



H N P D I S C U S S I O N P A P E R

Economics of Tobacco Control Paper No. 23

30192

Russia (Moscow) 1999 Global Youth Tobacco Survey:

Economic Aspects

Hana Ross

September 2004

Tobacco Free Initiative
World Health Organization



**RUSSIA (MOSCOW) 1999 GLOBAL YOUTH TOBACCO
SURVEY:**

Economic Aspects

Hana Ross

SEPTEMBER 2004

Health, Nutrition and Population (HNP) Discussion Paper

This series is produced by the Health, Nutrition, and Population Family (HNP) of the World Bank's Human Development Network ([HNP Discussion Paper](#)). The papers in this series aim to provide a vehicle for publishing preliminary and unpolished results on HNP topics to encourage discussion and debate. The findings, interpretations, and conclusions expressed in this paper are entirely those of the author(s) and should not be attributed in any manner to the World Bank, to its affiliated organizations or to members of its Board of Executive Directors or the countries they represent. Citation and the use of material presented in this series should take into account this provisional character. For free copies of papers in this series please contact the individual authors whose name appears on the paper.

Enquiries about the series and submissions should be made directly to the Managing Editor. Submissions should have been previously reviewed and cleared by the sponsoring department which will bear the cost of publication. No additional reviews will be undertaken after submission. The sponsoring department and authors bear full responsibility for the quality of the technical contents and presentation of material in the series.

Since the material will be published as presented, authors should submit an electronic copy in a predefined format (available at www.worldbank.org/hnppublications on the Guide for Authors page) as well as three camera-ready hard copies (copied front to back exactly as the author would like the final publication to appear). Rough drafts that do not meet minimum presentational standards may be returned to authors for more work before being accepted.

The Editor in Chief of the series is Alexander S. Preker (apreker@worldbank.org), the Managing Editor is Joy de Beyer (jdebeyer@worldbank.org). For information regarding this and other World Bank publications, please contact the HNP Advisory Services (healthpop@worldbank.org) at: Tel (202) 473-2256; and Fax (202) 522-3234.

The **Economics of Tobacco Control** sub-series is produced jointly with the Tobacco Free Initiative of the World Health Organization. The findings, interpretations, and conclusions expressed in this paper are entirely those of the author/s and should not be attributed in any manner to the World Health Organization or to the World Bank, their affiliated organizations or to members of their Executive Boards or the countries they represent.

The editors for the Economics of Tobacco Control papers are: Joy de Beyer (jdebeyer@worldbank.org), Ayda Yürekli (ayurekli@worldbank.org) and Anne-Marie Perucic (Perucica@who.int).

For free copies of papers in this series please contact the individual author whose name appears on the paper, or one of the editors. Papers are posted on the publications pages of these websites: www.worldbank.org/hnp and www.worldbank.org/tobacco

© 2004 The International Bank for Reconstruction and Development / The World Bank
1818 H Street, NW
Washington, DC 20433

All rights reserved.

Health, Nutrition and Population (HNP) Discussion Paper

ECONOMICS OF TOBACCO CONTROL PAPER NO. 23

Russia (Moscow) 1999 Global Youth Tobacco Survey: Economic Aspects

Hana Ross

Senior Research Specialist and Research Assistant Professor, University of Illinois at Chicago,
Health Research and Policy Centers

The Russia (Moscow) 1999 Global Youth Tobacco Survey was carried out under a joint project of the Russian Public Health Association and Canadian Public Health Association, with funding from RITC (Research for International Tobacco Control), an international secretariat housed at IDRC, Canada; and the Canadian International Development Agency (CIDA). This report was commissioned by the Health, Nutrition and Population Unit in the Human Development Network, World Bank, using grant funds provided by the Office on Smoking and Health of the US Centers for Disease Control and Prevention.

Abstract: The Global Youth Tobacco Survey (GYTS), supported by the US Centers for Disease Prevention and Control and the World Health Organization, was carried out in Moscow in 1999. Russia was one of the first of many countries to implement this standardized school-based survey of teenage smoking behavior, attitudes and knowledge. This report presents background information on smoking and tobacco control policies in Russia. It presents simple descriptive statistics of the GYTS survey data, focusing especially on the relationship between smoking behavior, cigarette prices, and other factors that can be affected by policies intended to reduce smoking, to reduce associated disease and premature deaths. Multiple regressions explore the factors that affect the decision to smoke, and the number of cigarettes that current smokers report smoking each month. The estimates suggest that higher prices are associated with lower smoking prevalence and fewer cigarettes smoked each month. Other factors with a statistically significant effect (increasing smoking) are: age, being male, owning cigarette promotional items and having been offered free cigarettes by cigarette company representatives. Seeing counter-advertising was also statistically significant and associated with less smoking.

Keywords: Russia, tobacco, smoking, youth smoking, tobacco tax, cigarettes, economics of tobacco, economics of tobacco control, tobacco policy, price elasticity, demand for cigarettes,

Disclaimer: The findings, interpretations and conclusions expressed in the paper are entirely those of the author, and do not represent the views of the World Bank or the World Health Organization, their Executive Directors, or the countries they represent. The GYTS is a collaborative project of WHO/CDC/participating countries and Associate Partners. Analyses of GYTS data are not necessarily endorsed by WHO, CDC or participating countries.

Correspondence Details: Hana Ross, Ph.D., Deputy Director, International Tobacco Evidence Network (ITEN), University of Illinois at Chicago, 1747 W. Roosevelt Road, Room 558, M/C 275 Chicago, Illinois 60608. Phone: 312/413-5423, Fax: 312/355-2801, Email: hanaross@uic.edu.

Table of Contents

FOREWORD	VII
ACKNOWLEDGEMENTS	IX
1. INTRODUCTION	1
1.1 SOCIO-ECONOMIC INDICATORS IN RUSSIA.....	1
1.2 SMOKING PREVALENCE IN RUSSIA.....	2
1.3 THE IMPACT AND INFLUENCE OF THE TOBACCO INDUSTRY	4
1.4 PUBLIC POLICY	6
2. DATA	11
2.1 THE GLOBAL YOUTH TOBACCO SURVEY	11
2.2 DATA VARIABLES.....	12
<i>Smoking Behavior</i>	12
<i>Socio-Economic Status</i>	14
<i>Cigarette Price</i>	14
<i>Exposure to Media Messages, Promotional Activities, and Prevention Efforts</i>	14
<i>Knowledge of Health Consequences</i>	15
3. BASIC DESCRIPTIVE STATISTICS	16
3.1 SMOKING PREVALENCE AND INTENSITY	16
3.2 CONSUMPTION LOCALITIES AND SOURCES OF CIGARETTES.....	18
3.3 BRAND CHOICES AND PRICES PAID FOR CIGARETTES	21
3.4 SMOKING UPTAKE, CESSATION EFFORTS, AND PERCEIVED RISK OF SMOKING	23
3.5 SCHOOL PREVENTION EFFORTS.....	25
3.6 ADVERTISING EXPOSURE	26
3.7 EXPOSURE TO SECONDHAND SMOKE	28
4. MULTIPLE REGRESSION ANALYSIS OF DEMAND	29
4.1 METHODOLOGY AND MODEL SPECIFICATION.....	29
4.2 REGRESSION MODEL RESULTS.....	32
5. SUMMARY AND DISCUSSION	37
REFERENCES	41

List of Tables

Table 1: Socio-economic indicators, 1999, Russia and Region Comparators.....	1
Table 2: Production of cigarettes and papirosi in Russia, 1995–2000	4
Table 3: Smoking prevalence (%) among teenage students, by gender and grade.....	17
Table 4: Behavior of current cigarette smokers.....	18
Table 5: Where students smoke(current and former smokers only).....	19
Table 6: How students get cigarettes (current smokers only).....	20
Table 7: How students get cigarettes – by smoking intensity (current smokers only)	21
Table 8: Usual price paid for their cigarettes by smokers who buy cigarettes	21
Table 9: Price paid for cigarettes by smokers who buy cigarettes, by intensity.....	22

Table 10: Brand choices(percent of current smokers).....	22
Table 11: Brand choices and price paid for cigarettes, percent of current smokers who buy cigarettes.....	23
Table 12: Attitudes toward future smoking and quitting (%).....	24
Table 13: Perceived risk of smoking (%).....	25
Table 14: Help/information availability at school (%).....	26
Table 15: Advertising exposure in month prior to survey (%).....	27
Table 16: Advertising exposure in month prior to survey, by smoking status	28
Table 17: Secondhand smoke (last week's exposure and attitudes).....	28
Table 18: Secondhand smoke exposure in prior week and attitudes, by smoking status	29
Table 19: Cigarette demand equation.....	34
Table 20: Demand equation second part, alternative measures of smoking intensity	35
Table 21: Price elasticities of Russian youth.....	36

FOREWORD

In 1999, the World Bank published “Curbing the Epidemic: governments and the economics of tobacco control”, which summarizes the trends in global tobacco use and the resulting immense and growing burden of disease and premature death. By 1999, there were already 4 million deaths from tobacco each year, and this huge number is projected to grow to 10 million per year by 2030, given present trends in tobacco consumption. Already about half of these deaths are in high-income countries, but recent and continued increases in tobacco use in the developing world is causing the tobacco-related burden to shift increasingly to low- and middle-income countries. By 2030, seven of every ten tobacco-attributable deaths will be in developing countries. “Curbing the Epidemic” also summarizes the evidence on the set of policies and interventions that have proved to be effective and cost-effective in reducing tobacco use, in countries around the world.

Tax increases that raise the price of tobacco products are the most powerful policy tool to reduce tobacco use, and the single most cost-effective intervention. They are also the most effective intervention to persuade young people to quit or not to start smoking. This is because young people, like others with low incomes, tend to be highly sensitive to price increases.

Why are these proven cost effective tobacco control measures –especially tax increases– not adopted or implemented more strongly by governments? Many governments hesitate to act decisively to reduce tobacco use, because they fear that tax increases and other tobacco control measures might harm the economy, by reducing the economic benefits their country gains from growing, processing, manufacturing, exporting and taxing tobacco. The argument that “tobacco contributes revenues, jobs and incomes” is a formidable barrier to tobacco control in many countries. Are these fears supported by the facts?

In fact, these fears turn out to be largely unfounded, when the data and evidence on the economics of tobacco and tobacco control are examined. The team of about 30 internationally recognized experts in economics, epidemiology and other relevant disciplines who contributed to the analysis presented in “Curbing the Epidemic” reviewed a large body of existing evidence, and concluded strongly that in most countries, tobacco control would not lead to a net loss of jobs and could, in many circumstances actually generate new jobs. Tax increases would increase (not decrease) total tax revenues, even if cigarette smuggling increased to some extent. Furthermore, the evidence show that cigarette smuggling is caused at least as much by general corruption as by high tobacco product tax and price differentials, and the team recommended strongly that governments not forego the benefits of tobacco tax increases because they feared the possible impact on smuggling, but rather act to deter, detect and punish smuggling.

Much of the evidence presented and summarized in “Curbing the Epidemic” was from high income countries. But the main battleground against tobacco use is now in low- and

middle-incomes countries. If needless disease and millions of premature deaths are to be prevented, then it is crucial that developing countries raise tobacco taxes, introduce comprehensive bans on all advertising and promotion of tobacco products, ban smoking in public places, inform their citizens well about the harm that tobacco causes and the benefits of quitting, and provide advice and support to help people who smoke and chew tobacco, to quit.

In talking to policy-makers in developing countries, it became clear that there was a great need for country-specific analytic work, to provide a basis for policy making, within a sound economic framework. So the World Bank and the Tobacco Free Initiative of the World Health Organization (as well as some of the WHO regional offices and several other organizations, acting in partnership or independently) began to commission and support analysis of the economics of tobacco and tobacco control in many countries around the world.

The report presented in this Economic of Tobacco Discussion Paper makes a valuable contribution to our understanding of the issues and likely economic impact of tobacco control in a specific country setting. Our hope is that the information, analysis and recommendations will prove helpful to policy makers, and help result in stronger policies to reduce the unnecessary harm caused by tobacco use. The analysis of the situation in Russia is especially important because it suffers one of the greatest tobacco-related tolls of human suffering and economic loss in the world. It should be noted that the Global Youth Tobacco Survey data analyzed in this paper were collected in Moscow in 1999. In 2004, a second round of the GYTS is being conducted in Moscow and in other cities in Russia. Once these data are available for analysis, a more representative picture of tobacco use by Russian youth will be revealed, as well as the opportunity to compare the 2004 situation in Moscow with the 1999 data.

Joy de Beyer

Tobacco Control Coordinator
Health, Nutrition and Population
World Bank

ACKNOWLEDGEMENTS

This analysis was supported by funding provided to the World Bank by the US Centers for Disease Control and Prevention, Office on Smoking and Health. The author is grateful to the Russian Public Health Association, particularly to its president, Dr. Andrey Demin (Andrei Demine), for providing access to the Russian Global Youth Tobacco Survey data, for making available valuable information about the tobacco control environment in the Russian Federation, and for reviewing drafts of the paper. The author is also grateful to the World Bank for publishing the report as an HNP Discussion Paper.

1. INTRODUCTION

Russia has one of the world's highest rates of smoking. Tobacco use in Russia damages health, and imposes a significant economic burden in medical expenses, productivity lost as a result of tobacco-related illness and early deaths, and money spent on tobacco products instead of on other things that could improve households' well-being. Russian families spend an average of 15% of their total budget on cigarettes.¹

This report analyses data collected in Moscow in 1999 on teenage smoking behavior, attitudes and knowledge, from an economic perspective. Russia was one of the first countries to implement the Global Youth Tobacco Survey (GYTS) program of the US Centers for Disease Control and Prevention and the World Health Organization. A second round of the GYTS is being carried out in Russia in several cities in 2004, so the 1999 survey will be referred to as GYTS-1.

1.1 Socio-Economic Indicators in Russia

Table 1 shows basic socio-economic indicators for Russia compared with those for the European and Central Asia region at the end of 1999, the year of the GYTS-1 survey.

Table 1: Socio-economic indicators, 1999, Russia and Region Comparators

Basic socio-economic indicators	Russia	Europe & Central Asia Region
Population (millions)	146.2	475
GNP per capita (US\$)	2,250	2,150
GNP (US\$ billions)	329.0	1,022
Average annual growth, 1993-99: population (%)	-0.3	0.1
Average annual growth, 1993-99: labor force (%)	0.0	0.6
Poverty (% of population below national poverty line)	30	-
Urban population (% of total population)	73	67
Life expectancy at birth (years)	66	69
Infant mortality (per 1,000 live births)	16	22
Illiteracy (% of population age 15+)	1	3
Gross primary enrollment (% of school-age population)	109	100

Source: World Bank. 2000. Russian Federation at a Glance. www.worldbank.org/data/countrydata/countrydata.html

¹ Ministry of Health information, cited in Moscow Times, Sept 28, 2002.

