Random Student Drug Testing: A Literature Review Conducted for
Zionsville Community Schools

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By

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Executive Summary

The purpose of this literature review was to examine the impact of random student drug testing (RSDT) on student behaviors and attitudes through empirical studies and to answer the following questions to the extent that the research can provide answers. 1) What is RSDT’s efficacy in deterring students from initial use of drugs or alcohol? 2) What is RSDT’s efficacy in stopping prior drug use and preventing restart after the period (athletics season) during which participation is required? 3) What is RSDT’s impact upon self-esteem of students who profess no drug use but who are forced to participate as a prerequisite of desired sports/other extracurricular engagement? 4) What is RSDT’s impact upon participation rates in clubs and sports and extracurricular activities? 5) Is there evidence of escalation of risky substance abuse behaviors in effort to continue abusing but avoid or go around the panel of substances screened by the RSDT employed by the school? 6) Are there any other deleterious effects (suicide ideation, ostracism, etc.) tied to use of random drug testing or as a result of real or false positive test results on an administered test and resulting sanction or mandatory treatment? Additionally, this review touched on other topics that converged around RSDT, including other prevention approaches, legal precedents, and arguments for and against the RSDT approach for prevention of adolescent alcohol and substance.

There have been very few empirical studies of RSDT to examine its effectiveness and/or impact. Only two studies had intervention and control groups as part of the study. Two additional studies provided an analysis of observational data collected by someone other than the researchers themselves. The findings in the latter studies should be considered with more caution due to the methodology of the studies themselves. The empirical data does, however, give us some information in regards to the questions posed in this literature review.
There were only two of six questions that could be answered within the empirical research. Given that there is very little research so far in the area of RSDT, the answers must still be held lightly until results are replicated in further studies. Researchers found that there is no significant difference on participation in sports and extracurricular activities between schools that do or don’t have RSDT policies (question 4). Researchers also found that students at schools with RSDT may engage in higher risk drug use behaviors and may increase drug use for substances not included in testing (question 5).
The topic of random drug testing (RSDT) of adolescents in public schools has been widely debated for decades and has been implemented in a number of middle and high schools around the United States. It has been noted that, “Much public debate in drug policy is minimally informed by scientific evidence” (Strang et al., 2012). The purpose of this literature review is to examine the impact of RSDT on student behaviors and attitudes through empirical studies and to answer the following questions to the extent that the research can provide answers. 1) What is RSDT’s efficacy in deterring students from initial use of drugs or alcohol? 2) What is RSDT’s efficacy in stopping prior drug use and preventing restart after the period (athletics season) during which participation is required? 3) What is RSDT’s impact upon self-esteem of students who profess no drug use but who are forced to participate as a prerequisite of desired sports/other extra-curricular engagement? 4) What is RSDT’s impact upon participation rates in clubs and sports and extracurricular activities? 5) Is there evidence of escalation of risky substance abuse behaviors in effort to continue abusing but avoid or go around the panel of substances screened by the RSDT employed by the school? 6) Are there any other deleterious effects (suicide ideation, ostracism, etc.) tied to use of random drug testing or as a result of real or false positive test results on an administered test and resulting sanction or mandatory treatment? These six questions will be answered from the literature over the course of this paper.

A review of the literature on RSDT covers a wide range of areas that converge on the topic of this particular prevention approach. Other areas of focus that need to be at least mentioned in a literature review on RSDT include the extent of the drug problem with adolescents and alternate drug prevention approaches. Then to narrow down to the topic of RSDT, it is necessary to mention the arguments for and against and the legal decisions that regulate the current approaches to drug testing students. These issues are foundational to
understanding the research studies. Finally, the primary point of this literature review is to review the research studies that have been conducted to test the effectiveness of drug and alcohol testing as a prevention approach. The bulk of this literature review will focus on the empirical studies done to investigate the effectiveness and other impacts of RSDT as a method of adolescent alcohol and drug abuse prevention. At the close of this review is a summary of how the results from the studies answer the six questions posed above. This literature review will not contain any recommendations because that is beyond the scope of a review of the pertinent literature.

