

# BMJ Open Measuring Armenia's progress on the Tobacco Control Scale: an evaluation of tobacco control in an economy in transition, 2005–2009

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## ABSTRACT

**Objectives:** This study aimed to measure the 5-year progress in the implementation of WHO Framework Convention on Tobacco Control (FCTC) in Armenia by applying the Tobacco Control Scale, a rapid assessment tool developed to assess the strength of tobacco control policies in Europe.

**Setting:** Armenia, an economy in transition, has extreme smoking rates among men (62.5%) despite acceding to FCTC in 2004. However, little research has been carried out to evaluate Armenia's progress in tobacco control.

**Methods:** The Tobacco Control Scale total score was estimated for Armenia using the original methodology; however, a different source of data was used in estimating the subscores on tobacco price and tobacco control spending.

**Results:** Armenia's total score on Tobacco Control Scale has considerably improved from 2005 to 2009, mostly due to larger health warnings and advertising ban, and increased public spending on tobacco control. The scores for smoke-free public places, advertising ban, health warnings and treatment categories were below the European average in 2005 and 2007, while the price score was higher. Neither total tobacco control score nor any of its components showed a significant predictive value in a simple regression analysis using the total score and subscores as predictors for log-transformed per capita tobacco consumption.

**Conclusions:** Higher than the European average price score for Armenia cannot be explained by the concept of affordability alone and may reflect a measurement error due to peculiarities of transition economies. The applicability of the Tobacco Control Scale could be limited to countries with mature economies, but not to transition countries such as Armenia with different social, political and economic environment. The scale modification, such as an adjustment for the policy enforcement and the effectiveness of public tobacco control spending along with alternative measures of affordability would be warranted to enhance its applicability in low-income and middle-income countries.

## INTRODUCTION

The WHO's Framework Convention on Tobacco Control (WHO FCTC), which came

## Strengths and limitations of this study

- The first study to assess the Framework Convention on Tobacco Control (FCTC) implementation in Armenia.
- Applies the Tobacco Control Scale, an important rapid assessment tool for measuring the strength of tobacco control policies, to a transition country such as Armenia, highlights the weaknesses of the scale and makes recommendations to enhance its validity and reliability.
- The findings from this study are limited to Armenia and similar economies in transition.

into force in early 2005, was envisioned as a global health good. Its ratification created momentum for advancing tobacco control among government and civil society in the former Soviet republics, where multinational tobacco companies quickly acquired the ageing and non-competitive monopolies after the transition to free market economies.<sup>1</sup> The FCTC is a legally binding treaty. However, its effectiveness is dependent on the comprehensiveness, strength and strict implementation by countries.<sup>2</sup> For nations that have high smoking rates, growing social democracies and struggling economies, tobacco control must compete with many other priorities that high-income nations have already addressed. Despite these constraints, many Eastern European and former Soviet countries have passed tobacco control laws based on the FCTC. The evaluation of these laws is essential to improve health.

Many approaches have been used in recent years to evaluate the effectiveness of national tobacco control policies, primarily in high-income nations. The conceptual framework for evaluating large-scale tobacco control interventions developed by the expert group from Western Europe suggests using multi-level data to assess the various short-term (policies), intermediate (eg, behaviours and

attitudes) and long-term outcomes (eg, morbidity and mortality).<sup>3</sup> While long-term outcomes are the best measure of a policy's impact, many low-income countries lack systematic health systems data collection due to constrained resources. Furthermore, though there are now many valuable approaches and tools for evaluating tobacco control policies, none are recognised as the gold standard.<sup>4,5</sup>

Joossens and Raw<sup>6</sup> have suggested a practical tool, the Tobacco Control Scale (TCS), for assessing the strength and comprehensiveness of tobacco control policies across countries based on secondary data analysis and expert-reported data. The TCS allows for rapid and cost-effective comparative assessments of national tobacco control policies. The model applied the scale to a group of 30 European Union (EU) nations (members or with candidate status), and ranked them on the strength of tobacco control policies.<sup>7</sup>

One country not included in this study, though the WHO includes it within its European region, is Armenia. Armenia's male smoking rates are among the highest in the world, while the rates for women are still quite low. According to the national data, the smoking prevalence was 62.5% among men and 1.7% among women in 2005.<sup>8</sup>

Armenia was the first among former Soviet countries to join the WHO FCTC; its accession to the treaty was shortly followed by the adoption of a national law and a state programme to control tobacco.<sup>9,10</sup> However, little research has been carried out to evaluate Armenia's progress in tobacco control, and only recently a comparative study conducted in the former Soviet countries has been published.<sup>11</sup> The study found large gaps in public knowledge of health effects of tobacco use across those countries, with Armenia and Georgia having the lowest score on support for tobacco control measures.

