with FCTC recommendations.

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Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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What this paper adds

Russia has high smoking rates and weak tobacco control policies. A simulation model is used to examine the effect of tobacco control policies on past and future smoking prevalence and premature mortality in Russia. The model shows:

- Some policies have recently been implemented, such as higher taxes, a media campaign and health warnings, which have already reduced smoking rates by 8% and prevented 1.4 million smoking attributable deaths (SADs)
- To be fully consistent with the FCTC, additional policies are required. These policies will reduce smoking rates by about 50% and prevented about 4 million SADs.

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Table 1

Policies, description and effect sizes of *Russia SimSmoke*

Policy	Description	Potential effect sizes (%)*
Tax policy	Cigarette price index, taxes measure in absolute terms	For each 10% price increase: 3% reduction ages 15–17, 3% reduction ages 18–24 2% reduction ages 25–34, and 1% reduction ages 35 and above
Smoke-free air policies (first four policies are additive)		
Worksite total ban	Ban in all areas -Apply only to those who are currently working and work indoors. Adjusted to reflect the percent of workers in the agricultural sector	9.0% reduction
Restaurants total ban	Ban in all indoor restaurants in all areas	3.0% reduction
Bars and pubs ban	Ban in all indoor areas of bars and pubs	1.5% reduction
Other places total ban	Ban in 3 of 4 (malls, retail stores, public transportation and elevators)	1.0% reduction
Enforcement and publicity	Government agency is designated to enforce and publicise the laws	Effects weakened by as much as 50% if 0 enforcement and publicity
Mass media campaigns (policies are mutually exclusive)		
Highly publicised campaign	Campaign publicised heavily on TV (at least 2 months of the year) and at least some other media	6.5% reduction
Moderately publicised campaign	Campaign publicised sporadically on TV and in at least some other media, and a local programme	3.5% reduction
Low publicised campaign	Campaign publicised only sporadically in newspaper, billboard or some other media.	1.0% reduction
Marketing bans (first three policies are mutually exclusive)		
Comprehensive marketing ban	Ban is applied to television, radio, print, billboard, in-store displays, sponsorships and free samples	10.0% reduction in prevalence, 12.0% reduction in initiation, 6.0% increase in cessation rates
Total advertising ban	Ban is applied to all media television, radio, print, billboard	6.0% reduction in prevalence, 8.0% reduction in initiation, 4.0% increase in cessation rates
Weak advertising ban	Ban is applied to some television, radio, print, billboard	2.0% reduction in prevalence and initiation only
Enforcement and publicity	Government agency is designated to enforce the laws	Effects weakened by as much as 50% if 0 enforcement
Warning labels (policies are mutually exclusive)		
Strong	Labels are large, bold and graphic	4.0% reduction in prevalence and in initiation, 10.0% increase in cessation rate
Moderate	Cover 1/3 of package, but not bold and graphic	1.5% reduction in prevalence 1% reduction in initiation, 5% increase in cessation rate

Policy	Description	Potential effect sizes (%)*
Weak	Laws cover less than 1/3 of package, not bold or graphic	1.0% reduction in prevalence and initiation rates, 2.0% increase in cessation rates
Cessation treatment policy		
Complete availability and provision of pharmaco- and behavioural treatments, quit lines, and brief interventions	NRT in stores w/out Rx, Varenecline by Rx, provision of treatments in all health facilities, quit line, 100% brief interventions with follow-up	6.75% reduction in prevalence, 55% increase in cessation rate. No effect on initiation rates
PT availability	PT is available and NRT is available without prescription	1.0% reduction in prevalence in the first year; 6% increase in cessation rate in all future years
Treatment coverage policies	With a high-level campaign	2.25% reduction in prevalence; 12% increase in cessation rate in all future years. (In the absence of a campaign, effects are reduced 25%.)
Quitlines	Active quitline	0.5% reduction in prevalence in the first year; 5% increase in cessation rate in all future years
Youth access restrictions (policies are mutually exclusive)		
Strongly enforced and publicised	Compliance checks are conducted regularly, penalties are heavy, and publicity is strong: vending machine and self-service bans	30.0% reduction for age <16 in prevalence and initiation only, 20.0% reduction for ages 16–17 in prevalence and initiation only
Moderately enforced	Compliance checks are conducted sporadically, penalties are potent, and little publicity	15.0% reduction for age <16 in prevalence and initiation only, 10.0% reduction for ages 16–17 in prevalence and initiation only
Low enforcement	Compliance checks are not conducted, penalties are weak, and no publicity	3.0% reduction for age <16 in prevalence and initiation only, 2.0% reduction for ages 16–17 in prevalence and initiation only

*Unless otherwise specified, the same percentage effect is applied as a percentage reduction in the prevalence in the initial year and as a percentage reduction in initiation rate and a percentage increase in the cessation rate in future years, and is applied to all ages and both genders. The effect sizes are shown relative to the absence of any policy.

NRT, nicotine replacement treatment.

