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MEDICATION CONTROL: THE EFFICACY AND COST OF DRUG TESTING

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SUMMARY

The rate of illegal drug use in unregulated racing appears to run from 12 to 20% or more. When effective drug testing and sanctions are introduced, the rate of illegal drug use may be expected to drop to between 0.3 and 3.0 per thousand samples tested. For individual drugs, the rate of drug use will drop to zero if the sanctions against its use are sufficiently aversive. However, there appears to always be a tendency on the part of horsemen to "try the lab", and a certain background incidence of illegal medication and its detection may be inevitable. It appears, therefore, that the positive call rates experienced in North America are a function of both the efficacy of the testing process, and also of the severity of the penalties imposed.

The cost of this testing varies from \$3/sample in Montana to \$75/sample in Washington State. Based on these figures, the cost to call a "positive" varies from about \$2,000 in Montana to \$188,000 in Washington State. While this may appear very expensive on a per positive basis, it in fact represents medication control in a much larger range of samples that would contain illegal medications in the absence of effective testing.

INTRODUCTION

Until recently, no good information was available concerning the cost or effectiveness of testing for illegal

drugs.¹ However, over the last three years, we have been conducting a survey on the effectiveness of medication testing, and are in a position to provide answers to some of the questions in this area.² Also, beyond our own work, data from the English Drug Testing Laboratory, Racecourse Security Services (RSS) on drug testing in England, Trinidad, and Iran has thrown further light on this problem.³

Our Positive Call Survey

Our inquiry into the effectiveness of drug testing arose in response to claims by some chemists that phenylbutazone "masks" or interferes with the detection of other drugs in post-race urines. On this basis, some chemists maintain that the presence of phenylbutazone interferes with the detection of other more deleterious medications. On the other hand, our own experience suggests that the ability of phenylbutazone to interfere with the detection of other medications is minimal, and of virtually no practical significance. In an effort to answer this, we commenced a survey of the "positive call" rates for illegal medications in North America. The rationale behind this approach was that if the use of phenylbutazone was indeed interfering with the detection of illegal medications, then the positive call rates for illegal drugs should be less in states that allow its use. Out of this survey came what is essentially the first analysis of the positive call rate for illegal medications in North America.

What Constitutes A "Positive"

Before we could accurately compare the positive call rates of differing jurisdictions, however, we had to determine what we would regard as a "positive." This problem arises because of the very different medication rules in different

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states. For example, Canada and New York do not allow detectable traces of any medication, while other states allow 2 µg or sometimes 5 µg/ml of phenylbutazone in blood. Similarly, some states allow furosemide, but New York and Canada do not. To get around this problem, we only compared the positive call rates for drugs that are illegal in all racing jurisdictions. These are stimulants, depressants, narcotic analgesics, local anesthetics and tranquilizers, which are illegal in all jurisdictions. We called positives for these drugs "hard" drug positives, and we compared the call rates for these "hard" or unquestionably illegal medications in about 28 North American racing jurisdictions.

There are difficulties in drawing hard conclusions from the data that were provided us, in part because of the quality of the data, in part because of the medication rules and range of analytical techniques involved, and also because of the great variation in the size of the jurisdictions. For example, New York tested the largest number of samples, about 200,000 a year, while Wyoming tested only 124 samples in one year. Because of this large discrepancy in the number of samples tested, a zero positive call rate for Wyoming for one year would not necessarily mean that testing in that state was less effective than testing in New York. Nevertheless, despite these limitations, some clear patterns concerning the efficacy of drug testing in North America became apparent and are presented here.

"Positive" Call Rates in Different Jurisdictions

The rates at which hard drug "positives" were called in North America between 1976 and 1983 varied from about 0.2/1000 samples tested to about 6/1000 tested. These were the extreme ranges however, and the most common "call" rate was about 1 hard positive/1000 samples tested. Some states were well above this modal rate, while others were below it. For example, the hard drug positive rate from New York appears to be in the area of about 0.3/1000 tested. However, because of the incomplete nature of the data provided us, the rate could be higher than this, but it could not be higher than about 1.6/1000 tested, based on the less than likely assumption that all the positives called in New York were "hard" drug positives (Table I).

Other representative call rates from large racing jurisdictions were 0.6/1000 from Canada, and 0.4/1000 from California. On the other hand, the positive call rate for "hard" or illegal drugs in Kentucky was about 3/1000 samples tested. Based on these figures, therefore, it appears that the call rates for hard medications are in the order of about 1/1000 or so in most racing jurisdictions. The range, however, is relatively large, with a ten-fold range in the positive call rates between fairly large jurisdictions not being uncommon. The next question that one might ask is what this very extensive drug testing costs the industry on the average. The answer to this question comes from some work published by the State of New York.

