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Trends in substance use and primary prevention variables among adolescents in Lithuania, 2006–19

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Background: Since the implementation of the Icelandic Model for Primary Prevention of Substance Use in Iceland (IPM), substance use has decreased steadily among 14–16-year-old adolescents and primary prevention factors have improved. Although the IPM is being implemented in several other regions around the world, information documenting its effectiveness in other country contexts is lacking. This study assessed trends in substance use and primary prevention variables in three cities in Lithuania following the implementation of the IPM. **Methods:** Data collected from repeated, comparative cross-sectional self-report surveys conducted among a total of 30 572 10th graders in the cities of Kaunas, Klaipeda and Vilnius, Lithuania, from 2006 to 2019, were analyzed. Cochran–Armitage test for linear trend and analysis of variance for linear trend was used to assess time-trends in prevalence of substance use and mean levels of primary prevention variables over time. **Results:** Following the implementation of IPM rates of cigarette smoking and the use of alcohol, cannabis and amphetamine has decreased among 10th graders in Lithuania's three largest cities and simultaneously preventive variables targeted have improved. Similar to Iceland, primary prevention variables were related to substance use in the expected direction, with the exception of organized sports participation, which was not associated with less likelihood of alcohol, cannabis and amphetamine use. **Conclusion:** Trends in substance use and primary prevention variables following the implementation of the IPM are similar in the three cities in Lithuania as in Iceland. Further research is needed to better understand the mechanisms underlying these trends.

Introduction

Since the implementation of the Icelandic Model for Primary Prevention of Substance Use (IPM) 20 years ago in Iceland, substance use has decreased steadily among 14–16-year-old adolescents.[1] Compared with other European nations, this steep downward trend is impressive and perhaps unique. The position of 10th-grade students in Iceland has gone from being among those most likely in Europe to use tobacco and alcohol, become drunk and experience alcohol-related accidents or injuries[2] to being among those least likely to have such experiences.[3] The IPM is a systematic primary prevention model which focuses on altering the social environment of youth to affect their behavioral choices and hence decrease the likelihood of substance use initiation and progression. The IPM has three main characteristics: (i) it is an evidence-based approach grounded in the sociology literature, involving a commitment to collect, disseminate and translate survey data to local communities; (ii) it is a community-based approach aiming at strengthening protective factors and decreasing risk factors for substance use in each local community, which involves collaboration between key community stakeholders who plan and implement prevention activities based on survey findings and (iii) it is designed to strengthen a dialog between researchers, policy makers and practitioners.[1,4–8] Evidence has shown that the prevalence of social risk and protective factors, within the domains of family, school, peer group and leisure time activities, targeted by the IPM have improved considerably in Iceland. For example, levels of parental monitoring and parental social involvement have increased linearly, engagement in unsupervised party lifestyle has nearly been eradicated, while participation in organized sports activities has increased linearly.[1,9,10]

The IPM is now being adapted and implemented in a growing number of regions around the world, including several countries in Europe, Australia and in Central- and Latin America, under the platform of Planet Youth (see https://planetyouth.org/). However, data documenting the trends in substance use and primary prevention variables (i.e. indicators of social protective and risk factors) in countries outside of Iceland that have attempted to implement the IPM, and that would enable us to understand the global effectiveness of the model and its approach, are lacking.

The implementation of the IPM in Lithuania

Lithuania is a Northern-European country with a population of 2.7 million. It is geographically located along the Baltic Sea in the west, and bordering Russia and Poland in the south, Belarus in the east, and Latvia in the north.[12] Lithuania belongs to the Baltic countries, along with Estonia and Latvia. Those countries have experienced major social change in the last 30 years, triggered by the fall of communism in Eastern-Europe in 1989.[13] Economic, technological, social and cultural changes have impacted people's lives in this area in complex and inter-connected ways. Many of these changes have been beneficial such as increase in opportunity and improved levels of equality, but some have been more challenging such as the rise in emigration and an increase in adolescent use of alcohol, cigarettes and cannabis.[3,13–15]

With the aim of improving the social conditions of young people in Lithuania and to decrease substance use related harms, in 2006

the Lithuanian cities Kaunas, Klaipeda and Vilnius begun implementing the IPM via their participation in the Youth in Europe project in cooperation with Icelandic Centre for Social Research and Analysis (ICSRA) and the Stockholm-based European Cities against Drugs Organization.[7–9] The implementation of the IPM was aligned with the IPM in Iceland, including the key pillars of the model.[1,4,5] In all the cities, the work has been evidence-based, surveys have been carried out on a regular basis and data collected and processed using ICSRA standards. Survey findings have been disseminated throughout communities and schools and results presented to parents and other local stakeholders. Municipal administration and community stakeholders have set goals, and formed policy and practice based on the study findings. Major focus areas include emphasis on increasing parental monitoring, parental involvement, youth participation in organized and supervised leisure activities, and preventing unsupervised parties and late outside hours among young people.

