Longitudinal Effects of School Drug Policies on Student Marijuana Use in Washington State and Victoria, Australia

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Marijuana is the most widely used illicit drug worldwide,[1,2] with an estimated 181 million (3.9%) of the world's adults using it in 2011.[3] Surveys in the United States and Australia have shown that marijuana use is particularly high among adolescents.[4,5] Concern about marijuana use has increased in recent years as a result of improved understanding of the harmful health and psychological effects of frequent use, especially among adolescents and young adults.[6,7] At the same time, many US states have passed marijuana laws making it legal for adults older than 21 years to possess small amounts of marijuana for medical purposes. Two states—Colorado and Washington— have legalized marijuana for recreational use by adults. Studies on the impact of marijuana legislation on marijuana use by US adolescents have yielded mixed results, with some pointing to an increase in use and others to no change or to a decrease in marijuana use.[8–13] Marijuana use is illegal in Australia.[14]

School-based prevention programs and policies have become the dominant mode of drug prevention for adolescents.[15] School drug policies aim to reduce levels of adolescent substance use by restricting access to drugs and exposure to drug use during school hours. Studies measuring access to marijuana at the individual, school, and country levels have shown consistent associations between increased access and higher rates of self-reported use by adolescents.[16–18] An Australian study showed that high rates of school-level marijuana use (an indirect measure of exposure) are associated with increased risk of use by secondary students.[19] In addition, students in Swiss schools with more incidents of marijuana intoxication (as reported by teachers) were more likely to report marijuana use, regardless of peer use,[20,21] itself a salient risk factor.[19,22] Even in the absence of direct exposure to others' marijuana use, students may be influenced by the general level of acceptability or

Objectives. We examined the longitudinal effect of schools' drug policies on student marijuana use.

Methods. We used data from the International Youth Development Study, which surveyed state-representative samples of students from Victoria, Australia, and Washington State. In wave 1 (2002), students in grades 7 and 9 (n = 3264) and a school administrator from each participating school (n = 188) reported on school drug policies. In wave 2 (2003), students reported on their marijuana use. We assessed associations between student-reported and administrator-reported policy and student self-reported marijuana use 1 year later.

Results. Likelihood of student marijuana use was higher in schools in which administrators reported using out-of-school suspension and students reported low policy enforcement. Student marijuana use was less likely where students reported receiving abstinence messages at school and students violating school policy were counseled about the dangers of marijuana use.

Conclusions. Schools may reduce student marijuana use by delivering abstinence messages, enforcing nonuse policies, and adopting a remedial approach to policy violations rather than use of suspensions. (*Am J Public Health*. Published online ahead of print March 19, 2015: e1–e7. doi:10.2105/AJPH.2014.302421)

disapproval of marijuana use in the broader school environment.[23,24] Thus, school drug policy may have a further potentially important function in addressing marijuana social norms in the school context.

Although almost all secondary schools in the United States and Australia have illicit drug policies, school-to-school variation in policy content exists.[25–27] Schools differ in how they develop, communicate, and enforce their policies as well as in policy intent (e.g., goals of abstinence vs harm minimization). In addition, schools vary with respect to their responses to incidents of student drug use, which range from highly punitive approaches such as expulsion and suspension to remedial responses such as counseling.[25-27] Despite calls from leading government agencies for schools to implement evidence-based, whole-school drug education policies and programs,[28,29] empirical evidence of effective policy effects is relatively scarce. Studies examining the effectiveness of school drug policies in reducing student drug use have demonstrated mixed results, although there is some evidence of the importance of policy enforcement.[30]

The majority of studies have focused on the impact of tobacco policy on student smoking.[31–42] Fewer studies have investigated the impact of policies on student alcohol[43-46] and illicit drug use.[47,48] With 1 exception,[45] none of these studies has demonstrated a longitudinal relationship between school policy and subsequent drug use. Further research is required to understand how these policies affect student drug use. Particularly needed are studies addressing the predictive impact of various elements of school policy, including punitive versus remedial policies and responses, policy enforcement, and exposure to abstinence and harm minimization messages related to substance use in the school context.

