The Prevalence of Anabolic Steroid Use by Southern California High School Athletes

Final Report

Report to the LA84 Foundation

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Table of Contents

Executive Summary

Introduction

The use of performance-enhancing drugs in youth sports has been a central concern of the LA84 Foundation. In 1988, the Foundation (known then as the Amateur Athletic Foundation) hosted a national conference sponsored by the National Forum on Anabolic/Androgenic Steroids. The Foundation, in the same year, published a booklet titled, "Sports Devastated," that gave young athletes and their parents information about the risks of anabolic steroid use. More than 40,000 copies were distributed to schools. In 1998 the Foundation, recognizing that drug use in youth sports was closely related to doping in adult sport, organized another national conference titled "Doping in Elite Sport." More recently, information on drug use in youth sports has become an important theme in the Foundation's coaching education program.

Since the late 1980s drug use in high school sports has become an increasingly prominent policy issue. Three states – Florida, New Jersey and Texas – have mandated drug testing programs for high school athletes. The California Legislature as well as other states legislatures and individual school districts have debated the merits of testing and educational programs to combat drug use in sports.

To understand more about performance-enhancing drugs in Southern California high school sports, the LA84 Foundation commissioned a study by Dr. Gary Green, Clinical Professor in the UCLA Division of Sports Medicine and researcher at the UCLA Olympic Analytical Laboratory. The study examined the use of anabolic steroids and muscle-building dietary supplements, as well as attitudes about anabolic steroid use and drug testing, among high school athletes in Southern California.

Dr. Green developed a questionnaire that athletes completed online. The study, which was approved by the UCLA Human Subject Protection Committee, yielded 252 usable responses from student athletes (53% male, 47% female) in the California Interscholastic Federation's Southern Section. Respondents represented 11 sports and 12 schools of various sizes, located in Santa Barbara, Ventura, Los Angeles, Orange and Riverside Counties. The responses to the questionnaire were consistent across all demographic groups.

Findings

Self reports of anabolic steroid use were low. Estimates of use by other athletes were significantly higher.

- 1% of athletes reported using anabolic steroids at least once.
- 15% believe that some of their teammates used anabolic steroids.
- Over 50% estimated that 10% of the athletes at their schools (excluding their own teammates) used anabolic steroids; another 12% believed that a quarter of the athletes, on other teams, at their schools were users.
- 70% felt that 10-25% of athletes at opponents' schools used anabolic steroids; another 15% estimated use by opposing athletes at 50% or higher.

Athletes self-reported using muscle-building dietary supplements more than anabolic steroids.

- 15% of all athletes reported using a muscle-building supplement at least once.
- Nearly a quarter (23%) of the boys reported the use of muscle-building supplements.

Athletes' attitudes towards anabolic steroids were overwhelmingly negative.

- 97% disagreed with the statement that it is "okay to use anabolic steroids to get a scholarship."
- 90% disagreed that it is "okay to use anabolic steroids once or twice."

Athletes supported drug testing in sports.

- 70% agreed that drug testing would be good for their sports.
- 82% felt that drug testing makes sports fairer.
- 62% believed drug testing would effectively catch people using anabolic steroids.
- 60% thought that drug testing is a deterrent to use.
- While only 43% supported drug testing at their schools aimed exclusively at steroids, 59% approved of drug testing for all illegal drugs.
- Only 9% would view anabolic steroid testing as a violation of their rights.

Discussion

One of the most striking results of the study is the discrepancy between athletes' self-reports of anabolic steroid use and their perception of use by others. Only 1% reported using anabolic steroids, but the general perception among the respondents was that about 10% of athletes at their schools used these

substances. Most respondents estimated use by athletes at opposing schools to be in the 10% to 25% range.

Like virtually all studies of teenagers' anabolic steroid use, this study relied on self-reporting. It is quite possible that some athletes who use steroids chose not to participate in the study. It also is possible that some athletes who did participate were unwilling to reveal their use of anabolic steroids. Thus, the actual level of use may be above 1%. Alternatively, the self-reporting may be an accurate reflection of reality, in which case, the perception of use by other athletes is in error. Finally, it may be the case that actual use falls somewhere between the self-reported rate and the estimates of other athletes' use.

While the self-reporting of a 1% usage rate is lower than some previous studies, it is consistent with other studies across several different age groups. For example, over the past 17 years the Monitoring the Future Study of 8^{th} to 12^{th} graders, including both athletes and non-athletes, has consistently demonstrated a self-report rate of 1-2.5% for anabolic steroids. The NCAA surveys collegiate athletes every four years regarding use and abuse habits of various drugs and their self-report rate for anabolic steroids has been about 1% over the past 12 years.

Recent drug testing results in college and high school sports also suggest low use of anabolic steroids. The positive rate for anabolic steroids under unannounced NCAA drug testing ranged from 0.5 to 1% between 1996 and 2005. Anabolic steroid testing of 500 high school athletes by the New Jersey State Interscholastic Athletic Association in 2007 returned only one positive result. Whether these low percentages primarily reflect negative attitudes towards anabolic steroids, or the deterrent effect of drug testing is unknown.

Another noteworthy finding is the level of support for drug testing among the group. Most athletes had faith in the ability of drug testing to ensure fairness in sport by catching offenders and deterring use.

These findings and earlier studies suggest that effectively reducing anabolic steroid use will require a multidisciplinary effort. The most promising approach is a comprehensive one that combines education and drug testing. The educational component should include information about the health effects of these substances and provide training in ethical decision making.

I. Background

Anabolic steroids, more properly called “anabolic-androgenic steroids” or “AAS” are testosterone or testosterone-like synthetic drugs that have both anabolic (muscle-building) and androgenic (male hormone) properties. Athletes take these drugs for their anabolic effects, but it is usually the androgenic expression that is responsible for their adverse reactions. It is likely that they were first introduced to athletics in the 1950’s in the former Soviet Union and have been present on the sports scene ever since.

In his 2004 State of the Union speech, President Bush sounded a clarion call regarding the epidemic of anabolic steroids in the United States. “The use of performance-enhancing drugs like steroids . . . sends the wrong message-that there are shortcuts to accomplishments, and that performance is more important than character. So . . . get tough and get rid of steroids now.”
According to national surveys, such as the Monitoring the Future Study[1] the use of anabolic steroids among high school students has been steadily increasing. Additional studies have also demonstrated increasing usage patterns in adolescents with rates of AAS use ranging from 1-6%.[2] Due to their inherent insecurities and emotional immaturity; teenagers are especially vulnerable to the allure of anabolic steroids. A recent study revealed that 30% of adolescent girls and boys reported thinking frequently about wanting more defined muscles[3]. Unfortunately adolescents’ physical immaturity may also make them more susceptible to the adverse effects of anabolic steroids. Although the main focus of drug testing has been on elite athletes in the Olympic Games, National Collegiate Athletic Association (NCAA) and professional sports, studies demonstrate that patterns of drug use are often established well before an athlete enrolls in college. The NCAA conducts a quadrennial survey of drug use and abuse habits of college student-athletes that involves more than 20,000 student-athletes nationwide. One of the items surveyed in the 2005 edition was the age at which anabolic steroid users began using these drugs. According to the survey, 55% began using anabolic steroids in either high school or junior high school[4]. It is apparent from this information that effective programs are needed at the high school level. These findings are similar to Dr. Green’s analysis of the1997 NCAA survey that found 52% of college anabolic steroid users had begun in junior high or high school.[5]

While it has been reported that anabolic steroid use is prevalent in high schools, there has been debate as to the appropriate population to target for interventions. Although Buckley found that 35% of 12th grade anabolic steroid users were not involved in a school-sponsored sport [6], other studies have determined that athletes have a higher prevalence of anabolic steroid use as compared to the general student population. A survey of Canadian youth ages 11 to 18 found that

students involved in sports and sport-related activity were significantly more likely to report having used anabolic steroids than those not involved in such activity.[7] A study of collegiate athletes by the Dr. Green and others found that collegiate athletes were more likely to use anabolic steroids than their non-athlete peers.[8] Finally, a recent study of high school students revealed that team sports participation was related to using products to enhance muscles and appearance, with participation in football being an even stronger correlation.[3]

Although national surveys of teens suggest that anabolic steroid use is a significant problem, there is very little firm data on the prevalence of anabolic steroid use in Southern California high school athletes. In order to develop a comprehensive prevention program, it is necessary to understand not only the prevalence of use, but also attitudes that may influence behavior. The LA84 Foundation recognized this as a significant issue facing high school sports and commissioned a study by Dr. Green to investigate this problem.