This study sought to assess the impact of implementation of the IPM on communities in Lithuania.[1,9] Presently, the only available data for Lithuania are country-wide data from the European School Survey Project on Alcohol and Other Drugs (ESPAD). Country-level studies do not render it possible to specifically assess trends within the three cities that have been employing the IPM. Thus the aim of this study is to provide this information by: (i) assessing time-trends in smoking behavior, alcohol use, cannabis use and amphetamine use among 15–16-year-old youth in the period 2006–19 in the cities Kaunas, Klaipeda and Vilnius; (ii) assessing the time trends in primary prevention variables during this period in the same cities and (iii) testing the associations between the primary prevention variables and substance use variables.

Methods

Samples and data

The Youth in Europe cross-sectional surveys have been conducted with ICSRA oversight among 10th grade students since 2006 as part of the implementation of the IPM in the three largest cities in Lithuania; Vilnius, Kaunas and Klaipeda.[9] The current study uses six waves of data from Kaunas and Klaipeda (years 2006, 2008, 2012, 2014, 2016 and 2018/2019) and four waves of data from Vilnius (years 2006, 2008, 2012 and 2016). The sixth and final wave was administered in December 2018 in Kaunas and in February 2019 in Klaipeda. In Vilnius, the largest city with a population of ∼ 500,000, participants were selected based on randomly drawn classes from all schools. In Kaunas and Klaipeda, the second and third largest cities with a population of ∼300 000 and 150 000, respectively, all 10th grade classes in all schools participated in the surveys.[12] In total, responses from 30 570 students were employed in the current study, of which 50% were boys. The response rate ranged from 74 to 92% within the three cities over all waves of data. Table 1 includes the number of participants in the three cities for all waves of data.

Table 1 Number of participants in 10th grades in the Youth in Europe surveys in Kaunas, Klaipeda and Vilnius in years 2006, 2008, 2012, 2014[a] and 2016 and 2018/2019[a]

	Kaunas		Klaipeda		Vilnius	
Year	*N*	% boys	*N*	% boys	*n*	% boys
2006	2741	47	2219	48	2343	50
2008	2554	52	1892	50	2238	48
2012	1533	51	1191	51	2377	50
2014	2316	52	1196	51	NA	NA
2016	2041	50	1183	50	2039	54
2018/2019	1784	49	925	49	NA	NA
Total	12 969	50	8606	50	8997	51

a: In 2014 and 2019 the Youth in Europe survey was not conducted in Vilnius; NA = not available, survey not administered this year.

Measures

Dependent variables

Smoking behavior. Two variables were used to assess smoking behavior. These were categorized as 'any smoking' and 'daily smoking' during the last 30 days and measured with the question: 'How much on average have you smoked during the last 30 days?' (nothing, than one cigarette per week, less than one cigarette per day, 1–5 cigarettes per day, 6–10 cigarettes per day, 11–20 cigarettes per day and more than 20 cigarettes per day). Categories were collapsed into two dichotomized variables measuring 'any smoking' (0 = nothing and 1 = yes, once or more in the last 30 days) and 'daily smoking' (0 = nothing or less than daily and 1 = daily).

Alcohol use. Three variables were used to assess alcohol use. Any lifetime alcohol use was measured with the question: 'How often have you had a drink of alcohol of any kind in your lifetime?' (never, 1–2 times, 3–5, times, 6–9 times, 10–19 times, 20–39 times and 40 times or more). Categories were collapsed into a dichotomized variable (0 = no and 1 = yes, once or more). Lifetime drunkenness and drunkenness during the last 30 days were assessed with the two questions: 'How often have you become intoxicated in your lifetime?' and 'How often have you become intoxicated during last 30 days?' Response categories were the same as with lifetime alcohol use. Categories were collapsed into two dichotomized variables, respectively (0 = no and 1 = yes, once or more in lifetime) (0 = no and 1 = yes, once or more last 30 days).