We aimed to fill the existing knowledge gap by assessing the longitudinal impact of school illicit drug policies on student marijuana use. We maximized variation in the measured policy components by using data from the International Youth Development Study (IYDS), an ongoing longitudinal cross-national study of schools and adolescents in Washington State and Victoria, Australia, which have

been shown to differ in their approach to school policy elements. Washington school policies have been more oriented toward total abstinence and more frequently enforced with harsh punishment (such as expulsion or calling law enforcement), whereas policies in Victoria schools have been more reflective of harm minimization principles.[25]

Previous studies investigating the validity of the IYDS school policy survey tools have shown that reports from school officials and students in the United States are significantly different from those in Australia and accurately reflect their respective national policy approaches to youth alcohol and drug use.[25,26] School official and student reports on IYDS school alcohol policy measures have longitudinally predicted student alcohol use.[45] In this study, we used IYDS school policy information collected from both school officials and students and self-reported student marijuana use 1 year later to address the following research questions:

1. Is student marijuana use predicted by the level of enforcement of school illicit drug policies?

2. Is student marijuana use predicted by different types of school responses to illicit drug use at school?

3. Is student marijuana use predicted by the degree to which school illicit drug policy is based on abstinence and harm minimization principles?

METHODS

The data used in this study were collected during the first and second years of the IYDS. Procedures for the IYDS sampling, school administrator survey, and student survey have been described in detail elsewhere.[25,49,50] Briefly, a 2-stage cluster sampling approach was used to recruit state-representative samples of school students from 3 grade cohorts (grades 5, 7, and 9) in Washington State and Victoria. In the first stage, 153 (70.5% of schools approached) Washington schools and 154 (65.5%) Victoria schools agreed to participate. In the second stage, 2885 (74.8%) of Washington State parents and students and 2884 (73.5%) of Victoria parents and students consented to participate. Students completed surveys during class time. The school principal (or a staff member nominated by the principal

as most knowledgeable of the school's drug policies and procedures) from each participating school completed a school administrator mail survey (97.4% participation rate).

In this study, we used data from participants in the grade 7 (middle) and grade 9 (oldest) cohorts, who completed a student survey in wave 1 (2002) and 1 year later in wave 2 (2003; n = 3850; 99% retention rate in both states) and from administrators at the schools they attended. Students were excluded if they did not have corresponding school administrator survey data (n = 91 students from 5 school administrators who did not complete the school survey) or if they changed schools between wave 1 and wave 2 (n = 449). Honesty criteria resulted in the exclusion of 46 students. The final sample consisted of 3264 students from 188 schools. Because of the 2 age cohorts in the sample, participants in wave 2 were aged approximately 14 or 16 years (Washington: mean = 15.0 years; SD = 1.1; range = 13.0–18.2; Victoria: mean = 14.9 years; SD = 1.0; range = 12.9–17.2).

Measures

The self-reported measure of student marijuana use was adapted from the Monitoring the Future survey.[51] The school policy measures in the school administrator and student surveys were developed by the IYDS to measure school drug policy environments in Washington and Victoria. Many school administrator survey items were derived from existing measures of school policies in the United States and some items, as well as the student survey items, were developed by IYDS staff to measure additional dimensions of interest.[25,26] The cross-sectional and prospective validity of the school policy measures has been documented previously.[25,26,34,45]

Student-level outcome and school policy variables. The measure of current marijuana use at wave 2 asked students, "In the past 30 days on how many occasions (if any) have you used marijuana (pot, weed, grass)?" A binary indicator of marijuana use was formed (none vs ≥ 1 times).

We used responses regarding the most frequently used drugs, alcohol and cigarettes, to measure low policy enforcement. Students indicated their agreement with the following 2 items, "Many students smoke on school grounds without getting caught" and "Many students drink alcohol on school grounds without getting caught," on a 4-point scale from

ranging from *YES!* (coded as 4) through *yes* (3) and *no* (2) to *NO!* (1). The mean response formed a measure of low policy enforcement.