II. Purpose

The purpose of the study was to develop and administer a survey to Southern California high school student-athletes to determine the prevalence of anabolic steroid use and attitudes towards performance-enhancing drugs and drug testing.

III. Methods

a. Sampling Plan

This study was begun in the fall of 2006 and designed to be completed by the end of the academic year in June of 2007. California High Schools compete under the aegis of the California Interscholastic Federation (CIF) which is made up of several Sections. It was decided to utilize the Southern Section of the CIF due to its large geographic area that encompasses a diverse population. The cooperation of the leadership of the Southern Section was enlisted and the president of the Southern Section, Dr. Jim Staunton, wrote a letter of support (Appendix A). The Southern Section provided a listing of all 564 schools that make up this Section. A biomathematical statistician was employed to conduct a randomization program for these schools. The first step was that all schools with a general enrollment of 50 or less were excluded. The remaining schools were stratified into small (enrollment 50-999) and large (over 1000) schools. From there, schools were sorted with respect to the second digit of their zip codes yielding four groups: 90, 91, 92, and 93, respectively. This eventually yielded eight groups: 90- small, 90- large, 91- small 91- large, etc. All eligible school were then sorted into the 8 groups and randomly selected. In order to ensure that every student-athlete in the Southern Section had an equal chance of being selected for the study, at least two schools were needed in each group. Furthermore, in order to prevent the smaller schools from being overrepresented,

three of the larger schools were selected for each zip code. The only exception to this was the 93- zip code in which only two large schools were selected due to the relative paucity of schools in this geographic area. This led to 19 schools ultimately being randomized for initial inclusion in the study.

According to the sampling plan, the initial 19 selected schools would be invited to participate in the study. If a selected school declined to participate, the next school in that category in the randomization process would be invited. Schools would continue to be invited until either the target number of schools in that category was achieved or the study was terminated.

b. Questionnaire Development

As background to the study, a literature search was conducted in several areas. The first was a review of the literature with respect to drug surveys in high school students, with an emphasis on anabolic steroid research in athletes. Existing surveys that targeted this audience were reviewed and in many cases, communication with study authors was conducted to assess their methods. Questionnaires from validated research studies were obtained and questions reviewed for relevance with respect to meeting the objectives of the study. Permission was obtained from the authors to use their respective questions. Eventually 53 questions regarding the use of anabolic steroids, attitudes towards drug testing and anabolic steroids were compiled into a survey instrument. (Appendix B) A prototype of the survey was developed and a pilot survey was given to approximately 50 male and female intercollegiate athletes at two Division I universities and the respondents were surveyed with respect to any suggestions for improving the survey. Based on this pilot data, changes were made to the final questionnaire.

A literature review was also conducted regarding the use of electronic versus paper surveys. The literature confirmed that the administration of electronic surveys had similar results when compared to the traditional paper and pencil surveys[9]. Furthermore, discussions with high school principals provided assurances that home internet access among today's high school students was fairly universal. In addition, alternative methods, such as electronic scanning of paper questionnaire were explored with the UCLA Biomathematics Department and it became clear that an electronic survey was the most efficient and accurate method of sampling.

A search was then conducted to determine the optimal format for the survey. After extensive research, Survey Monkey.com was selected as a web-based platform to conduct the survey. Their web-based design allows subjects to easily access the survey and answer questions quickly and efficiently with the results easily downloaded into an excel file for statistical analysis. The questionnaire was then formatted into their web site and it was piloted again and found to be very easy to use and required only about five to 10 minutes to complete. The LA84 Foundation (formerly the Amateur Athletic Foundation of Los Angeles)

agreed to host the survey on their web site.
(http://www.la84foundation.org/3ce/ped_frmst.htm)

c. Human Subject Approval

In order to conduct this study, approval was necessary from the UCLA Human Subject Protection Committee (HSPC) that oversees the ethical conduct of all research studies at UCLA. An application was submitted. Owing to the fact that information regarding illegal drug use was being collected in the survey, extensive revisions were required and provisions for confidentiality were required which delayed approval. In addition, the UCLA HSPC had never before approved a study with electronic informed consent (as opposed to traditional paper signatures). After a great deal of negotiation, the study was ultimately approved by the Committee on November 1, 2006. As a condition for approval, all participating schools were required to submit written letters agreeing to comply with the UCLA code of ethical research. Each subject who participated in the study was required to provide informed consent with parental assent also required for subjects less than 18 years of age. (Appendix C)

d. Survey Administration

Once the survey instrument was completed and HSPC approval secured, the process of school recruitment began. Invitation letters to the principals and athletic directors were emailed to the initial 19 schools with follow up emails and telephone calls. If a school declined, the next school in that category was invited. Dr. Green conducted all of the communication with the schools until April of 2007. In March of 2007, a senior UCLA medical student, Michael Chen, was added to the project as a volunteer and approved by the UCLA Human Subject Protection Committee. When he joined the project, all 19 initial schools had been contacted. Mr. Chen was assigned to the task of inviting new schools to participate, as well as assisting in attending recruitment meetings at schools that had already agreed to participate. In addition to Mr. Chen, a research assistant was hired for approximately six weeks in April and May. At that point in the study, approximately nine schools already had been surveyed. However, the number of participants at each school was less than anticipated. Ms. Danya Sarembock was hired, with approval of UCLA Human Subject Protection Committee, to re-contact those schools that had already participated in order to return to those schools to remind students to participate.

Once a school agreed to participate in the study, a time was arranged for Dr. Green to visit the school and address the student-athletes at that school. At that meeting, the purpose of the study was explained to the students and a flyer was distributed (see Appendix D) with the details of the survey, the web-site address and the password to enter the survey. Time was allotted for questions. Alternatively, schools could request paper copies of the parental assent form and students could use the school computer lab to take the survey if they had a signed copy of their parent's assent. Following the initial meeting with the athletes, the school received a $100 donation to their athletic fund.

e. Statistical Analysis

A statistician with the UCLA Department of Biomathematical Statistics developed statistical methods to analyze the data. Descriptive statistics were tabled for several subgroups, including school size, geographic area, gender, age, ethnicity, participation in team sports, and use of muscle-building dietary supplements. Statistical comparisons between subgroups were made with chi-square tests for percentages and Kruskal-Wallis rank sum tests for ordinally scaled variables. Sets of questions within subject were compared using the Friedman rank test, testing the null hypothesis that each response came from the same distribution. In addition, pairs of questions were compared using the Wilcoxon signed rank test. A p value of 0.05 was considered statistically significant.