1.2 Smoking Prevalence in Russia

Smoking became fashionable in Russia during the time of Peter I. The czar was a heavy smoker, and his habit contributed to his premature death.

Currently, smoking is popular in all sectors of Russian society, unconstrained by legal or social sanctions or restrictions (Gerasimenko and Demine 2001).² Smoking is more common among those suffering material deprivation and is also associated with heavy drinking (McKee et al. 1998). Cigarettes are the most popular form of tobacco consumption. Cheap papirosi, which contain fifth-grade tobacco, are popular among prisoners, soldiers and poor smokers. Instead of a filter, they have a long hollow cardboard tube, whose ends are squashed flat before being lit.

The prevalence of smoking in the 1990s among Russian adults has been estimated in several surveys. A multistage, stratified-sample survey undertaken in the summer of 1996 found that men aged 25 to 34 had the highest smoking prevalence at 73%, followed by men aged 18 to 24 with 65% smoking participation. There were 41% smokers among men aged 65 and older, but this lower smoking prevalence could be the result of higher death rates among smokers, as well as lower prevalence rates in the decades when these men began to smoke. Russian women smoke less than men—the Ministry of Health estimates overall prevalence at 63% for men and 10% for women, but smoking is strongly inversely related to age among women, reflecting sharp increases in prevalence over the past three decades. About 27% of women aged 18 to 34 were smokers in the 1996 survey, and 5% of women aged 55 and older (McKee et al. 1988). Recent evidence suggests that prevalence among young women has risen sharply (Demin 2004).

The unfavorable trend in smoking prevalence is also documented by estimates among the labor force where smoking increased from 51% in 1987 to 71% at the end of the 1990s (Gerasimenko and Demine 2001). Surveys at the end of the 1990s indicate that about 60% of current smokers say they would like to quit this unhealthy habit.

There have been several estimates of smoking prevalence among Russian youth:

- An early 1990s survey of smoking among Moscow school children found that 14% of boys aged 10 to 11 and 53% of boys aged 16 to 17 had smoked at least one cigarette in the three months before the survey. The corresponding figures for girls were much lower, at 1% and 28% respectively (Prokhorov and Alexandrov 1992).
- A 1993/94 study in St. Petersburg found that 60% of 15-year-old boys and 44% of 15-year-old girls had experimented with smoking.
- Follow-up studies in Moscow in 1992 and 1993 found an overall prevalence increase among 11- to 16-year-olds from 32% to 43%. Smoking among 13- to 16-year-old boys increased from 40% to 49%. The increase for girls, from 25% to 38%, was even greater (WHO 1997).

² Please note that Andrei K. Demine's name is also written (in its Anglicised version) as Andrey K. Demin.

- A 1994 survey of 4,594 school children in Nal'chik reported that 38% of boys and 12% of girls smoked at least one cigarette per week (El'Garov and El'Garova 1994).
- A survey in 1998 focusing on youth aged 11 to 15 found that 9% of males and 6% of females in this age group were already smoking daily (Currie et al. 2000).
- The estimates from the end of the 1990s suggest that 59% of males and 36% of female youth attending the higher grades of high school smoked. A survey from the same period among urban students aged 15 to 17 found that 39% of males and 28% of females smoked (Gerasimenko and Demine 2001). These estimates are close to the GYTS-1 results obtained at the beginning of 1999 in Moscow of 37% male and 28% female smoking participation among high school students.

The estimates of total domestic cigarette consumption at the end of the 1990s measured by sticks of cigarettes are imprecise because of the existence of the underground economy. BAT data report (legal) sales in Russia as 246 billion cigarettes in 2000. Estimates put total consumption (including black market sales) at between 300 and 700 billion cigarettes per year, with a guesstimate that 20% to 45% of all cigarettes available on the market are sold illegally (Gerasimenko and Demine 2001). Total spending on tobacco products is thought to be between US \$4-8 billion per year, compared to total annual spending on pharmaceuticals of only US \$2.5 billion per year (Gerasimenko and Demine 2001, Demin 2004). The Health Ministry estimate of total spending was much lower at 36 billion rubles (US1.14 billion) in 2002, but even this is an extremely large sum (Moscow Times, 2002).

The health consequences of these smoking rates are severe in Russia. The incidence of smoking-related deaths is already high and climbing. According to World Health Organization (WHO) estimates, about 300,000 deaths in Russia can be attributed to tobacco use every year, 100,000 of which are caused by cancer. This is more than the number of deaths caused by traffic accidents, use of illegal drugs, and suicide combined. It is estimated that a male smoker's life expectancy is 6.7 years shorter than a non-smoking man. The difference is 5.3 years for females (Gerasimenko and Demine 2001).

Employing a method developed by Peto et al. (1994), which uses estimates of the fraction of particular causes of death attributable to smoking, smoking was estimated to account for 30% of all male deaths (42% in the age group 35 to 69 years), and 4% of all female deaths (6% in the age group 35 to 69) in 1990. According to Peto et al.'s calculations, approximately 250,000 men died in Russia in 1995 due to tobacco use, three quarters of them (about 190,000) between the ages of 35 and 69.

It is obvious that tobacco use contributes to the extremely low life expectancy in Russia, which was 60 years for males, and 72 years for females in 1999 (World Bank 2001). Estimates for 1990 suggested that a man in Russia who reached the age of 35 had a 52% chance of dying before age 70, similar to the risk estimated for sub-Saharan Africa, and substantially higher than the average risk of death (30%) among middle-aged men in Western countries (Murray and Lopez 1997). The situation is unlikely to have improved since 1990.

1.3 The Impact and Influence of the Tobacco Industry

The consumption of cigarettes produced by Western companies accelerated in Russia in the 1990s. This was aided by the near collapse of local production capacity in 1990, due to a breakdown of distribution networks and lack of spare parts. Western companies rapidly took advantage of this situation with RJ Reynolds, Philip Morris, and British American Tobacco (BAT) providing an “emergency” supply of 38 billion cigarettes (Tobacco Control International 2000). This represented a 72-fold increase in the number of imported American cigarettes in the first six months of 1991 (Connolly 1996). Since then, cigarette imports have continued to rise, almost doubling between 1995 and 1998 from 41 billion to 75 billion cigarette sticks.

The demand for foreign cigarette brands, combined with diminishing production of local, cheaper cigarettes, created incentives for an illegal cigarette market. According to industry estimates, contraband and counterfeit goods make up around 4% to 5% of the foreign cigarette market. Legal cigarette production has grown dramatically, from 127 billion to 327 billion cigarettes between 1995 and 2000 (Table 2). Papirosi production levels fluctuated between 10 and 17 billion from 1995 to 2000, while their market share fell steadily.

Table 2: Production of cigarettes and papirosi in Russia, 1995–2000

Year	Cigarette production (billions of sticks)	Papirosi production (billions of sticks)	Total cigarette production		Total production	
			% with filters	% without filters	% of cigarettes	% of papirosi
1995	127	14	25	75	90	10
1996	132	10	31	69	93	7
1997	165	12	42	58	93	7
1998	197	14	48	52	93	7
1999	266	17	50	50	94	6
2000	327	14	54	46	96	4

Source: Demine, A. K. 2001a.

In 1994, the Russian Federation produced around 1,900 tons of raw tobacco (WHO 1997), which represented a decline in local production. In 1995, only 740 tons of raw tobacco was produced, and in 1998 production decreased further to 520 tons (Corrao et al. 2000). The gap left by local production was filled by raw tobacco imports, which rose sharply with the entrance of the international tobacco companies. From 1990 to 1994, Russia imported around 140,000 tons of raw tobacco annually. Tobacco leaf imports increased further by 40% between 1995 and 1998, reaching 200,830 tons in 1998 (Corrao et al. 2000). The import costs of tobacco in 1993 amounted to US \$348 million (0.7% of

all import costs), while export earnings from tobacco totaled only US \$6 million (0.01% of total export earnings) (WHO 1997).

During these years, transnational tobacco companies seized the opportunities created by the first stages of market reforms in Russia and formed partnerships with local tobacco businesses supported by the Russian government. Since 1991, Western investment in the tobacco industry has exceeded US \$2 billion, making it the largest Western investment in any sector in Russia. Around the time of the survey, over 65% of the Russian tobacco industry's capacity was under the control of the transnational industry, including RJ Reynolds (which became Japan Tobacco International (JTI) after 1999), the Liggett Group, Rothmans International Tobacco, BAT (these latter two merged in 1999), Reemtsma (purchased by Imperial Tobacco in 2002), and Philip Morris (Dobrov 2001).

Countries undergoing economic transition, such as Russia, are particularly vulnerable to the impact of global tobacco corporations because of the disproportionate budgets at the disposal of these corporations. Currently, over 51% of the shares in the Russian tobacco industry belong to foreign investors. These investors are well positioned, as the Russian tobacco market is the third most important in the world.

Of the 86 cigarette factories registered with the Russian Ministry of Finance, 60 are sizable plants, and 30 are large factories manufacturing major brands. Twenty factories are associated with Tabakprom, and 10 are joint ventures with foreign companies. These 10 account for 68% of the cigarettes made in the country (Weissman 2000). A local company called Yelets is the most important producer of papirosi in the country. It makes about five billion sticks a year under the brand name Belomorkanal. The same factory also produces the local cigarette brand Prima. Tabakprom, the domestic tobacco industry organization, estimates that domestically produced cigarettes account for around 50% to 60% of sales (WHO 1997). The Russian government seeks to promote domestic cigarette production and discourage cigarette imports by its tax policy.

The tobacco industry employs about 15,000 people and pays them less than US \$50 million per year (i.e., US \$3,333 average yearly salary). The annual net profit of the tobacco industry in Russia around the time of the survey was estimated to be at least US \$2 billion. In 1999, tobacco taxes collected amounted to slightly more than RUR 6 billion (about US \$24 million). The taxes collected from the tobacco industry accounted for only 2% of the federal budget (in some countries, tobacco taxes provide as much as 10% of total government revenues).

Tobacco companies in Russia, as in other countries, sponsor prestigious sports and cultural events and organize competitions with tempting prizes. In one attempt to improve their internationally damaged reputation, they developed a new strategy for dealing with the Russian public. In September 1999, a high-ranking representative of BAT announced that the company's official policy was that smoking is the free, informed, and responsible decision of adults, and minors should not smoke. Further, BAT expressed its willingness to learn more about the public health aspects of tobacco smoking in Russia and at the same time began to cooperate with the Government of

Moscow on anti-smoking street advertising for minors. The campaign motto was: “Smoking? There Is No Time for This,” and promoted sports instead of smoking. BAT further proposed to distribute information about smoking at all tobacco sales outlets. A representative of the company offered to collaborate with experts and non-governmental organizations. BAT has continued to run high-profile campaigns on Youth Smoking, and has been a strong presence in national tobacco policy discussions, including participation of a high ranking BAT official in the Russian Government delegation at the negotiation sessions for the WHO Framework Convention on Tobacco Control in Geneva, Switzerland (A. Demin, personal communication 2004).

The most important non-governmental organization (NGO) active in tobacco prevention, the Russian Public Health Association, has refused to collaborate with the tobacco industry. It sees the alleged Youth Smoking Prevention campaigns as a blatant ploy by BAT to enhance its public image, as a way to head off possible lawsuits by insurance companies and individuals, and an effort to preempt legislative efforts to regulate the industry.

In 2002 a National Coalition for Smoke Free Russia was established with technical and financial support from the Canadian International Development Agency (CIDA) and Canadian Public Health Association (CPHA).

1.4 Public Policy

Regulating tobacco consumption has a long tradition in Russia. As early as 1613, the ruling Romanoff family prohibited tobacco in the country, imposing severe penalties for smoking. The first offense was punished by whipping, a slit nose, and deportation to Siberia. The second offense led to execution. The smoking ban was lifted in 1676.

Current public policy is formulated by the Ministry of Health, which is advised by leading research institutions in the country. They work closely with the legislative body to establish laws regulating tobacco consumption and to secure financial resources necessary for the implementation and enforcement of these laws (Tkacenko 2002).

At the time of the GYTS-1 survey, the principal law regulating tobacco production, sale and consumption was the constitutional law of the Russian Federation Concerning the Protection of Citizens’ Health of 1993.

The Federal Law on Tobacco

As the existing legislative treatment of tobacco production, sale, and consumption did not sufficiently protect the nation from the negative consequences of smoking (Tkacenko 2002), in 1999 the Ministry of Health submitted a bill to the State Duma of the Federal Assembly of the Russian Federation that would limit smoking and the use of tobacco products, modeled on legislation in Canada and the EU. This initiative was supported by several research institutes and NGOs (Demine 2001). Particularly active was the Russian

Public Health Association (RPHA), which helped to prepare the draft of the Federal Law on Tobacco. The Duma accepted the principles stated in the document on June 10, 1999, after the first reading. However, strong tobacco industry lobbying effort succeeded in weakening the bill so much that many public health experts consider the amended version debated at the crucial second reading a step backwards rather than forwards for protecting health (Gerasimenko and Demine 2001).

For example, the original bill would have prohibited sale of cigarettes within 100 meters of health, educational, cultural, and sport institutions. Retailers would have been obligated to verify the age of any young person and face a fine and/or license revocation in case of non-compliance with the law. It also proposed a complete ban on advertising in all mass media, cinemas, and theaters and outdoors, and a ban on tobacco company sponsorship of cultural or sporting events.

The weakened bill passed on the second reading in the Duma, became law in July 2001, and came into force in January 2002. The articles include the following:

- Article 3 prohibits the manufacturing, distribution, and sale of filtered cigarettes with nicotine content over 1.2 mg and tar content over 14 mg. (The original bill had set limits of 1.1 mg for nicotine and 12 mg for tar.) The limits for non-filtered cigarettes are 1.3 mg of nicotine and 16 mg of tar. These limits affect mostly local cigarette producers, because, for example, the local cigarette brand Prima has a 22 mg tar level per cigarette, whereas Western cigarettes typically have much lower tar levels, around 12 mg of tar per cigarette. (The tar and nicotine levels adopted in 1995 had set a maximum level of 1.3 mg of nicotine for all cigarettes, and permissible levels of tar of 15 mg for imported cigarettes, 20 mg for domestic filtered cigarettes, and 24 mg for domestic unfiltered cigarettes.)
- All cigarette packs have to contain a readable health warning, which must occupy a minimum 4% of a pack's surface, and list nicotine and tar content of cigarettes. However, this is grossly below international "best practice" which requires warnings to cover at least 30% of the surface area of the largest face of the pack.
- The law forbids the sale of single cigarettes and cigarette packs containing fewer than 20 sticks, and bans cigarette sale through vending machines. However, there is no prohibition on cigarettes being given away free, a common promotional practice that targets young people. The article also prohibits tobacco sales in health, educational, cultural, and sports institutions.
- Article 4 imposes a legal age limit of 18 for purchasing tobacco products. Non-compliance with this law on the part of a store clerk can lead to an administrative hearing and sanctions.
- Article 5 states that advertising of tobacco products is regulated by the current law of the Russian Federation About Advertising (1995), which limits TV cigarette advertising.
- Article 6 bans smoking in workplaces, on public transport, during flights under three hours, in covered sport facilities, and in health care establishments. Smoking is also prohibited in cultural and educational institutions and in government buildings, with

the exception of designated, separated smoking areas. Violators of the provision may be subject to fines of up to 10 times the minimum monthly wage.

