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ABSTRACT

This report provides information about drug testing by American secondary schools, based on results from national surveys. The purposes of this study are (1) to provide descriptive information on drug testing practices by schools from 1998 to 2001, and (2) to examine the association between drug testing by schools and reported drug use by students. School-level data on drug testing were obtained through the Youth, Education, and Society study, and student-level survey data were obtained from the same schools participating in the Monitoring the Future study. A relatively small percentage of schools (about 18%) reported testing for drug use, with more high schools than middle schools reporting the use of drug testing. Drug testing was not associated with students' reported illicit drug use, nor with the rate of use among experienced marijuana users. Drug testing athletes was not associated with illicit drug use among male high school athletes. Policy implications are discussed. (Contains 25 references and 5 tables.) (Author)

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The Relationship Between Student Illicit Drug Use and School Drug-Testing Policies

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Running foot: Drug Testing in Schools—Yamaguchi et al

Abstract

This report provides information about drug testing by American secondary schools, based on results from national surveys. The purposes of the study are: (1) to provide descriptive information on drug testing practices by schools from 1998 to 2001; and (2) to examine the association between drug testing by schools and reported drug use by students. School-level data on drug testing were obtained through the Youth, Education, and Society study and student-level survey data were obtained from the same schools participating in the Monitoring the Future study. A relatively small percentage of schools (about 18%) reported testing students for drug use, with more high schools than middle schools reporting the use of drug testing. Drug testing was not associated with students' reported illicit drug use, nor with the rate of use among experienced marijuana users. Drug testing athletes was not associated with illicit drug use among male high school athletes. Policy implications are discussed.

The Relationship Between Student Illicit Drug Use and School Drug-Testing Policies

In the "war on drugs," schools have employed a variety of mechanisms in enforcing zero-tolerance policies, including drug testing, metal detectors, closed circuit cameras, and sniff dogs. These policies and procedures are often justified as necessary to ensure a safe, drug-free learning environment. However, drug testing can be costly for schools. A single standard drug test with the ability to detect marijuana, tobacco, cocaine, heroin, opiates, amphetamines, barbiturates, and tranquilizers can range from $14 to $30 per test, while a test for steroid use costs $100 per test.[1]

Drug testing is sometimes viewed as an attractive strategy for schools with problematic student illicit drug use rates because drug tests are perceived to be a reliable and objective way of detecting (and thus deterring) student drug use. In 1995, the U.S. Supreme Court case of Vernonia School District v. Acton set a national precedent by upholding a school's right to use random, suspicionless drug testing of student athletes.[2] Most recently, in the 2002 case of Earls v. Tecumseh School District, the U.S. Supreme Court upheld school district rights to drug test students who participated in any extracurricular activities.[3] There has been much criticism from a legal and moral perspective of the Supreme Court's reasoning in deciding these cases.[4-10] According to a Department of Justice report, the Vernonia ruling was deemed effective because some teachers noted a decrease in drug use and an improvement in discipline following school implementation of drug testing.[11] However, no scientific studies were conducted in the Vernonia school district to measure actual student drug use rates. Thus, speculation about the effectiveness of the drug-testing policy could not be confirmed.

While most courts have found school drug-testing policies to be legally permissible, there is still much controversy over the appropriateness of school drug testing.[7, 12] One area of significant controversy has to do with targeting the population to be tested: Is it better to test only

students suspected of drug use; to do random drug testing of particular groups of students (for example, athletes);[6, 13] or to go further and randomly test all students?

Unfortunately, little literature has examined the effectiveness and utility of drug testing. For example, even though students in athletics and extracurricular activities may have the lowest reported drug use rates,[14] the legal cases of Earls in 2002 and Vernonia in 1995 indicate the legality of schools to target these groups of students. In addition, the initiation of a school drug-testing policy usually results from an identified drug problem in the school, but very little evaluation has been conducted to determine if the drug-testing policy is effective in reducing the drug problem in school. In fact, some legal analysts have suggested that a drug-testing policy may actually increase or further the problem of drugs in schools.[9, 15] Hence, more empirical research is needed to help administrators make informed decisions about drug testing in schools.