IV. Results

Nineteen schools initially were selected as representative of the Southern Section High Schools of the CIF. All of those schools were contacted and nine eventually agreed to participate in and completed the study. The other 10 declined and additional schools were then recruited until either the category was completed or the 2006-07 school year ended. An additional 50 schools were contacted, and three agreed to participate and eventually completed the survey for a total of 12 schools. The reasons for declining to participate varied. Over 60% did not respond to repeated contacts and were deemed “passive declines” and 20% actively responded and declined to participate, although no firm reason given. The remaining reasons given were: the inability to obtain parental consent (e.g. boarding schools), the campus was moving, or the study required school board approval.

Data was analyzed comparing schools that were initially selected for the survey (n=9) versus those that were invited later in the study (n=3). The major statistical difference was that athletes at the latter schools were more likely to have used creatine in the past 12 months and were more likely to have used other muscle-building supplements in the past 30 days, year and lifetime. The latter group also was more likely to be planning on using other muscle-building supplements in the next year. The only other finding was that the latter surveyed schools were more likely to favor drug testing for Olympic and professional athletes as compared to those in the original group.

For the eight geographic/school-size categories, one achieved complete participation (93- large schools) and the remaining seven categories each were missing one school. Although the original plan called for the study to include 11 large and eight small schools, the final result was eight large schools and four small ones. The participating schools were distributed over a wide geographical area and were located in Santa Barbara, Ventura, Los Angeles, Orange, and Riverside Counties. The distance between the two furthest schools was 250 miles and the researchers drove a total of 1650 miles during the course of the

study. Table I summarizes the geographical/school-size categories and the numbers who participated. For the purposes of this report, the names of the schools have been redacted in order to protect the confidentiality of the schools and consistent with the requirements of the UCLA Human Subject Protection Committee. Of the 12 schools, seven were public schools, four were private-religious and one was a secular-private school. The major differences between the religious and secular schools was that those who attended religious schools were more likely to have used creatine and muscle-building supplements and planned to use them in the future.

We received a total of 252 usable responses from male and female student-athletes across 11 sports. Table II details the demographics of the respondents. In doing statistical analysis, the samples were not weighted due to the relatively low response rate and lack of a true denominator (i.e. number of athletes at each school). In terms of use of AAS, only two students (1%) admitted to any lifetime use of AAS and one student was planning to use in the next 12 months. The results are further displayed graphically in Figures 1, 2, 3.

The results were analyzed by age, gender, geography (zip code) ethnicity, and sport. There were no significant differences with respect to age, the only exception being that younger students were less likely to think of themselves as team leaders. For gender, the only differences were boys were more likely to use creatine or muscle-building dietary supplements. Boys were also more likely to consider playing sports professionally. Girls reported more AAS use at their school, but less AAS use on their own team or by their opponents as compared to boys.

The responses were fairly similar with respect to geography, although there were some minor statistical differences when analyzed according to zip code. These included the report by students in certain zip codes that a slightly higher percentage of athletes at their schools were using AAS. The responses were fairly homogenous when analyzed for ethnicity with the only statistical differences being that Caucasians were less likely to think they would be playing sports professionally while Latinos were more likely to consider playing sports in college and professionally.

Owing to the relatively low number of responses for any particular sport, sports were grouped into team sports (baseball, basketball, football, soccer, softball, volleyball, water polo) and individual sports (cross country, swimming, tennis, and track). The only difference between the groups was that individual sport athletes felt that a higher percentage of athletes at their school used AAS as compared to team sport players. There was no statistical difference between opinions on the amount of AAS on their own team, regardless of type of sport played.

The results of questions designed to elicit attitudes regarding anabolic steroids supports a relatively low prevalence of anabolic steroid use by the respondents. For example, 90% disagreed with the statement that it is okay to try anabolic steroids once or twice and only 3% stated that it was okay to use anabolic steroids to get a college scholarship. In keeping with that theme, only 1% said they would try anabolic steroids even if the side effects were dangerous. (See Table III) Interestingly, 64% stated that they were aware of the CIF policy on AAS.

Although questions regarding AAS use and attitudes towards AAS seemed to indicate a paucity of AAS use among respondents, other responses indicate a different pattern of AAS use among their peers. Questions about usage of AAS at their school, among teammates and opponents were particularly revealing. Students estimated that about 10-25% of their opponents used AAS versus 10% of athletes at their school and close to 0% used on their own teams. The response to these three questions, use at their school, by opponents, on their own team, were all statistically different ($p<0.0005$) and are summarized in Figure 4.

Put another way, only 14% of the students felt that there was any use of AAS on their team versus 70% who felt that there was some use of AAS among athletes on other teams at their schools or on teams they played against at other schools. Further analysis of the data revealed that over 50% responded that 10% of the athletes at their school (although not on their team) used anabolic steroids and 12% said one-quarter of their school's athletes used anabolic steroids. When asked about teams they play against, 70% felt that at least 10-25% of the players on other teams were using anabolic steroids and 15% felt that 50% or more of their opponents were using AAS.

As a follow up, students were asked to agree or disagree with the statement, "I have teammates who use anabolic steroids." Seventy percent disagreed with that statement, 20% had no opinion and 10% agreed. From these responses, it appears that the perception among the respondents is that about 10% of student-athletes use AAS.

Although very few admitted using AAS, about 15% of student-athletes (23% of males) reported lifetime use of a muscle-building dietary supplement by the question "On how many occasions have you used other dietary supplements [other than creatine] to build muscle in your lifetime?" Those students who had used these substances at least once were more likely to be male, play football, attend a private-religious school, have teammates who used AAS, plan on getting a college scholarship, have used AAS, more likely to use AAS even if there were dangerous side effects and have used creatine. As previously mentioned, only 8% of respondents admitted to having used the dietary supplement creatine during their lifetime. (See Figure 5)

There were also several questions regarding attitudes towards drug testing in sports. Although students were in favor of a drug testing program at their school for both AAS and illegal drugs, testing for illegal drugs was favored by a significantly greater number (p value of <0.0021). Fifty-seven percent favored testing for illegal drugs (with 18% opposed) versus 43% in favor of AAS testing (20% opposed). The remaining respondents had no opinion on the matter. The results of the students' attitudes towards drug testing are summarized in Table IV.

Another question on drug testing was the students' opinions on whether drug testing should be conducted at various levels of sport, i.e. Olympic, professional, collegiate and high school. In their responses to each of the four levels of sports, students felt most strongly that Olympic athletes should be tested (85%) and least likely that high school athletes be tested (67%). These differences were statistically different with a p value of <0.0001. The responses for professional and collegiate athletes fell in the middle and were statistically similar to each other, but were statistically distinct from Olympic and high school athletes. Overall, students seemed to support the idea of drug testing with 70% agreeing with the statement that drug testing athletes is good for my sport and 82% agreeing that drug testing makes sports fairer. Only 9% felt that drug testing for anabolic steroids violates their rights. With respect to the influence of drug testing on AAS use, a full 65% agreed with the statement that drug testing makes me want to avoid AAS and 60% felt that drug testing reduces AAS use.

V. Discussion

The study successfully developed a questionnaire in an electronic format that could be administered to high school athletes through a web-based platform. The survey instrument delivered reproducible results and appeared to be tailored appropriately to this population. Most of the respondents delivered usable information that was filled out correctly. In addition, the electronic format proved to be quick and easy to use, there were no reports of limitations due to lack of internet access and the results were accurately downloaded to allow for statistical analysis. At each school meeting, students were informally asked to demonstrate by a show of hands home internet access. Prior to each meeting, the principal at each school confirmed that home internet access was near 100%. There were no requests by students for paper consent forms for those students without internet access. It appears that lack of access to the internet at home was not a significant limiting factor.