- Article 7 regulates the distribution of health information on smoking, and other prevention activities. These information and prevention messages are supposed to appear regularly in mass media and become an integral part of school curriculum. Smoking scenes are to be eliminated from new TV programs and featured films “unless deemed an integral element of the artistic design”, which makes the provision completely ineffectual. Smoking by public officials may not be promoted in public media.

Cigarette Taxes

Since 1991, tobacco prices have been increasing in nominal terms, but have fallen sharply in real terms (after adjusting for inflation). For example, the price of Marlboros fell in real terms by 8.5% each year between 1990 and 2000 (Guindon, Tobin and Yach, 2002). Excise taxes on tobacco products were introduced in 1994, and steep import duties on cigarettes (but not on raw tobacco) came into effect in the same year (Hurt 1995). This tax policy was designed to promote domestic cigarette production and discourage cigarette imports. Since 1995, all imported tobacco products have had to bear excise stamps.

After the financial crisis in August 1998, cigarettes increased in price 2.5 times in nominal terms, but prices fell in real terms, given high inflation fueled by the ruble devaluation against the US dollar. But the population’s purchasing power fell dramatically as a result of the crisis, and the trend evident from the early 1990s toward more expensive and higher-quality brands slowed down, and many smokers turned to cheaper cigarettes and papirosi. The average retail price per pack (in a supermarket) of Marlboro brand cigarettes in the first half of 1999 in Russia was US \$1.02. The most popular local brand cost about US \$0.62, and a pack of Belomorkanal papirosi sold for just US 7 cents (2 rubles) (Economist Intelligence Unit 2000, R. Dixon 2000). Taking into account purchasing power parity (considering price levels and incomes), cigarettes are more affordable in Russian than in most other countries (Guindon et al 2002).

Russia’s tobacco taxes were increased 100% on January 1, 2000, as had been announced one year previously by the Russian government. Despite this tax hike, Russian tobacco excise taxes remained among the lowest in the world, representing only 5% to 7% of the retail price (Mitreva 2000). According to the Ministry of Tax and Duties, further tax increases are inevitable.

In 2000, the highest cigarette excise taxes applied to long filtered cigarettes (85 mm in length) (RUR 60 per 1,000 sticks). The remaining cigarettes with filters were divided into five categories and subject to excise taxes ranging from RUR 41 to RUR 19 per 1,000 sticks. Cigarettes without filters were subject to an excise tax of RUR 7 per 1,000 sticks. Papirosi were taxed the least at RUR 4.8 per 1,000 sticks. Cigars were taxed between RUR 2.5 and 7.2 per stick. Loose tobacco for rolling cigarettes was subject to RUR 144 per kilogram excise tax. Standard pipe tobacco was taxed at RUR 32 per kilogram, but a

different variety of pipe tobacco was subject to RUR 336 per kilogram excise tax (USDA 2000).

In 1999, value added sales tax (VAT) was 20%. Import duty was levied at 33% of the cigarette price (minimum RUR 3 per 1,000 cigarettes). All imported cigarettes were further subjected to an excise import duty of ECU 2 per 1,000 cigarettes.

Government revenue from tobacco taxes has been increasing in nominal terms. In 1998 annual revenue totaled RUR 4 billion, and by 1999 the total had risen to RUR 6 billion. (In 1999 a special cigarette excise tax was introduced.) Furthermore, a new licensing law became effective in July 2000 and improved tax collection significantly (Mitreva 2000).

Restrictions on Smoking

In Russia, at the time of the GYTS-1 survey, smoking was prohibited in educational and health care facilities, in public transport, in government buildings, during domestic flights shorter than 5.5 hours, in theaters, in covered sports arenas, and in some workplaces (Corrao et al. 2000). Smoking was also forbidden in buildings occupied by the State Duma after June 28, 2000, and the local Moscow government adopted the same policy, making its legislative building a non-smoking facility. (However, some deputies proposed establishing designated smoking areas.) Compliance and enforcement are issues.

In St. Petersburg, the mayor declared the city a non-smoking zone, and in 2000, the Republic of Yakutsk set an important precedent by adopting a local law limiting the use of tobacco and tobacco products as part of its progressive public health prevention program. In Tyumen the local governor prohibited outdoor advertising of tobacco and alcohol.

Youth Access Restrictions

In 1981, the former Soviet Union banned cigarette sales to those under age 16. However, this measure was mostly ignored. Since 1994, the sale of cigarettes and other tobacco products to underage youth has been forbidden in Moscow (the city surveyed by the GYTS-1).

In 2000, in order to improve their image, tobacco companies in Russia began to call for a ban on cigarette sales to youths under 18 years old. However, the tobacco control bill that included a similar provision restricting youth sales (among other measures) debated by the Russian Parliament in 2001 was opposed by the strong tobacco lobby.

Advertising and Promotional Restrictions

In 1980, the former Soviet Union banned all tobacco advertising. However, after the break up of the USSR in 1991, this law was largely ignored. In 1993, the Duma (the Russian Parliament) approved restrictions on tobacco advertising as a part of the

constitutional law of the Russian Federation Concerning Physical Culture and Sport. It forbade the advertising of tobacco and tobacco products during sports programs on TV or radio (Tkacenko 2002). However, the press ministry refused to support the law because of the revenue consequences for advertising agencies.

In 1995, the Duma considered two versions of an anti-smoking advertising law: one prepared by the Ministry of Health and Medicine which proposed banning all tobacco advertising, and the second prepared by the State Anti-Monopoly Committee which proposed limiting tobacco advertising in mass media. The Parliament adopted the second (weaker) version, which banned tobacco advertising on television between 7 a.m. and 10 p.m., in public transport, in theaters, and in indoor sport facilities. Furthermore, the law stated that tobacco themes could not be used in youth-oriented programs, and all advertisements and domestic cigarette packs (but not imported ones) had to carry a health warning covering at least 5% of the surface of the advertisement or pack.

Once again, the legal restrictions on tobacco advertising were not enforced by the government, and were mostly ignored by the tobacco industry. The industry objections to the law were based on alleged job losses and loss of revenue by advertising agencies. The tobacco industry in Russia spends about US \$2 billion every year on tobacco advertising, a figure that contrasts sharply with the US \$20 million devoted to anti-smoking campaigns by the government.

The attempt to completely abolish all advertising of tobacco and tobacco products in the new tobacco law was met with sharp criticism by tobacco companies and advertising agencies, and a massive campaign against the bill, which resulted in the provisions on advertising being removed, on the grounds that they should be legislated separately in an advertising bill.

Other Tobacco Control Policies and Initiatives

- Since July 2000, the new licensing law prohibits the production and sale of tobacco products without a special license. To qualify for a producer license, a tobacco enterprise must have a control laboratory and meet several technological requirements. It is expected that the licensing of production will limit the production of low-quality tobacco products.
- Anti-tobacco programs are organized by The Ministry of Health and Medicine of the Russian Federation, with assistance from a designated coordinator and the Coordinating Council on Disease Prevention and Healthy Lifestyles. The ministry works closely with regional counterparts to promote preventive measures, create an efficient information system, and support tobacco cessation programs. A federal action plan to reduce smoking in Russia was adopted by all the regions in 1994, many of which prepared regional action plans as well. At the regional level, centers and departments of preventive medicine have carried out anti-tobacco programs. However, only 17 out of 89 regional offices run successful prevention programs as measured by targets established by the Complex Federal Program of the Ministry of Health (Gerasimenko and Demine 2001).

- The National Center for Preventive Medicine of the Russian Ministry of Health and the National Cancer Research Center have jointly developed a school curriculum for early prevention of smoking among children and adolescents. World No Tobacco Day and UICC (Union Internationale Contre le Cancer/International Union Against Cancer) International No Smoking Day are celebrated yearly, with wide distribution of materials and involvement of the media.
- The most active NGO in Russia focusing on smoking prevention is the Russian Public Health Association (RPHA), founded in 1995. It collaborates with public health experts and with relevant NGOs operating in Russia. RPHA has published several important documents on tobacco, including *Smoking or Health in Russia: Public Health Policy Report*. It is also involved in interventions at school level. RPHA conducted the GYTS-1 in Moscow (Demine 2001).
- There was an unsuccessful attempt on the part of some deputies to introduce a state monopoly on tobacco production and distribution. This proposal was turned down in the State Duma after international tobacco companies exercised their lobbying power (Gerasimenko and Demine 2001).
- Another initiative which was not passed in Parliament was “About genocide in the nations of the Russian Federation,” which declared tobacco and alcohol to be lethal products.
- In 2000, Russia joined the group of countries bringing lawsuits against the tobacco industry. It charged Philip Morris and other tobacco companies with causing suffering to Russian smokers, hiding the risks of cigarettes, and damaging Russia’s economy. A private party, a citizen of St. Petersburg, whose health was damaged by cigarette consumption, initiated another lawsuit in 2001.

2. DATA

2.1 The Global Youth Tobacco Survey

The World Health Organization (WHO) and the US Centers for Disease Control and Prevention developed the Global Youth Tobacco Survey (GYTS) project to track tobacco use among youth in countries around the world, using a common methodology and core questionnaire. The GYTS is school-based and employs a two-stage sample design to collect representative data on smoking among students aged 11 to 17. The first stage is a probabilistic selection of schools. The second stage is a random selection of classes from participating schools. All students in the selected classes were eligible for the survey. Though it was tempting to include numerous administrative territories throughout Russia, it was ultimately decided to conduct the survey in Moscow only, for logistic reasons (Demine 2001).

Russia’s GYTS-1 survey was implemented in Moscow by the Russian Public Health Association, as part of a joint project with the Canadian Public Health Association, with funding from the Canadian International Development Agency (CIDA) and Research for

International Tobacco Control (RITC), a secretariat of Canada's International Development Research Center (IDRC).

The survey was conducted in April and May 1999. All public schools containing any of grades 7, 8, 9, and 10 were included in the first-stage sampling frame. Schools were selected with probability proportional to school enrollment size. The second sampling stage consisted of systematic equal probability sampling (with a random start) of classes from each school that participated in the survey. A weight was associated with each questionnaire to reflect the likelihood of sampling each student and to reduce bias by compensating for differing patterns of non-response. There were 15 respondents who reported attending a professional school and two students who reported attending a technical school (although the survey was taken only in public schools). These latter students were considered out-of-scope and these 17 observations were dropped from the analyzed data.

Of the 100 schools originally selected, 99 participated in the survey (i.e., 99% response rate). In those schools, 4,074 of the 4,755 sampled students completed usable questionnaires (i.e., 86% response rate). The overall response rate was 85% (99% x 86%).

2.2 Data Variables

Numerous variables were constructed from the information available in the survey, and are discussed below. The missing observations on all created variables were captured by a series of dichotomous indicators, which assumed a value of one if the observation was missing, zero otherwise. Information coded in this manner allowed all observations to be kept in the analysis even when some data for a respondent were not available.

Smoking Behavior

The most important set of variables described the smoking behavior of respondents. The variable *Smoker* is a dichotomous indicator of current smoking participation and was defined as equal to one for those who smoked on at least one day during the 30 days prior to the survey, zero otherwise. According to this definition, there were 31.7% (± 2.6) current smokers in the sample.

There were 37 students who did not answer the question regarding number of smoking days, but indicated the number of cigarettes smoked on a day when they smoked (on average 1.8 cigarettes per day). To compensate for the missing information, a second dichotomous indicator of current smoking participation was created. The variable *Smoker1* was given the value of one for respondents who reported at smoking on at least one day during the last 30 days or who answered the question about how many cigarettes they had smoked on the days on which they smoker, zero otherwise. This yielded 32.7% (± 2.6) smokers in the sample.

The second definition of a smoker (Smoker1) was used in the analysis unless specified otherwise. Employing the broader definition reduced measurement error for students' smoking status and improved precision of the estimates, as, instead of 379 missing responses for variable Smoker, there were only 176 missing responses for variable Smoker1.³

Three continuous variables described smoking intensity of current smokers. The first intensity variable was the number of days during the 30 days before the survey on which respondents smoked at least one cigarette. (An average high school student smoker in Russia smoked 16.6 (\pm 0.9) days in a month.) The second intensity variable represented the average number of cigarettes smoked in a day when the respondent smoked. (On average, it was 5.7 (\pm 0.4) cigarettes per day.) The third intensity variable was constructed by multiplying the two previous measures, which gave the average cigarette consumption in the previous 30 days for a current smoker. (Average monthly consumption was 121.8 (\pm 13.2) cigarettes.) However, the monthly smoking intensity estimate may be biased due to the inconsistencies and missing observations in reporting the number of cigarettes and the number of smoking days. It was based on 1,193 observations, which represents only 96.6% of smokers defined by the most commonly used definition (variable Smoker1), and only 93.8% of smokers defined more loosely by variable Smoker1.

Some respondents used tobacco products other than cigarettes, so a dichotomous variable was created to identify the 10.7% (\pm 1.2) of respondents who used tobacco products other than cigarettes. There were 36.1% (\pm 2.5) of the students surveyed who smoked cigarettes and/or used some other form of tobacco product.

The survey also reported the brand of cigarette that students usually smoked. This information was coded in five dichotomous variables for the brands listed in the questionnaire (Golden Jawa, L&M, Lucky Strike, Camel, and Marlboro), one dichotomous variable for other non-listed brands, and one dichotomous indicator for those who did not have a favorite brand.

Some students, who were not classified as current smokers, may have been contemplating smoking, which is associated with a high probability of future smoking (McNeill et al. 1988). These students were identified by a dichotomous variable that equals zero if they said they definitely would not smoke a cigarette if offered one by a friend, and definitely thought they would not be smoking within a year or within five years, or one otherwise. The mean of this variable, 57.2 (\pm 2.1), indicated that over half of the non-smokers in the sampled population contemplated smoking.

³ The difference in the number of missing responses is much greater than the 37 respondents who did not answer the question about the number of smoking days because the data were weighted to take account of the survey design.