**Drug Abuse Prevalence Among Adolescents**

There can be little argument that substance abuse among teenagers is a problem in the United States. What complicates this issue is how to obtain adequate statistics to illuminate the significance of the problem. Because it is not feasible to actually perform random drug tests on a significant sample of the US adolescent population, the statistics on drug and alcohol use depend on self-report survey measures. One of the primary sources cited in the literature is the Substance Abuse and Mental Health Services Administration (SAMHSA). Since 1990, SAMHSA has been conducting annual surveys on drug use. The most recent survey results of the National Survey on Drug Use and Health (NSUDH) are from 2013. The NSUDH research found that in 2013 nearly 2.2 million adolescents (8.8%) between the ages of 12 and 17 had used illicit drugs in the past month and 2.9 million (11.6%) had used alcohol in the past month (Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, 2014). Additionally, the NSUDH found that 1.3 million adolescents (5.2%) met the criteria for a substance use disorder, which would require specialized treatment. Another recent study used a representative sample of 10,123 adolescents aged 13-18 and found some other striking results.
That research indicated that 78.2% of adolescents had consumed alcohol, with 47.1% reaching regular drinking levels by the age of 18 (Swendson et. al, 2012). Additionally, 40.5% of adolescents reported using drugs when the opportunity was presented to them. Almost 36.6% of adolescent drug users met the criteria for substance use disorders. There was a median onset of both alcohol and drug abuse at age 14, suggesting that early adolescence is a critical age for making decisions around alcohol and other substance abuse. These statistics give a picture of how significant the problems of alcohol and substance use are among adolescents during middle and high school years. An important focus on a problem of such magnitude must be prevention, especially because only about 10% of people age 12 and older with drug and alcohol problems get treatment (Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, 2014).

**Prevention Approaches**

There have been a myriad of proposed and tested prevention strategies for adolescent substance abuse. Most of the prevention approaches have been school-based (Faggiano et al., 2008). In a rigorous systematic review of randomized controlled trials (RCTs), Faggiano et al. found that the most effective school-based prevention approaches were focused on improving skills, particularly social skills and life skills (2008). In contrast, studies focused on knowledge of substance use dangers and on improving self-esteem to guard against peer pressure did not produce significant changes in substance use behaviors. Many prevention approaches for adolescent substance use have targeted an individual’s resistance to peer pressure for substance use (Snitzman, 2013). This is a primary area of focus for the Drug Abuse Resistance Education (DARE) Program as well as other programs around the idea of “just say no.” Prevention programs with this resistance focus have been shown to have “small, inconsistent, and
unsustained effects” (Snitzman, 2013, p. 849). For example, a well-known study on the effects of
the DARE Project conducted 10 years after the DARE intervention at schools showed that there
was no prevention effect from those who experienced DARE from those who did not (Lynam et
al., 1999). In contrast, interventions targeted to the broader social context of behavior have
produced some positive results on adolescent behaviors including substance use (Bond et al.,
2004; Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004), however, there have been no
studies to investigate the impact of these types of programs directly on alcohol and substance use
behaviors.

**Arguments For and Against RSDT**

Given the significance of adolescent alcohol and drug use and agreement on the matter of
need for an effective prevention approach for this problem, there have been many voices in the
literature in favor of RSDT in schools. Some of those in favor see random drug testing as an
effective deterrent for adolescents during a crucial period of their lives, a mechanism to catch
drug use before it becomes addictive, and a way to refer students for treatment when needed
(Office of National Drug Policy, 2002). They argue that the approach will result in increased
academic achievement and less likelihood of lifetime use. Other supporters make the argument
that random drug testing in the military has resulted in sharp decreases in positive drug test
results since the testing began (Dupont & Graves, 2005; Bray et. al., 2010). Another potential
positive of RSDT is a spillover effect, where students who are not subject to testing will be
positively influenced by their peers who are subject to the testing (James-Burdumy, Goesling,
Deke, & Einspruch, 2012). Additionally, “Drug testing is sometimes viewed as an attractive
strategy for schools with problematic student illicit drug use rates because drug tests are
perceived as a reliable and objective way of detecting (and thus deterring) student drug use”
(Yamaguchi, Johnston, & O’Malley, 2003, p. 159). Those who argue for this approach believe that an effective deterrent is needed, that RSTD is an effective deterrent, and that RSDT provides an objective and reliable measurement of success in drug prevention.