The results indicated that only 1% of the respondents admitted to using AAS. This is consistent with past studies across several different age groups. For example, over the past 17 years the Monitoring the Future Study[1] of 8th to 12th graders (not just athletes) has consistently demonstrated a self-report rate of 1-2.5% for AAS. The NCAA surveys collegiate athletes every four years regarding

use and abuse habits of various drugs and their self-report rate for AAS has been about 1% over the past 12 years. Additionally, the positive rate for AAS under unannounced NCAA drug testing ranged from 0.5 to 1% between 1996 and 2005. In New Jersey in 2007 among high school athletes tested in a state-mandated program, the positive rate for AAS was well below 1%. Although some studies have found somewhat higher rates of AAS use in high school populations, it does appear that a 1% rate of AAS use is consistent with other self-report research.

There did not seem to be any major differences between the nine schools that were part of the first randomization as compared to those schools that were selected later in the study. This was a concern give that the school response rate was much higher among initial schools than latter schools. The only major finding was that the latter schools appeared to have a greater prevalence of the use of muscle-building supplements. Since the use of muscle-building supplements was associated with potential AAS use, perhaps officials from those schools that agreed to participate were concerned about problems in this area at their respective schools. However, only 8% of the respondents came from these latter schools, so any conclusions are speculative. Additional confounding variables were school size and religious schools. This is because three of the four private- religious schools were in the group of schools that were secondarily invited and 97% of the respondents from small-size schools attended private-religious schools. The data revealed that athletes at the religious schools were more likely to use creatine and muscle-building dietary supplements. There were four religious schools among the original 19 schools selected and all but one declined to participate.

Many of the demographics had little influence on the results. For example, although the study was weighted more towards younger and lower grade subjects, the only real difference was that younger students were less likely to consider themselves team leaders. The large number of younger students was expected because the survey was administered in the spring and thus, seniors from fall sports would have been unlikely to attend the survey-study meetings since they had completed their high school eligibility. Another factor may have been that since the survey was performed later in the school year, younger athletes had been socialized to team norms. As mentioned above, there was very little effect of gender, geography, or ethnicity on the results and students were relatively homogenous in their responses. Although only 12 of the planned 19 schools participated, the missing seven schools were equally divided among the seven geographical and school size categories. This limited the impact of geographic bias in the study.

Surprisingly, whether a student played a team sport or individual sport did not seem to influence the responses. The only exception was the perception of AAS use at their school. Although those athletes who participated in team or individual sports reported no differences on questions regarding AAS use among

their teammates or opponents, there was a difference with respect to overall school use. Individual sport athletes were more likely to say a higher percentage of athletes at their school used AAS than were team sport players (p=0.026). Thirty-four percent of team-sport athletes responded that no athletes at their school used AAS compared to 18% of individual-sport athletes who felt there was no use at their particular school. The perception of individual team sport athletes is that there is much greater use of AAS in sports other than their own. Interestingly, individual sport athletes were more likely to want drug testing for illegal drugs as compared to team sport athletes, although both groups had the same responses for AAS testing.

Although a goal of the study was to provide a description of athletes either at risk for or already using AAS, it has instead produced a profile of the non-using athlete. This fact was poignantly demonstrated by an anonymous letter I received during the study (see Appendix E) The study may thus be helpful in understanding why high school students elect not to use AAS. From this survey, it appears that non-AAS using student athletes do not feel it is okay to use AAS to get a college scholarship, would not use AAS if the side effects were dangerous, and feel that their coaches, teachers and principals would not approve of them using AAS. It appears that the non-using respondents in this survey did not use AAS for a combination of ethical and medical reasons. These points can be emphasized in future educational programs.

The study also revealed perceptions of AAS use among non-using high school athletes. Although most students felt that there was little or no AAS usage on their own particular team, there was a widespread perception that there was at least 10% of athletes at their school and among opponents were using AAS. While it is not uncommon for athletes at all levels to assume that their opponents have an unfair advantage, it was somewhat surprising that the perception of use at their own school was so great. It is of course impossible to verify these responses, but this is a significant finding and needs to be addressed.

Overall, it appears that there was an inverse relationship between the amount of AAS reportedly used by their teammates and the perceived use of AAS among other athletes at their school. For example, individual sport athletes felt there was a lower use of AAS on their teams, but more on other teams at their school. At the same time, girls felt that there was less AAS on their teams as compared to boys, but they reported more AAS use at their school than their male counterparts.

Although 99% of the respondents denied the use of AAS, 23% of the male athletes admitted to some lifetime use of muscle-building dietary supplements other than creatine. This percentage is consistent with previous reports of adolescents seeking more defined muscles.[3] Use of muscle-building dietary supplements is worrisome because it is a risk factor for later AAS use. The author's experience with AAS users has demonstrated that users often begin

with muscle-building supplements and graduate to AAS when the supplements fail to deliver expected gains in muscle. This experience is supported by this data in which those using muscle-building supplements demonstrated less concern about the adverse effects of AAS and considered AAS use acceptable to get a college scholarship.

The attitudes towards drug testing revealed a mixed picture. These athletes strongly supported drug testing in a variety of sports settings, such as the Olympics Games; professional, college and high school sports, although the least amount of support was for testing at the high school level. Overall, the majority was accepting of AAS drug testing in high school and felt it would be fair, good for their sport and did not violate their rights. This would be expected in a population that did not use AAS. The students also seemed to favor testing for all illegal drugs over testing aimed only at anabolic steroids. It is possible that these students view illegal drugs (not including AAS) as a greater problem than AAS. Interestingly, the large majority did feel that drug testing for anabolic steroids was accurate and effective in deterring AAS use.

Although this study generated several interesting findings, there are limitations to the research. The most obvious is the relatively small numbers of subjects. In arranging visits to the individual schools, extensive communication with the school's principal and athletic director was conducted in order to enlist their support. All of the schools were very interested in the results and anxious to determine the extent of any problems with AAS at their institutions. The respective schools arranged an assembly with either the entire student body or all of the school's athletes.

The SurveyMonkey program allowed for immediate updates on data collection and the ability to determine the number of subjects from each school. Following the initial meetings, schools were contacted frequently with updates of the number of participating students from their school and encouraged to recruit additional subjects. Almost all of the coaches at the respective schools attended the meetings and were also encouraged to support their athletes' participation in the study. Despite the several thousand student-athletes that were invited to participate, a relatively small number completed the survey.

One barrier that might have limited participation was the requirement for parental assent. Although each school reviewed the study and agreed to participate, the UCLA HSPC required parental assent due to the fact that questions about illegal drug use were part of the survey. In recent discussions with the UCLA HSPC staff, it has been suggested that eliminating questions that directly ask about AAS use may remove the necessity of having parental assent. Given that responses to direct questions on AAS use may be inherently unreliable, removing barriers to participation may increase the value of the survey. Previous work has identified baseline characteristics that identify potential AAS users[10]. These include perceived severity of AAS adverse effects, coach's tolerance of

AAS use and knowledge of AAS use. Questions such as these, indirect indicators of use, plans to use AAS and muscle-building supplements may be more useful than direct questions about usage.

There are additional limitations that may impact the findings as well. The low number of AAS users likely reflects the fact that users of illegal substances may be less likely to participate in surveys and if they do participate, less likely to admit usage. Although there is no current drug testing in the CIF, AAS are banned and concerns about confidentiality may have limited the responses. Another influence on the study may be that nine of 19 initially selected schools (47%) agreed to participate in the study, only 6% of the next group of invited schools participated.

