

# **“No Systematic Doping in Football”: A Critical Review**

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## **Abstract**

This paper examines the degree to which football administrators are correct to believe that there is relatively little use of performance-enhancing drugs in elite football. In contrast to FIFA’s reliance on the results of drug testing as a means of gauging this phenomenon, this paper attempts to triangulate the evidence from the broader spectrum of sources of information about drug use in sport. Though meaningful and accurate data on the use of such drugs in a sport are difficult to obtain, sources indicate that whilst doping might not be as widespread in football as it is in other sports and that its prevalence appears to vary from country to country, there is evidence to suggest that systematic doping programmes have been implemented at a number of leading European football clubs. FIFA’s short-sighted assessment of the problem potentially restricts the effectiveness of, and the deterrent posed by, existing anti-doping programmes in football.

Over the last two decades a growing amount of evidence has become available about the extent of illicit drug use in sport. Although much of this evidence has been anecdotal, some has come from relatively reliable sources like parliamentary or judicial inquiries at which evidence is given under oath. Although we cannot be sure of the precise level of drug use in modern sport, most writers agree that the phenomenon has increased markedly since the Second World War, and in the last three decades in particular. Mottram has recently cited drug use as “perhaps the biggest challenge facing sport today.”<sup>i</sup>

Although there has recently been a study of drug use by amateur footballers in Cameroon,<sup>ii</sup> it remains the case that there are almost no systematic data about the extent of drug use in football. We do know that the use of performance-enhancing drugs in football is not new. In 2004 a BBC radio programme provided wide-ranging evidence of the history of the use of performance-enhancing drugs in English football.<sup>iii</sup> The programme reported use by the Arsenal team of “pep pills” prior to an FA Cup match against West Ham United in the 1924-25 season,<sup>iv</sup> questions raised in the House of Commons in 1939 about Wolverhampton Wanderers’ use of extracts from monkey testicles,<sup>v</sup> Stanley Matthews’s description of his use of pills what were almost certainly amphetamines prior to an FA Cup fourth round tie in 1946,<sup>vi</sup> and testimony from Manchester United players Albert Scanlon and Harry Gregg of their use of amphetamines during the 1950s. There was, indeed, considerable concern over the use of drugs in football at this time. In response to a Council of Europe investigation in 1963, football was identified by the British government as one of

three sports (the other two being cycling and athletics) with the most severe problem of drug use.

Despite such historical evidence, officials of the Fédération Internationale de Football Association (FIFA) largely assume, and publicly state, that football is relatively free from drug use. Typically FIFA President Sepp Blatter has argued that, “from current data, the incidence of doping in football seems to be very low and we have no evidence of systematic doping in football.”<sup>vii</sup> Gordon Taylor, Chief Executive of the Professional Footballers Association (PFA) in England, has similarly stated that, “I’m almost certain that we have a clean sheet over performance-enhancing drugs.”<sup>viii</sup> Articles co-authored by FIFA’s Chief Medical Officer, members of FIFA’s Doping Control and Medical Committees and the editor of the *British Journal of Sports Medicine*, also reflect the belief that performance-enhancing drugs are rarely used by footballers.<sup>ix</sup>

Such a stance is not unique to football for, as Yesalis *et al.* note, sports administrators, when faced with allegations of drug use in their sports, “have often tended to deny that a major doping problem exists ... or have at least played down its magnitude.”<sup>x</sup> Yet the case of football is rather different. FIFA officials base their claim on the relatively low incidence of positive tests from players. Convinced of the rigour of their drug testing programme, they have cited a number of possible explanations for these “favourable” test results:

- “The stringent drug testing programme occurs during the entire football season in most countries;

- Football players worldwide understand that prohibited substances in sport will neither improve their physical performance nor their football specific skills and hence are reluctant to use agents that are not effective and subject to possible sanction;
- Ongoing education campaigns by FIFA for doctors, administrators, officials and players have encouraged a drug-free culture in football.”