Concerned with the country's high smoking rates and uncertain about the effect of the adopted policies and the progress in implementing the FCTC made by Armenia as a full member of the WHO FCTC, we used the TCS for measuring the country's progress from 2005 to 2009 and comparing it to the other countries in the WHO European region.

## METHODS

The TCS measures the strength of the six most effective tobacco control strategies<sup>12</sup> based on their priority, with the greatest weight given to tobacco price and smoke-free policies (the figures below in parentheses reflect the maximum possible scores for each area which sum up to total score of 100 on TCS):

1. Tobacco price (30);
2. Smoke-free policies (22);
3. Tobacco control spending (15);
4. Comprehensive ban on advertising and promotion (13);
5. Health warnings (10);
6. Tobacco dependence treatment (10).

We used the original methodology and the questionnaire (2005) described in detail elsewhere<sup>6</sup> (see online supplementary appendix 1). To estimate the score for Armenia on price of tobacco products, we applied the same measure of cigarettes affordability used by Joossens and Raw which is based on the ratio of cigarette price and per capita 'real' income; however, using the International Monetary Fund World Economic Outlook (IMF WEO) database<sup>13</sup> instead of the Eurostat database that does not contain data on Armenia. For the estimation of other sub-scores, we used local and international data sources (see online supplementary appendix 2). Regression analysis was conducted to assess relationship between the estimated tobacco control score and per capita cigarette consumption (log transformed) in Armenia in years 2005, 2007 and 2009.

No ethics approval was sought for this study that used secondary data analysis.

## RESULTS

On the TCS, the estimated total score for Armenia was 36 for 2005, 52 for 2007 and 59 for 2009. [Table 1](#) provides detailed information on each component of the scale.

### Cigarette price

The price score increase from 23 in 2005 to 26 in 2009 reflects small incremental increases for cigarette prices in two selected categories, namely Marlboro and the most popular price category (MPPC).

### Smoke-free policies

The smoke-free score remained very low (5 of 22 possible) throughout the entire period. Though the smoking ban in educational, health and culture institutions and public urban transport is in effect since March 2005, smoking areas are allowed in other settings and no protection from secondhand smoke is provided in dining places, such as cafes and restaurants. Moreover, the enforcement of these limited provisions has been a major problem.

### Public spending on tobacco control

Since 2006, the state allocated a significant amount of 100 million drams per annum for tobacco control public information campaigns. As a result, the TCS estimate in this category increased sharply from 0 to 13 between 2005 and 2007.

### Comprehensive ban on tobacco advertising

Tobacco advertising is banned in electronic media (TV and radio) since 2002 and on billboards since 1 October 2006. Consequently, the subtotal score for tobacco advertising ban increased from 6 in 2005 to 8 in 2007 and remained unchanged through 2009.

### Health warnings

The health warnings score of 2 (out of possible 10) corresponds to small (4%) health warnings on cigarette

**Table 1** Estimated TCS Score for Armenia 2005–2009

	1 July 2005		1 July 2007		1 July 2009
	Armenia	European mean score <sup>6</sup>	Armenia	European mean score <sup>7</sup>	Armenia
Price (30)	23	17	24	17	26
Smoke-free public places (22)	5	8	5	11	5
Public spending on TC (15)	0	2	13	3	14
Comprehensive advertising ban (13)	6	9	8	11	8
Health warnings (10)	2	6	2	6	6
Treatment (10)	0	5	0	5	0
Total TCS score (100)	36	47	52	52	59

TCS, Tobacco Control Scale.

packs that were on Armenian market before 1 February 2008. Since 2008, Armenia met the minimal requirements of the FCTC as related to health warnings, having one main and four additional messages, in contrasting colours and occupying 30% of the pack's both sides. This change is reflected in the multifold increase of the score in 2009.