There is also the question of ethnic diversity in that 64% of the respondents identified themselves as Caucasian. In order to maximize the geographical diversity of the study, the Southern Section of the CIF was selected. Although this goal was accomplished, the Los Angeles Unified School District was excluded from the study since they are not part of this Section. It is possible that the more urban City Section with a different ethnic composition would have yielded different results, however there were few significant ethnic differences in our results. Previous reports of ethnicity have yielded mixed results with some studies citing lower AAS rates among Caucasians [13], while others show highest rates for Caucasians[5], Latinos[14], and African-Americans[15], respectively. Future studies should address this issue and strive for a more balanced ethnic profile. Following completion of this project, a cross-sectional study of AAS use in high school girls was published in June of 2007. The study of 7,000 girls revealed an AAS usage rate of about 5%. More importantly, AAS use was associated with the use of alcohol, cigarettes, marijuana, cocaine and diet pills. AAS users were more likely to carry weapons, have had sexual intercourse before the age of 13 and had significant feelings of sadness[16]. These findings should be incorporated into future questionnaires and educational programs.

VI. Conclusions

This study demonstrated that a multi-school electronic survey could be conducted among high school students and collect meaningful results. Despite surveying males and females from a wide geographic area encompassing 11 sports, and multiple ethnicities, the responses were fairly homogeneous. Students in general did not use AAS and did not agree with the use of these drugs. Despite the fact that respondents to the survey had a negative view of AAS, a majority felt that there was significant AAS use amongst their opponents and at their school. This aspect alone is cause for concern and certainly warrants more investigation. Either the perception is erroneous and students

need to be educated about actual AAS usage, or there is widespread use of these drugs.

Although the use of AAS was reported as low in this group, there was a significant use of muscle-building dietary supplements. This demonstrates that the desire to increase muscle mass is still a significant issue, even in a population with a low prevalence of AAS use.

Among the respondents, there was a general acceptance of drug testing in sports. The majority of students was supportive of drug testing and felt it would help their sport, reduce AAS use and did not infringe on their rights. This reflects an overall national trend in that several states, including Florida, New Jersey and Texas, are conducting state-wide drug testing of their interscholastic athletes, or plan to do so in the near future.

VII. Future Directions

The study was the first step assessing the problem of AAS use in Southern California. The major contribution of this research is the light it sheds on students' perceptions of AAS use at their school and on teams that they play against. These should be incorporated into future educational programs.

On a larger scale, drug testing[11] and educational programs[12] have been studied as a solution to the problem of AAS in this age group, however, many unanswered questions remain[17]. The use of performance-enhancing drugs in sports is a complex problem and will likely demand a variety of approaches. The next step is to develop a comprehensive model that combines education and drug testing for high schools. The educational component should necessarily include not only information about the health effects of these substances, but skill building in the area of ethical decision making.

About the principal investigator:

Dr. Gary Green served as the principal investigator for this study. He is currently a clinical professor at the UCLA School of Medicine in the Division of Sports Medicine. He conducts research at the UCLA Olympic Analytical Laboratory in the area of performance-enhancing drug use in athletes. He is also board-certified in both Internal Medicine and Sports Medicine and is a partner at the Pacific Palisades Medical Group where he sees a variety of patients in both primary care and sports medicine. Dr. Green has served as a team physician for intercollegiate athletes at UCLA and is currently the team physician for Pepperdine University. He has also been the medical director of the UCLA Intercollegiate Drug Testing program since 1989 and in that role has extensive

experience counseling athletes. He chaired the NCAA Drug Testing Committee for six years and serves on the United States Anti-Doping Agency's Review Board. Since 2003, he has served as a consultant to Major League Baseball on Anabolic Steroids and Performance-Enhancing Drugs. Dr. Green has published numerous scientific papers and book chapters on the science of drug testing and drug abuse by athletes.

Dr. Green has given lectures throughout Southern California on anabolic steroids and had the opportunity to talk to high school coaches and athletes about anabolic steroids. He was also a featured speaker at the Drug Enforcement Agency's Steroids and Athletic Stimulants Summit held in Los Angeles in October 2004, as well as a similar meeting in Texas in February 2005. Dr. Green has testified in front of the California Senate regarding performance-enhancing drugs and drug testing and consulted on legislation to protect minors from dangerous nutritional supplements and anabolic steroids. Dr. Green served as a member of the US Congressional Zero Tolerance Committee that was formed after the March 2005 Congressional hearings into anabolic steroid use. Dr. Green is currently working with ongoing Drug Enforcement Agency investigations in the Southern California region regarding physicians who illegally prescribe anabolic steroids. In this capacity, he has become acutely aware of the availability of anabolic steroids throughout the community. In addition, Dr. Green is also a member of the California Interscholastic Federation (CIF) Sports Medicine Committee that oversees the health and safety of California high school athletes.

Acknowledgements

I would like to thank Anita DeFrantz and the LA84 Foundation for their support and funding of this project and Dr. Wayne Wilson in particular. I would also like to thank Jacqueline Hansen for inviting me to participate in the LA84 Foundation Coaching Clinics and the opportunity to educate our area coaches. Thanks go also to the UCLA Olympic Analytical Laboratory staff and Dr.'s Don Catlin and Tony Butch for allowing me to pursue this project and the support to accomplish it. Finally, I want to thank Rita Engelhardt of the UCLA Department of Biomathematical Statistics for her excellent statistical work.

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Tables

Table I
Summary of Participating Schools

original category	original # selected	# of original schools participating	Additional Schools participate	total # studied
90 small	2	1	0	1
90 large	3	1	1	2
91 small	2	1	0	1
91 large	3	2	0	2
92 small	2	0	1	1
92 large	3	2	0	2
93 small	2	0	1	1
93 large	2	2	0	2
Final	19	9	3	12

School Demographics

Large Schools	8
Small Schools	4
Public Schools	7
Private Schools	5
Secular Schools	8
Religious Schools	4

Table II
Study Demographics

Grade	#	%		Age	#	%
Grade 9	92	36		Age 14	64	25
Grade 10	74	29		Age 15	72	29
Grade 11	57	23		Age 16	67	27
Grade 12	29	12		Age 17	33	13
				Age 18	16	6
Total	252	100			252	100

Gender	#	%		Ethnicity	#	%
Male	143	57		Asian	17	7
Female	109	43		African	18	7
				Latino	74	29
				Caucasian	163	64
Total	252	100			255	

More than one response allowed

Sport	Chart Key	#	%
Baseball	BB	32	8
Basketball	BKB	39	10
CrossCountry	XC	35	9
Football	FB	68	17
Soccer	SOC	17	4
Softball	SB	21	5
Swimming	SW	48	12
Tennis	TEN	20	5
Track	TRK	59	15
Volleyball	VB	22	6
WaterPolo	WP	28	7
Total		389	

More than one response allowed

Table III

Attitudes towards AAS	
Survey Question	**% disagreeing with statement**
It is okay to use steroids to get a scholarship	97%
It is okay to try anabolic steroids once or twice	90%
I would try anabolic steroids even if they produced strange side effects or were dangerous	97%

Table IV

Attitudes towards drug testing

	Percentages		
Survey Question	**Disagree**	**Neutral**	**Agree**
Drug testing athletes makes me want to avoid anabolic steroids	18	18	**65**
Drug testing reduces anabolic steroid use	24	16	**60**
I want a drug-testing program at my school for anabolic steroids	18	39	**43**
I want a drug testing program at my school for all illegal drugs	20	22	**58**
Drug testing will catch people who are using anabolic steroids	15	23	**62**
Drug testing for anabolic steroids violates my rights	**76**	15	9
Drug testing for anabolic steroids is a bad idea	**78**	16	6