The purposes of this study are (1) to provide a synopsis of the national trends in school drug testing between 1998 and 2001, in order to provide some idea of the extent to which such policies are actually being used; and (2) to examine the association between drug testing and reported drug use by students. We address the following research questions:

1. What percentage of schools employs a drug-testing policy?
2. Which students are tested for drugs in these schools?
3. On what basis are students tested for drugs in schools?
4. How do characteristics of the school and its student body relate to drug testing?
5. What is the relationship between student drug use and school drug testing?

Method

Sample

Data for these analyses were obtained through two related studies. The student data were obtained from the Monitoring the Future (MTF) study (supported by the National Institute on Drug Abuse), consisting of nationally representative 8th, 10th, and 12th grade students.[16] Data on school characteristics, including the drug-testing policies, were obtained from administrators (usually the principals) of the relevant MTF schools under a separately funded research project, the Youth, Education, and Society (YES) study (supported by the Robert Wood Johnson Foundation). National-replicate half-samples of schools that were cycling out of the MTF study each year provided the data used in the current study. From 1998 through 2001, self-administered questionnaires were collected from approximately 30,000 8th grade students in 260 schools, 23,000 10th grade students in 227 high schools, and 23,000 12th grade students in 235 high schools.

Two subsets from the high school student sample (that is, 10th and 12th grade students) are examined separately in this paper. One subset is comprised of male athletes, defined as those students who reported great participation in school athletic teams (approximately 3,000 male athletes in 303 high schools); the second is experienced marijuana users, defined as those students who reported using marijuana on 20 or more occasions in their life (approximately 8,000 students in 331 high schools).

Outcome Measures

Student marijuana use. Students completed self-administered questionnaires from the MTF study regarding their drug use. Specifically, marijuana use over the past 12 months was assessed on a 7-point scale (1 = 0 occasions, 2 = 1-2 occasions, 3 = 3-5 occasions, 4 = 6-9 occasions, 5 = 10-19 occasions, 6 = 20-39 occasions, and 7 = 40 or more occasions). A binary variable for 12-month marijuana use was created (0 = No use, 1 = Use).

Student illicit drug use other than marijuana. Students completed questionnaires on other illicit drug use over the past 12 months, such as cocaine, heroin, and barbiturates. A mean was taken from these items to create a single scale of illicit drug use (other than marijuana), on the same 7-point scale. A binary variable for 12-month use of "any other illicit drug" was also created (0 = No use, 1 = Use).

School-Level Measures

School level information was gathered from an administrator, usually the principal, through a mailed survey. The response rate across the four years averaged 82.6%.

Drug-testing policy in schools. Respondents were asked, "In the school year, did your school test any students for illicit drug use?" If the answer was "yes," the respondent was directed to follow-up questions regarding the school's drug-testing policies. The drug-testing policy questions were divided into two areas: random drug testing and causal (suspicion-based) drug testing.

Drug testing and students. School officials were asked which groups of students were drug tested within the school year. These questions were first included in the YES survey in 1999. The groups of students included the following categories: students participating on an athletic team, students in other extracurricular activities, selected students based on suspicion or cause, students on school probation, students who volunteered to be tested, all students, and "other." Respondents were asked to mark all that applied.

Reasons for drug testing. Schools were asked the reason for drug testing students. They were asked to select from the following reasons: based on suspicion or cause, routine drug testing, students or their parents volunteered, mandated testing, and "other." Respondents were asked to mark all that apply.

School characteristics. Schools are characterized by their grade (8th grade = middle school, 10th and 12th grade = high school), sector (public or private), population density (from census classification of large Metropolitan Statistical Area [MSA], other MSA, or non-MSA), number of students (< 75 students = small school size, 75-225 = medium, > 225 = large), socio-economic status (< 15% of students with free or reduced lunch programs = high SES, 15%-39% = middle, ≥ 40% = low), region (from census classification of Northeast, North Central, South, or West), and majority race/ethnicity (majority White school [≥ 66% White students in school], African American school [> 50% African American students in school], Hispanic school [> 50% Hispanic students in school], or other).