Cost Per Positive Called

Recently, the Legislative Commission on Expenditure

TABLE I
Call Rates for "Hard" Drug* Positives,
Cost/Sample and Cost/Positive in 16 North
American Jurisdictions

State	\bar{X} Cost per Sample†	\bar{X} Call Rate (Hard Drugs)‡	\bar{X} Cost per Positive
Arkansas	\$ 15.00	2.5/1000	\$ 6,000.
Canada	50.56	0.6/1000	84,266.
Colorado	9.15	1.3/1000	7,038.
Florida	62.88	0.8/1000	78,600.
Kentucky	24.59	2.9/1000	8,479.
Maine	63.17	1.7/1000	37,158.
Massachusetts	11.98	1.9/1000	6,305.
Montana	3.23	1.5/1000	2,153.
New Jersey	7.99	0.2/1000	39,950.
New York	22.44	0.8/1000	28,050.
Ohio	17.25	1.0/1000	17,250.
Puerto Rico	83.94	1.4/1000	59,957.
South Dakota	15.34	6.5/1000	2,360.
Washington	75.56	0.4/1000	188,900.
West Virginia	29.90	1.5/1000	19,933.
Wyoming	30.79	1.6/1000	19,243.
	\bar{X} 32.73	\bar{X} 1.6/1000	\bar{X} 37,852.

*A "hard" drug is a stimulant, depressant, local anesthetic, narcotic analgesic or tranquilizer. These drugs are illegal in all jurisdictions.

†Source: State of New York. Legislative Commission on Expenditure and Review. State Equine Drug Testing and Research, 1985.

‡Woods, Chay, Houston, Blake, Tobin: Efficacy of testing for illegal medication in horses: a survey. JAVMA, 187:927-930, 1985.

and Review of the New York State Legislature reviewed the costs of testing for drugs in racehorses and about 16 states provided this information.⁴ As shown in Table 1, there is a substantial range in the testing cost per sample in different states, ranging from a low of about \$3 per test in Montana to up to \$75 per test in Washington State. This is again a wide range in testing costs, somewhat wider than the range for the positive call rates.

The existence of these two sets of figures prompted a number of interesting calculations. The first calculation was to determine whether there is any correlation between the cost of testing and the efficacy of testing. On this basis, we examined the data of Table I for a correlation between the positive call rate for hard medications and the cost per test. If one analyzes the data of Table I in this way, it turns out that there is no correlation between the cost of testing and the efficacy of testing as measured by the positive call rate.

The second calculation of interest was a simple determination of the cost of each hard drug positive called in the jurisdictions for which we had data available. Based on the wide range of positive call rates, the even wider range in

costs, and the apparent lack of correlation between these factors, one might expect an even wider range for the cost of a hard drug positive in each state. This turns out to be the case, and as shown in Table I, the cost to call a hard drug positive varies from about \$2,000 a positive in Montana to the rather dramatic figures of about \$188,000 in Washington State. The cost to call a single "hard" drug positive therefore varies almost one hundred-fold between states, and the amount spent on calling positives is apparently comparable to the amounts on money that would fund a good stakes race program.

Efficacy of Drug Testing

Is the regulation of medication cost effective in view of the very large sums of money spent on it? To answer this question, we have to attempt to estimate the effectiveness of testing for illegal drugs. More importantly, we have to determine how much illegal medication there would be in the absence of effective medication control. The best answer that we have to this question comes from racing in England, Trinidad, and Iran, where horses were suddenly subjected to drug testing, if not for the first time, at least at a greatly increased level of competence. What happened is that samples from these countries were abruptly sent to Racecourse Security Services (RSS) in England, which provides state-of-the-art testing for drugs. In addition, in 1976, RSS unexpectedly introduced a new test for anabolic steroids. In each case, the rate of illegal drug detection was between 12% and 20% in the first samples which were presented to the RSS labs. In the case of the anabolic steroid samples, the rate of illegal use of this agent dropped to zero within a period of weeks. Broadly similar results were reported from Trinidad. On the other hand, illegal medication use in Iran tended to stay high, likely because of political conditions in Iran.