Figures

Figure 1

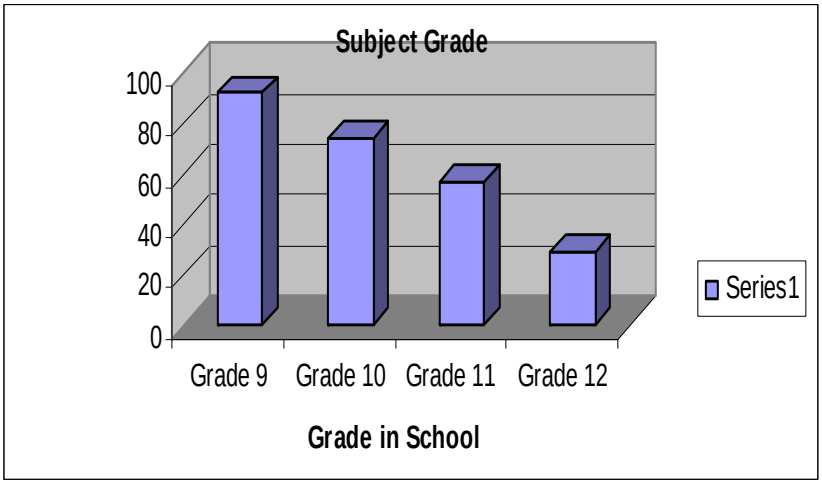


Figure 2

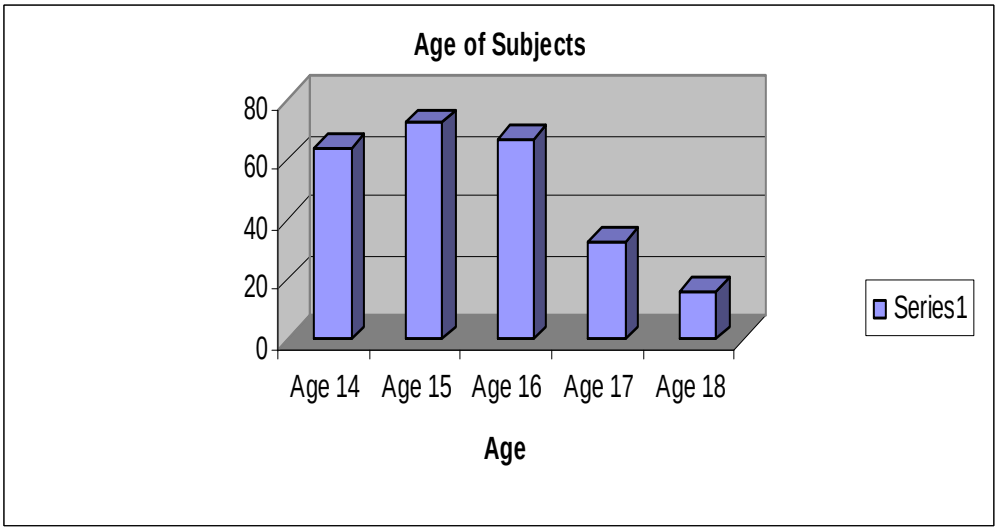


Figure 3

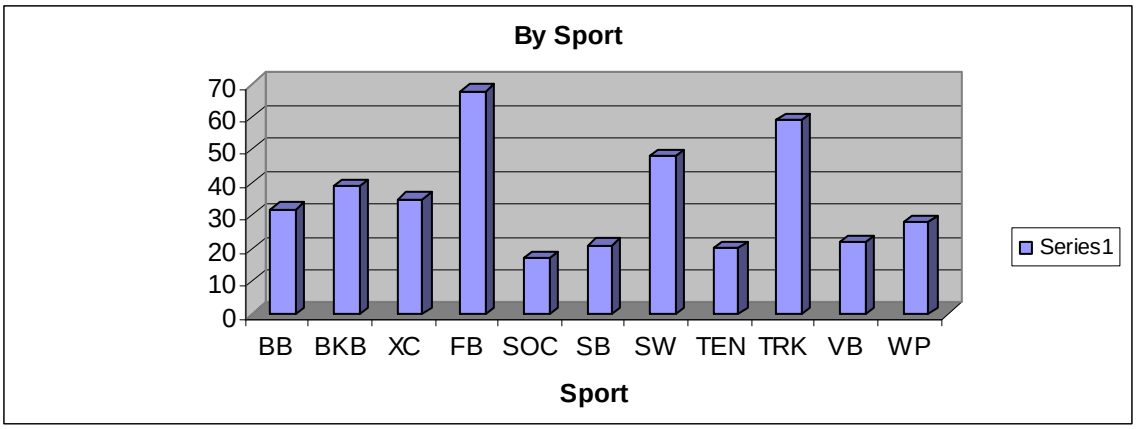


Chart Key

Sport	Chart Key
Baseball	BB
Basketball	BKB
CrossCountry	XC
Football	FB
Soccer	SOC
Softball	SB
Swimming	SW
Tennis	TEN
Track	TRK
Volleyball	VB
WaterPolo	WP

Figure 4

Response to the question of “What percentage of athletes use anabolic steroids on your team, at your school or on teams you play against?”