A fourth possible explanation, though one that is quickly dismissed as “unlikely,” is that football’s drug testing programme is “insufficient to detect drug use.”<sup>xi</sup>

The object of this paper is to critically evaluate these claims. This is no easy task for, as Mottram has noted, “[m]eaningful data on the prevalence of use of performance-enhancing drugs in sport are difficult to obtain” for, by its very nature, drug use in sport is a covert activity.<sup>xii</sup> Yesalis *et al.* note that there are four major sources of information about the prevalence of drug use among athletes: investigative journalism, including the writings and testimonials of athletes and others involved in sport; government investigations; surveys; and results from drug testing. All four sources suffer from significant methodological problems. Yesalis *et al.* suggest, for example, that those who have used drugs and who serve as informants “may project their own behaviour onto others in an attempt to rationalize their drug use,” producing an overestimate of the level of drug use.<sup>xiii</sup> However, they argue – almost certainly correctly - that most of the methodological difficulties are more likely to lead to an *underestimate* of the level of drug use. In particular, they argue that:

the responses of athletes to the questions of journalists, drug use surveys, or even government investigations may be influenced by the athlete's desire to respond to questions in a socially desirable manner, memory lapse, the illegal nature of the substances being surveyed, and a general distrust of those doing the questioning.

They also note that drug testing "is hamstrung by significant limitations in technology," and conclude that, "All these limitations would likely result in a significant under-reporting bias."<sup>xiv</sup>

While each of the sources of information on drug use in sport raises particular methodological difficulties, the fact that we are not dependent on a single source enables us triangulate our findings, thus increasing the validity of our conclusions. As Goode has noted in relation to the problems of estimating the extent of drug use more generally in American society:

As a general rule, the greater the number of *independent* sources of information that reach the same conclusion, the more confidence we can have in that conclusion. That is what we mean by triangulation: getting a factual fix on reality by using several separate and disparate sources of information. To the extent that several independent data sources say the same thing, we can say that their conclusions are more likely to be true.<sup>xv</sup>

To a greater or lesser extent, data on drug use in football can be gleaned from each of the four major sources identified by Yesalis *et al.* In examining these data sources, we made three important assumptions which should be noted. Firstly, we focussed

primarily on the European game. This we did because European football has supplied the majority of positive tests in recent years (72.7 in 2004, 74.4% in 2005),<sup>xvi</sup> but also because the press coverage of European football is both greater and easier to access, and because the prior research on drug use in football, and all legal investigations, have been European based. Secondly, we focussed primarily on the use of performance-enhancing rather than recreational drugs for, across sport, the former is generally perceived to be rather more serious than the latter. Thirdly, in our selection of data we have primarily been concerned with evidence of the *systematic* administration of substances, for analysts largely agree that drug use which is organized at an institutional level is more problematic than that which is individual and often therefore largely *ad-hoc*. Moreover, our focus on systematic drug use directly addresses one of the key claims that FIFA officials make about drug use in football.

This paper examines each of these four data sources to assess more adequately the prevalence of the use of illicit drugs in football, before turning to consider some of the implications of these findings. It is our contention that there are both empirical and theoretical grounds for believing, firstly, that a significant minority of European elite footballers are using performance-enhancing drugs and that, secondly, some clubs have been involved in the systematic organization and delivery of doping programmes. We also argue that there are clear grounds to suggest that the use of performance-enhancing drugs is not as widespread in football as in many other sports, and that drug use is likely to be more common in some European countries than in others. We conclude by arguing that FIFA's limited analysis of evidence of the use of performance-enhancing drugs in football leads to an underestimation of the scale of

the problem which the sport faces, and thus threatens the efficacy of their anti-doping programme.