We measured perceived consequences of marijuana policy violation by asking students, "If a student was found using marijuana at school, which of the following would most likely happen? (circle all that apply)." Responses were as follows: (1) he or she would be talked to by a teacher about the dangers of using marijuana, (2) he or she would be suspended, (3) he or she would be expelled, and (4) the police would be called. Each response was coded as 1 if circled and 0 if not circled.

We measured abstinence and harm minimization policies by asking students whether they agreed with the following 2 statements regarding their school: "We are taught to say no to alcohol" (abstinence) and "We are taught how to use alcohol safely" (harm minimization). Response options were *YES!* (4), *yes* (3), *no* (2) and *NO!* (1).

We calculated a measure of honesty based on student reports of being "not honest at all" when completing the survey, using a fictional drug, or using illicit drugs more than 120 times in the past 30 days.[52]

School-level school policy variables. School administrators were asked, "In your opinion, how strictly are the substance use policies being enforced at your school?" Responses options ranged from *very strictly* (1) to *not at all strictly* (4).

We determined penalties for illicit drug use by asking school administrators to indicate whether their schools had illicit drug policies. The 97.3% of administrators who responded yes were then asked to indicate the likelihood of issuing specific consequences when "students are caught using, possessing or being under the influence of illicit drugs on school grounds or at school events." Responses were as follows: expelled from school; referred to legal authorities (police); suspended from school; referred to a school counselor or nurse; recommended to participate in an assistance, education, or cessation program; or required to participate in an assistance, education, or cessation program. Responses were dichotomized as *always or almost always* (1) or *sometimes, rarely,* or *never* (0).

We measured abstinence and harm minimization policy by asking administrators whether they agreed with the following 2 statements: "School policies emphasize total abstinence from drug use" (abstinence) and

TABLE 1—Descriptive Statistics for Outcome, Predictor, and Control Variables by State: International Youth Development Study; Washington State and Victoria, Australia; 2002 and 2003

Variable	Victoria (n = 1722 Students and 98 Schools), % (No.), Mean ±SD, or Median (IQR)	Washington (n = 1542 Students and 90 Schools), % (No.), Mean ±SD, or Median (IQR)
Control variables		
Family SES, median (interquartile range)	1.9 (1.5–2.4)	2.0 (1.9–2.5)**
Older cohort	49.9 (860)	48.9 (754)
Wave 1 current marijuana use, past 30 d	3.6 (62)	7.9 (121)**
Outcome variable (wave 2):		
Current marijuana use, past 30 d	7.2 (123)	11.7 (180)**
School administrator–reported variables (wave 1)		
Punitive penalties for illicit drug use		
Call police	28.4 (25)	69.8 (60)**
Expulsion	10.8 (9)	15.9 (13)
Out-of-school suspension	62.9 (56)	89.7 (78)**
Remedial penalties for illicit drug use		
Recommend program	33.3 (26)	52.4 (43)*
Require program	40.2 (33)	67.8 (59)**
Refer to nurse or counselor	78.9 (71)	77.7 (66)
Low policy enforcement[a]	1.5 ±0.6**	1.1 ±0.3
Abstinence policy[b]	3.9 ±1.3	4.9 ±0.4**
Harm minimization policy[b]	3.3 ±1.3**	2.1 ±1.3
Student-reported variables (wave 1)		
Talked to by teacher	38.1 (656)**	29.6 (457)
Suspension	38.8 (668)	39.7 (612)
Expulsion	57.7 (994)**	51.2 (790)
Police called	44.0 (758)	53.7 (828)**
Low policy enforcement[c]	2.2 ±0.7**	1.9 ±0.8
Abstinence policy[b]	3.0 ±0.9	3.4 ±0.7**
Harm minimization policy[b]	2.7 ±1.0**	2.4 ±1.1

Note. IQR = interquartile range; SES = socioeconomic status. Statistics are based on nonmissing values. The range of sample sizes for student variables was 1526–1722 for Victoria and 1471–1542 for Washington; the range of sample sizes for school variables was 78–98 for Victoria and 82–90 for Washington.
[a]On a scale ranging from 1 to 4, on which 1 = *very strictly,* 2 = *moderately strictly,* 3 = *not very strictly,* and 4 = *not at all strictly.*
[b]On a scale ranging from 1 to 5, on which 1 = *not at all,* 2 = *a little,* 3 = *some,* 4 = *quite a bit,* and 5 = *a lot.*
[c]On a scale ranging from 1 to 4, on which 1 = *NO!,* 2 = *no,* 3 = *yes,* and 4 = *YES!*
*P < .05; **P < .001 in state comparison.