### Treatment to help smokers stop

Of the possible treatment score of 10, Armenia has the least score, due to limited assistance available to smokers willing to quit.

Neither total tobacco control score nor any of its components showed a significant predictive value in a simple regression analysis using the total score and subscores as predictors (independent variables) for log-transformed per capita tobacco consumption.

## DISCUSSION

The estimated score for Armenia on TCS for smoke-free public places, advertising ban, health warnings and treatment categories are below the European average in 2005 and 2007. However, the price score estimates are above average in 2005 and 2007 and so the score on public spending in 2007. This is unexpected finding since in the European region, the countries where price of cigarettes remains very low are postsoviet<sup>i</sup> countries, including Armenia.<sup>14</sup> However, the affordability of tobacco products cannot be determined by price alone. Only when price assessed along with real income of population and standards of living in a specific country, then it may provide a relatively accurate measure of cigarette affordability.<sup>15</sup> The TCS price score is based on this concept, and, therefore, the estimated high score for price of cigarettes in Armenia reflects the low real income of the population.

Nevertheless, while interpreting these findings, other potential sources of bias needs to be taken into account, including a potential measurement error. As the scale assigns equal weights to two selected brands, Marlboro and the MPPC, important information may be missing if

the market is dominated by one of those brands; for example, in case of Armenia, less expensive domestic cigarettes have a greater share on the market (up to 75% in 2000).<sup>16</sup>

Another issue could be inadequate accuracy and comparability of data. Thus, there is a good chance that Armenia's gross domestic product (GDP) data do not capture a considerable amount of remittances to Armenia from household members abroad due to seasonal or longer term migration of the labour force.<sup>17</sup> In this case, underestimation of the real income in Armenia would mask a greater, than reflected in our estimates, affordability of cigarettes. Affordability could increase also due to cigarette smuggling; however, no convincing evidence on smuggling to Armenia is available.<sup>18</sup>

Finally, the estimates could have been affected by exchange rates fluctuations. Thus, the 42% increase in the price of Marlboro pack in Armenia assessed in US\$ (US \$0.93 in 2005 to US\$1.32 in 2009) was equivalent to only 11% of its retail price in local currency. Our previous research suggested that the affordability of cigarettes has increased from 2005 to 2007 in Armenia.<sup>19</sup> Therefore, the calculated price score for Armenia might be considerably overestimated due to reasons discussed above.

Armenia's score for smoke-free public places in 2005 was much lower than the European average score in this category (5 vs 8). Many European countries have significantly improved their smoke-free scores from 2005 to 2007, including formerly soviet Lithuania, Latvia and Estonia, an advancement that was greatly facilitated by the European integration process and the EU Directives on tobacco control.<sup>20</sup> Thus, Armenia lags on smoke-free policies behind the majority of EU countries, failing to provide a complete and effective protection from exposure to secondhand smoke at worksites and public places.

In category of public spending in tobacco control, Armenia earns a score of 13 of possible 15 in 2007, thus exceeding the average public spending score for about three times. The score reflects the significant allocations made by the Armenian government in 2006–2008 following the accession to the FCTC and approval of the state programme on tobacco control. For instance, in 2007 the amount of 100 millions of Armenian drams per annum would be roughly equivalent to US\$275 000 comprising

<sup>i</sup>With the exception of Baltic countries.

about 0.038% of Armenia's GDP (in national currency). However, outcomes of the highly segmented and irregular antitobacco campaign are questionable.<sup>10</sup> Thus, the amount of public spending on tobacco control information campaigns, though indicates the government's commitment to tobacco control, may not necessarily be a measure of success in raising public awareness on tobacco issue as it does not account for the campaign's effectiveness and the implementation. Therefore, we suggest complementing this merely monetary score with other measures, such as density, timeline and area covered by media campaign, based on expert opinion.

Armenia is doing relatively well on advertising ban, having banned tobacco advertising in all electronic media since 2002 and outside advertising in 2006. The score increase by 2 in 2007 is congruent with overall improvement in this category among 30 countries. However, the majority of eastern European countries had higher scores in 2007 than Armenia with Estonia attaining the maximum possible score of 13. The main challenge ahead for Armenian tobacco control community would be banning point of sale advertising and all types of indirect advertising, promotion and sponsorship.