## **Data on Performance-enhancing Drug Use in Football**

### ***Evidence from Testing***

Football was the first sport to conduct drug testing at a major event, introducing tests for the 1966 World Cup and thus pre-empting the first testing at an Olympic Games by two years.<sup>xvii</sup> FIFA has also been at the forefront of moves in international sport to use blood tests, introducing them in 2002 to supplement urine tests at the Japan-Korea World Cup.<sup>xviii</sup> These testing procedures have generated few positive test results. Two players were ejected from major football tournaments for taking drugs during the 1970s: Ernest Jean Joseph of Haiti in 1974, and Willie Johnston of Scotland in 1978.<sup>xix</sup> Between 1994 and 2005, just four (0.12%) of the 3,327 tests carried out at FIFA competitions were positive;<sup>xx</sup> most famously Diego Maradona, captain of Argentina at the 1994 FIFA World Cup who tested positive for ephedrine. Of the 22,500 drug tests worldwide in 2004, just 92 were positive, and the majority of these positive tests derived from the use of recreational drugs such as marijuana (39 cases) and cocaine (29 cases).<sup>xxi</sup> Figures released by the World Anti-Doping Agency (WADA) indicate that of 23,478 football-related tests performed by WADA accredited laboratories in 2005, 343 produced adverse findings.<sup>xxii</sup> Drug testing in international football, therefore, has revealed remarkably little evidence of the use of drugs in general, and the use of performance-enhancing drugs in particular. FIFA's Chief Medical Officer, Jiri Dvorak, concludes that, "It can only be assumed that team

sports such as football are not as prone to misuse of performance enhancing substances as are individual sports.”<sup>xxiii</sup>

Drug testing programmes in domestic football leagues have similarly produced relatively few positive results for performance-enhancing drugs. Data from UK Sport, the body which administers drug tests in British football, indicate that, over the period from 1988 to 2001-2002, there were in Britain 89 positive drug tests in football (these data include the results of testing on behalf of the Welsh and Scottish Football Associations, as well as the English FA). The most commonly detected drugs were Class 1A stimulants such as pseudoephedrine and metabolites of cocaine, of which there were 40 positive cases, and marijuana, for which there were 29 positive test results.<sup>xxiv</sup> It is probably the case that the metabolites of cocaine were associated with recreational drug use rather than with drugs which were taken for performance-enhancing reasons. UK Sport figures indicate that the number of positive tests per year has gradually fallen – from 14 in 2003-04, 11 in 2004-05, to just 6 in 2005-06. Cocaine and marijuana cases remain the most common. Included within these figures are a number of high profile footballers who have tested positive for recreational drug use, most notably Mark Bosnich and Adrian Mutu of Chelsea in 2002 and 2004 respectively, and this has reinforced the impression that a culture of recreational, rather than performance-enhancing, drug use exists in English football.

However, between 1998 and 2002 footballers also produced six positive tests for anabolic agents. All these players initially escaped punishment or were given suspended punishments after successfully arguing, for instance, that the substance had been ingested inadvertently. However, the Rushden and Diamond’s goalkeeper Billy

Turley subsequently tested positive for a recreational drug, at which point his prior suspended two year ban (he had tested positive for the banned steroid nandrolone) was enforced.<sup>xxv</sup> Turley remains the only British player to have been punished for using a performance-enhancing drug. The only English league player to have been found guilty of taking performance-enhancing drugs since this time is Middlesbrough's Portuguese international Abel Xavier, who tested positive for the anabolic steroid dianabol during a UEFA Cup tie in Greece in 2005. His initial 18 month ban was subsequently reduced to 12 months by the Court of Arbitration for Sport (CAS) and subsequently the club decided to re-instate his contract.<sup>xxvi</sup>

Though the actual numbers cited suggest a definition of "positive doping samples" which may be rather different from that used by UK Sport, Dvorak *et al.* demonstrate that a greater number of positive tests for drugs have occurred in other European domestic leagues. During 2004 and 2005 there were 30 positive tests in France, 21 in both Italy and Portugal, and 20 in Belgium compared to (according to FIFA figures) just one in England.<sup>xxvii</sup>

At times "clusters" of positive tests occur. For instance, between April and October 1997, five players, from a number of top French teams, tested positive for anabolic steroids.<sup>xxviii</sup> In Italy in 2000-2001 nine leading players in Serie A, and a number of more minor players, tested positive for nandrolone.<sup>xxix</sup> A number of these involved leading Dutch international footballers (notably Jaap Stam and Edgar Davids), and with the Dutch captain Frank de Boer also testing positive for nandrolone whilst playing for Spanish team Barcelona, there were suggestions that a common link might have been the Dutch national squad.<sup>xxx</sup> The fact that 31 first division players in

Portugal also tested positive during a five month period in 2001 suggests however that the use of nandrolone at this time was more widespread.<sup>xxxix</sup> That these clusters always involve performance-enhancing drugs suggests not only an improvement/increase in testing, but also that the drug use has an underlying pattern rather than being ad-hoc.