Student-Level Measures

Student characteristics. Student characteristics that have been shown to have strong relationships to drug use were used as control variables. Students reported measures of race (African American, Hispanic, White, or other) and gender. Parental educational attainment, a proxy for student socioeconomic status, was a composite item based on the average of the father and mother's educational level ("What is the highest level of schooling your mother/father completed?" 1 = completed grade school or less, 2 = some high school, 3 = completed high school, 4 = some college, 5 = completed college, 6 = graduate or professional school after college, 7 = don't know or does not apply). Religiosity was measured by a composite of two items ("How often do you attend religion services?" 1 = never, 2 = rarely, 3 = once or twice a month, 4 = about once a week or more; "How important is religion in your life?" 1 = not important, 2 = a little important, 3 = pretty important, 4 = very important). Truant behavior was a composite of two items ("During the last four weeks, how often have you gone to school, but skipped a class when you weren't supposed to?" 1 = Not a all, 2 = 1-2 times, 3 = 3-5 times, 4 =

6-10 times, 5 = 11-20 times 6 = more than 20 times; "During the last four weeks, how many whole days of school have you missed because you skipped or 'cut'?" 1 = none, 2 = 1 day, 3 = 2 days, 4 = 3 days, 5 = 4-5 days, 6 = 6-10 days, 7 = 11 or more days). Grade point average was measured on a 9-point scale ("Which of the following best describes your average grade in this school year?" 1 = D, 2 =C-, 3 = C, 4 = C+, 5 = B-, 6 = B, 7 = B+, 8 = A-, 9 = A). College plans were assessed by the likelihood of completing college ("How likely is it that you will graduate from college (four year program)?" 1 = definitely won't, 2 = probably won't, 3 = probably will, 4 = definitely will). Evenings out per week were assessed by how often students spend evenings out without parental supervision ("During a typical week, on how many evening do you go out for fun and recreation? Don't count things you do with your parents or other adult relatives." 1 = less than one evening per week, 2 = one evening, 3 = 2 evenings, 4 = 3 evenings, 5 = 4-5 evenings, 6 = 6-7 evenings).

Statistical Analyses

To address the first three research questions (percentage of schools with drug-testing policies, student populations tested, and basis for testing), descriptive analyses were conducted. For the fourth research question regarding school characteristics and drug testing, logistic regressions were conducted to determine significant associations. For the fifth research question regarding the relationship between student drug use and school drug testing policy, hierarchical linear modeling (HLM) was used for *(a)* 8^{th}, 10^{th}, and 12^{th} grade students, *(b)* high school male athletes, and *(c)* experienced marijuana users in high school. For all three samples, the first set of multilevel models involved examining the association of the school drug-testing policy with both the continuous and binary outcome variables. If there was a significant effect, a second set of

models examined the association of the school drug-testing policy, controlling for student demographic characteristics.

Results

Drug Testing in Schools

Table 1 provides the descriptive statistics for drug testing from 1998 through 2001, revealing that drug testing was employed in a relatively small number of schools. Across the four years, 18.14% of schools in the study reported using drug testing of any kind; and they contained 19.23% of all students in the national samples. There was no significant linear upward trend from 1998 through 2001, though in the first three years one had appeared to be emerging.

Students and Drug Testing

Among groups of students who were drug tested during 1999-2001, students who were suspected of using drugs were the most likely to be tested, with 14.04% of schools testing such students and 14.07% of students being in schools that tested for cause and suspicion.

From 1999-2001, drug testing students in extracurricular activities occurred in only 2.28% of the schools (containing 2.49% of students). There appears to be a general upward trend in drug testing students in extracurricular activities (OR = 2.39; 95% CI = 1.21, 4.70). Specifically, in 1999, only 0.57% of schools (affecting 1.62% of students in the school sample) reported drug testing students in extracurricular activities; in 2000, 2.92% of schools (affecting 3.10% of students in the school sample) did so; while in 2001, 3.30% of schools (affecting 2.81% of students in the sample) reported drug testing students in extracurriculars.