Those opposed to RSDT have many concerns. These include potential expulsions and truancy, students’ negative perceptions of school and potential stigma from peers in addition to the high costs of testing each student (Caan, 2005; James-Burdumy et al., 2012). Arguments have been made that students who use substances would avoid participation in sports and/or extracurricular activities to avoid being tested (James-Burdumy et al., 2012; Taylor, 1997). Taylor argued that such a situation could actually escalate their drug use when they cease to be involved in social activities with positive peers. Additionally, some have argued that the targeted populations for RSDT based on legal precedents (athletes and extracurricular participants) are the least likely to be using drugs (Snitzman, 2013). There are also the concerns about the methodology of testing, including the costs and efficacy of urine drug screens (James-Burdumy et al., 2012; Gerada & Clare, 2005). In a more systematic approach to gathering opinions, one study surveyed a sample of 1085 physicians who treated adolescents and found that the majority do not support random student drug testing in schools as a screening practice (Levy, Harris, Sherritt, Angulo, & Knight, 2006). Those opposed to RSTD express concerns about the broader social implications of this approach, including an increase in other risk factors for legal problems such as truancy, negative perceptions of authority figures, and social isolation. Additionally, some question the reliability of urine drug screens and the economic practicality of RSDT.

**Legal Background on Random Drug Testing**

The initial idea for random drug testing as a deterrent to substance use came from policies in the US military (Dupont & Graves, 2005). People in the military, however, are of
legal age and have made a voluntary commitment to the armed forces. Part of that commitment is an agreement to live by standards that are different from those of the civilian population. The circumstances are different for students because they are minors and must engage in education by law. Two court cases involving random drug testing in schools have been instrumental in the current state of affairs where student drug testing has been policy in up to 14% of US school districts as of 2005 (Ringwalt et al., 2008). The first case, in 1995, was Vernonia School District of Oregon v. Acton. In that case, the Supreme Court upheld the right of the school to perform random suspicionless drug testing of athletes, in part, because athletic participation is a voluntary activity (Yamaguchi et al., 2003). The fact that the drug testing was random and suspicionless in this setting satisfied the court regarding Fourth Amendment rights protecting against unreasonable search and seizure. In the second case the Supreme Court declared in 2002 in Pottawatamie v. Earl that it is legal for schools to have mandatory random drug testing for all students who participate in competitive extracurricular activities (Yamaguchi et al., 2003). The decision does not apply to all enrolled students, but it did broaden the population beyond student athletes. Although these are the primary legal precedents, Ringwald et. al (2008) found that as much as 28% of school districts who have at least one school participating in random drug testing use a pool of all students for testing rather than just athletes or athletes and other participants in extracurricular activities. Other populations of students subject to testing included students who drove to school (33%) and students on probation (39%).

Research Studies

In order to determine the efficacy of RSDT as a prevention approach, empirical support is necessary. Much of the evidence for the effectiveness of RSDT is anecdotal in nature. For example, in the court decisions in Vernonia v. Acton and Pottawatamie v. Earl, the Supreme
Court weighed the evidence of the teachers’ reports of student behavior change as part of the argument for the effectiveness of RSDT even though empirical research had not been conducted (DuPont, Merlo, Arria, & Shea, 2013; Yamaguchi et al., 2003). Additionally, reports of the effects of RSDT in Indiana were based on the opinions of administrators and teachers (Loesevitz, 2007). While anecdotal evidence is plentiful, empirical evidence is more rare. However, empirical research carries the weight of a scientifically rigorous approach to answering questions.