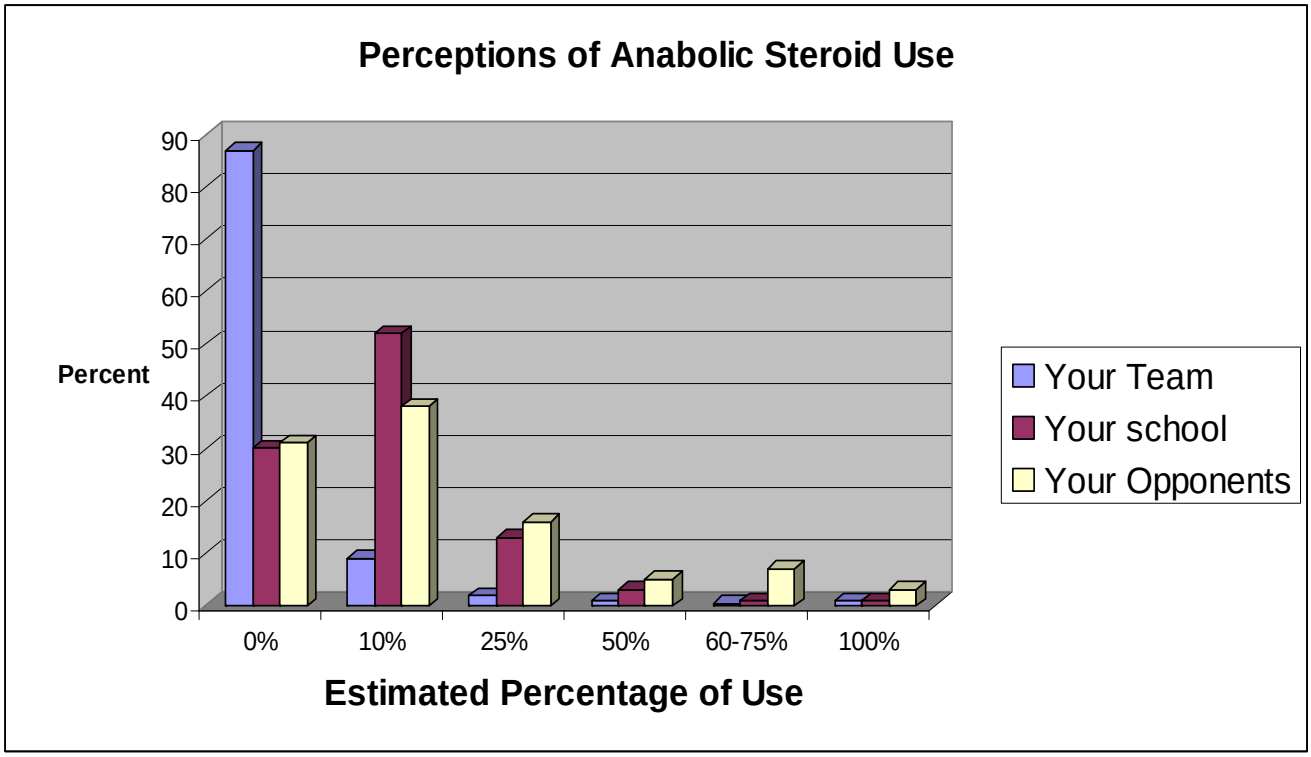
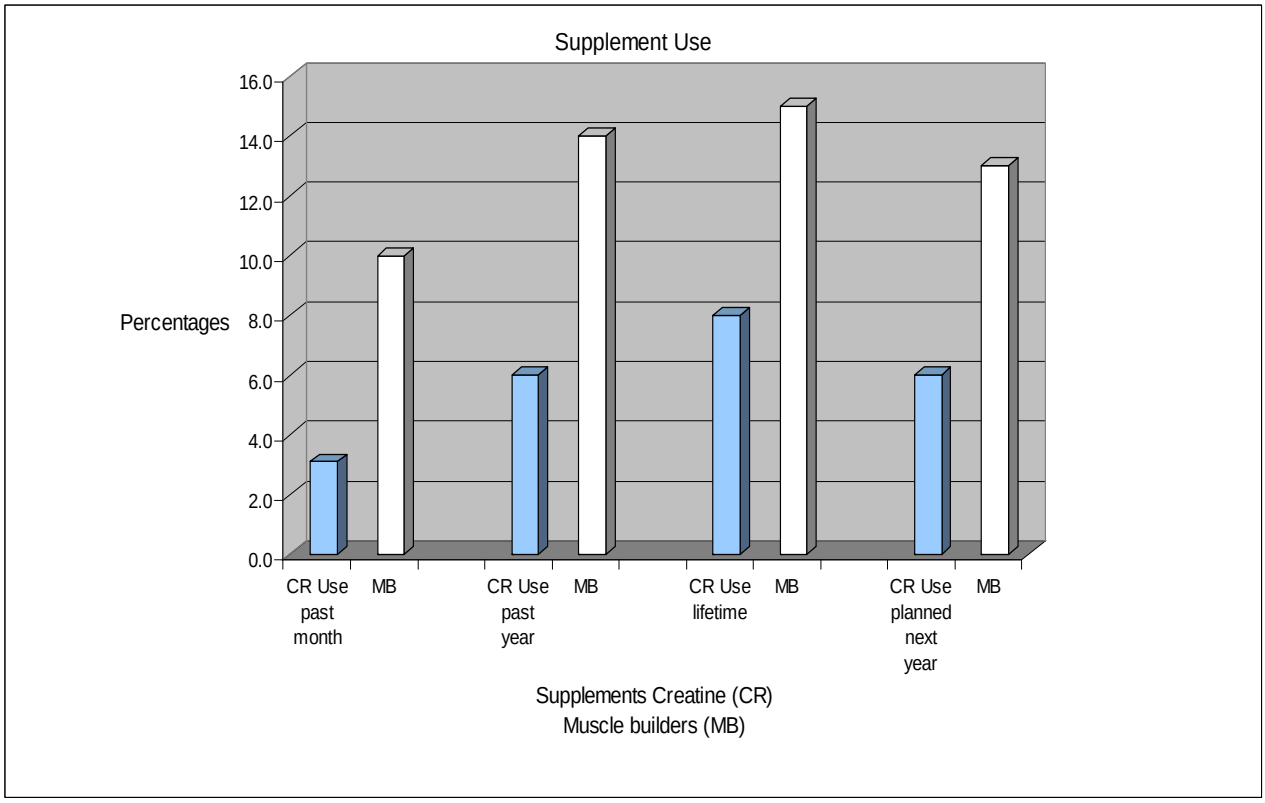


Figure 5

Use of creatine and other Muscle-Building Supplements in the past month, year, lifetime and planned use in the next year.



Appendix A

Letter of support from Dr. Jim Staunton

Dear Principal:

This letter is written to express my support, and the support of the CIF Southern Section, for the study that Dr. Green is attempting on the use of anabolic steroids and performance-enhancing drugs among student-athletes in Southern California. As you are no doubt aware, anabolic steroids are recognized as a problem in athletics and the CIF has a strong policy against the use of such drugs. While all of us acknowledge these drugs are a problem in sports, there are a number of questions regarding the extent of its use and the best way to tackle this problem. Dr. Green is attempting to answer some of those questions in a well-designed survey.

Dr. Green has developed a short questionnaire that he is proposing to administer through an on-line survey to 5-10,000 student-athletes in Southern California. This study will go a long way in determining the amount of anabolic steroid use, attitudes towards these drugs and will determine some possible solutions to addressing the problem. Dr. Green is a nationally-recognized physician and researcher in this field and is working with the California Interscholastic Federation and the Amateur Athletic Foundation of Los Angeles on this project. It is approved by the UCLA Human Subject Protection Committee and the complete confidentiality and anonymity of all of the subjects as well as responding schools has been assured. No school will be named in any reporting of this survey.

Through a randomized, statistical analysis, your school has been selected to participate in this study. Dr. Green has designed the study in order to have minimal impact on both your school and athletic routine. If you agree to participate, your school will have to provide a letter of agreement and provide Dr. Green with an opportunity to explain the project to your athletes. He estimates this will take about 15 minutes. The student-athletes then complete the survey on their own time by accessing a secure web site and completing the brief questionnaire.

In return for your school's participation, you will receive a $100 donation to your school's athletic fund, the composite results of the survey for your school and my appreciation for assisting in this important work.

Thank you for considering this study and please feel free to contact me if you have any questions.

Sincerely,

Jim Staunton
Jim Staunton, Ed.D.
CIF Southern Section Commissioner of Athletics
T: 562-493-9500
jims@cifss.org

Appendix B

Survey Instrument

Survey Questionnaire on Anabolic Steroids and Drug Testing

What High School do you attend?

1. How old are you now in years?
2. Today's Date:
3. What is your gender?
4. What grade are you in school?
5. Which one of the following ethnic groups best describes you? (Mark all that apply
   Asian
   Native Hawaiian or other Pacific Islander
   American Indian or Native Alaskan
   Latino
   Black, African-American
   White
6. Please mark all the SCHOOL team sports activities for which you are on, will be on, or have been on during this school year
   Football
   Volleyball
   Cross Country
   Soccer
   Cheerleading or rally
   Basketball
   Wrestling
   Swimming and Diving
   Dance or Drill Team
   Track and Field
   Tennis
   Golf
   Softball
   Baseball
   Gymnastics
   Other
   I do not participate in school sports
7. Did you participate in school sports last year?
8. Do you participate in sports or dance teams other than school teams? (Mark all that are true)
   Non-school team
   Individual competitive sport
   I do not participate in sports outside of school

Anabolic steroids are used to gain strength. They are not cortisone steroids used for treatment of asthma or rashes

9. On how many occasions have you used anabolic steroids in pill or injectable form (Don't count pills you buy in health food stores) Mark one circle per line.