Larger health warnings were required by the national law since 2005; however, the law granted a long gray period for the implementation of the requirement; the packs with 4% warnings became outlawed only in February 2008. Thus, though with a 4-year delay, Armenia reached the European average score on health warnings. Pictorial health warnings on cigarette pack are shown to be a highly cost-effective way in raising awareness on health hazards of smoking and many countries across the world have successfully implemented this strategy; however, Armenia did not. Presently, the EU Tobacco Products Directive (2001/37/EC) only recommends pictorial warning, while mandating them would benefit not only member and candidate states but also the EU neighbourhood countries, including Armenia.

No progress was revealed in the area of tobacco dependence treatment from 2005 to 2009 when measured on the TCS. Nevertheless, in 2009 the country did a step forward by developing national guidelines on treatment of tobacco dependence. Several first-line pharmacological treatments for tobacco dependence were available over the counter, including nicotine replacement therapy and Zyban (bupropion). Tabex (cytisine), better known in Eastern Europe, has been on market as well as, more recently, Chantix. Therefore, we suggest that the scale's sensitivity in treatment-related section could be enhanced by adding more components to the questionnaire. Specifically, national guidelines on smoking cessation, training of smoking cessation specialists, smoking cessation components in medical school curriculum and system-based approach towards smoking cessation (ie, integrating it into healthcare) are essential parts of tobacco dependence treatment and need to be reflected in the score. As it currently is, the scale also does not count for availability of pharmaceutical aids,

while in many countries this also might be a problem. Some of these concerns were already addressed in the new 2010 scoring system on treatment, such as reporting smoking status in medical charts.<sup>21</sup>

To sum up the main points made above, Armenia's total score on TCS has considerably improved from 2005 to 2009, most notably due to larger health warnings and advertising ban, as well as increased public spending on tobacco control. Progress in passage of the laws but no progress in implementing smoke-free policies or establishing a smoking cessation infrastructure has been made in Armenia. The FCTC suggests that the process of policy change can be accelerated by combining multiple important strategies, including education and legislation. In Armenia, however, the increased public spending did not translate into meaningful educational campaigns and inadequate implementation of the FCTC obligations resulted in weak (partial) smoke-free legislation. Weak policies cannot bring the desired reduction in tobacco consumption. This conforms to data from two nationwide surveys, the Armenian Health System Performance Assessment Report 2012 and the Demographic and Health Survey that found no change in smoking prevalence among men from 2005 through 2010.<sup>22-23</sup> Therefore, the study finding of no relationship between TCS score and per capita cigarette consumption supports our view of overestimated values of the score for Armenia.

The implementation of smoke-free policy in a nation with high smoking rates poses a challenge that is not unique for Armenia. Transition to social democracy and effective public governance has been slow in many post-soviet countries and this could partly explain the ineffective implementation of the tobacco control measures in Armenia. However, the high rates of male smoking and social normalcy of smoking behaviour are unequivocally a major challenge for the smoke-free policy implementation. Other important reasons to be noted are the remarkable presence of the tobacco industry (local manufacturers and tobacco importers) on Armenia's business and political scene, including a strong tobacco lobby in the legislative, that could interfere with the political commitment to comply with the FCTC obligations and lead to passage of weak laws with no enforcement mechanisms. Adopted but not properly enforced, even the best policy cannot translate into desired reduction in tobacco consumption. Finally, transition economies such as Armenia may have substantially different tobacco markets (eg, different market shares for expensive and cheaper brands) and related regulations (such as tax policies favouring local product) as compared with high-income countries.

## CONCLUSIONS

Though the initial purpose of this work was to assess the progress made in Armenia in implementing its tobacco control policy through application of the scale for

tobacco control policy suggested by Jossens and Raw, it was also an opportunity to test the applicability of the scale for transition countries. Based on our findings: first, since the Eurostat database covers a limited number of countries, we suggest utilising a more comprehensive IMF WEO database that provides economic indicators, including adjusted “real” data for most of the low-income and middle-income countries in the world.