Notwithstanding this evidence, the data from drug testing suggest that the use of performance-enhancing drugs in football is relatively rare. It is important to note, however, that there is a widespread recognition among informed observers that the number of positive test results merely represents the tip of a much larger iceberg. The Dubin Commission in Canada, for instance, concluded that “many, many more athletes than those actually testing positive have taken advantage of banned substances and practices” and that “positive test results represent only a small proportion of actual drug users.”<sup>xxxix</sup> It therefore seems probable that this pattern of positive drugs tests merely scratches the surface of a more widespread phenomenon. Other sources of information support this claim and indicate how FIFA’s approach to estimating the prevalence of drug taking in football can best be describe as myopic.

### ***Testimonials of those Involved in Football***

A number of allegations of doping made by players and managers suggest that the number of positive drugs tests underestimates the extent of drug use in football. In 1999, Dr. Wilfried Schiesslir (club doctor with German Bundesliga club Nuremburg) and Robert Louis Dreyfus (head of *adidas* and president of Olympique Marseilles) called for the liberalization of anti-doping laws in football because the “current system of doping control is flawed.”<sup>xxxix</sup> In 2002, Dr. Michel D’Hooghe, chairman of FIFA’s Medical Commission argued that players across Europe were using

erythropoietin (EPO), human growth hormone and anabolic steroids. He further claimed that “high profile stars” had started to employ their own medical specialists and that doctors known to have been active in administering performance-enhancing drugs in cycling and endurance skiing were “suddenly appear(ing) around football clubs all over Europe.”<sup>xxxiv</sup> Players such as Emmanuel Petit, Marc Overmars and Gianluca Vialli have made similar allegations that leading players in the game were using performance-enhancing drugs to cope with the physical demands of playing an increasing number of games. In 1999, for instance, Petit said that, “If the present number of games continues, something is going to give. We will all have to take drugs to survive. Some footballers already do. I know that.”<sup>xxxv</sup>

Perhaps more interesting, however, is the testimony of Arsenal manager Arsene Wenger. Speaking in 2004 Wenger claimed that some players joining Arsenal had displayed symptoms of EPO use. He said, “We have had some players come to us at Arsenal from other clubs abroad and their red blood cell count has been abnormally high. That kind of thing makes you wonder.” He went on to exonerate the players, stating that, “There are clubs who dope players without players knowing. The club might say that they were being injected with vitamins and the player would not know that it was something different.”<sup>xxxvi</sup> Wenger’s comments are interesting in that they are based on tangible evidence derived from Arsenal’s own blood testing programme. The evidence upon which Wenger based his suggestion that such players had been subject to club-administered doping regimes is, however, less clear.

That such organized and systematic doping occurs in European football is, however, indicated by the testimony of a number of retired players. Two former Marseilles

players have publicly stated that the club provided players with performance-enhancing drugs. In his autobiography (published in 2002) Marcel Desailly stated that club chairman, Bernard Tapie, had instructed the squad to take pills before big matches and that whilst some team mates refused, Desailly himself took the tablets “several” times. Whilst Desailly was not sure what these pills were, he recalled that the box of tablets contained the warning that: “This medicine, above a certain dose, can be considered as a doping substance for high-level sportsmen.”<sup>xxxvii</sup> Four years later midfielder Jean-Jacques Edouard confessed to having agreed to take an illicit substance prior to the 1993 Champions League Final. Moreover, he argued that performance-enhancing drug use occurred in all but one of the clubs for which he had played, and that at Marseilles, “we all (except Rudi Voller) took a series of injections and I felt different during the game, as my physique responded differently under strain.”<sup>xxxviii</sup> Only one Marseilles player (Christophe Dugarry) tested positive for a banned substance, and then some years later.<sup>xxxix</sup>