From 1999-2001, drug testing student athletes occurred in only 4.93% of the schools (which had 5.86% of students in the school sample). There appears to be a general upward trend in drug testing athletes (OR = 1.76; 95% CI = 1.18, 2.61). For example, in 1999, 2.87% of

schools (affecting 4.59% of students) reported drug testing student athletes. In 2000, 7.02% of schools (affecting 7.39% of students), and in 2001, 4.95% of schools (affecting 5.68% of students) drug tested student athletes.

Reason for Drug Testing

Among schools that reported any form of drug testing, the most common reason was for cause or suspicion. Across the four years, 14.15% of the schools, containing 14.75% of the students, tested due to cause or suspicion. While there is a general upward trend in drug testing based on cause or suspicion, it is not statistically significant. Similarly, drug testing by other methods such as routine or random, volunteer, and mandatory follow a general upward trend. However, trends in routine, voluntary, and mandatory drug tests did not reach statistical significance.

School Characteristics and Drug Testing

Table 2 shows the descriptive statistics for drug testing of any kind related to school characteristics. A bivariate logistic regression found that significantly more high schools (22.74%, containing 23.82% of the students) reported drug testing than did middle schools (8.00%, containing 9.89% of students; $p < .001$). Similarly, socioeconomic status (SES) of the schools had significant differences in drug testing ($p < .05$), where high and low socioeconomic schools reported more drug testing (20.16% and 21.50% schools, respectively) than schools in the middle-SES category (13.20%). School size had significant differences ($p<.05$), where large schools reported more drug testing than small schools (22.65% and 14.22% schools, respectively). In a multivariate analysis, school level and school size remained significant, while SES did not, as a predictor of drug testing.

Drug Testing and Student Marijuana Use

Table 3 shows the descriptive statistics for student drug use based on the school drug-testing policies. In the HLM analyses for 8th, 10th, and 12th grade students, drug testing (of any kind) was not a significant predictor of student marijuana use in the past 12 months. Neither was drug testing for cause or suspicion .

Table 4 shows the descriptive statistics for high school male athletes' drug use based on school drug-testing policies for athletes. Drug testing athletes was not a significant predictor of marijuana use by male athletes in high school. Table 5 shows the descriptive statistics for experienced marijuana users, based on the school drug-testing policies. Drug testing of any kind, including for cause or suspicion, was not a significant predictor of their marijuana use. These results remained for all samples, even after controlling for student demographic characteristics.

Drug Testing and Other Illicit Drug Use

Similar to the results for marijuana use, drug testing of any kind and drug testing for cause and suspicion were not significant predictors for the use of other illicit drugs among 8th, 10th, and 12th grade students. Within the high school subsamples, the use of illicit drugs among high school male athletes and current marijuana users was not significantly different based on drug testing at the school. Even after controlling for student demographic characteristics, drug testing was not a significant predictor for other illicit drug use in any of the samples.

Discussion

Though there has been much media attention on drug testing in schools, the proportion of schools that tested students for drugs remains relatively low and occurs mostly in high schools. DeMitchell and Carroll[17] found similar results, with 79% of superintendents surveyed in their study saying that they were not considering a drug-testing policy in their schools. However, recent court decisions indicate that regardless of whether or not a school has an illicit drug

problem, drug testing is deemed constitutional. It remains to be seen how many school administrations initiate drug testing now that the legality of the issue has been clarified.

Still, the question remains: does drug testing prevent or inhibit student drug use? Members of the Supreme Court appear to believe that it does.[3] However, among the 8th, 10th, and 12th grade students surveyed in our study, school drug testing was not associated with either the prevalence or the frequency of student marijuana use, or of other illicit drug use. Nor were drug-testing athletes associated with lower-than-average marijuana and other illicit drug use by high school male athletes. Even among those who identified themselves as fairly experienced marijuana users, drug testing was also not associated with either the prevalence or the frequency of their marijuana or other illicit drug use.