"School policies are based on the assumption that most youth will experiment with drugs" (harm minimization). Response options ranged from *not at all* (1) to *a lot* (5).

Control variables. We controlled for several variables in examining the impact of aspects of school policy on marijuana use: state (Victoria vs Washington), gender, cohort (oldest vs middle), family socioeconomic status (SES),[45] and previous-year marijuana use. The binary measure of previous year (past 30 days marijuana use in wave 1) was identical to the marijuana use measure in wave 2.

Statistical Analysis

We performed all analyses using Stata version 12.1 (StataCorp LP, College Station, TX). First, we summarized the school policy, marijuana use, and control variables for each state separately and compared differences using the t test for continuous measures and the χ^2 test for categorical variables. Then, we tested the bivariate (unadjusted) association between each school administrator–reported policy variable and student marijuana use in a random effects logistic regression using maximum likelihood estimation. We also performed a series of random effects logistic regressions to identify associations between each control variable and student marijuana use. We used partially adjusted models in which each policy variable was entered simultaneously with the control variables. These analyses modeled the random effects at the school (cluster) level. We performed random effects logistic regression analysis using the *xtlogit* command of Stata.

The bivariate associations between student-reported policy components, as well as each control variable and marijuana use, were tested in bivariate logistic regressions. We then performed a series of partially adjusted logistic regressions to estimate the predictive association between each policy component and marijuana use while accounting for control variables. All logistic regressions accounted for the clustering of students within classes using the *svy* command in Stata.

We evaluated interactions between school- and student-reported policy components and the variables state, cohort, gender, and wave 1 marijuana use to determine any differential effects. Of the 68 comparisons, only 3 were statistically significant (at $P < .05$). We therefore present the analyses for the nonstratified sample (with subgroup analyses performed for the 3 significant interaction cases). With the exception of the school administrator–reported penalties for illicit drug use items, fewer than 3% of cases were missing data for each variable; we therefore excluded missing data from the analyses. Missing data for the 6 school-reported penalties for illicit drug use items ranged from 3.4% to 12.1%. Student-level cases missing for these items were more likely to be from Victoria and in the older cohort, although they did not differ with respect to current marijuana use at wave 2. For 2 of the items (recommend or require program), cases with missing data had a lower SES. These differences may have biased the results slightly.

RESULTS

Table 1 presents the sample characteristics for Washington State and Victoria. On both survey

TABLE 2—Unadjusted and Adjusted Associations for School-Level Policy Variables as Predictors of Student Current Marijuana Use 1 Year Later: International Youth Development Study; Washington State and Victoria, Australia; 2002 and 2003

	Unadjusted		Adjusted[a]	
Variable	No.	OR (95% CI)	No.	OR (95% CI)
Multilevel model				
State (Washington)	3243	1.76* (1.30, 2.39)		
Cohort (older)	3243	2.63* (1.97, 3.51)		
Family SES	3150	0.73* (0.55, 0.98)		
Wave 1 current marijuana use[b]	3216	16.59* (11.72, 23.48)		
School administrator-reported policy variables				
Punitive penalties				
Call police	3032	1.32 (0.96, 1.82)	2926	1.0 (0.72, 1.38)
Expulsion	2884	1.31 (0.83, 2.06)	2782	0.98 (0.65, 1.49)
Out-of-school suspension	3058	2.36* (1.53, 3.66)	2952	1.62* (1.06, 2.49)
Remedial penalties				
Recommend program	2781	1.32 (0.93, 1.87)	2683	1.03 (0.75, 1.41)
Require program	2949	1.86* (1.34, 2.58)	2847	1.29 (0.93, 1.77)
Refer to nurse or counselor	3028	1.13 (0.76, 1.69)	2922	1.14 (0.79, 1.63)
Low policy enforcement	3176	1.05 (0.77, 1.42)	3061	1.35* (1.01, 1.82)
Abstinence policy	3202	1.26* (1.08, 1.47)	3083	1.14 (0.97, 1.34)
Harm minimization policy	3222	0.92 (0.82, 1.03)	3105	0.97 (0.86, 1.09)