Illegal substances. Two variables were used to assess use of illegal substances. These were measured with the questions 'How often have you used the following substances?' (a) 'Cannabis' and (b) 'Amphetamine'. Both questions were assessed with never, 1–2 times, 3–5 times, 6–9 times, 10–19 times, 20–39 times and 40 times or more. Categories were collapsed into two dichotomized variables measuring lifetime use of cannabis and amphetamine (0 = never and 1 = yes, once or more in lifetime).

Primary prevention (independent) variables

Parental monitoring and parental involvement. Two variables were used to assess parental monitoring. These were measured with the questions 'How well does the following apply to you?' (i) 'My parents know with whom I am in the evenings' (ii) 'My parents know where I am in the evenings'. Two variables were used to assess parental social involvement. These were measured with two questions: 'How well does the following apply to you?' (iii) 'My parents know my friends' (iv) 'My parents know my friends' parents'. Scores and response categories for the four questions were (1 = applies to me very well, 2 = applies to me rather well, 3 = applies to me rather badly and 4 = applies to me very badly). The four variables were reverse-coded for lower scores to indicate low levels of parental monitoring and involvement and high scores to indicate high parental monitoring and involvement.

Participation in organized sports. Participation in organized sports with a club or team was measured with the question: 'How often do you participate in sports with a club or a team?' (1 = almost never, 2 = once per week, 3 = 2–3 times per week, 4 = 4–6 times per week and 5 = almost every day).

Party life-style. Party life-style was measured with the question: 'How often does the following apply to you?': 'Going to parties' (1 = almost never, 2 = less than once per month, 3 = 1–3 times per month, 4 = 1–3 times per week and 5 = 4 times per week or more).

Control variables. Control variables were gender (boys = 1, girls = 2), family structure (0 = lives with both parents, 1 = lives in other arrangements) and family financial status measured with the question: 'How well off financially is your family compared with

other families in your country?' (1 = much better off to 7 = much worse off).

Data collection procedures

The Youth in Europe surveys are administered with a standardized 11-step data collection protocol[11] which involves obtaining institutional approvals, determining the sample, acquiring schools contact and consent for participation, preparation of survey materials, distribution of consent forms, and so on. Data collection was fully confidential and no identifiable information was collected. To secure a high response rate within each participating school which is essential for the intervention procedures within the IPM, a passive parental/caregiver consent format is employed with participant assent. Participants were fully permitted to deny participation or skip individual questions as they pleased. In each school the students were given one class session to complete answering the survey that was administered by teachers. Between 2006 and 2016, surveys were administered in a pencil-and-paper format but electronically in 2019.

Data analysis

Cochran–Armitage test for trend was used in 2×1 tables against a χ^2 distribution to assess linear time-trends in the seven substance use variables across all available waves of data (see table 2). Analysis of variance for linear trend was used to assess time-trends in mean levels of each of the primary prevention variables. Logistic regression models were run using each primary prevention variable (six variables) as an independent variable and every substance use variable (seven variables) as a dependent variable. This was done separately for each of the three cities with the pooled data while controlling for background variables. The alpha for statistical significance in this study was set at $P < 0.01$.

Results

Table 2 shows trends over time in proportions for the substance use variables and mean levels for the primary prevention variables in the three cities. The results show a significant downward linear trend for all cigarette and alcohol use variables under study, i.e. from 2006 to 2016 in Vilnius and from 2006 to 2018/2019 in Kaunas and Klaipeda. Furthermore, the results indicate a significant downward linear trend in this time period for amphetamine use in all the cities and in cannabis use in Vilnius and Klaipeda. Regarding the change in cannabis use in Kaunas over time, the linear trend from 2006 to 2018 was not significant at level $P < 0.01$, but at a more conventional level $P < 0.05$ ($\chi^2_{(1)} = 6.0$, $P = 0.01$). However, when tested for the time period 2008–2018, the linear downward trend in cannabis use in Kaunas was significant at level $P < 0.01$ ($\chi^2_{(1)} = 9.8$, $P = 0.002$).

Looking at the trend in primary prevention variables the results demonstrate a significant linear trend over time for all those variables, with the exception of 'parents know my friends' in Kaunas where no change was observed. Mean levels of parental monitoring, parental involvement and organized sport participation increased over time in Kaunas, Klaipeda and Vilnius. Party lifestyle, however, decreased over time.