**First Observational Study**

An observational study seeks to answer questions without performing an intervention or observing a control group for comparison. The first study to examine the student drug testing in a methodical fashion asked research questions and used existing data to find the answers. Researchers asked two questions that relate to this literature review: “How do characteristics of a school and its student body relate to drug testing? What relationship exists between student drug use and school drug testing” (Yamaguchi et al., 2003, p. 159)? This study contained a cross section of 8th, 10th, and 12th grade students between the years of 1998 and 2001. The sample of more than 60,000 students came from approximately 500 schools. Schools in this study that performed drug testing did so mostly for cause/suspicion rather than using the RSDT approach. Surveys in this study asked students about marijuana use and other illicit drug use within the past year.

The results of this study showed that the presence or absence of drug testing in a school did not predict marijuana or other illicit drug use within the past year. Additionally, there was no difference in the average use of marijuana or other illicit drugs between male athletes at schools where drug testing was present and schools where it was not.
The SATURN Project

In 1999 the National Institute on Drug Abuse (NIDA) funded the first phase of research, a pilot study, for the SATURN (Student Athlete Testing Using Random Notification) Project (Goldberg et al., 2003). This research study was conducted using a methodology similar to the U.S. Olympic Committee’s No Advanced Notice approach. In the rationale for this study, Goldberg et al. appeared to be particularly concerned with the increased likelihood that athletes could be using performance-enhancing drugs like anabolic steroids (2003). This concern aligned with the using an anti-doping agency method as a model for the study. Additionally, curtailing drug use with athletes could have a positive effect on the broader student population because of their elevated social status among their peers. The researchers broadened the list of illicit substances to study whether or not random drug testing would curtail alcohol and other drug abuse. In lieu of criminal consequences for a positive drug screen, athletes would be referred for counseling, receive a one-game suspension, and have parents notified of the screening results.

The study relied on a survey of student attitudes, both athletes and non-athletes in a self-selected intervention school in Oregon that adopted mandatory random drug testing and a control school in Oregon that was selected due to a similar student body as the interventions school.

The results of the study indicated that the random drug testing may have had some effect on student athlete attitudes and past 30-day drug use in the intervention school. There was a statistically significant decrease in self-reported 30-day past use of illicit drugs (marijuana, cocaine, amphetamines, narcotics, sniffing glue or paint, and PCP) and ergogenic substances (creatine, pseudoephedrine, amphetamines, androstenedione, and anabolic steroids). There was no statistically significant difference in 30-day past use of alcohol, tobacco, or ergogenic drugs (anabolic steroids, androstenedione, and amphetamines) or of use of “any drugs” from the entire
list. There was also no statistically significant difference in lifetime use. No differences were noted in the non-athletes substance use or attitudes either, suggesting that there were no positive or negative effects on the attitudes and substance use patterns of the rest of the student body at the intervention school. With the student athletes, however, there was a statistically significant increase in several risk factors for drug use based on attitudes and perceptions associated with increased use of alcohol and other drugs (e.g. negative attitudes towards school, less perceived negative consequences of drug use, higher perceived peer drug use, increased perceived tolerance of drug use by authority figures, and increased risky behaviors).

An additional study in the SATURN Project was conducted with several schools in Oregon over the course of two years (Goldberg et al., 2007). The methodology was similar to that of the pilot study, however, there were several intervention schools and control schools that were randomized in this prospective trial study, making the outcomes more generalizable. All schools participating in this study wanted to adopt random student drug testing. The intervention schools began the program at the outset of this study, and the control schools deferred adopting the random drug testing until after the study. Although nine intervention schools agreed to participate, two of the schools did not adhere to study parameters, and two schools changed their random drug testing timelines to a season-only schedule after legal challenges. That left five intervention schools that completed the two-year study with a total of 653 students participating. Of the initial nine control schools, which deferred drug testing during the study, three did not follow the research parameters. That left six control schools in the study with a total of 743 students participating. Additionally, the research was conducted over two school years with five data collection points at the beginning and end (Fall and Spring) of two school years and the beginning of a third school year (Fall). One final change was in the way drug use was
categorized. Although marijuana, amphetamines, narcotics, anabolic steroids, sniffing glue and using diet pills were assessed separately on the questionnaire, they were also indexed as “illicit drug use” to address the potential risk of a student switching drugs and appearing to have lower use of an individual class of drugs. This change resulted in four self-reported data points at each of the five collection points; past 30-day illicit drug use, past 30-day illicit drug and alcohol use, past year drug use, and past year illicit drug and alcohol use.