In addition to effectiveness, there are other issues to be weighed by policy makers that we have not addressed in this paper. These include cost-effectiveness,[18] false positives through poor training and handling,[19] and alienation and resistance from students.[7, 20]

While this study offers some valuable new findings on this important policy matter, it has some clear limitations. First, because of the cross-sectional design of the study, we cannot make definitive causal interpretations regarding the effects of drug testing; only a panel design in a randomized or natural experiment would have the capacity to do so. It is conceivable that the schools that instituted drug testing initially had higher use, and that drug testing reduced those levels to ones that just happen to be similar to those in other schools. The net result would be no association, as observed in this study, despite there having been some effect from drug testing. We consider this scenario quite unlikely, but cannot rule it out with the cross-sectional design. Second, all of the data on drug testing were obtained from a single source—a school

administrator. It would be helpful to have data on student awareness of, or views about, drug testing.

Conclusion

This study explores the association between student drug use and drug-testing policies in schools. While the lack of evidence for the effectiveness of drug testing is not definitive, the results certainly suggest that drug testing in schools may not be the panacea for reducing student drug use that some (including some on the Supreme Court) had hoped.[3] Past research has shown that the strongest predictor of student drug use is students' own attitudes toward drug use and perceptions of peer use.[21-25] To prevent harmful student behaviors such as drug use, school policies that address these key values, attitudes, and perceptions may be more important in drug prevention than drug testing.

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Table 1. Descriptive Statistics of Drug Testing in Schools

	1998		1999		2000		2001		Total	
	% Schools	% Students	% Schools	% Students	% Schools	% Students	% Schools	% Students	% Schools	% Students
Drug Testing of Any Kind	14.36	16.22	19.54	21.10	23.39	24.04	15.93	15.57	18.14	19.23
Drug testing certain groups of students										
Student Athletes	--	--	2.87	4.59	7.02	7.39	4.95	5.68	4.93	5.86
Other Extracurriculars	--	--	.57	1.62	2.92	3.10	3.30	2.81	2.28	2.49
Cause/Suspicion	--	--	14.37	15.19	15.79	15.70	12.09	11.18	14.04	14.07
School Probation	--	--	4.02	3.42	4.09	3.35	2.75	1.36	3.61	2.73
Volunteered	--	--	4.60	5.66	3.51	3.92	3.30	3.01	3.80	4.24
Bases for drug testing										
Cause/Suspicion	9.74	10.56	15.52	17.00	18.82	18.65	13.19	12.92	14.15	14.75
Routine	2.56	3.32	3.45	3.42	6.47	5.53	4.40	4.06	4.16	4.06
Volunteer	5.13	5.98	5.75	6.53	6.47	5.85	7.69	6.32	6.24	6.17
Mandated	5.64	5.19	2.30	2.02	5.88	4.58	5.49	5.26	4.85	4.23

Notes: Percentages are based on total sample for each year. There were missing data for one school in 1998, one in 2000, and one in 2001.

Weights were used to provide a nationally representative sample of students in schools.

Table 2. Drug Testing by School Characteristics: 1998-2001, Combined

	Schools		Students	
	N	%	N	%
School Level				
Middle [a]	225	8.00	25,191	9.89
High +++, ***	497	22.74	50,307	23.82
Sector				
Public [a]	610	18.36	69,427	19.03
Private	112	16.96	6,071	20.80
Population Density				
Large MSA [a]	183	16.39	18,456	15.94
Other MSA	387	19.12	44,124	20.86
Non-MSA	152	17.76	12,917	18.07
School SES				
Low SES [a]	258	20.16	23,578	21.15
Mid SES +	250	13.20	25,665	13.72
High SES	214	21.50	26,255	22.92
School Size				
Smallest Third [a]	218	14.22	11,859	13.12
Middle Third	270	17.41	30,625	18.05
Largest Third +, **	234	22.65	33,014	22.40
Majority Race/ethnicity				
Majority White [a]	457	19.04	46,612	19.91
Majority Black	68	16.18	6,123	15.98
Majority Hispanic	53	16.98	6,010	20.56

Table 2, cont.