Finally, table 3 shows logistic regression models with primary prevention variables as predictors of substance use. The results indicate that for Kaunas, Klaipeda and Vilnius, parental monitoring, parental involvement and party lifestyle are significantly associated with all the substance use variables, with the exception of 'parents know my friends' in Klaipeda and amphetamine use, with higher levels of monitoring and involvement relating to lower odds of substance use but with party lifestyle relating to higher odds of such use. As regards organized sport participation, for Kaunas, Klaipeda and Vilnius, it is significantly associated with lower odds of smoking behaviors. Organized sport participation, however, was either not significantly associated with or positively associated with the alcohol use variables under study, indicating higher odds of ever becoming drunk among those who regularly engage in such sport activities.

Discussion

This study assessed whether social factors and substance use variables addressed by the IPM, show a similar time trend in the three Lithuanian cities as they have in Iceland during the last 20 years.[1] First, the results revealed a significant downward trend in the use of all the substances under study for the three cities. There was a strong downward trend in alcohol use, with the proportion of 10th graders who had ever used alcohol declining in the three cities from 95 to 97% in 2006–83–86% in 2016–76% in 2018/2019 in Kaunas and Klaipeda. Similarly, lifetime drunkenness decreased in the three cities from 66 to 68% in 2006–48–51% in 2016–41–44% in 2018/2019 in Kaunas and Klaipeda. This is an important finding as studies have shown that substance use follows cohorts.[6] That means that a cohort that is proportionally lower in use early on compared with prior cohorts is likely to remain lower in use later in adolescence. Furthermore, these findings are consistent with the 2015 ESPAD results that indicated a country-level decrease in alcohol use in Lithuania among 10th graders between 2011 and 2015.[16]

Likewise, a robust downward trend was observed for cigarette smoking in all three cities, with approximately one out of three 10th graders admitting to smoking cigarettes daily in 2006, one out of five in 2016 but one in every ten in 2018/2019 in Kaunas and Klaipeda. A decrease in cigarette use among this age group has been detected in several European countries in the last 20 years; however, the pattern in Lithuania revealed an increase from 1995 to 2003 and then a downward trend between 2003 and 2015, resulting in a similar prevalence in 1995 as in 2015.[16] Although not as robust as with smoking and alcohol use, the current results indicate a linear decrease in both lifetime cannabis and amphetamine use among 10th grade students in the three Lithuanian cities. Interestingly, the Lithuanian country level ESPAD results from 1999 to 2015 show no decrease in lifetime cannabis use in this age group.[16]

Second, with the exception of one parental monitoring variable in Kaunas, the results show a significant linear trend for all primary prevention variables in the hypothesized direction.

Third, the primary prevention variables for parental monitoring, parental involvement and party lifestyle turned out to be significantly related to the use of all types of substances in a similar manner as has been demonstrated in Iceland.[1,9] This means that adolescents who report their parents knowing with whom and where they were in the evenings, and that their parents know their friends and the parents of their friends, were less likely to report having engaged in the use of cigarettes, alcohol, cannabis and amphetamine than those who reported lower scores on these variables.

Finally, unlike Iceland, organized sport participation was not related to lower prevalence of use of alcohol, cannabis and amphetamine in the three cities.[1,9] Sport participation revealed a weak but significant association with less likelihood of daily smoking. With regard to alcohol use, the association was either non-significant or in the opposite direction where adolescents in the three cities who were highly engaged in organized sports were more likely to have ever become drunk than other adolescents. This may suggest that the social organization of formal sport in Lithuania is different from Iceland[17–19] where participation in organized sports has been shown to confer protection against use. Further research is needed to better understand the mechanisms involved in these relationships.