Socio-Economic Status

The socio-economic status of respondents was described by another set of variables. The average value for the continuous variable Age is 14.0 years (± 2.4). The minimum age coded in the survey was 11 years old or under, which was recorded as 11. The maximum age code for respondents was 17 or over, which was recorded as 17. The variable Male indicates the gender of a respondent, one for male and zero for female. In the sample, there were 49% male respondents and 51% female respondents.

Four dichotomous indicators captured the grade (7, 8, 9, or 10) students attended. The mean age increased with grade. The average age was 12.7 (± 0.1) in grade 7, 13.7 (± 0.1) in grade 8, 14.6 (± 0.1) in grade 9, and 15.6 (± 0.1) in grade 10. Most of the students attended the first three grades, with 27.7% in grade 7, 27.6% in grade 8, and 31.5% in grade 9. Grade 10 was represented the least, with only 13.4% of all respondents.

There was no information on personal or family income, or on educational attainment of parents in the survey.

Cigarette Price

Two measures of cigarette price were constructed from the survey based on responses to the question: “What is the price of the cigarettes that you usually smoke?” Only those who bought cigarettes provided this information (about 32% of the sample).

The first price measure was the individual’s exact response to this question (with prices expressed in rubles). On average, those who bought cigarettes paid RUR 14.1 (± 11.0) for each pack. The second measure is a school-based average of the individual responses, which was assigned to all students in the sample. The average of this price measure was RUR 14.3 (± 4.1) for a pack of cigarettes.

Exposure to Media Messages, Promotional Activities, and Prevention Efforts

The exposure of students to media messages and advertising was captured in four dichotomous variables: having seen cigarette brand names on TV, on billboards or posters, in newspapers or magazines, and during social events during the month before the survey. The four variables were added to create an index measuring total cigarette advertising exposure in media. The minimum value of the index is zero (only 1.1% (± 0.4) of the sample was not exposed to any cigarette advertising/promotion); the maximum index value is 4 -- almost half of the sample (47.8% ± 1.6) saw cigarette advertising or promotions in all four listed media/places. The average value of the index is 3.2 (± 0.03).

Non-media tobacco promotional activities were documented by two dichotomous variables: possession of a cigarette promotional product (22% (± 1.8) respondents possessed one or more), and having been offered a free cigarette by a company’s agent (17% (± 1.9) respondents were offered a free cigarette).

Two dichotomous indicators were used to measure exposure to anti-smoking messages, having seen print media anti-smoking advertising in the previous month (74.5% (± 1.8) respondents) and having seen anti-smoking advertising during a social event (57.6% (± 2.4) respondents) in the past month.

Both advertising and anti-smoking advertising variables are potentially endogenous because smoking status can affect attention paid to both types of message.

Exposure to information designed to discourage smoking was measured by several dichotomous indicators: cigarette harm discussed in the family, the danger of smoking taught in class, teen smoking discussed in class, and specific effects of smoking taught in class. Time since the last discussion of smoking during a lesson was captured by an index, which ranged from five (discussion about smoking occurred this school term) to zero (discussion about smoking never occurred). The information on school prevention efforts was summarized in a dichotomous indicator that was assigned a value of one if any school activity of this sort was reported. About 53% (± 2.2) of respondents were exposed to prevention efforts at school, and 38.6% (± 3.7) reported never discussing smoking at school. The variable capturing exposure to anti-smoking messages from family members (73% (± 1.5) of respondents) may be endogenous if smokers attracted more warning messages due to their risky behavior.

Knowledge of Health Consequences

Two variables were created for knowledge and beliefs about the health consequences of smoking: dichotomous indicators for believing (definitely or probably) that smoking is harmful to health, and that secondhand smoke is harmful to health. Nearly 93% (± 2.3) of respondents believed that smoking can harm the health of smokers, and 85% (± 2.3) viewed secondhand smoking as harmful to others. However, these beliefs can be influenced by a person's smoking status and both variables are therefore endogenous in the cigarette demand equation.

A dichotomous variable captured smoking status of fathers and mothers of respondents. More than 56% (± 1.6) of respondents said their father smoked, and nearly 23% (± 1.4) said their mother smoked, which is broadly consistent with surveys of adults.

The smoking status of friends was expressed as an index equaling zero if none of the respondent's friends smoked, one if some of them smoked, two if most of them smoked, and three if all of the respondent's friends smoked. The average value of the index was 1.2 (± 0.05), indicating that on average a respondent had one smoker among his or her friends.

3. BASIC DESCRIPTIVE STATISTICS

Because the GYTS-1 data were collected by a survey with a complex sample design, appropriate statistical techniques had to be employed to obtain accurate results. For example, it was necessary to use sampling weights to calculate point estimates (means and percentages). The sampling weights reflected the likelihood of sampling each student and reduced bias by compensating for differing patterns of non-response. Weighting the data allowed more accurate inferences about the larger population from which the sample was drawn. STATA statistical software processed the complex sample design of the GYTS-1.

Numerous variables describing young people's smoking behavior in Russia were analyzed first for the whole sample, then separately by gender, and then finally for each grade (7, 8, 9, and 10). Because attended grade is highly correlated with age, grade results can also be considered as age results.

Not all survey participants recorded their gender or the grade they were attending at the time of the survey. These respondents were excluded when making point estimates stratified by corresponding characteristics. As a result, a slightly different number of respondents was included when computing total sample estimates, estimates for each gender, and estimates for each grade, which explains why sample averages differ slightly from the number obtained by averaging estimates across genders or grades.

3.1 Smoking Prevalence and Intensity

Smoking prevalence among teenage students in Russia is described in Table 3. Nearly 67% of students had already experimented with cigarettes at the time of the survey. Using the standard definition of a current smoker (smoking on at least one of the previous 30 days), 31.7% of the sample were smokers (indicated as (1) in the table). Adding in the students who did not report the number of days they smoked in the past 30 but specified how many cigarettes they smoked per day, 32.7% of the sample were smokers (estimate (2) in the table). Almost half of those who had ever experimented with cigarettes were current smokers. Current smoking prevalence among females (27% or 28%, depending on the which variable was used) was only about 25% less than the male smoking rate (36% or 37%, depending on which variable was used).

Table 3: Smoking prevalence (%) among teenage students, by gender and grade

Behavior	Sample	Male	Female	Grade 7	Grade 8	Grade 9	Grade 10
Any cigarette experience	66.7 (± 2.7)	71.4 (± 3.1)	61.7 (± 3.4)	57.9 (± 5.3)	64.2 (± 4.1)	71.3 (± 4.3)	75.7 (± 6.4)
Current smoker (1)	31.7 (± 2.6)	36.1 (± 3.2)	27.4 (± 3.2)	21.4 (± 4.4)	27.5 (± 4.0)	38.8 (± 4.2)	42.4 (± 6.6)
Current smoker (2)	32.7 (± 2.6)	37.1 (± 3.3)	28.4 (± 3.3)	22.8 (± 4.6)	28.1 (± 4.1)	39.6 (± 4.3)	43.1 (± 6.7)
Currently use other tobacco products	10.7 (± 1.2)	15.4 (± 2.1)	6.1 (± 1.0)	9.0 (± 2.2)	9.3 (± 2.0)	11.5 (± 2.6)	14.4 (± 3.7)
Currently use any tobacco product	36.1 (± 2.5)	41.5 (± 3.2)	30.5 (± 3.2)	27.0 (± 4.1)	32.1 (± 4.0)	41.8 (± 4.2)	46.2 (± 6.2)
Tried cigarettes before age 10 (% of those who ever smoked)	22.8 (± 1.3)	32.9 (± 2.2)	11.6 (± 1.5)	31.1 (± 3.2)	24.1 (± 2.6)	17.9 (± 2.2)	19.0 (± 2.8)

Notes: The numbers in parentheses represent 95% robust confidence interval.

Both smoking experimentation and cigarette use increased with grade, which was highly correlated with age.

Russians began their smoking experience relatively early, particularly boys. Almost one-third of males in the sample population had tried a cigarette before the age of 10. Younger students reported having started experimenting with cigarettes earlier than their older counterparts, which may indicate a trend among Russian youth toward earlier experimenting.

The use of other tobacco products was less common than cigarette use, but significant. More than 15% of male students and about 6% of females reported using other tobacco products. Over 36% of Russian youth used some form of tobacco product.

The frequency and intensity of smoking among current cigarette smokers is analyzed in Table 4. The intensity among males was almost twice as high as among females. One-third of smokers consumed cigarettes on a daily basis, and the majority of them consumed between two to five cigarettes per day. The number of smoking days increased with grade. On average, smokers in Russian high schools smoked about 122 cigarettes per month.

Over one-third of current smokers (more females than males) said they were more likely to smoke if they were drinking or using other drugs. The strength of the smoking-drinking link increased with grade/age.

Starting the day with a cigarette or having a desire to do so is one measure of addiction. According to this measure, more male teenage smokers (43%) were addicted than females (29%). The rate of addiction increased with grade/age until grade 9.

Table 4: Behavior of current cigarette smokers

Behavior	Sample	Male	Female	Grade 7	Grade 8	Grade 9	Grade 10
Number of smoking days in a month	16.6 (± 0.9)	18.8 (± 1.1)	14.0 (± 1.2)	13.7 (± 2.4)	14.9 (± 2.0)	17.9 (± 1.1)	18.6 (± 1.5)
-smokes 1 or 2 days/month (%)	19.5 (± 2.5)	13.1 (± 3.0)	27.1 (± 3.7)	28.2 (± 8.3)	24.0 (± 6.3)	16.2 (± 3.8)	12.6 (± 4.4)
-smokes 3 to 5 days/month (%)	11.9 (± 2.0)	11.0 (± 2.7)	12.7 (± 2.6)	14.2 (± 5.0)	14.5 (± 5.1)	9.4 (± 2.3)	11.3 (± 4.5)
-smokes 6 to 9 days/month (%)	9.8 (± 1.8)	9.5 (± 2.1)	10.3 (± 2.5)	9.0 (± 3.6)	8.5 (± 3.5)	10.8 (± 3.3)	10.6 (± 3.7)
-smokes 10 to 19 days/month (%)	11.4 (± 1.9)	10.9 (± 2.5)	12.0 (± 2.8)	12.3 (± 3.9)	11.2 (± 4.0)	11.3 (± 3.5)	11.0 (± 3.7)
-smokes 20 to 29 days/month (%)	14.4 (± 2.5)	15.0 (± 3.1)	13.8 (± 3.1)	12.1 (± 5.7)	15.2 (± 5.3)	14.8 (± 3.2)	14.6 (± 5.3)
-smokes each day (%)	33.0 (± 3.3)	40.5 (± 4.5)	24.1 (± 4.6)	24.1 (± 3.4)	26.7 (± 7.5)	37.5 (± 5.2)	39.9 (± 3.3)
Number of cigarettes per day	5.7 (± 0.4)	6.5 (± 0.5)	4.6 (± 0.5)	4.8 (± 1.1)	5.4 (± 1.1)	6.0 (± 0.6)	5.8 (± 0.8)
-usually less than 1 cigarette/day (%)	12.4 (± 2.3)	9.5 (± 2.2)	15.6 (± 3.7)	16.5 (± 6.3)	18.0 (± 5.9)	8.8 (± 2.3)	8.7 (± 4.4)
-usually 1 cig/smoking day (%)	18.7 (± 2.1)	16.3 (± 2.7)	22.3 (± 3.6)	24.4 (± 6.0)	21.9 (± 5.6)	16.2 (± 3.8)	15.2 (± 4.0)
-usually 2-5 cigarettes/smoking day (%)	39.0 (± 3.3)	37.0 (± 3.3)	41.6 (± 5.0)	38.6 (± 8.2)	35.2 (± 6.5)	38.7 (± 5.0)	43.7 (± 6.6)
-usually 6-10 cigarettes/smoking day (%)	19.7 (± 2.6)	22.8 (± 3.1)	15.2 (± 3.9)	13.9 (± 5.4)	14.9 (± 4.7)	25.4 (± 4.5)	21.0 (± 4.3)
-usually 11-20 cigarettes/smoking day (%)	7.8 (± 1.9)	10.7 (± 2.6)	4.4 (± 2.0)	3.9 (± 2.8)	7.6 (± 3.3)	8.3 (± 2.5)	9.7 (± 4.6)
-usually > 20 cigarettes/smoking day (%)	2.4 (± 0.9)	3.6 (± 1.3)	1.1 (± 0.9)	2.8 (± 3.3)	2.4 (± 1.9)	2.7 (± 1.6)	1.7 (± 1.5)
Number of cigarettes per month	121.8 (± 13.2)	153.1 (± 16.5)	83.9 (± 14.8)	106.7 (± 35.3)	117.9 (± 33.9)	146.2 (± 20.9)	140.9 (± 26.1)
Smoking encouraged by alcohol/drugs	37.2 (± 4.3)	35.5 (± 4.4)	39.8 (± 6.1)	19.8 (± 8.2)	25.8 (± 5.0)	41.6 (± 5.6)	53.5 (± 8.0)
Smokes in the early morning (addiction)	36.2 (± 3.3)	42.7 (± 4.9)	28.8 (± 3.8)	28.6 (± 6.7)	30.6 (± 6.7)	43.1 (± 5.3)	38.6 (± 6.9)

Notes: The numbers in parentheses represent a 95% confidence interval.

3.2 Consumption Localities and Sources of Cigarettes

Table 5 describes where students usually smoke. Smokers were asked to select one out of seven listed places. Most said they smoked in public places such as streets, parks, and stores. Social events were also a popular venue, selected by almost 14% of smokers, more often by females than by males. Smoking at school was more common among

males then females, and was more prevalent among the oldest cohort in grade 10. Smoking at home was more frequent among younger students.

Table 5: Where students smoke (current and former smokers only)

Usual place for smoking	Sample %	Male %	Female %	Grade 7 %	Grade 8 %	Grade 9 %	Grade 10 %
Home	6.1 (± 1.2)	5.4 (± 1.6)	6.8 (± 2.3)	7.2 (± 2.9)	5.4 (± 2.3)	6.1 (± 2.0)	5.9 (± 3.6)
School	6.9 (± 2.2)	7.8 (± 2.9)	5.7 (± 2.7)	6.8 (± 6.0)	5.5 (± 2.9)	6.3 (± 2.8)	9.7 (± 5.0)
Work	0.2 (± 0.2)	0.0 (± 0.0)	0.3 (± 0.4)	0.0 (± 0.0)	0.0 (± 0.0)	0.4 (± 0.5)	0.4 (± 0.8)
Friend's house	4.2 (± 1.1)	2.7 (± 1.5)	6.0 (± 1.9)	4.4 (± 2.4)	4.3 (± 2.6)	4.6 (± 2.0)	3.8 (± 2.5)
Social events	13.6 (± 2.7)	8.4 (± 2.2)	19.7 (± 5.0)	8.7 (± 3.6)	9.6 (± 3.8)	14.6 (± 3.6)	22.1 (± 8.4)
Public spaces (e.g., street, parks, store)	43.5 (± 3.1)	46.6 (± 4.1)	40.2 (± 5.3)	34.1 (± 6.5)	45.7 (± 6.8)	47.9 (± 5.1)	43.6 (± 8.8)
Other	25.5 (± 2.9)	29.2 (± 3.6)	21.4 (± 3.6)	38.8 (± 5.8)	29.5 (± 5.6)	20.2 (± 3.8)	14.7 (± 5.9)

Notes: The numbers in parentheses represent a 95% confidence interval.