Table 2

SimSmoke projections of male smoking prevalence for ages 15 years and older, Russia, 2009–2055

Policy/years	2009	2015 (%)	2020 (%)	2025 (%)	2035 (%)	2045 (%)	2055 (%)
Status quo policies	58.6%	51.8	49.2	46.5	43.5	41.2	39.6
Independent policy effects*							
Excise tax increase		49.8	45.0	40.3	36.1	32.9	30.6
Complete smoke-free air law		47.2	44.5	41.8	38.8	36.4	34.8
Comprehensive marketing ban		48.5	45.9	43.2	40.2	37.8	36.1
High-intensity tobacco control campaign		49.5	46.9	44.1	41.1	38.7	37.1
Strong youth access enforcement		51.7	48.9	46.0	42.7	40.3	38.4
Cessation treatment policies		50.3	47.0	44.0	40.9	38.5	37.0
Combined policy effects		39.1	33.9	29.2	25.0	21.9	20.0
% *Change in smoking prevalence from status quo*†							
Independent policy effects							
Excise tax increase	–	−3.8	−8.6	−13.4	−17.0	−20.2	−22.7
Complete smoke-free air law	–	−8.9	−9.5	−10.0	−10.9	−11.7	−12.1
Comprehensive marketing ban	–	−6.4	−6.6	−7.0	−7.6	−8.2	−8.6
High-intensity tobacco control campaign	–	−4.3	−4.6	−5.1	−5.6	−6.1	−6.3
Strong youth access enforcement	–	−0.1	−0.6	−1.0	−1.7	−2.2	−2.9
Cessation treatment policies	–	−2.8	−4.5	−5.3	−6.0	−6.5	−6.4
Combined policy effects	–	−24.6	−31.1	−37.1	−42.6	−46.8	−49.4

*Policies are implemented at FCTC-consistent levels in 2015 and maintained at that level through 2055, except for excise taxes which are increased in steps from 28% of retail price in 2014 to 40% in 2015 to 60% in 2020 and 70% in 2025 and maintained at that level until 2055.

†Percent changes measured as the relative change from the status quo level [eg, (Prevalence w/policy in 2020-Prevalence w/status quo in 2020)/Prevalence w/status quo in 2020].

Table 3

SimSmoke projections of female smoking prevalence for ages 15 years and older, Russia, 2009–2055

Policy/years	2009	2015 (%)	2020 (%)	2025 (%)	2035 (%)	2045 (%)	2055 (%)
Status quo policies	20.7%	19.9	19.9	19.8	20.2	19.9	19.5
Independent policy effects*							
Excise tax increase		19.1	18.1	17.1	16.8	16.0	15.1
Complete smoke-free air law		18.1	18.0	17.8	18.0	17.6	17.2
Comprehensive marketing ban		18.6	18.6	18.4	18.7	18.3	17.9
High-intensity tobacco control campaign		19.0	18.9	18.8	19.0	18.7	18.3
Strong youth access enforcement		19.9	19.8	19.6	19.8	19.5	19.0
Cessation treatment policies		19.3	18.9	18.6	18.8	18.3	17.9
Combined policy effects		15.0	13.6	12.3	11.6	10.5	9.7
% *Change in smoking prevalence from status quo*†							
Independent policy effects							
Excise tax increase	–	−4.0	−8.9	−13.5	−16.8	−19.8	−22.4
Complete smoke-free air law	–	−8.9	−9.5	−10.0	−10.8	−11.6	−12.1
Comprehensive marketing ban	–	−6.4	−6.6	−6.9	−7.4	−7.9	−8.3
High-intensity tobacco control campaign	–	−4.4	−4.7	−5.1	−5.6	−6.1	−6.4
Strong youth access enforcement	–	−0.1	−0.5	−1.0	−1.7	−2.2	−2.9
Cessation treatment policies	–	−2.8	−5.0	−6.0	−7.0	−7.9	−8.2
Combined policy effects	–	−24.8	−31.8	−37.6	−42.6	−47.0	−50.1

*Policies are implemented at FCTC-consistent levels in 2015 and maintained at that level through 2055, except for excise taxes which are increased in steps from 28% of retail price in 2014 to 40% in 2015 to 60% in 2020 and 70% in 2025 and maintained at that level until 2055.

†Percent changes measured as the relative change from the status quo level [eg, (Prevalence w/policy in 2020-Prevalence w/status quo in 2020)/Prevalence w/status quo in 2020].

Table 4

SimSmoke projections of male and female smoking attributable deaths, Russia, 2009–2055

Policy/years	2009	2015	2020	2025	2035	2045	2055	Cumulative 2015–2055
Status quo policies	417 667	417 047	419 133	428 697	425 367	384 094	333 503	16 547 739
Independent policy effects*								
Excise tax increase			416 633	420 591	397 883	343 855	287 850	15 484 812
Complete smoke-free air law			411 029	412 811	390 453	350 267	301 593	15 466 630
Comprehensive marketing ban			413 452	417 741	401 620	361 479	312 058	15 814 409
High-intensity tobacco control campaign			415 161	420 775	407 653	366 500	316 750	15 994 566
Strong youth access enforcement			419 133	428 697	425 154	383 044	331 083	16 523 421
Cessation treatment policies			415 753	420 562	404 782	360 383	310 495	15 879 372
Combined policy effects			396 987	381 448	311 896	260 764	210 863	12 850 760
Absolute change in attributable deaths from status quo (deaths averted)†								
Independent policy effects								
Excise tax increase	–	–	2500	8106	27 484	40 238	45 653	1 062 927
Complete smoke-free air law	–	–	8104	15 886	34 914	33 826	31 911	1 081 109
Comprehensive marketing ban	–	–	5681	10 956	23 747	22 615	21 445	733 330
High-intensity tobacco control campaign	–	–	3973	7922	17 715	17 593	16 754	553 173
Strong youth access enforcement	–	–	–	–	213	1050	2420	24 318
Cessation treatment policies	–	–	3380	8135	20 585	23 711	23 008	668 367
Combined policy effects	–	–	22 147	47 249	113 471	123 329	122 640	3 696 979

*Policies are implemented at FCTC-consistent levels in 2015 and maintained at that level through 2055, except for excise taxes which are increased in steps from 28% of retail price in 2014, to 40% in 2015, to 60% in 2020, and 70% in 2025 and maintained at that level until 2055.

†Deaths averted measured as the change from the status quo level [e.g., Deaths w/policy in 2020- Deaths w/status quo in 2020].