Note. CI = confidence interval; OR = odds ratio; SES = socioeconomic status.
[a]Partially adjusted models controlled for the effects of state, cohort (grade), family SES, and wave 1 current marijuana use.
[b]Current marijuana use was defined as ≥ 1 time in the past 30 days.
*P < .05.

occasions, the prevalence of current marijuana use was significantly higher among Washington students than among Victoria students.

School administrator reports of illicit drug policy revealed that Washington schools, compared with Victoria schools, were more likely to call police, use out-of-school suspensions, and recommend or require students to attend programs in response to illicit drug incidents. Victoria schools, on average, reported lower policy enforcement than Washington schools. None of the Washington schools rated their policy enforcement in the not-very-strictly or not-at-all-strictly categories. Victoria schools, on average, reported higher levels of harm minimization policy orientation and lower levels of abstinence policy than Washington schools.

Students reported that the most common responses to breaches of illicit drug policy were expulsion for the Victoria students and calling the police for the Washington students. About 40% of students in both states cited suspension

as an option. Being counseled by a teacher about the dangers of using marijuana was another common option reported by the Victoria students. Victoria students were more likely to report low enforcement of school drug and alcohol policy. Similar to school administrator responses to policy orientation, significantly more Washington students reported an abstinence approach, and significantly more Victoria students reported a harm minimization approach.

Results of the random effects regression models used to investigate the predictive associations between school administrator–reported policy variables and student marijuana use 1 year later are presented in Table 2. We found no statistically significant effects of several aspects of school policy on student marijuana use: calling the police, expulsion, recommending a program, or referring to a nurse or counselor. Use of out-of-school suspensions and low policy enforcement each predicted increased odds of student marijuana use in partially adjusted models.

Tests of interactions provided no strong evidence of differential effects between the 2 grade cohorts and between male and female students. Interactions for state (Victoria vs Washington) indicated differential effects on marijuana use for the low policy enforcement variable only. Recalculation of the odds ratios (ORs) for Victoria and Washington State separately (including the control variables state, gender, cohort, and family SES) showed that low policy enforcement predicted higher student marijuana use in the Victoria sample only (OR = 1.50; 95% confidence interval [CI] = 1.08, 2.08). Interactions for wave 1 marijuana use status showed differential effects on marijuana use only for the out-of-school suspension variable. Recalculation of the odds ratios for time 1 marijuana user and nonuser groups separately (including the control variables state, gender, cohort, and family SES) showed that school reports of using out-of-school suspension predicted student marijuana use only in the time 1 marijuana-using sample (OR = 4.36; 95% CI = 1.39–13.64).

Table 3 presents the predictive associations between student-reported policy components and current marijuana use. In the unadjusted models, the odds of student marijuana use were reduced when students reported that being talked to by a teacher, expulsion, and calling the police were likely responses to illicit policy violations and for abstinence policy orientation. With the exception of expulsion, these significant effects were retained in the partially adjusted models. Student reports of low policy enforcement predicted increased marijuana use in the unadjusted and partially adjusted models.

Tests of interactions provided no strong evidence of differential effects between the 2 grade cohorts, male and female students, or Time 1 marijuana users and nonusers. Examination of the interactions for state showed differential effects only for the low enforcement variable. Recalculation of the ORs for Victoria and Washington separately (including the control variables time 1 marijuana use, gender, cohort, and family SES) showed that low enforcement predicted increased student marijuana use only in the Victoria sample (OR = 1.94; 95% CI = 1.46, 2.58).