The results of the second study were different from the pilot study. In this study the baseline data were similar between the control and intervention schools, however, there were higher rates of past 30 days and past year use of anabolic steroids in the intervention schools. The deterrent effect at the interventions schools was only found for past year illicit drug use. In contrast to the pilot study, there was no effect in past 30-day illicit drug or drug and alcohol use. The deterrent effect was expected to be present for the past 30-day drug use because of the potential threat of drug testing. The differences for illicit drug use appeared in the first and the last follow up period. Differences for illicit drug and alcohol use were found at the first and second follow up periods. In addition to the self-reported drug use patterns, there were differences between intervention schools and control schools in some attitude measures that are risk factors for substance use. Intervention schools showed significant changes in three variables of interest; students had less confidence in their athletic performance, less belief that authorities were opposed to drug use, and more desire to take risks.

**The Cluster Randomized Trial**

Researchers in this study investigated three questions around mandatory random student drug testing (MRSDT): “(1) Does MRSDT reduce substance use among students who are subject to testing? (2) Are there spillover effects on other students? (3) Does MSRSDT have unintended
negative effects on students’ attitudes or activity participation?” (James-Burdumy, Goesling, Deke, & Einspruch, 2012, p. 173). This study was the largest experimental evaluation of school-based MSRSRT at the time it was conducted, between 2007 and 2008. There were 36 high schools across seven states that participated in the study as a condition of receiving a grant from the US Department of Education’s Office of Safe and Drug Free Schools.

The methodology included a staggered implementation of RSDT in addition to self-report surveys that were based on the SATURN Project. There were 20 schools that were randomly assigned to begin drug testing immediately while the other 16 schools were assigned to a control group. The control group needed to delay any support for, announcements about, or engagement in RSDT until after the study was completed in 2008. There were 4,720 participants in the study from the 9th through 12th grades. The study guidelines required that at least 50% of eligible students be tested for a minimum of five substances. The substances that needed to be included in the testing were marijuana, cocaine, methamphetamine, opiates, and amphetamines. If schools wanted to test for additional substances, they could do so (e.g. three districts tested for alcohol). Schools could also choose the populations to be included in testing (i.e. athletes only or athletes and other extracurricular activity participants). RSDT frequency ranges varied from as little as four times per year to as much as six times a month. Out of 3,480 drug tests, there were 40 tests with positive results. The most common positive result was for marijuana. Students were also surveyed twice, in the spring of 2007 with a follow-up in the spring of 2008. Although testing was required for only five substances, the surveys inquired about the frequency of students using 10 substances within the past 30 days and the past 6 months. Student reported substance use rates that were higher than the rate of positive drug tests in the study (1%).
The results give preliminary answers to the researchers’ questions that were posed in the study. On the first question of whether MSRSĐT reduces substance use in students who are subject to testing, this study showed a statistically significant impact on substance use within the last 30 days by students who were subject to MRSĐT compared to those who were in the control schools. The impact of the past 30-day substance use was limited to the substances that were being tested according to each school’s MRSĐT policy. On the question of spillover effects on other students, the results showed no significant difference in self-reported substance use in the past 30 days or the past 6 months between the intervention and control schools among students who were not subject to MRSĐT. Students not subject to testing in MRSĐT schools report similar past 30-day use, past 6 months use, and intent to use substances in the coming year as those in the control schools. The participation rates in activities subject to MRSĐT were similar between intervention and control groups suggesting that MRSĐT did not inhibit student participation in covered activities.

**The Second Observational Study**

The most recent study on student drug testing used existing survey data over a period of 14 years to analyze substance use patterns (Terry-McElrath, O’Malley, & Johnston, 2013). This study was similar to the first observational study. The sample was again from 8th, 10th, and 12th grade students. The sample size was around 275,000 students from over 2000 schools. Past 30 day use and past year use were measured in this study.

There were several findings of interest in this study. In middle schools and high schools, marijuana use was significantly lower among athletes at schools with RSDT than those without. However, there was a significantly higher rate of other illicit drug use for both middle and high
schools with RSDT. Additionally, there was no significant difference in athletic or extracurricular activity participation in schools with or without RSDT.