The English experience with anabolic steroids provides the most clearcut example for the rate of drug use in an unregulated environment, and the effectiveness of drug testing when combined with appropriate penalties. It appears that prior to 1976, the anabolic steroids were being used widely in English racing, and there was no effective test for them. Then, in the fall of 1976, the English racing authority introduced, without warning, its new anabolic steroid test. In the first weeks of December, the English Jockey Club was calling anabolic steroid positives at the rate of about 12% of the number of samples being tested. Within a matter of weeks, however, the positive call rate for anabolic steroids in England had fallen to zero, and remained at zero for two years. This is one of the most dramatic demonstrations of the ability of a test, combined with the use of effective sanctions, to reduce to virtually zero the incidence of illegal drug use in racing horses.

The data from Racecourse Security Services suggests that when effective drug testing is introduced, its use, in association with appropriate penalties can, within a period of weeks, reduce the level of illegal use of a medication to virtually zero for long periods. However, in the overall

context of illegal medication, there is apparently a willingness to "test" the lab, and search for agents which can "go through the lab." This results in a change in medication patterns, and a constant background level of positives, as horsemen pursue the "cat and mouse" game of trying different medications on the laboratory. The willingness of horsemen to play this game apparently depends at least partly on the ability of the laboratory to detect illegal medications, but also on the severity of the sanctions imposed by the authority when illegal drug use is uncovered.

The Role of Sanctions in Medication Control

The most clearcut example of the role of sanctions occurred in the case of the Trinidad and Tobago authority. In this jurisdiction, the rate of illegal drug use was about 20% when the sending of samples to RSS commenced. Over a period of five months, however, the rate of illegal drug use dropped to close to zero. Thereafter, the rate crept up to a "steady state" level of about 1.0 to 1.5% and remained at that level for the period of the survey. This is apparently the level of illegal drug use that is likely to obtain in Trinidad, given the attitudes of horsemen, the authority, and the penalties that the authority is willing to impose.

Another aspect of medication control which showed in the Trinidad data was the fact that the penalty for the use of amphetamines did not appear to be sufficiently rigorous. In the initial samples tested, a number of amphetamines were "called," and its use dropped to zero, as one would expect if the penalty for its use was appropriate. However, use of amphetamines reappeared in Trinidad racing, suggesting that the penalty that the authorities were imposing was not sufficient to completely inhibit its use. In addition, the relatively high background rate of drug use in Trinidad, with about 1% or more of samples reporting positive, suggests that the penalty structure for this jurisdiction is different from those used in North America.

The role of penalties in the control of medication likely accounts for the results from Iran. In Teheran racing, although positives were detected and "called" by Racecourse Security Services, no change in the rate of illegal medication use occurred. It appears most probable that the reason for this discrepancy is that no administrative action or sanctions were being taken. At that time (1978-1980) attention in Iran was likely directed towards the Iranian revolution, and the use of illegal medications in racing horses appears to have drawn little prosecutorial attention. Thus, as is suggested by common sense, the imposition of suitable deterrent sanctions is an integral part of the regulation of illegal medication use.

Another factor which shows up clearly in the data from Racecourse Security Services is the variation between different countries in the patterns of drug use. The tendency to use potent central nervous system stimulants in horses is apparently minimal in Britain, as these drugs have never been reported from British racing. On the other hand, amphetamine was detected in almost epidemic proportions in Trinidadian racing (12 amphetamines in 500 samples in

one year,) and remained in use, although at a much lower level, throughout the period for which testing was performed by RSS laboratories. While no information is available on the penalties imposed in Trinidad racing for an amphetamine "positive," they were apparently not sufficient to completely inhibit the use of this drug, as noted earlier.

In summary, therefore, the rate of use of illegal medication in an uncontrolled environment appears to run from 12 to 20% or more. When effective drug testing is introduced, along with effective sanctions, the rate of drug use may be expected to drop to between 0.3 and 3.0 per thousand samples tested, a very substantial drop indeed. The costs of this testing varies from \$3/sample in Montana to \$75/sample in Washington State. Based on these figures, the cost of call an individual "positive" varies between about \$2,000 in Montana to \$188,000 in Washington State. While this may appear to be a very expensive cost, it in fact represents medication control in a much larger range of samples that would contain illegal medications in the absence of effective testing. When effective testing coupled

with effective sanctions are introduced, the incidence of illegal medication can be reduced to virtually zero for individual drugs for long periods of time. However, there is apparently always a tendency for horsemen to "probe" the system by trying other medications, so a certain incidence of illegal medication and its detection is inevitable. It appears, therefore, that the positive call rates experienced in North America are a function of both the efficacy of the testing process, and also of the severity of the penalties imposed.

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