Sources of cigarettes for current smokers and issues related to youth access to cigarettes are reported in Table 6. The most common way of obtaining cigarettes was to buy them in stores or from street vendors (63% of the sample). The second most common source was to borrow cigarettes from another person. Borrowing was common among one-fifth of the female smokers. Vending machines were a source of cigarettes for 6.5% of smokers. Stealing cigarettes, asking somebody else to buy cigarettes for them, and receiving cigarettes as gifts was more common among younger smokers.

Even though only 10% of students in the sample were legally eligible to buy cigarettes, students of all ages were successful in obtaining cigarettes by some means. This is evidence of weak enforcement of the law restricting sales to youth. On average, about one-fifth of those who attempted to buy cigarettes were denied the purchase. Girls were more successful in buying cigarettes than boys. The denial rate decreased with age.

Table 6: How students get cigarettes (current smokers only)

Usual means of getting cigarettes	Sample %	Male %	Female %	Grade 7 %	Grade 8 %	Grade 9 %	Grade 10 %
Buy in store/street vendor	63.0 (± 3.7)	67.5 (± 4.5)	57.6 (± 5.5)	55.3 (± 6.3)	63.1 (± 6.5)	65.4 (± 5.1)	64.8 (± 6.8)
Buy from vending machine	6.5 (± 3.7)	6.4 (± 2.2)	6.9 (± 2.8)	9.0 (± 4.5)	6.6 (± 1.9)	7.7 (± 3.2)	6.3 (± 3.9)
Buy through someone else	1.7 (± 0.8)	1.1 (± 0.8)	2.2 (± 1.4)	3.3 (± 2.4)	2.1 (± 1.1)	2.2 (± 1.6)	0.0 (± 0.0)
Borrow	16.7 (± 2.4)	13.7 (± 2.7)	20.5 (± 4.3)	15.9 (± 5.4)	18.3 (± 4.9)	15.2 (± 3.7)	18.4 (± 4.7)
Steal	2.3 (± 0.9)	1.8 (± 1.2)	2.9 (± 1.4)	5.2 (± 3.0)	2.6 (± 1.9)	1.3 (± 1.0)	1.3 (± 1.4)
Gift from older person	5.2 (± 1.3)	4.6 (± 1.7)	5.4 (± 1.7)	7.0 (± 3.7)	7.3 (± 2.5)	4.4 (± 1.9)	3.3 (± 2.5)
Get cigarettes in some other way	4.6 (± 1.2)	4.8 (± 1.8)	4.4 (± 1.9)	4.3 (± 2.7)	4.5 (± 2.7)	3.9 (± 2.0)	6.0 (± 3.4)
Denied sale due to age (current smokers who buy cigarettes)	19.8 (± 3.7)	25.7 (± 5.2)	11.9 (± 3.4)	38.4 (± 8.0)	27.9 (± 7.2)	14.1 (± 4.2)	4.4 (± 3.3)

Notes: The numbers in parentheses represent a 95% confidence interval.

Comparing cigarette sources for smokers with different smoking intensities explores whether methods of obtaining cigarettes change with the level of cigarette use. For this purpose, all smokers were divided into four groups according to number of smoking days per month and number of cigarettes per smoking day. The results in Table 7 show that smokers with higher smoking intensity relied much more on commercial sources of cigarettes compared to those who smoked with lower intensity. Borrowing cigarettes, stealing them, or receiving them as a gift were the more usual methods for less frequent smokers. Almost 41% of people who smoked on less than 10 days a month used these sources of cigarettes. Only 12% of those who smoked 10 or more days per month obtained their cigarettes in the same way. The denial rate in attempts to purchase cigarettes was higher for less frequent smokers (who also tend to be younger). Frequent smokers may have already established a more reliable source of cigarettes.

Table 7: How students get cigarettes – by smoking intensity (current smokers only)

Usual means of getting cigarettes	Smokes on less than 10 days/month (%)	Smokes on 10 or more days/month (%)	Smokes 5 or fewer cigarettes/day (%)	Smokes more than 5 cigarettes/day (%)
Buy in store/street vendor	44.9 (± 5.5)	76.2 (± 4.2)	56.2 (± 4.5)	79.4 (± 4.5)
Buy from vending machine	4.6 (± 1.9)	7.9 (± 2.7)	7.1 (± 2.2)	5.3 (± 2.6)
Buy through someone else	2.7 (± 1.4)	0.8 (± 0.7)	1.7 (± 0.9)	1.0 (± 1.0)
Borrow	30.1 (± 4.4)	7.3 (± 1.9)	21.3 (± 3.0)	5.9 (± 2.7)
Steal	4.2 (± 1.8)	0.9 (± 0.8)	2.7 (± 1.1)	0.8 (± 1.1)
Gift from older person	7.1 (± 2.4)	3.7 (± 1.6)	5.9 (± 1.6)	4.0 (± 2.2)
Get cigarettes in some other way	6.4 (± 2.3)	3.1 (± 1.6)	5.2 (± 1.5)	3.6 (± 2.3)
Denied sale due to age (of current smokers who buy cigarettes)	21.0 (± 5.2)	16.4 (± 3.9)	20.2 (± 4.5)	14.3 (± 4.5)

Note: The numbers in parentheses represent a 95% confidence interval.

3.3 Brand Choices and Prices Paid For Cigarettes

Table 8 reports how much Russian teenage smokers said they usually paid for their cigarettes. The majority of those who bought cigarettes paid between RUR 11 and 15 per pack (about US \$0.44 to \$0.60). The average price paid was higher for females than males, and increased with age/grade.

Table 8: Usual price paid for their cigarettes by smokers who buy cigarettes

Price paid	Sample	Male	Female	Grade 7	Grade 8	Grade 9	Grade 10
Less than RUR 5 (%)	3.7 (± 1.1)	4.1 (± 1.7)	2.9 (± 1.4)	8.8 (± 3.8)	3.8 (± 2.3)	1.3 (± 1.3)	2.4 (± 2.1)
RUR 5 to 10 (%)	19.3 (± 3.4)	24.6 (± 5.1)	12.4 (± 3.2)	28.8 (± 7.5)	23.7 (± 6.5)	14.6 (± 4.7)	12.1 (± 6.6)
RUR 11 to 15 (%)	43.2 (± 3.7)	43.9 (± 4.8)	42.9 (± 5.1)	33.0 (± 7.3)	39.6 (± 6.2)	50.8 (± 6.3)	46.6 (± 7.9)
RUR 16 to 20 (%)	16.5 (± 3.1)	13.0 (± 3.3)	21.2 (± 4.4)	12.9 (± 5.0)	17.8 (± 5.7)	17.9 (± 4.4)	16.2 (± 4.8)
Over RUR 20 (%)	17.3 (± 2.8)	14.4 (± 3.2)	20.6 (± 4.3)	16.4 (± 5.4)	15.3 (± 4.8)	15.4 (± 5.7)	22.6 (± 5.8)
Average price	14.1 (± 0.4)	13.3 (± 0.5)	15.1 (± 0.5)	12.8 (± 0.9)	13.7 (± 0.8)	14.5 (± 0.7)	15.1 (± 1.0)

Note: The numbers in parentheses represent a 95% confidence interval.

Table 9 tabulates average price paid by smoking intensity. Overall, there was no significant difference in average price across the subsamples shown, but there were more occasional and light smokers in the higher price ranges. This may reflect gender differences, or perhaps that heavier smokers choose cheaper cigarette brands or seek out cheaper sources.

Table 9: Price paid for cigarettes by smokers who buy cigarettes, by intensity

Price paid	Smokes < 10 days/month	Smokes 10+ days/month	Smokes 5 or less cigs/day	Smokes > 5 cigs/day
< RUR 5 (%)	3.7 (± 2.0)	3.1 (± 1.6)	4.4 (± 1.8)	1.2 (± 1.8)
RUR 5 to 10 (%)	18.3 (± 4.8)	18.4 (± 4.3)	19.2 (± 4.1)	16.0 (± 5.2)
RUR 11 to 15 (%)	37.2 (± 4.6)	51.4 (± 5.1)	41.3 (± 4.9)	56.7 (± 6.2)
RUR 16 to 20 (%)	20.3 (± 4.2)	14.2 (± 3.8)	18.4 (± 3.9)	12.8 (± 3.9)
Over RUR 20 (%)	20.5 (± 5.0)	12.9 (± 3.4)	16.7 (± 3.9)	13.3 (± 4.1)
Average price	14.6 (± 0.5)	13.7 (± 0.6)	14.2 (± 0.5)	14.0 (± 0.7)

Notes: The numbers in parentheses represent a 95% confidence interval.

Table 10 summarizes the popularity of five listed cigarette brands. The cheapest, Golden Jawa, locally produced by BAT, was the most popular, although L&M was more popular among females and younger smokers. Most students reported smoking some other brand, perhaps cheap local brands or papirosi (given the low average prices paid). Established brand preference was more common among males than females.

Table 10: Brand choices (percent of current smokers)

Brand	Sample	Male	Female	Grade 7	Grade 8	Grade 9	Grade 10
Golden Jawa	19.7 (± 3.5)	26.9 (± 5.5)	10.7 (± 3.0)	12.2 (± 5.6)	22.2 (± 5.8)	23.6 (± 6.4)	17.1 (± 6.0)
L&M	13.7 (± 2.4)	10.9 (± 2.8)	17.7 (± 4.1)	19.5 (± 7.3)	14.2 (± 4.9)	12.7 (± 3.4)	10.4 (± 4.7)
Lucky Strike	1.8 (± 0.8)	2.7 (± 1.5)	0.6 (± 0.7)	1.7 (± 1.6)	1.0 (± 1.2)	3.0 (± 1.7)	0.5 (± 0.9)
Camel	1.5 (± 0.7)	1.5 (± 1.0)	1.3 (± 1.0)	2.7 (± 2.1)	2.0 (± 1.4)	1.2 (± 1.0)	0.4 (± 0.8)
Marlboro	11.7 (± 1.8)	12.5 (± 2.3)	11.0 (± 3.0)	13.2 (± 4.8)	11.2 (± 4.1)	10.0 (± 2.7)	13.4 (± 4.6)
Other brands	35.9 (± 4.0)	31.5 (± 4.9)	41.3 (± 4.9)	35.5 (± 10.0)	27.4 (± 5.7)	36.3 (± 5.6)	44.6 (± 8.7)
No brand preference	15.7 (± 2.4)	14.0 (± 2.5)	17.4 (± 3.6)	15.1 (± 5.3)	22.1 (± 5.4)	13.2 (± 3.5)	13.6 (± 4.8)

Note: The numbers in parentheses represent a 95% confidence interval.

Table 11 analyzes how much smokers with different brand preferences usually paid for their cigarettes. The highest spenders were those who smoked Marlboro, followed by Camel smokers. Golden Jawa smokers paid the least. Those who spent relatively small amounts per pack tended to have no brand preference. The wide variation in price paid for Lucky Strikes and Marlboros is striking, and suggests that many are buying on the black market.

Table 11: Brand choices and price paid for cigarettes, percent of current smokers who buy cigarettes

	Less than RUR 5	RUR 5 to 10	RUR 11 to 15	RUR 16 to 20	Over RUR 20
Golden Jawa	2.5 (± 1.8)	27.7 (± 8.6)	62.0 (± 7.7)	6.2 (± 3.8)	1.6 (± 1.6)
L&M	3.8 (± 3.1)	18.0 (± 7.2)	57.9 (± 10.5)	18.1 (± 6.7)	2.2 (± 2.5)
Lucky Strike	5.0 (± 10.2)	0.0 (± 0.0)	37.1 (± 22.0)	27.1 (± 19.6)	30.7 (± 23.8)
Camel	0.0 (± 0.0)	0.0 (± 0.0)	41.5 (± 24.5)	52.6 (± 24.8)	6.0 (± 11.6)
Marlboro	2.4 (± 2.8)	4.3 (± 4.0)	18.9 (± 7.8)	38.1 (± 8.6)	36.4 (± 9.2)
Other non-listed brands	2.7 (± 1.8)	17.8 (± 4.1)	42.0 (± 6.2)	14.2 (± 3.9)	23.3 (± 6.5)
No brand preference	9.1 (± 5.7)	25.0 (± 12.4)	44.2 (± 12.0)	15.8 (± 7.3)	6.0 (± 4.9)

Notes: The numbers in parentheses represent a 95% confidence interval.

3.4 Smoking Uptake, Cessation Efforts, and Perceived Risk of Smoking

The students' beliefs and intentions about their future smoking behavior are reported in Table 12. Over 5% of current non-smokers said they would probably or definitely accept a cigarette from a friend, almost 5% expected to probably or definitely smoke within a year, and about 7% believed they would probably or definitely smoke within five years. All these expectations were stronger among females. The intention to smoke within a year increased with age.

Over 57% of current non-smokers can be classified as high-risk for smoking uptake--a commonly used definition is that only non-smokers who answered "definitely not" to all three questions are not at risk of starting to smoke. This risk is higher among females. Psychologists and sociologists suggest that high-risk smoking uptake individuals are particularly susceptible to prevention measures (Pierce et al. 1998).

Seventy percent of current smokers expressed a desire to quit their habit, and 90% believed they could do so easily. Almost 77% of those who smoked in the previous year had tried to quit. Almost 64% of those who had ever smoked reported that they had already succeeded in giving up smoking. This is inconsistent with the data presented in

Table 3, which show that about 67% of students reported having experimented with cigarettes and a third of the sample were classified as current smokers. Taking all experimenters as the “ever smoked” group, the successful quitting rate could be at most a little over 50%. This discrepancy is evidence of students’ misperceptions about smoking behavior and the ease of quitting. Many smokers did not consider themselves smokers, or believed they had already successfully quit, despite still occasionally smoking.