Summary

Each of the questions posed at the beginning of this literature review are addressed individually in this summary.

1) What is RSDT’s efficacy in deterring students from initial use of drugs or alcohol?

The research instruments did not directly ask this question of students in the self-reported surveys. The closest instrument items relating to this question ask about alcohol use in the past year or other substance use in the past year. Only one study found a significant difference between students from schools where there was no RSDT and those where RSDT was conducted (Linn Goldberg et al., 2007). This finding surprised the researchers, especially when they found no differences in past 30-day substance use (which they hypothesized would differ). So although there is some suggestion that RSDT may reduce alcohol and substance use within the last 12 months, the empirical studies do not give an answer on whether or not initial use of drugs or alcohol are deterred through RSDT.

2) What is RSDT’s efficacy in stopping prior drug use and preventing restart after the period (athletics season) during which participation is required? The research questions in the existing empirical studies did not directly answer this question. There is some evidence that RSDT may reduce substance use within the past year (Linn Goldberg et al., 2007) for students subject to testing, which suggests that a reduction in use could persist. However, only one study reported this finding. Two studies found a reduced rate of past 30-day substance use in schools with RSDT (L Goldberg et al., 2003; James-Burdumy et al., 2012). However, both of these studies also uncovered troubling findings. Goldberg et. al. found increases in student attitudes
and beliefs associated with increased drug use (2003). The other finding was an increased use in other illicit drugs besides marijuana in schools with RSDT (James-Burdumy et al., 2012), suggesting that students may switch to drugs that are harder to detect with testing. The research offers a guarded possibility that drug use in students subjected to RSDT could be lower beyond the participation period, according to one study, but the effect was a surprise to researchers and was not replicated in other studies.

3) What is RSDT’s impact upon self-esteem of students who profess no drug use but who are forced to participate as a prerequisite of desired sports/other extra-curricular engagement? The research does not indicate a link to self-esteem so no empirical findings can answer this question. However, one research study did report on a reduction in athletes’ belief in their own competence at schools with RSDT (Linn Goldberg et al., 2007).

4) What is RSDT’s impact upon participation rates in clubs, sports and other extracurricular activities? This was a topic examined in the empirical research. Although it was hypothesized that RSDT may reduce participation rates in athletics (Taylor, 1997), none of the studies that examined this question of participation in athletics or other extracurricular activities found any statistically significant effect (Linn Goldberg et al., 2007; James-Burdumy et al., 2012; Terry-McElrath et al., 2013). So the research suggests that there would be no significant impact in participation rates for a school with RSDT.

5) Is there evidence of escalation of risky substance abuse behaviors in effort to continue abusing but avoid or go around the panel of substances screened by the RSDT employed by the school? The research gives some answers to this question. One study found that students in schools with RSDT had higher preferences for risky drug use behavior (L Goldberg et al., 2003), and another study found increased use of substances other than marijuana in schools with RSDT.
(James-Burdumy et al., 2012). The latter study also found that the effect of reduced 30-day use in schools with RSDT was only significant for substances on the panel for testing. The empirical evidence suggests that students may prefer more risky drug behaviors and switch substances to avoid detection in schools where RSDT is employed.

6) Are there any other deleterious effects (suicide ideation, ostracism, etc.) tied to use of random drug testing or as a result of real or false positive test results on an administered test and resulting sanction or mandatory treatment? The research does not answer this question. In regards to false positives, rates of positive drug tests were only reported in one study, and they were lower than self-reported substance use (James-Burdumy et al., 2012). This led the researchers to conclude that RSDT is not an effective approach for primarily identifying and treating students with substance use problems.

There were only two of six questions that could be answered within the empirical research. Given that there is very little research so far in the area of RSDT, the answers must be held lightly until results are replicated in further studies. The findings indicate that there is no significant difference in sports and other extracurricular activity participation between schools that do or do not have RSDT policies (question 4). The findings also indicate that students may engage in higher drug risk behaviors and may increase drug use for substances not included in testing (question 5).
References


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