In contrast to the Marseilles evidence, allegations of a systematic doping programme at Spartak Moscow football club arose directly from the positive test of a player. Yegor Titov tested positive for bromantan (a stimulant and masking agent) whilst playing for Russia against Wales in November 2003. The Russian media subsequently claimed that this drug had been administered as part of a systematic doping programme at Spartak, citing the sudden withdrawal of Spartak players on the eve of Russia’s match against Ireland in September 2003 as suspicious. Two former Spartak players, Vladislav Vashchuk and Maxim Demenko, subsequently provided testimony of their participation in this doping programme. Demenko recalled that,

“Small white pills were given to first team players before each game,” and Vashchyuk said that doctors often used a drip to administer banned drugs.<sup>x1</sup>

Finally, in 2006 *Le Monde* accused Spanish clubs Real Madrid, Barcelona, Valencia and Real Betis of having employed the services of Spanish doctor Eufemiano Fuentes. Fuentes was then being investigated by a Spanish judicial inquiry into doping in sport and was arrested in May 2006 on charges of crimes against public health. Though Barcelona and Madrid denied the allegations, and insisted that Fuentes had never been linked to their players either formally or informally, the journalist responsible, Stephane Mandard claimed that he had seen Fuentes’ handwritten notes mentioning the teams as having been treated by him.<sup>xii</sup> These allegations support D’Hooghe’s assessment of drug use in European football cited earlier.

Evidence from testimonials therefore suggests that organized doping programmes have existed at a number of leading clubs in several European countries. An interesting aspect of these testimonials is that none have come from players who have been found guilty of doping offences, but have been volunteered by those who have been neither accused nor convicted of taking performance-enhancing drugs. Indeed, the players have largely projected themselves as “victims” in these scenarios, either given insufficient information or misled by doctors and football club administrators. Clearly some have stood to benefit commercially from such revelations (e.g. through increased sales of an autobiography), but this notwithstanding, these testimonials point to a relatively coherent and consistent picture: that in some European countries, leading football clubs have administered systematic doping programmes.

### ***Government and Judicial Investigations***

Across sport the most penetrating investigations of doping have come from government inquiries and quasi-legal investigations. It is widely acknowledged, for instance, that the Dubin Commission of Inquiry established in Canada following the positive drug test of Ben Johnson at the 1988 Olympic Games,<sup>xlii</sup> and the inquiry headed by Australian Senator Black,<sup>xliii</sup> have furnished us with the greatest understanding of the use of performance-enhancing drugs in sport. Though neither looked at drug use in football there have been two inquiries – one in Germany and one in Italy – that are relevant here.

Post-unification inquiries into the state sponsored doping programmes operated in Eastern Germany provide perhaps the most comprehensive and compelling evidence of doping in sport. These inquiries have shown that elite athletes were systematically doped by the East German state and were tested in the GDR prior to competition to ensure that athletes representing their country could evade official drug testing. As in other sports, the East German national football teams were “required to use drugs in order to compete successfully against other nations”.<sup>xliv</sup> Research has, for instance, revealed records of drugs tests which demonstrated widespread and systematic use of amphetamines.<sup>xlv</sup> The use of performance-enhancing drugs within the national leagues was, however, officially forbidden by the East German state, in an attempt to promote greater playing equality between clubs. However, not all clubs complied with state orders, and used the knowledge developed at national level within their own club-based systematic doping programmes. Football, therefore, was no different from any other sport in communist East Germany, characterized by systematic doping programmes at both club and international levels prior to 1989.

The events surrounding inquiries into drug use in Italian football are rather more complicated. In that they have revealed doping offences involving leading players at a leading club, and in that they relate to democratic Western societies in which evidence of systematic doping programmes has been less common, they have perhaps produced more sensational findings.

Events were triggered by an interview with the then AS Roma manager, Zdenek Zeman, published in *L'Espresso Magazine* in July 1998.<sup>xlvi</sup> Zeman stated that the use of performance-enhancing drugs was rife in Serie A, and suggested that football needed to “come out of the pharmacy.” In particular he referred to two Juventus players, Gianluca Vialli and Alessandro Del Piero, whose muscular development had “surprised him.” Given the implication of illegal drug use, Vialli and Del Piero started legal proceedings against Zeman. Debate in the Italian and international press generated pressure sufficient to lead the Public Attorney of Turin, Raffaele Guarinielo, to start an investigation. Guarinielo interviewed firstly Zeman and then Sandro Donati, a member of the Italian National Olympic Committee’s (CONI) medical commission, leading to two significant findings.