Next, we suggest that the Tobacco Control Policy Scale may not work well for assessing and comparing the strength of tobacco control in low-income and middle-income countries due to: (1) low comparability of estimates on price and public spending scores that pertains to differences between emerging and mature markets and corresponding tobacco market regulations, and (2) not adequately accounting for lack of tobacco control policy implementation in countries with no tradition of policy enforcement. Therefore, the applicability of the TCS in transition economies such as Armenia could be enhanced by the scale adjustment for the policy enforcement level and for the effectiveness of tobacco control public spending, and also by considering alternative measures of affordability while estimating the price score.

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**Table 1. Assessing the tobacco control policies in Armenia 2005-2009 on the Tobacco Control Scale.**

The Tobacco Control Scale Questionnaire (Joossens&Raw, 2005).

ARMENIA	Maximum possible score	2005	2007	2009
Type of Policy	Subtotal score (max)	Subtotal score	Subtotal score	Subtotal score
<b>I. Price of cigarettes and other tobacco products</b>	<b>30</b>	<b>23</b>	<b>24</b>	<b>26</b>
Price of Marlboro, and price of most popular price category, in January 2005 – <b>additive</b>				
1. The price of Marlboro in January 2005, taking into account Gross Domestic Product per capita expressed in Purchasing Power Standards (PPS). Country with highest price ratio receives 15 points. (see notes)	15	14	14	15
2. The price of a packet of cigarettes in the most popular price category in January 2005, taking into account Gross Domestic Product per capita expressed in the PPS. Country with highest price ratio receives 15 points.	15	9	10	11
<b>II. Smoke free work and other public places on 1 July 2005</b>	<b>22</b>	<b>5</b>	<b>5</b>	<b>5</b>
1. Workplaces excluding cafes and restaurants – <b>one only</b> of	<b>10</b>			
Complete ban without exceptions (no smoking rooms); enforced	10			
Complete ban, but with closed, ventilated, designated smoking rooms; enforced	8			
Complete ban, but with ventilated, designated smoking rooms; enforced	6			
Meaningful restrictions; enforced	4			
Legislation, but not enforced	2	2	2	2
2. Cafes and restaurants – <b>one only</b> of	<b>8</b>			
Complete ban; enforced	8			
Complete ban, but with closed, ventilated, designated smoking	6			

rooms; enforced				
Meaningful restrictions; enforced	4			
Legislation, but not enforced	2			
<b>3. Public transport and other public places – <i>additive</i></b>	<b>4</b>			
Complete ban in domestic trains without exceptions	1			
Complete ban in other public transport without exceptions	1	1	1	1
Complete ban in educational, health, government and cultural places without exceptions	2	2	2	2
<b>OR</b> Ban in educational, health, government and cultural places, but with designated smoking areas or rooms	1			
<b>III. Spending on public information campaigns in 2004</b>	<b>15</b>	<b>0</b>	<b>13</b>	<b>14</b>
Tobacco control spending by the government in 2004, as a proportion of Gross Domestic Product (GDP). Country with highest ratio receives 15 points (see notes).				
<b>IV. Comprehensive bans on advertising and promotion on 1 July 2005</b>	<b>13</b>	<b>6</b>	<b>8</b>	<b>8</b>
Points for each type of ban included – <i>additive</i>				
Complete ban on tobacco advertising on television	3	3	3	3
Complete ban on outdoor advertising (e.g. posters)	2		2	2
Complete ban on advertising in print media (e.g. newspapers and magazines)	2	1	1	1
Complete ban on indirect advertising (e.g. cigarette branded clothes, watches, etc)	2	2	2	2
Ban on point of sale advertising	1			
Ban on cinema advertising	1			
Ban on sponsorship	1			
Ban on internet advertising	½	1/2	1/2	
Ban on radio advertising	½	1/2	1/2	
<b>V. Large direct health warning</b>	<b>10</b>	<b>2</b>	<b>2</b>	<b>6</b>