Table 12: Attitudes toward future smoking and quitting (%)

	Sample	Male	Female	Grade 7	Grade 8	Grade 9	Grade 10
Will smoke if offered a cigarette by a friend (% of non-smokers)	5.3 (± 0.7)	3.2 (± 0.7)	6.9 (± 1.2)	5.1 (± 1.3)	6.9 (± 1.6)	3.6 (± 1.0)	5.2 (± 1.7)
Expect to smoke within a year (% of current non-smokers only)	4.8 (± 0.7)	4.1 (± 1.0)	5.0 (± 0.9)	3.8 (± 1.1)	4.7 (± 1.4)	4.4 (± 1.2)	7.2 (± 0.6)
Expect to smoke within 5 years (non-smokers only)	7.1 (± 0.7)	6.8 (± 1.2)	7.4 (± 1.0)	7.6 (± 1.3)	8.0 (± 1.4)	5.3 (± 1.2)	7.1 (± 2.3)
High-risk smoking uptake (current non-smokers only)	57.2 (± 2.1)	54.6 (± 3.8)	59.2 (± 3.0)	56.5 (± 4.4)	57.0 (± 4.3)	59.3 (± 4.3)	55.3 (± 5.4)
Current desire to stop smoking (% smokers)	70.6 (± 3.1)	71.5 (± 4.0)	68.9 (± 5.7)	69.1 (± 8.0)	73.3 (± 5.5)	68.5 (± 6.4)	71.4 (± 6.5)
Tried to quit during the past year (of those who smoked last year)	76.9 (± 3.0)	76.6 (± 3.7)	76.9 (± 4.1)	77.3 (± 6.4)	78.4 (± 4.9)	77.1 (± 3.5)	74.2 (± 7.1)
Thinks he/she can quit easily (% current smokers)	90.6 (± 1.6)	89.9 (± 2.6)	91.6 (± 2.9)	91.4 (± 4.4)	90.3 (± 3.4)	89.3 (± 3.1)	92.5 (± 3.0)
Successfully quit smoking (of those who ever smoked)	63.7 (± 2.9)	60.7 (± 4.0)	66.8 (± 3.1)	79.2 (± 5.7)	69.5 (± 4.8)	54.6 (± 4.3)	50.6 (± 5.6)
Quit smoking due to health concerns (of those who quit)	60.1 (± 3.0)	64.4 (± 4.4)	55.2 (± 3.9)	63.0 (± 4.8)	60.5 (± 4.9)	61.0 (± 5.3)	53.5 (± 7.4)
Quit smoking to save money (of those who quit)	3.7 (± 1.2)	4.8 (± 1.9)	2.7 (± 1.0)	2.5 (± 1.2)	2.9 (± 1.6)	4.1 (± 2.0)	6.8 (± 4.4)
Quit smoking due to family pressure (of those who quit)	6.4 (± 1.4)	7.1 (± 1.7)	5.6 (± 2.1)	6.9 (± 2.7)	5.6 (± 2.2)	6.3 (± 1.9)	6.7 (± 3.4)
Quit smoking due to peer pressure (of those who quit)	2.5 (± 0.7)	1.4 (± 0.8)	3.7 (± 1.3)	2.0 (± 1.3)	3.7 (± 1.9)	1.8 (± 1.2)	2.2 (± 1.5)
Received professional help to quit (of those who ever smoked)	7.9 (± 1.3)	8.4 (± 2.0)	6.9 (± 1.3)	8.6 (± 2.1)	7.6 (± 2.5)	7.9 (± 2.4)	6.7 (± 2.7)

Note: The numbers in parentheses represent a 95% confidence interval.

Eight percent of those who had ever smoked had received professional help to quit smoking. Health concerns were the main reason for quitting, especially among males. Only 3.7% of respondents cited saving money as the reason for quitting smoking, with more males than females being motivated to quit by financial reasons. Studies in the US

have found that economic concerns are more pressing for males than for females (Chaloupka and Pacula 1999).

Students' knowledge of the health consequences of smoking is documented in Table 13. Only 65% of students thought that smoking definitely harmed health; 28% thought it was probably harmful and 7% did not think it was a risk to health. Only about half were convinced that secondhand smoke was a health risk, a third thought it probably harmed health, and 15% thought it probably or definitely was not harmful to health. There were differences between smokers and non-smokers with respect to these beliefs. Smokers were less convinced of the detrimental effects of cigarette consumption, which indicates that smokers internalize less information about health risks than non-smokers. The youngest group was least knowledgeable about the health risks of smoking.

Table 13: Perceived risk of smoking (%)

Beliefs	Sample	Smokers	Non-smokers	Grade 7	Grade 8	Grade 9	Grade 10
Smoking is harmful to your health (probably or definitely yes)	92.9 (± 2.3)	93.0 (± 3.3)	92.9 (± 2.6)	91.4 (± 3.6)	93.3 (± 3.6)	92.3 (± 4.4)	95.7 (± 5.7)
- smoking is definitely harmful to your health	64.8 (± 2.4)	59.3 (± 3.4)	67.7 (± 2.7)	62.9 (± 3.8)	63.7 (± 3.9)	63.7 (± 4.4)	70.8 (± 5.7)
- smoking is probably harmful to your health	28.1 (± 2.2)	33.7 (± 3.1)	25.2 (± 2.4)	28.5 (± 3.4)	29.6 (± 3.3)	28.6 (± 4.3)	24.9 (± 5.8)
- smoking is definitely not harmful to your health	4.7 (± 0.8)	3.9 (± 1.2)	5.1 (± 1.0)	5.7 (± 1.3)	4.2 (± 1.1)	5.4 (± 1.5)	3.0 (± 1.8)
- smoking is probably not harmful to your health	2.4 (± 0.4)	3.2 (± 0.9)	2.0 (± 0.5)	3.0 (± 1.1)	2.5 (± 1.0)	2.3 (± 0.7)	1.2 (± 1.2)
Secondhand smoke is harmful (probably or definitely yes)	85.4 (± 2.3)	83.2 (± 3.3)	86.3 (± 2.5)	82.0 (± 3.3)	83.8 (± 3.2)	86.6 (± 4.1)	91.3 (± 5.5)
- secondhand smoke is definitely harmful	51.9 (± 2.5)	47.0 (± 4.0)	54.2 (± 2.7)	49.8 (± 3.8)	48.6 (± 3.5)	51.2 (± 4.1)	61.0 (± 6.0)
- secondhand smoke is probably harmful	33.5 (± 1.9)	36.2 (± 2.7)	32.1 (± 1.1)	32.2 (± 2.7)	35.2 (± 2.9)	35.4 (± 4.1)	30.4 (± 5.0)
- secondhand smoke is definitely not harmful	7.0 (± 1.0)	7.8 (± 1.5)	6.7 (± 1.1)	8.5 (± 1.7)	7.5 (± 1.9)	6.8 (± 1.6)	4.6 (± 1.9)
- secondhand smoke is probably not harmful	7.6 (± 1.4)	9.0 (± 2.3)	6.9 (± 1.6)	9.5 (± 2.7)	8.7 (± 2.3)	6.7 (± 1.6)	4.0 (± 2.7)

Notes: The numbers in parentheses represent a 95% confidence interval.

3.5 School Prevention Efforts

Table 14 indicates that about 53% of students were exposed to some smoking prevention at school, and that 15% had discussed smoking in class in the current school term.

Because the classes were mixed genders and more males than females reported never discussing smoking in class, it may be that males paid less attention to these prevention messages than females.

More students in lower grades claimed that they had never discussed smoking in class, which may explain their poorer knowledge of the health consequences of smoking. There are several reasons for teaching school prevention more intensively in the lower grades: about 57% of students in these grades are at risk of smoking uptake, they begin to smoke or experiment with smoking earlier than higher grades, and they are less convinced about detrimental effects of smoking and secondhand smoke.

Table 14: Help/information availability at school (%)

	Sample	Male	Female	Grade 7	Grade 8	Grade 9	Grade 10
Danger of smoking taught in class	40.2 (±4.7)	38.0 (± 4.8)	42.1 (± 5.5)	35.3 (± 8.6)	36.2 (± 7.9)	54.2 (± 6.9)	30.3 (± 11.9)
Teenage smoking discussed in class	27.4 (± 3.2)	24.5 (± 3.3)	30.0 (± 4.4)	29.2 (± 6.6)	26.2 (± 5.4)	28.9 (± 4.9)	23.4 (± 8.4)
Specific effects of smoking taught in class	36.5 (± 4.0)	34.3 (± 3.9)	38.5 (± 4.7)	30.5 (± 6.6)	29.9 (± 7.0)	54.7 (± 5.4)	26.5 (± 10.3)
Smoking discussed in class this term	15.2 (± 3.2)	15.0 (± 3.0)	15.4 (± 3.9)	14.1 (± 4.8)	16.1 (± 5.6)	17.6 (± 4.8)	11.9 (± 3.8)
Any kind of smoking prevention in class	52.7 (± 2.2)	52.2 (± 4.5)	52.8 (± 4.5)	47.2 (± 7.1)	49.9 (± 7.7)	66.3 (± 5.2)	43.6 (± 9.4)
Smoking never discussed in class	38.6 (± 3.7)	44.3 (± 3.8)	33.3 (± 4.4)	48.7 (± 5.8)	44.0 (± 7.4)	29.1 (± 4.5)	29.8 (± 5.0)

Note: The numbers in parentheses represent a 95% confidence interval.

3.6 Advertising Exposure

Despite the existence of some restrictions on cigarette advertising in Russia, the exposure of high school students to these types of messages was enormous. Results in the first part of Table 15 imply that, on average, every student was exposed to cigarette advertising in three different media. The most frequently observed advertising medium was billboards (94% exposure) followed by TV (89% exposure), social events (79% exposure), and press (77% exposure). There were no gender differences. More of the older students said they had seen advertising in the press and during social events, which may reflect their selection of press and more social opportunities, or selective attention.

About 22% of students owned a cigarette promotional item. Further, despite the ban on distribution of free cigarette samples in Russia, 17% of students (more for males and older students) had been offered free cigarettes by company representatives.

Results in the second part of Table 15 show that youth were also exposed to anti-smoking messages, although this exposure was less than for advertising. Almost 75% of students

saw anti-smoking advertising in the media, and about 58% saw anti-smoking advertising during a social event. The youngest age group seems to pay the most attention to these anti-smoking messages.

Table 15: Advertising exposure in month prior to survey (%)

Type of exposure	Sample %	Male %	Female %	Grade 7 %	Grade 8 %	Grade 9 %	Grade 10 %
Brand names on TV (of those who watch TV)	89.1 (± 1.2)	88.9 (± 1.6)	89.2 (± 1.6)	89.1 (± 2.0)	88.2 (± 2.4)	90.6 (± 1.7)	88.3 (± 3.4)
Billboard advertisement	94.3 (± 0.8)	93.5 (± 1.2)	95.2 (± 1.0)	94.0 (± 1.5)	94.4 (± 1.4)	94.0 (± 1.5)	95.3 (± 1.6)
Advertising in press	76.5 (± 1.3)	73.8 (± 2.1)	79.2 (± 1.6)	71.9 (± 2.9)	76.3 (± 2.9)	78.4 (± 2.4)	80.8 (± 4.3)
Advertising at events (of those who attend events)	78.8 (± 1.5)	78.6 (± 2.1)	79.3 (± 2.5)	76.9 (± 3.3)	76.5 (± 3.8)	82.3 (± 2.0)	80.2 (± 4.7)
Index of total advertising exposure	3.2 (± 0.03)	3.2 (± 0.05)	3.2 (± 0.04)	3.1 (± 0.07)	3.2 (± 0.06)	3.3 (± 0.05)	3.3 (± 0.10)
Owns promotional item	22.1 (± 1.8)	22.5 (± 2.4)	21.8 (± 2.3)	21.3 (± 3.3)	22.2 (± 3.5)	23.0 (± 3.0)	22.2 (± 5.0)
Free cigarette from tobacco company	17.0 (± 1.9)	20.2 (± 2.6)	13.8 (± 2.0)	9.7 (± 1.9)	14.2 (± 2.6)	21.0 (± 2.7)	26.0 (± 6.1)
Anti-smoking advertising in any media	74.5 (± 1.8)	74.1 (± 1.8)	75.0 (± 3.0)	78.3 (± 2.0)	73.8 (± 3.7)	73.2 (± 3.3)	73.2 (± 5.2)
Anti-smoking advertising at events (of those who attend events)	57.6 (± 2.4)	58.0 (± 2.9)	57.2 (± 3.7)	62.6 (± 4.3)	58.5 (± 4.3)	57.2 (± 3.9)	49.8 (± 4.9)

Note: The numbers in parentheses represent a 95% confidence interval.

The first part of Table 16 analyzes exposure to cigarette advertising by smoking status. Smokers were more attentive to all cigarette advertising media than non-smokers. A higher percentage of non-smokers than smokers said they owned a cigarette promotional item, which is unusual. Almost twice the percentage of smokers (24%) as non-smokers (13%) had been offered a free cigarette by a tobacco company representative. Given that about 57% of current non-smokers are at high-risk for beginning to smoke, there is justification for banning free cigarette distribution.

The second part of Table 16 shows that teenage non-smokers were more attuned to anti-smoking advertising both in media and during social events than were teenage smokers, although the differences are small.

Table 16: Advertising exposure in month prior to survey, by smoking status

Type of exposure	Smoker %	Non-smoker %
Brand names on TV (of those who watch TV)	88.9 (± 1.9)	89.0 (± 1.4)
Billboard advertisement	95.0 (± 1.2)	94.0 (± 1.0)
Advertising in press	79.7 (± 2.3)	75.0 (± 1.7)
Advertising at events (of those who attend events)	80.8 (± 2.2)	77.7 (± 1.9)
Index of total advertising exposure	3.3 (± 0.05)	3.1 (± 0.03)
Owns promotional item	28.8 (± 3.2)	37.8 (± 2.0)
Free cigarette from tobacco company	24.3 (± 3.4)	13.4 (± 1.6)
Anti-smoking advertising in any media	73.8 (± 2.3)	74.9 (± 2.0)
Anti-smoking advertising at events (of those who attend events)	54.9 (± 2.9)	59.5 (± 3.0)

Note: The numbers in parentheses represent a 95% confidence interval.

3.7 Exposure to Secondhand Smoke

Over 55% of students were exposed to secondhand smoke at home, 72% were exposed to it outside the home (Table 17). Exposure in both places was less among younger groups. Awareness of negative effects of secondhand smoke (52%) was lower than awareness of harmful effects of direct smoking (65%). Younger students were less convinced than older students that secondhand smoke harms health. Seventy-one percent of students were in favor of banning smoking in public places. The support for public smoking restrictions decreased markedly with age, but was still the clear majority view among the tenth graders.