TABLE 3—Unadjusted and Adjusted Associations for Student-Level Policy Variables as Predictors of Student Current Marijuana Use 1 Year Later: International Youth Development Study; Washington State and Victoria, Australia; 2002 and 2003

Variable	Unadjusted		Adjusted[a]	
	No.	OR (95% CI)	No.	OR (95% CI)
Logistic regression model				
State (Washington)	3243	1.71* (1.27, 2.29)		
Cohort (older)	3243	2.58* (1.90, 3.50)		
Family SES	3150	0.80 (0.61, 1.04)		
Wave 1 current marijuana use[b]	3216	15.67* (11.39, 21.54)		
Student-reported policy variables				
Talked to by teacher	3243	0.52* (0.39, 0.69)	3124	0.61* (0.45, 0.83)
Suspended	3243	1.24 (0.97, 1.58)	3124	1.12 (0.85, 1.48)
Expelled	3243	0.74* (0.57, 0.96)	3124	0.88 (0.65, 1.18)
Police called	3243	0.73* (0.55, 0.97)	3124	0.74* (0.55, 1.00)
Low policy enforcement	3211	1.78* (1.52, 2.08)	3092	1.50* (1.22, 1.82)
Abstinence policy	3218	0.68* (0.59, 0.77)	3099	0.68* (0.59, 0.79)
Harm minimization policy	3201	0.90 (0.80, 1.02)	3085	0.94 (0.82, 1.09)

Note. CI = confidence interval; OR = odds ratio; SES = socioeconomic status.
[a]Partially adjusted models controlled for the effects of state, cohort (grade), family SES, and wave 1 current marijuana use.
[b]Current marijuana use was defined as ≥ 1 time in the past 30 days.
*$P < .05$.

DISCUSSION

This study is one of the first to analyze the longitudinal effects of school illicit drug policy on student marijuana use. Both student and school administrator reports of school policy were investigated and found to be predictive of student marijuana use 1 year later.

The first research question was related to policy enforcement. Enforcement has been identified as a key factor in studies of school tobacco[31,35,53–56] and alcohol[45] policy, and our findings indicate that it is similarly important as a predictor of student marijuana use. Both school administrator and student reports of low policy enforcement predicted an increase in the likelihood of later marijuana use.

The second research question concerned the differential impact of school responses to breaches of illicit drug policy. Of particular note is the finding that students who attended schools that reported always or almost always using out-of-school suspensions for illicit drug policy violations were 1.6 times as likely to be marijuana users 1 year later. Accumulating evidence has shown that suspensions are related to unintended negative outcomes for the

suspended student, such as disengagement from school, delinquency or antisocial behavior, smoking, and alcohol and drug use,[52,57,58] and concerns have been raised as to the value of such practices.[59] Our findings also reveal that school use of suspensions is associated with increased risk of marijuana use for the entire student body, not just for those who are suspended.

However, student reports of likely suspensions for marijuana policy violations, although indicative of elevated risk of marijuana use, were not statistically predictive, suggesting the elevated risk of marijuana use shown in the school-report model may be attributable to other co-occurring school factors. We tested the reverse causality hypothesis, in which schools with greater numbers of marijuana-using students are more likely to use suspensions, in additional analyses controlling for the total number of illicit policy violations in the school in the past year. This alternative hypothesis was not supported because we observed no significant attenuation in the association between school use of suspensions and student marijuana use (data available on request).

Student-reported teacher counseling for policy violators predicted an almost 50% reduction in the likelihood of later marijuana use. Some previous studies have found protective effects of student counseling on the risk of student harmful drinking[45] and smoking.[60] However, school administrators' reports of referral to a nurse or counselor were not related to student marijuana use. Whether this was the result of differences in the wording of the measure between the student and school administrator surveys (referral to a teacher vs a nurse or counselor) or whether students' and school administrators' reports are capturing different dimensions of school policy and enforcement is not clear. Similar percentages of schools in Victoria and Washington reported using counseling responses, whereas Victoria students were more likely than Washington students to report teacher counseling. It is also interesting to note that the proportion of schools reporting referring student offenders to a nurse or counselor was about double that of students reporting a teacher counseling response, which might suggest that schools are overreporting their use of counseling remedial approaches. Further longitudinal research on the impacts of various remedial approaches to drug policy violations is warranted.