This study has some limitations. Given the cross-sectional design, we are studying correlations between variables and are therefore unable to determine a direction of causality between constructs. Hence, we cannot conclude that the exposure to the

Table 2 Trends for primary prevention variables (means) and substance use variables (%) for Kaunas, Klaipeda and Vilnius in the time period 2006–2018/2019

Substance use variables	Kaunas							Klaipeda							Vilnius[a]				
	2006	2008	2012	2014	2016	2018	Linear trend[b]	2006	2008	2012	2014	2016	2019	Linear trend[b]	2006	2008	2012	2016	Linear trend[b]
%	%	%	%	%	%	$\chi^2_{(1)}$	%	%	%	%	%	%	$\chi^2_{(1)}$	%	%	%	%	$\chi^2_{(1)}$	
Smoking 30 days	41.1	43.0	41.6	34.4	30.9	21.8	220.8**	41.9	44.1	41.7	36.9	30.6	19.7	151.5**	43.7	44.1	41.3	30.2	90.3**
Daily smoking	30.5	31.1	26.4	21.0	17.5	10.9	334.6**	32.2	34.0	30.5	25.6	19.9	10.6	189.8**	32.9	31.7	29.2	19.8	96.9**
Alcohol use	95.6	94.6	86.7	89.0	86.3	75.9	435.7**	96.5	96.0	90.6	87.2	82.9	76.4	422.1**	95.3	94.8	92.4	84.9	174.1**
Drunk lifetime	65.9	65.6	59.9	50.7	51.3	40.6	387.1**	67.7	65.6	57.8	51.7	47.9	44.4	263.4**	66.1	65.0	60.1	49.7	137.9**
Drunk 30 days	20.3	22.1	19.4	13.8	18.3	11.5	74.6**	19.8	19.4	9.4	11.9	17.0	10.9	57.6**	24.0	21.3	19.3	19.5	14.4**
Cannabis	20.0	22.0	17.2	21.3	19.7	17.1	6.0*	29.2	30.4	26.6	26.3	18.8	21.5	54.6**	26.6	23.8	24.4	20.1	20.0**
Amphet.	4.1	3.6	2.1	1.5	1.6	1.7	53.8**	6.4	6.3	2.2	2.7	1.8	3.0	66.0**	4.7	5.8	2.1	1.7	56.5**
Prevention variables	2006	2008	2012	2014	2016	2018	A^c $F_{(1)}$	2006	2008	2012	2014	2016	2019	A^c $F_{(1)}$	2006	2008	2012	2016	A^c $F_{(1)}$
	Mean SD							Mean SD							Mean SD				
Par1	3.19	3.10	3.31	3.38	3.41	3.46	267.9**	3.04	3.00	3.18	3.23	3.40	3.47	279.9**	3.04	3.00	3.21	3.36	209.9**
	0.89	0.93	0.81	0.80	0.78	0.76		0.95	0.95	0.87	0.85	0.76	0.76		0.93	0.95	0.84	0.79	
Par2	3.20	3.13	3.39	3.39	3.40	3.50	279.3**	3.00	3.00	3.19	3.26	3.38	3.46	321.9**	3.01	3.01	3.22	3.34	218.9**
	0.87	0.88	0.75	0.78	0.78	0.74		0.95	0.95	0.84	0.83	0.76	0.74		0.93	0.92	0.83	0.79	
Par3	3.25	3.18	3.27	3.26	3.25	3.27	4.3	3.16	3.07	3.10	3.15	3.24	3.25	20.0**	3.09	3.04	3.13	3.23	46.8**
	0.81	0.84	0.78	0.77	0.79	0.81		0.82	0.85	0.80	0.78	0.81	0.82		0.85	0.87	0.81	0.80	
Par4	2.24	2.17	2.47	2.40	2.45	2.45	146.4**	2.03	2.00	2.18	2.22	2.40	2.40	216.6**	2.07	2.03	2.25	2.43	236.9**
	0.99	0.96	0.94	0.92	0.93	0.94		0.92	0.93	0.87	0.92	0.96	0.96		0.94	0.91	0.90	0.95	
Sport	2.40	2.57	2.48	2.58	2.65	2.59	16.5**	2.24	2.38	2.36	2.51	2.58	2.49	30.5**	2.15	2.27	2.37	2.38	24.3**
	1.69	1.75	1.80	1.85	1.86	1.82		1.65	1.72	1.81	1.88	1.84	1.84		1.54	1.56	1.72	1.70	
Party	2.31	2.13	2.03	1.89	NA	NA	198.4**	2.39	2.26	2.11	1.94	NA	NA	137.6**	2.41	2.24	2.12	NA	78.0**
	1.11	1.01	1.00	0.99				1.14	1.06	1.13	1.02				1.10	1.04	1.06		

NA = not available; SD = standard deviation; Par1 = Parents know whom with in evenings; Par2 = Parents know where in evenings; P3 = Parents know friends; P4 = Parents know friends' parents.
a: Survey not administered in 2014 and 2019.
b: Cochran–Armitage for linear trend.
c: Analysis of variance for linear trend.
**: $P < 0.001$; *$P = 0.01$.