Table 17: Secondhand smoke (last week's exposure and attitudes)

Exposure/attitudes	Sample	Male	Female	Grade 7	Grade 8	Grade 9	Grade 10
Home exposure	55.3 (± 2.1)	54.8 (± 2.9)	55.9 (± 2.6)	54.6 (± 3.0)	51.9 (± 3.7)	56.9 (± 3.4)	59.5 (± 5.5)
Exposure in other places	72.0 (± 2.0)	74.5 (± 2.3)	69.4 (± 2.8)	64.3 (± 3.2)	67.4 (± 3.4)	77.3 (± 3.5)	82.7 (± 3.7)
Believes secondhand smoke is definitely harmful	51.9 (± 2.5)	52.6 (± 3.2)	51.1 (± 3.4)	49.8 (± 3.8)	48.6 (± 3.5)	51.2 (± 4.1)	61.0 (± 6.0)
Supports cigarette ban in public places	71.0 (± 2.0)	69.7 (± 2.7)	72.4 (± 2.4)	81.5 (± 3.0)	75.3 (± 3.8)	64.7 (± 3.7)	59.0 (± 5.1)

Note: The numbers in parentheses represent a 95% confidence interval.

Table 18 analyzes exposure to and beliefs about secondhand smoke by smoking status. The results show that smokers were significantly more exposed to secondhand smoke than non-smokers and were less convinced about the harmful effect of this exposure. Just less than half the current smokers supported bans on smoking in public places, compared to 82% of non-smokers.

Table 18: Secondhand smoke exposure in prior week and attitudes, by smoking status

Exposure/attitudes	Smoker %	Non-smoker %
Home exposure	68.3 (± 3.4)	48.4 (± 2.3)
Exposure in other places	88.6 (± 2.2)	63.9 (± 2.5)
Believes secondhand smoke is definitely harmful	47.0 (± 4.0)	54.2 (± 2.7)
Supports cigarette ban in public places	48.2 (± 3.1)	81.7 (± 2.3)

Note: The numbers in parentheses represent a 95% confidence interval.

4. MULTIPLE REGRESSION ANALYSIS OF DEMAND

4.1 Methodology and Model Specification

The descriptive statistics discussed in section 3 consider only simple relationships between smoking behavior and other factors in isolation from each other. Multiple regressions allow the effects of all variables on smoking behavior to be estimated simultaneously, controlling for other relevant variables. The most important economic aspect is the effect of price on decisions to smoke, and on the quantity of cigarettes smoked.

The cigarette demand equation was estimated in two parts following a model developed by Cragg (1971). This model is frequently employed in studies on cigarette demand. In the first step, a smoking participation equation was estimated using the Probit model to identify the factors that affect the probability of a student being a smoker rather than a non-smoker. In the second step, an OLS regression was estimated to explain monthly cigarette consumption, selecting only students defined as smokers for this part of the analysis. STATA statistical software was used to compute the results.

The dependent variable in the second part of the analysis was expressed in natural logarithm form. The logarithmic transformation was necessary to convert the skewed distribution of the monthly consumption variable to a distribution resembling more closely the normal distribution. The assumption of normality of the error term is

important for testing the hypothesis regarding independent variables' significance in the regression.

Because some students were either not consistent in their responses to questions about the number of smoking days and/or number of cigarettes smoked per day, or they did not provide answers to one of these questions, the second part of the model was also re-estimated using the natural logarithm of daily cigarette consumption and the natural logarithm of number of smoking days in a month.

The questionnaire obtained information from smokers on how much they usually paid for a pack of cigarettes. It is problematic to estimate a cigarette demand equation for a country where there is no real variation in cigarette prices (based, for example, on regional tax differences). Because Russia has a uniform cigarette tax on the same cigarettes types, the differences in prices paid by individuals emerged from their brand choices, whether they bought from legal outlets or in the black market, and other decisions related to the purchase (e.g. the type of sales outlet chosen). Because price is not independent of smoker's decisions, it is endogenous (not "given" or exogenous).

A possible method in dealing with price endogeneity is to estimate a simultaneous equations model. The two-stage least square (2SLS) model estimates price as a function of instrumental variables, which affect price but are not included in the cigarette demand equation. The possible instruments for the price equation would include variables that affect the costs of producing and distributing different brands via different markets (legitimate versus black market). This information was not available for this study, so a simultaneous equation model could not be estimated.

Another method to deal with price endogeneity, which was applied in this analysis, is to create a new price variable: an average of all reported prices in each school. This price measure has three advantages:

- First, it solved the problem of missing responses among smokers who did not buy their own cigarettes. The average school price was assigned (based on the school's identification number) to all smokers in the school, including those who did not provide price information or who did not buy cigarettes themselves. Replacing missing responses with the school's average price improved the precision of the estimates and eliminated potential bias of the results if the missing observations were systematic with respect to price.
- Second, the average price could also be assigned to non-smokers who were not asked to provide price information. Being able to associate non-smokers with a price was essential for estimating the effect of price on smoking participation. It was assumed that students in each school faced similar cigarette prices.
- Third, this technique partially alleviated price endogeneity because it may have reflected some local differences in distribution costs and local cigarette price promotions.

The model tested both the average school price and the individually reported prices.

The smoking status of parents and friends can play an important role in a youth's decision to smoke. However, these variables were not included in the demand equation because they captured part of the price effect. The full impact of price on youth smoking was the result of both the direct effect on a youth's smoking as well as the indirect effect. The indirect effect resulted from changes in peer smoking and in parents' and other adult smoking in reaction to prices, and from changes in availability of cigarettes from various sources resulting from price shifts (e.g., a reduced availability from social sources, less ability to steal from parents, stores, etc., after a cigarette price increase). Including the smoking status of parents or peers in the demand equation would have captured part of the effect of price and created a downward bias on the price coefficient.

There are two versions of the model. The first includes only exogenous independent variables (variables that are not correlated with smoking status or smoking intensity) and price. The second version expands on the first by a set of potentially endogenous independent variables of interest. Each version has two parts: the participation equation (Probit) and the conditional demand equation (OLS).

Version 1, part 1:

Smoking status = a function of age, sex, school grade attended, cigarette harm discussed in the family, the danger of smoking taught in class, teens smoking discussed in class, specific effects of smoking taught in class, index for recent discussion on smoking and health in class, school average price.

Version 1, part 2:

Log (number of cigarettes consumed in a month) = a function of age, sex, school grade attended, cigarette harm discussed in the family, the danger of smoking taught in class, teens smoking discussed in class, specific effects of smoking taught in class, index for recent discussion on smoking and health in class, school average price.

Version 2, part 1:

Smoking status = a function of age, sex, school grade attended, cigarette harm discussed in the family, the danger of smoking taught in class, teens smoking discussed in class, specific effects of smoking taught in class, index for recent discussion on smoking and health in class, cigarette harm discussed in the family, strength of beliefs of harmful health effects of smoking, exposure to print media anti-smoking advertising, exposure to anti-smoking advertising during a social event, possession of a promotional item, noticing cigarette brand names on TV, seeing a billboard or a poster with cigarette advertising, seeing cigarette advertising in the press, seeing cigarette advertising during a social event, free promotional cigarette offered, school average price.

Version 2, part 2:

Log (number of cigarettes consumed in a month) = a function of age, sex, school grade attended, cigarette harm discussed in the family, the danger of smoking taught in class, teens smoking discussed in class, specific effects of smoking taught in class, index for recent discussion on smoking and health in class, cigarette harm discussed in the family, strength of beliefs of harmful health effects of smoking, exposure to print media anti-

smoking advertising, exposure to anti-smoking advertising during a social event, possession of a promotional item, noticing cigarette brand names on TV, seeing a billboard or a poster with cigarette advertising, seeing cigarette advertising in the press, seeing cigarette advertising during a social event, free promotional cigarette offered, school average price.

Both parts of the model control for missing information on the included variables by creating a set of dichotomous indicators for those who did not answer a particular question. Individuals with missing information on smoking status were excluded from the first part of the model, and non-smokers and those with missing information on smoking intensity were left out of the second part of the model.

4.2 Regression Model Results

Table 19 presents results of both versions of the regression analysis. The left side of the table shows results for the model controlling only for socio-economic characteristics of an individual, school anti-smoking policies, and cigarette price. The right side of the table presents results for the model that also includes the set of potentially endogenous variables. The inclusion of these variables did not change the sign and statistical significance of the first model coefficients with the exception of the index controlling for recent discussion of smoking in class.

The dependent variable in the first part of the models is respondent smoking status. A measure of smoking intensity (number of cigarettes per month) is the dependent variable in the second part. All respondents are included in the first part; only smokers enter the second part. The numbers reported in the table represent marginal effects of independent variables on the dependent variables; so for example, a coefficient of 0.09 for the variable male in the first part means that being a male increased the probability of being a smoker by 9%. The numbers in parentheses are 95% robust confidence intervals.

The regression results confirm that both smoking participation and smoking intensity among Russian students increased with age, and were higher for males than females.

The effect of school prevention policies on youth cigarette demand in Russia was mixed. All of the variables with the exception of the index variable were associated with lower smoking prevalence, but only the coefficient for discussion of teenage smoking in class was statistically significant. Three out of four policies seemed to also reduce smoking intensity among current smokers, but the only statistically significant result, for teaching the danger of smoking, had an unexpected positive sign.

The second version of the model added additional relevant but potentially endogenous variables. Endogeneity was not the only concern; some of these variables may also have been correlated with unobservable factors not controlled for in the model. In that case, their coefficients would have been biased. Therefore, the results must be interpreted with caution. For example, anti-smoking messages from the family were found to have a

positive effect on both measures of smoking. This may indicate that parents of smokers are more likely to talk to provide anti-smoking messages. The positive and statistically significant coefficients may not indicate any causal effect of anti-smoking messages on cigarette consumption.

Beliefs in the harmful effect of smoking was associated with lower smoking intensity and less probability of smoking, but only the coefficient in the smoking participation equation was statistically significant.

Exposure to anti-smoking messages either in the media or during a social event was also associated with lower cigarette demand. The effect of media counter-advertising on smoking intensity was statistically significant.

Possession of a tobacco company promotional item and receiving free promotional cigarettes were statistically significant, and associated with higher smoking participation and smoking intensity. However, in order to infer that these activities had a causal effect on smoking participation, one would need to assume that representatives of tobacco companies were giving away promotional items and free cigarettes to random samples of students, and not focusing on current smokers.

Exposure to cigarette advertising in the press was statistically significant and associated with higher smoking participation. Advertising on billboards and during social events had the expected sign (associated with higher youth cigarette demand), but were not statistically significant.

The coefficient on average cigarette price was negative – higher prices were associated with lower smoking participation and smoking intensity. The result for smoking participation was statistically significant. The variable for price directly reported by smokers in the second part of the model (used instead of the average price for the school) also had the expected negative coefficient and was statistically significant. For every ruble increase in the price of cigarettes a student paid, they smoked 2% fewer cigarettes per month.

Because some students were either not consistent in their responses with respect to number of smoking days and/or number of cigarettes smoked per day, or they did not provide an answer to one of the two questions, the second part of the model was also re-estimated using alternative measures of smoking intensity: the natural logarithm of daily cigarette consumption and the natural logarithm of number of smoking days in a month. Estimating the effect of independent variables on the two measures of smoking intensity independently allowed more respondents to enter the analysis and possibly identified additional variables affecting smoking intensity. These results are reported in Table 20.

Table 19: Cigarette demand equation

Variables	Model	1st model version		2nd model version	
		1st part	2nd part	1st part	2nd part
Age		0.089** (±0.029)	0.265** (±0.183)	0.087** (±0.027)	0.193** (±0.181)
Male		0.095** (±0.037)	0.895** (±0.248)	0.074** (±0.037)	0.736** (±0.231)
School grade attended		-0.007 (±0.037)	0.154 (±0.222)	-0.010 (±0.035)	0.147 (±0.229)
Danger of smoking taught in class		-0.018 (±0.047)	0.374** (±0.364)	-0.024 (±0.047)	0.366** (±0.343)
Teenage smoking discussed in class		-0.042** (±0.040)	-0.025 (±0.270)	-0.060** (±0.040)	-0.143 (±0.258)
Specific effects of smoking taught in class		-0.020 (±0.048)	-0.226 (±0.330)	-0.015 (±0.049)	-0.174 (±0.298)
Index for recent discussion on smoking and health in class		0.008* (±0.010)	-0.041 (±0.069)	0.007 (±0.010)	-0.040 (±0.071)
Anti-smoking message from family		-	-	0.158** (±0.038)	0.905** (±0.392)
Believes smoking is harmful		-	-	-0.031** (±0.022)	-0.120 (±0.176)
Anti-smoking advertising in any media		-	-	-0.006 (±0.039)	-0.326** (±0.291)
Anti-smoking advertising at events		-	-	-0.029 (±0.037)	-0.065 (±0.265)
Owens promotional item		-	-	0.105** (±0.046)	0.271** (±0.225)
Cigarette brand names on TV		-	-	-0.016 (±0.052)	-0.039 (±0.326)
Billboard advertisement		-	-	0.031 (±0.077)	0.246 (±0.592)
Advertising in press		-	-	0.034* (±0.039)	-0.115 (±0.278)
Advertising at events		-	-	0.007 (±0.042)	0.277 (±0.331)
Free cigarette from tobacco company		-	-	0.092** (±0.048)	0.791** (±0.315)
Average school price		-0.011* (±0.012)	-0.049 (±0.082)	-0.012* (±0.012)	-0.045 (±0.081)
Directly reported price		-	-0.023** (±0.023)	-	-0.026** (±0.023)

Note: The numbers in parentheses represent a 95% confidence interval.

*Variable significant at 10% level, two-tailed test **Variable significant at 5% level, two-tailed test

Table 20: Demand equation second part, alternative measures of smoking intensity

Variables \ Model	1st model version		2nd model version	
	No. of smoking days/month	No. of smoked cigarettes/day	No. of smoking days/month	No. of cigarettes smoked /day
Age	0.111** (±0.096)	0.142*** (±0.102)	0.066 (±0.097)	0.111** (±0.099)
Male	0.495*** (±0.146)	0.406*** (±0.121)	0.414*** (±0.134)	0.325*** (±0.116)
School grade attended	0.112* (±0.119)	0.057 (±0.112)	0.117* (±0.121)	0.046 (±0.115)
Danger of smoking taught in class	0.195* (±0.199)	0.196** (±0.171)	0.198** (±0.188)	0.192** (±0.167)
Teenage smoking discussed in class	-0.023 (±0.131)	-0.015 (±0.175)	-0.082 (±0.125)	-0.078 (±0.166)
Specific effects of smoking taught in class	-0.147 (±0.204)	-0.068 (±0.165)	-0.132 (±0.182)	-0.039 (±0.152)
Index for recent discussion on smoking and health in class	-0.002 (±0.042)	-0.031* (±0.035)	0.000 (±0.039)	-0.030 (±0.037)
Anti- smoking message from family	-	-	0.526*** (±0.183)	0.393*** (±0.216)
Believes smoking is harmful	-	-	-0.049 (±0.082)	-0.080 (±0.101)
Anti-smoking advertising in any media	-	-	-0.168** (±0.158)	-0.148* (±0.161)
Anti-smoking advertising at events	-	-	-0.077 (±0.132)	0.008 (±0.138)
Owns promotional item	-	-	0.144** (±0.134)	0.152** (±0.121)
Cigarette brand names on TV	-	-	-0.051 (±0.187)	-0.011 (±0.173)
Billboard advertisement	-	-	0.107 (±0.372)	0.131 (±0.264)
Advertising in press	-	-	-0.081 (±0.177)	-0.013 (±0.146)
Advertising at events	-	-	0.161 (±0.194)	0.059 (±0.159)
Free cigarette from tobacco company	-	-	0.363*** (±0.186)	0.452*** (±0.176)
Average school price	-0.018 (±0.044)	-0.034* (±0.039)	-0.014 (±0.043)	-0.033* (±0.038)

Notes: The numbers in parentheses represent a 95% confidence interval. *Variable significant at 10% level, two-tailed test **Variable significant at 5% level, two-tailed test

Employing the alternative measures of smoking intensity resulted in several differences. School grade was positively and significantly related to smoking intensity, independent

of age, which was also included and was also significant and positive, as before. A statistically significant result was also obtained for recent discussion of smoking in class, which was associated with fewer cigarettes consumed by smokers in a day. The number of cigarettes smoked per day was significantly associated with the average cigarette price, with the expected negative sign – the higher the price, the fewer cigarettes smoked.