			Number of occasions					
		None	1-2	3-5	6-9	10-19	20-39	40+
A	In your lifetime							
B	In the last 12 months							
C	The last 30 days							
D	Plan to in the next 12 months							

10. On how many occasions have you used the supplement creatine? Mark one circle per line.

			Number of occasions					
		None	1-2	3-5	6-9	10-19	20-39	40+
A	In your lifetime							
B	In the last 12 months							
C	The last 30 days							
D	Plan to in the next 12 months							

11. On how many occasions have you used other dietary supplements to build muscle? Mark one circle per line?

			Number of occasions					
		None	1-2	3-5	6-9	10-19	20-39	40+
A	In your lifetime							
B	In the last 12 months							
C	The last 30 days							
D	Plan to in the next 12 months							

12. There is a drug-testing program at my school.
    Yes No Don't know

13. My school has a policy on anabolic steroids
    Yes No Don't know
14. I participate in the athlete drug-testing program at my school.
    Yes No

15. I have been drug tested at my school
    Yes No
16. I am likely to be drug tested during the upcoming school year.
    Yes No Unsure
17. I know someone who has been tested at my school.
    Yes No
18. I know someone was able to "beat" the drug test (used anabolic steroids and didn't get caught) at my school.
    Yes No
19. It is okay to use anabolic steroids to get a college athletic scholarship.
    Yes No
20. It is OK to try anabolic steroids once or twice.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

21. I would try anabolic steroids even if they produced strange side effects or were dangerous.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

22. Drug testing athletes makes me want to avoid anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

23. Drug testing reduces anabolic steroid use.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

24. I want a drug-testing program at my school for anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

25. I want a drug-testing program at my school for all illegal drugs.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

26. I think drug testing increases the awareness of harmful effects of anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

27. I am nervous about being drug tested.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

28. Drug testing causes non-drug users to worry about being wrongly identified as users.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

29. I think that drug testing is accurate.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

30. I would not participate in school sports if athletes were drug tested at my school.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

31. I am proud of my school.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

32. I like being at this school.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

33. Drug testing for anabolic steroids violates my rights.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

34. Drug testing for anabolic steroids is a bad idea.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

35. My participation in a drug testing program does or would help me turn down anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

36. Students are able to use anabolic steroids and "fool" the drug test.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

37. Drug testing will catch people who are using anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

38. If I were caught using anabolic steroids, I would be in trouble with my parents.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

39. My teachers and principal disapprove of students using anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

40. My coaches disapprove of students using anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

41. I support my school's policy on anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

42. I am worried about getting caught using anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

43. I think that drug testing athletes is good for my sport.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

44. Drug testing makes sports fairer.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

45. I have teammates who use anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

46. I think all professional athletes should be tested for anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

47. I think all Olympic athletes should be tested for anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

48. I think all college athletes should be tested for anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

49. I think all high school athletes should be tested for anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

50. My coaches know that some athletes on my team are using anabolic steroids.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

51. I consider myself a good athlete

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

52. I have natural athletic ability.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

53. I consider myself a team leader.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

54. Athletes are good role models in my school.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

55. I plan on playing sports in college

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

56. I plan on playing sports professionally.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

57. I plan to get a scholarship to play sports in college.

Strongly Disagree			Don't disagree Or agree			Strongly Agree
1	2	3	4	5	6	7

58. Out of 100 ATHLETES at your school, how many do think use anabolic steroids?

0	10	25	50	60	75	100

59. What PERCENT of athletes on YOUR team do you think use anabolic steroids?

0	10	25	50	60	75	100

60. What PERCENT of athletes on teams you play against do you think use anabolic steroids?

0	10	25	50	60	75	100

Appendix C

Parental Assent for Research

University of California, Los Angeles

PARENT PERMISSION FOR MINOR TO PARTICIPATE IN RESEARCH

The use of anabolic androgenic steroids in high school athletes

You are asked to allow your child to participate in a research study conducted by Gary Green, MD, from the UCLA Olympic Laboratory at the University of California, Los Angeles. The study is sponsored by the Amateur Athletic Foundation of Los Angeles. Your child was selected as a possible participant in this study because he or she participates in interscholastic sports. Your child's participation in this research study is voluntary.

PURPOSE OF THE STUDY

The purpose of this study is to determine the use of anabolic androgenic steroids in high school athletes, as well as their attitudes towards these drugs.

PROCEDURES

If you agree to allow your child to participate in this study, we would ask him/her to: complete an *online* anonymous survey on anabolic steroids. This will take about 15-30 minutes to complete. There will not be any names on the questionnaires and no identifying information. Even if you give permission for your child to participate in this survey, he/she may decide not to participate. School officials will not be provided with any information on any individuals. Results of the research will be provided to the school principal and the athletic director, including information on steroid use by males and females, as well as by athletes of different ages. In order to minimize the risk to individual subjects and to maintain subject's confidentiality, individual team results will be reported only for teams that have rosters of 20 or more players, where 50% (i.e. 10 or more) have responded.

POTENTIAL RISKS AND DISCOMFORTS

There is no penalty for not participating in the study and whether or not your child participates in this study will not affect his/her athletic participation at the school.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

Neither you nor your child will receive any direct benefit from his/her participation in the research. The results of the research will help the researchers find ways to reduce the use of anabolic androgenic steroids in athletes.

PAYMENT FOR PARTICIPATION
Your child will receive no payment for participation.

CONFIDENTIALITY
All surveys will be anonymous and there will not be any individual information collected that would link your child with the data.

PARTICIPATION AND WITHDRAWAL

You can choose whether or not to allow your child to be in this study. If you agree to allow your child to be in this study, you may withdraw your consent at any time without consequences of any kind.

IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact: Dr. Gary Green. He can be reached via e-mail at: ggreen@mednet.ucla.edu or 2122 Granville Ave, Los Angeles, California, 90025 or 310-825-8941.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your child's consent at any time and discontinue participation without penalty. You are not waiving any of your legal rights because of your decision to permit him/her to participate in this research study. If you have questions regarding your rights as a research subject, contact the Office for Protection of Research Subjects, 2107 Ueberroth Building, UCLA, Box 951694, Los Angeles, CA 90095-1694, (310) 825-8714.

Appendix D

Study Announcement

VOLUNTEERS ARE NEEDED TO PARTICIPATE IN A

UCLA RESEARCH STUDY

Researchers from the David Geffen School of Medicine at UCLA are conducting a survey on the use of anabolic androgenic steroids in high school athletes. Subjects will be asked to complete a questionnaire on-line that will take approximately 15 minutes of your time. You may only take the survey ONE time.

There is no penalty for not participating in the study and your participation in this study will not affect your athletic participation at the school. All questionnaires are totally anonymous and individual results will not be given to your principal, athletic director, coach, or anyone else at your school. Summary results of the research will be provided to the school principal and athletic director that will include information on rates of anabolic steroid use by males and females and according to age. In order to ensure that individuals will not be identified, team results will only be reported for teams that have rosters of 20 or more players and where 50% or more of the players participate in the survey.

If you wish to participate in the study, here are the instructions:

1) Go to the web site: http://www.aafla.org/3ce/ped_frmst.htm
2) Follow the instructions and click on the link: "Take the survey"
3) Type in the following password: sports
4) The password should all be in small letters.
5) Complete the rest of the questionnaire.

If your parents do not have access to a computer, you will be provided with a paper consent form they can complete and then bring that to school.

If you have any questions, please contact:
Dr. Gary Green
drgreenresearch@yahoo.com

Appendix E

Anonymous Letter

Received Via E-mail 1/22/07

Dear Dr. Gary Green,

I am a high school athlete at XXXXXX High School, one of the schools in your survey on high school athletes using anabolic androgenic steroids. I thought of the guys that i know who use and doubted that they would take any survey, so I don't know if it will help, but here is a summary of an average clean athlete's perspective on the drug issue at my school. Whatever program we currently have is mentioned once a year and forgotten about a week later by the athletes. Kids on heroin and crack will get kicked off the team if somebody reports them to the coach, but it puts athletes between a rock and a hard place; should an athlete report athletes who uses steroids or drugs and risk compromising a winning season? Coaches and students are either not educated enough or don't care enough. You might find it ridiculous, but i knew guys who actually thought they swam faster when stoned out of their minds. Kids don't realize how steroids work, or even what the side effects are. They just want to find an easy way to be the best.

I wish you the best in your study,
an clean athlete