Other	144	16.67	16,753	17.81
Region				
North East [a]	169	19.53	14,128	22.25
North Central	190	15.26	20,224	16.09
South	226	19.47	26,348	18.32
West	137	18.25	14,797	21.98

Notc: + $p < .05$; +++ $p < .001$ based on bivariate logistic regression results. ** $p < .01$; *** $p < .001$based on multivariate logistic regression results. From 1998 through 2001 combined, two schools had missing data. Weights were used to estimate a nationally representative sample of students from the three grades included in the Monitoring the Future study (grades 8, 10, and 12).

Table 3. Means and Standard Deviations of Student Drug Use and Drug Testing: 1998-2001, Combined

	12-month Marijuana Use					12-month Other than Marijuana Use				
		1-7 Scale		Prevalence			1-7 Scale		Prevalence	
	N	Mean	SD	Mean	SD	N	Mean	SD	Mean	SD
8th grade all students										
Drug testing of any kind										
No	26,423	1.41	1.14	.16	.35	26,877	1.05	.22	.10	.29
Yes	3,236	1.40	1.16	.15	.35	3,279	1.05	.28	.10	.30
Drug testing based on cause/suspicion										
No	27,024	1.41	1.15	.16	.35	27,486	1.05	.23	.10	.29
Yes	2,616	1.36	1.04	.14	.32	2,650	1.04	.23	.09	.27
10th grade all students										
Drug testing of any kind										
No	17,858	2.01	1.81	.31	.46	18,066	1.10	.35	.17	.37
Yes	5,559	2.01	1.80	.33	.47	5,629	1.09	.33	.16	.37
Drug testing based on cause/suspicion										
No	18,915	2.01	1.82	.32	.46	19,135	1.10	.35	.17	.37
Yes	4,502	1.99	1.73	.32	.46	4,560	1.09	.31	.16	.35

Table 3, cont.

12th grade all students

Drug testing of any kind

No	17,437	2.20	1.94	.36	.47	17,758	1.12	.41	.19	.39
Yes	5,653	2.27	1.97	.37	.47	5,740	1.14	.43	.21	.39

Drug testing based on cause/suspicion

No	18,584	2.19	1.93	.36	.47	18,923	1.12	.41	.19	.39
Yes	4,506	2.34	1.98	.39	.47	4,575	1.15	.44	.21	.39

Note: Weights were used to estimate a nationally representative sample of students in schools.

Table 4. Means and Standard Deviations for High School Male Student Athletes and Drug Testing Athletes: 1999-2001, Combined

	12-month Marijuana Use					12-month Other than Marijuana Use				
		1-7 Scale		Prevalence			1-7 Scale		Prevalence	
	N	Mean	SD	Mean	SD	N	Mean	SD	Mean	SD
Drug testing athletes										
No	3,004	2.27	2.07	.37	.49	3,061	1.12	.45	.18	.39
Yes	152	2.02	2.08	.33	.55	152	1.12	.55	.20	.46

Note: Weights were used to estimate a nationally representative sample of students in schools.

Table 5. Means and Standard Deviations for High School Drug Users and Drug Testing: 1998-2001, Combined

	12-month Marijuana Use					12-month Other than Marijuana Use				
		1-7 Scale		Prevalence			1-7 Scale		Prevalence	
	N	Mean	SD	Mean	SD	N	Mean	SD	Mean	SD
Drug testing of any kind										
No	6,465	5.42	1.79	.94	.23	6,488	1.46	.74	.55	.49
Yes	2,061	5.42	1.80	.94	.23	2,062	1.45	.73	.54	.50
Drug testing based on cause/suspicion										
No	6,857	5.41	1.80	.94	.23	6,879	1.46	.74	.55	.49
Yes	1,669	5.46	1.76	.95	.22	1,671	1.45	.72	.53	.49

Note: Weights were used to estimate a nationally representative sample of students in schools.

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