The price elasticities from the different model specifications are summarized in Table 21. The price elasticity of smoking participation ranged from -0.47 to -0.51, depending on the model version. The higher the price, the lower the probability of being a smoker. The price elasticity of conditional demand ranged from -0.32 to -0.69, depending on the model version and on the price measure, indicating that higher prices were associated with fewer cigarettes smoked. The total price elasticity ranged from -1.15 to -1.16, and was based only on the average school price because it was the sum of elasticities computed from Probit and OLS models.

The estimates suggest that youth cigarette demand in Russia was price elastic: each percentage increase in cigarette price was associated with about a 1.15% decrease in cigarette demand. About half of this effect was the result of lower smoking participation; the other half of the effect was caused by lower consumption among smokers. However, the results with respect to prices have to be interpreted cautiously because of the problematic nature of the price measure as discussed earlier in this report.

Table 21: Price elasticities of Russian youth

Model \ Variable	Average school price	Directly reported price
Probit, 1st version	-0.466	-
Probit, 2nd version	-0.505	-
OLS, 1st version	-0.694	-0.324
OLS, 2nd version	-0.641	-0.370
Total elasticity, 1st version	-1.160	-
Total elasticity, 2nd version	-1.146	-

5. SUMMARY AND DISCUSSION

Smoking prevalence among teenage students in Russia was, at 32%, the second highest among the 11 countries that participated in the first wave of the GYTS in 1999.⁴ The only country in the GYTS 1999 sample with higher prevalence was Ukraine. Even though the smoking rate among young Russian females was lower than among young males, there is some evidence that this gap is closing. Prevalence increased with age and the oldest group in grade 10 had a 43% smoking prevalence.

Smoking intensity was relatively high, and increased with age. Daily consumption was reported by one-third of current smokers, and nearly half of the male smokers already showed signs of being addicted to cigarettes (smoking first thing in the morning).

Smoking participation levels may rise, as more than half of current non-smokers were at risk of smoking initiation. More than 50% of students were exposed to secondhand smoke at home and almost 75% were exposed in public places.

The majority of teenage smokers smoked in public places such as on streets and in parks, but almost half of them supported a ban on smoking in these areas.

Even though 90% of the sample was under the age limit for buying cigarettes, almost two-thirds of respondents obtained cigarettes from regular stores or street vendors. Higher-intensity smokers relied much more on commercial sources of cigarettes than those who smoked less. Only one-fifth of attempted underage cigarette purchases were denied. This is evidence that the youth access law is not effective or enforced.

Russian teenage smokers were paying on average between RUR 11 and 15 per pack of cigarettes (about US \$0.44 to \$0.60) in 1999. At the time of the survey, the average price of local brands in Moscow was RUR 21 (Economic Intelligence Unit 2000), and the average price of a pack of Marlboros was RUR 32. This suggests that many students were buying cheap local cigarette brands, or papirosi, or that they were obtaining cigarettes from places other than official commercial sources.

Even though more than two-thirds of current smokers wanted to quit smoking, only about half of them had succeeded in doing so. Professional smoking cessation help was used by only a small percentage of those who had tried to quit.

There was some knowledge among students about the health consequences of smoking, but over one-third of the respondents were not convinced that smoking could harm their health. Nevertheless, health concerns were the main reason for quitting smoking. A small percentage of students cited money as the reason they had quit smoking.

Some smoking prevention was taught at the schools in Moscow at the time of the survey, but almost 40% of the students had never discussed smoking in class. The regression

⁴ The other countries are Barbados, China, Costa Rica, Fiji, Jordan, Poland, Sri Lanka, Ukraine, Venezuela, and Zimbabwe.

analysis provides some limited evidence that this type of prevention may reduce cigarette consumption among the targeted population.

Students in Moscow are highly exposed to cigarette advertising. The effect of this exposure on youth cigarette demand is not clear, but the regression analysis did not reject the hypothesis that cigarette advertising in press media increases smoking. However, the results clearly show that both ownership of a cigarette promotional item and an offer of a free cigarette from a tobacco company representative were associated with higher smoking participation and higher smoking intensity. Better law enforcement of the ban on free sample distribution would probably help lower cigarette consumption among Russian high school students.

Counter-advertising is also present in the Russian capital and it was noticed by three-quarters of the students. Awareness of this anti-smoking advertising in the media was associated with lower smoking intensity.

The effect of cigarette prices on smoking was analyzed using the average price paid by students in each school. Although this price measure had its limitations, it may have reflected some local price variation based on access to cigarette sources and on local price promotions. The estimates indicate that higher prices are associated with lower smoking participation and lower smoking intensity. The price elasticity of smoking participation (decisions on whether or not to smoke) ranged around -0.5, and the price elasticity of conditional demand (changes in quantity in response to changes in price among smokers only) ranged from -0.32 to -0.69. The total price elasticity estimate fell between -1.15 and -1.16, suggesting that the youth cigarette demand in Moscow was price elastic. The relatively high elasticity estimates is consistent with the hypothesis that smokers with lower socio-economic status, such as Russian smokers, are more price-responsive (Farely et al. 1998). Therefore, tax increases that raise cigarette prices would be a very effective way of reducing smoking among Russian students.

Based on the findings of the GYTS-1 survey in Moscow, and considering the harm to adult health that tobacco use in Russia causes, the rising trend in use of tobacco, the weak and ineffective policies to discourage tobacco use and global experience, the Russian Public Health Association has suggested the following measures to help reduce smoking among young people in Russia (Demine 2001 and 2004):⁵

1. Prohibit smoking in public places.
2. Ban all cigarette advertising and sponsorship.
3. Provide comprehensive information to the population, especially to children and young adults, on the dangers of tobacco use.

⁵ The “Appeal of IV Moscow Scientific – Practical Conference “Prevention and Treatment of Tobacco Dependence – Current Situation and Future Prospects”, Moscow May 31, 2004 contains 18 specific measures, including making tobacco control a clear priority, signing the Framework Convention on Tobacco Control, strengthening tobacco control components in state bodies at all levels, ending all official collaboration with activities funded or implemented by the tobacco industry, specifically including so-called “educational” programs funded by tobacco companies.

4. Enforce a ban on free cigarette distribution.
5. Improve the quality of school anti-smoking programs.
6. Provide effective smoke-cessation assistance programs for school students (and adults).
7. Ban cigarette sales to minors.
8. Increase excise taxes on cigarettes to raise prices substantially.

This report agrees with the proposed measures, and strongly recommends using cigarette taxes as a public policy tool, coupled with efforts to reduce black market sales.

REFERENCES

- Chaloupka**, F.J. and R.L. Pacula. 1999. Sex and race differences in young people's responsiveness to price and tobacco control policies. *Tobacco Control* 8: 373-377.
- Connolly**, G.N. 1996. "Tobacco, trade and Eastern Europe." In *Tobacco and Health*. London: Plenum Press.
- Corrao**, M.A., G.E. Guindon, N. Sharma, and D.F. Shokoohi. 2000. *Tobacco Control Country Profiles*. American Cancer Society, Atlanta, GA.
- Cragg**, J.G. 1971. Some statistical models for limited dependent variables with application to the demand for durable goods. *Econometrica* 39: 829-844.
- Currie**, C., J. Todd, C. Thompson, and R. Smith. 2000. *Health behaviour in school-age children: A World Health Organization (WHO) cross-national study*. WHO Regional Office for Europe.
- Demine**, A.K. 2001. *Tobacco control related activities of the Russian Public Health Association*. <www.cdc.gov/tobacco/global/gyts/reports/russia.pdf> cited 13 Mar. 2003.
- Demin**, A. K. 2004. *WNTD-2004 and FCTC Process in Russia*. Cover note, Appeal of Participants of IV Moscow Scientific – Practical Conference on Prevention and treatment of Tobacco Dependence – Current Situation and Future Prospects. 14 June, 2004. demin@rpha.org.
- Demine**, A. K. 2001a. *Production of papirosi and cigarettes in Russia between 1995 and 2001*. Russian Public Health Association.
- Dobrov**, D. 2001. Istoriya: 1991-2000. *Kommersant – Vlast*. 28: 25 Sept. 2001. (In Russian)
- Economist Intelligence Unit**. 2000. *Worldwide Cost of Living Survey*. London, United Kingdom. <<http://store.eiu.com/description/CLdes.asp>>, cited 8 Mar. 03.
- El'garov**, A.A. and L.V. El'garova. 1994. Otnoshenie shkol'nikov Nal'chika k vrednym privyчкам. *Ter-Arkh* 66:45–8.
- Farely**, M.C., et al. 1998. *Cigarette price elasticities by race, age, income, and gender*. Working paper, North Carolina, USA, Research Triangle Institute.
- Gerasimenko**, N.F. and A.K. Demine. 2001. *Tobacco policy and politics in Russia*. Moscow, Russian Public Health Association.
- Guindon**, G.E., S. Tobin and D. Yach. 2002. *Trends and affordability of cigarette prices*. *Tobacco Control*, 11:25-43. Available at www.tobaccocontrol.com

- Hurt, R.D.** 1995. Smokin' Russia: What do Stalin and Western tobacco companies have in common? *Mayo Clin Proc* 70:1007–11.
- McKee, M., M. Bobak, R. Rose, V. Shkolnikov, L. Chenet, and D. Leon.** 1998. Patterns of smoking in Russia. *Tobacco Control* 7:22–26.
- McNeill, A.D., M.J. Jarvis, J.A. Stapleton, M.D. Russell, J.R. Eiser, P. Gammage, and M. Gray.** 1988. Prospective study of factors predicting uptake of smoking adolescents. *Journal of Epidemiology and Community Health* 43, 72-78.
- Mitreva, Maya.** 2000. Russia's Revival. *Tobacco Reporter*. July 2000. <www.tobaccoreporter.com/backissues/Jul2000/July2000_feature3.asp>, cited 8 Mar. 2003.
- Murray, C.J.L. and A.D. Lopez.** 1997. Mortality by cause for eight regions of the world: Global Burden of Disease Study. *Lancet* 349:1269–76.
- Peto R., A.D. Lopez, J. Boreham, et al.** 1994. *Mortality from smoking in developed countries 1950–2000*. Oxford: Oxford University Press.
- Pierce, J.P., E.A Gilpin, L.S Emery, A.J. Farkas, S.H. Zhu, W.S. Choi, C.C. Berry, J.M. Distefan., M.M. White, S. Soroko, and A. Navarro.** 1998. *Tobacco control in California: Who's winning the war? An evaluation of the tobacco control program, 1989-1996*. La Jolla, California, USA: University of California, San Diego.
- Prokhorov, A.V. and A.A. Alexandrov.** 1992. Tobacco smoking in Moscow school students. *Br J Addict* 87:1469–76.
- Tkacenko, H.V.** 2002. *Anti-smoking policy in Russia*. <www.rpha.newmail.ru/publications/bulletin/bull02/02.htm>, cited 8 Mar. 03.
- Tobacco Control International.** 1992. The pushers are coming! The pushers are coming!...to Russia. *Tobacco Control Int* 1:9.
- USDA.** 2000. GAIN Report #RS0001. Global Agriculture Information Network. Foreign Agricultural Service/USDA.
- Weissman, R.** 2002. US cigarette maker presses Russia over tobacco taxes. <<http://lists.essential.org/pipermail/intl-tobacco/2000q3/000252.html>>, 8 Mar. 2003.
- WHO.** 1997. *Tobacco or health: A global status report*. Country profiles by region. Russian Federation. World Health Organization, Tobacco or Health Program. <www.cdc.gov/tobacco/who/whofirst.htm>, cited 8 Mar. 2003.
- World Bank.** 2001. *World Development Indicators*. World Bank, Washington DC.



HEALTH, NUTRITION,
AND POPULATION



HUMAN DEVELOPMENT NETWORK
THE WORLD BANK

About this series...

This series is produced by the Health, Nutrition, and Population Family (HNP) of the World Bank's Human Development Network. The papers in this series aim to provide a vehicle for publishing preliminary and unpolished results on HNP topics to encourage discussion and debate. The findings, interpretations, and conclusions expressed in this paper are entirely those of the author(s) and should not be attributed in any manner to the World Bank, to its affiliated organizations or to members of its Board of Executive Directors or the countries they represent. Citation and the use of material presented in this series should take into account this provisional character. For free copies of papers in this series please contact the individual authors whose name appears on the paper.

Enquiries about the series and submissions should be made directly to the Editor in Chief Alexander S. Preker (apreker@worldbank.org) or HNP Advisory Service (healthpop@worldbank.org, tel 202 473-2256, fax 202 522-3234). For more information, see also www.worldbank.org/hnppublications.

The Economics of Tobacco Control sub-series is produced jointly with the Tobacco Free Initiative of the World Health Organization. The findings, interpretations and conclusions expressed in this paper are entirely those of the authors and should not be attributed in any manner to the World Health Organization or to the World Bank, their affiliated organizations or members of their Executive Boards or the countries they represent.

The editors for the Economics of Tobacco Control papers are: Joy de Beyer (jdebeyer@worldbank.org), Emmanuel Guindon (guindone@who.int) and Ayda Yurekli (ayurekli@worldbank.org).



THE WORLD BANK

1818 H Street, NW
Washington, DC USA 20433
Telephone: 202 477 1234
Facsimile: 202 477 6391
Internet: www.worldbank.org
E-mail: feedback@worldbank.org



WORLD HEALTH ORGANIZATION

Avenue Appia 20 1211
Geneva 27, Switzerland
Telephone: 41 22 791 2126
Facsimile: 41 22 791 4832
Internet: www.who.int
E-mail: tfi@who.int