<b>labels on 1 July 2005</b>				
1. Rotating health warnings	2			2
2. Size of warning – <b>one only of</b>	4			
10% or less of packet	1	1	1	
11 – 25% of packet	2			
26 – 40% of packet	3			3
41% or more of packet	4			
3. Contrasting colour (e.g. black lettering on white background)	1	1	1	1
4. Picture	3			
<b>VI. Treatment to help dependent smokers stop</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>
1. Quitline – <b>one only of</b>	2			
Well funded national quitline or well funded quitlines in all major regions of country	2			
<b>OR</b> National quitline with limited funding or a patch work of small local quitlines	1			
2. Network of smoking cessation support	3			
3. Reimbursement of treatment	3			
Cessation support network covering whole country (3); free (3)	6			
Cessation support network, but only in selected areas, e.g. major cities (2); free (3)	5			
Cessation support network covering whole country (3), partially free (2)	5			
Cessation support network, but very limited, just a few centres (1), free (3)	4			
Cessation support network, but only in selected areas, e.g. major cities (2), partially free (2)	4			
Cessation support network covering whole country (3), not free (0)	3			
Cessation support network, but very limited, just a few centres (1), partially free (2)	3			
Cessation support network, but only in selected areas, e.g. major cities (2); not free (0)	2			
Cessation support network, just a	1			



few centres (1), not free (0)				
4. Reimbursement of medications – <b>one only</b> of	2			
Reimbursement of pharmaceutical treatment products	2			
<b>OR</b> Partial reimbursement of pharmaceutical treatment products	1			
<b>Total score</b>	<b>100</b>	<b>36</b>	<b>52</b>	<b>59</b>

Table notes. **Cigarette price:** Gross Domestic Product can be expressed in PPS (purchasing Power Standard). PPS per capita has been used to take account of real purchasing power in different countries; points are awarded using the same method as for public information campaign spending. **Public information campaign spending:** the top country, the UK, is awarded 15 points; the UK ratio (spending/GDP) is then divided by 15 and the resulting number gets 1 point; countries achieve points for multiples of that number. For a more detailed explanation please see [tobcon](#) url. **Advertising:** television is the medium most used for tobacco advertising in countries with no advertising restrictions; outdoor advertising (e.g. posters) is a prominently used medium when television advertising is banned; indirect advertising (e.g. clothing, watches, or other products with cigarette branding, is the industry's favoured loophole when there are otherwise comprehensive advertising bans. **Why rankings for price and spending?** PPS takes account of affordability within a country. This introduces a (constantly changing) ratio, rather than absolute figures. In order to simplify this abstract ratio ranking system, we attributed the highest score to the country with the highest ratio. The method is best understood by consulting the raw data and resulting points scored, on the website.

APPENDIX 2.

**Table 1.** Supporting data on price and public spending subscores of Tobacco Control Scale estimates for Armenia.

Country/ year	UK			Armenia			Notes
	2005	2007	2009	2005	2007	2009	
Popu- lation (thousands)	59 673	60 393	61 595	3 218	3 221	3 267	As of January of the previous year
GDP millions (US dollars)	2 197 942	2 456 515	2 193 184	3 577	6 384	8 648	IMF WEO data (previous year)
Tobacco control budget (local currency)	92 000 000 (GBP)	73 000 000 (GBP)	62 000 000 (GBP)	0	100 000 000 (AMD)	100 000 000 (AMD)	UK: Joossens& Raw data* Armenia: National Assembly of the Republic of Armenia <a href="http://www.parliament.am">www.parliament.am</a>
Tobacco control budget (US dollars)	247 650 000	127 020 000	89 900 000	0	275 103	322 900	
PPS per capita (internat. dollars)	30 590	34 019	34 873	3 329	4 558	4 979	IMF WEO data (previous year)
Price Marlboro (US dollars)	9.2	10.42	9.3	0.93	1.29	1.32	UK: Joossens & Raw data* Armenia: personal observations
Marl- boro to PPS per capita	30.08	30.63	26.67	27.94	28.3	26.51	
MPPC (US dollars)	9.4	10.2	8.61	0.62	0.9	0.93	

MPPC to PPS per capita	30.72	29.98	24.69	18.62	19.75	18.68	
Marlboro + MPPC to PPS per capita	60.80	60.61	51.36	46.56	48.05	45.19	
Per capita (age 16+) cigarette consumption (thousand packs)				103.7	105.6	93.2	National Statistical Service of the Republic of Armenia www.armstat.am

\* See the original article in References [Reference#6]

Notes.

The online currency convector was used for transferring GBP and Euro into US dollar

<http://www.x-rates.com/>. For transferring Armenian Dram into US dollar, we used the archive of the Central Bank of Armenia <http://cba.am>