The reduced likelihood of marijuana use among students reporting punitive penalties, such as calling the police (adjusted OR [AOR] = 0.74; 95% CI = 0.55, 1.00) and expulsion (AOR = 0.88; 95% CI = 0.65, 1.18) might be indicative of such policies acting as a deterrent. However, we did not specifically measure marijuana use on school grounds, where a deterrent effect would most likely be observed. Punitive penalties might also help schools shape student norms by sending out a strong negative message about illicit drug use. This concept is supported by the finding that student reports of strong school abstinence messages predicted lower marijuana use.

The final research question focused on the relative impact of abstinence-based and harm minimization–based policies on student marijuana use. There is some evidence that student perceptions of abstinence approaches are protective against marijuana use (AOR = 0.68; 95% CI = 0.59, 0.79), although school reports of abstinence policies are not (AOR = 1.14; 95% CI = 0.97, 1.34). Harm

minimization did not have an impact on the likelihood of student marijuana use in the school-reported or student-reported models. However, harm minimization approaches might be expected to exert maximal effects on harmful patterns of marijuana use rather than any use in the past 30 days. This was observed in a previous study of alcohol use in which harm minimization policies were not associated with the likelihood of any drinking in the past 30 days but reduced the likelihood of student binge drinking and alcohol-related harms.[45] Further research on the impacts of school harm minimization policies on marijuana use patterns and behaviors would be beneficial.

Limitations

This study has a number of limitations. First, the study was observational, not experimental, and so causal effects cannot be firmly established. Second, we did not include a measure of self-reported marijuana use on school grounds, which is where the strongest deterrent effects of policy might be expected. Third, the student- and school administrator–reported policy measures require further validation and optimization. There were some differences in wording between the student and administrator items, rendering direct comparisons problematic. In some cases, the policy items specified not marijuana use but rather illicit drug use more broadly. Student assessment of strict policy enforcement, abstinence, and harm minimization were based on responses to tobacco and alcohol policy items. We chose these items to provide more variation because use of these substances is legal at older ages, whereas use of illicit drugs is never legal. However, further improvement in specificity of the items in future research would be beneficial. The use of self-report data may give rise to response bias and inaccuracies.

This study also has major strengths. It drew on data from large representative samples of secondary students in 2 states that differ in their policies regarding substance use, thereby increasing the variation in the policy variables. Survey procedures and instruments were matched between the 2 states, and attrition was extremely low.[50] We used reports of school policy from both school administrators and students to overcome some of the limitations associated with using just 1 data source. For example,

students' reports might be subject to nonpolicy factors such as stories they have heard, and school reports might be subject to response desirability bias. Finally, the use of longitudinal data and the attempt to control for previous-year marijuana use adds to the rigor of the tests conducted.

Implications

Our findings confirm previous research indicating that schools should take measures to increase the enforcement of a no-use policy for substance use on school grounds. This might be achieved through intentional efforts to communicate in schools what the policies are for substance use and rule violations and by increasing monitoring of substance-using behaviors on school grounds. In addition, delivery of strong abstinence messages relating to illicit drugs through policy and curriculum is important and might be reinforced by the use of some punitive penalties, such as notifying the police. However, our finding related to the negative impact of school suspensions is of concern and worthy of further research. Rather than rely only on punitive responses, schools may be advised to provide education and counseling to students. ∎

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Contributors

T. J. Evans-Whipp conceptualized the analytic design, conducted the analysis, and prepared the original draft of the article. S. M. Plenty assisted with data analysis and participated in the preparation of the original article and subsequent revisions. R. F. Catalano designed the overall International Youth Development Study (IYDS) and assisted with the analytic design, interpretation of results, and revision of the article. T. I. Herrenkohl assisted with interpretation of results and revision of the article. J. W. Toumbourou designed the overall IYDS and assisted with interpretation of results and revision of the article.

Human Participant Protection

All study procedures were approved by the institutional review board at the University of Washington and the Ethics in Human Research Office at the Royal Children's Hospital in Victoria and relevant education authorities in each state.

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