Table 3 Logistic regression models, for Kaunas, Klaipeda and Vilnius, for the bivariate relationships between independent prevention variables and dependent substance use variables, controlling for gender, family structure and financial status

	Kaunas						Klaipeda						Vilnius					
	Smoking		Alcohol use			Illegal substances	Smoking		Alcohol use			Illegal substances	Smoking		Alcohol use			Illegal substances
	S1	S2	A1	A2	A3	C	A	S1	S2	A1	A2	A3	C	A	S1	S2	A1	A2	A3	C	A
	Exp(B)							Exp(B)							Exp(B)						
Par1	0.64**	0.63**	0.63**	0.58**	0.61**	0.68**	0.55**	0.66**	0.65**	0.64**	0.57**	0.65**	0.64**	0.62**	0.65**	0.66**	0.72**	0.58**	0.62**	0.67**	0.57**
Par2	0.56**	0.56**	0.58**	0.50**	0.56**	0.60**	0.45**	0.58**	0.57**	0.58**	0.52**	0.57**	0.58**	0.52**	0.58**	0.59**	0.63**	0.50**	0.55**	0.62**	0.53**
Par3	0.84**	0.87**	0.82**	0.81**	0.80**	0.83**	0.74**	0.87**	0.86**	0.82**	0.78**	0.77**	0.86**	0.86	0.83**	0.84**	0.85*	0.75**	0.74**	0.80**	0.67**
Par4	0.83**	0.83**	0.72**	0.79**	0.80**	0.81**	0.76**	0.84**	0.83**	0.72**	0.77**	0.79**	0.84**	0.84*	0.80**	0.83**	0.74**	0.73**	0.77**	0.75**	0.63**
Sport	0.97*	0.93**	1.08**	1.06**	1.03	1.03	0.98	0.99	0.95*	1.06	1.04*	1.04	1.04*	1.08	0.98	0.96*	1.02	1.05*	1.03	1.02	1.00
Party	2.03**	1.97**	1.74**	2.08**	1.94**	1.85**	2.12**	1.94**	1.86**	2.42**	2.14**	1.80**	1.94**	2.09**	2.07**	1.99**	1.66**	2.12**	1.85**	1.82**	1.79**

S1 = Smoking 30 days; S2 = Daily smoking; A1 = Alcohol use life time; A2 = Drunk life time; A3 = Drunk last 30 days; C = Cannabis use life time; A = Amphetamine use life time; Par1 = Parents know whom with in evenings; Par2 = Parents know where in evenings; P3 = Parents know friends; P4 = Parents know friends' parents.
**: $P < 0.001$; *$P < 0.01$.

IPM focused-variables is the causal reason for the observed decline in substance use and thus we cannot rule out other possible influential factors, including secular trends in substance use in Europe and the impact of other parallel prevention efforts in the cities or country. Furthermore, we cannot rule out that the use of other substances, not measured in the current study, contributes to the decline observed. For example, in 2016 the use of e-cigarettes was high in prevalence among adolescents in Kaunas and Klaipeda who had ever smoked cigarettes, but very low among those who had never smoked cigarettes.[20] In conclusion, since the implementation of IPM, rates of cigarette smoking and the use of alcohol, cannabis, and amphetamine decreased linearly among 10th grade students in Lithuania's three biggest urban centers. During the same time period, preventive variables emphasized and addressed by the IPM improved linearly. Finally, risk and protective factors targeted by the IPM in Iceland relate similarly to substance use variables in Lithuania, with the exception of organized sports participation, which was not associated with less likelihood of alcohol, cannabis and amphetamine use as it does in Iceland.

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Conflict of interest: None declared.

Key points

- Following the implementation of IPM in Lithuania's three largest cities, prevalence of cigarette smoking and the use of alcohol, cannabis and amphetamine has decreased linearly among 10th graders.
- During the same time period, prevention variables emphasized and addressed by the IPM have improved linearly.
- Risk and protective factors targeted by the IPM relate similarly to substance use variables in Lithuania and Iceland, with the exception of organized sports participation, which is not related to less liklihood of alcohol, cannabis and amphetamine use in Lithuania.

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