On the basis of the interview with Zeman, Guarinielo ordered a raid on the Juventus premises which revealed that the club held 281 different pharmaceutical substances. The majority of these substances were not on the IOC’s list of banned substances, though at least five anti-inflammatory drugs containing banned substances were found.<sup>xlvii</sup> It was, however, the sheer quantity of pharmaceuticals found that raised suspicions for, as Gianmartino Benzi, medical advisor to Guarinielo, noted, “the club

was equipped like a small hospital.”<sup>xlvi</sup> As a witness at the subsequent trial suggested, “either the players were always sick or they took drugs without justification ... to improve performance.”<sup>xlix</sup>

Donati claims that his accusations of irregular testing procedures led Guariniello to order that the IOC accredited Acqua Acetosa laboratory in Rome be searched.<sup>1</sup> Police discovered documents hidden in the building’s air vents and the laboratory was closed. The president of CONI resigned and the director of the laboratory was sacked when it came to light that some of the doping controls conducted on footballers did not include tests for the detection of anabolic steroids or other hormones. It was later revealed that some documents relating to drug tests in football had disappeared,<sup>li</sup> and that laboratory technicians had been told not to publicize positive test results.<sup>lii</sup> Further documents revealed that some 24 Parma players had abnormally high haematocrit levels, indicative of the probable use of EPO. Government raids on doping laboratories around Italy discovered “a trail of abuse involving officers who had falsified documents and were guilty of fraud in relation to doping.”<sup>liii</sup>

The steady accumulation of evidence led Guariniello to bring charges against two Juventus club officials. In January 2002 Juventus managing director Antonio Giraudo and club doctor Riccardo Agricola were charged with supplying pharmaceutical products to several of the club’s players between July 1994 and September 1998, a period in which Juventus won three Italian titles and the European Cup. It was acknowledged that the substances in question were legal, but that they were administered in such a manner as to produce the same effects as illicit substances.<sup>liv</sup>

The trial lasted almost two years, during which some of the world's leading players, including Zinedine Zidane, Roberto Baggio, Del Piero and Vialli, were called as witnesses. The players stated that they had taken legal substances - for instance Zidane revealed that he had used creatine - but the testimony of two court-appointed independent witnesses proved crucial. Eugenio Muller, a pharmacologist, stated that there could be "no therapeutic justification" for the club's administration of prescription-only drugs. Three drugs were cited in particular: Samyr, an anti-depressant, was taken by 23 players; Neoton, a drug containing creatine used for heart conditions, was taken by 14 players; and Voltaren, a pain killer and anti-inflammatory drug, was used by 32 players. In the case of Voltaren in particular, the drug was not used to treat isolated or occasional injuries; rather, according to Muller, its use was "planned, continuous and substantial."<sup>lv</sup>

Juventus lawyers protested that the use of these substances was not illegal and club president Vittorio Chiusano argued that these were "products widely used by many other Italian footballers."<sup>lvi</sup> Post-trial revelations suggest that he was probably correct (see below), but new charges introduced during the trial relating to the use of EPO proved more damning. Club records produced in court indicated that Juventus' own blood testing programme revealed particularly high haematocrit levels from a number of players. On two occasions Didier Deschamps recorded increases of 20% in the space of a few months.<sup>lvii</sup> Deschamps' red blood cell count of 51.2% (45-47% is considered normal), would have been sufficient for cycling's international governing body (the UCI) to withdraw a cyclist from racing.<sup>lviii</sup> Reviewing these records, a leading haematologist, Giuseppe d'Onofrio, said that it was "very probable" that Deschamps was among seven players who had taken small doses of EPO. D'Onofrio

however was “practically certain” that two other players - Antonio Conte and Alessio Tacchinardi - had used EPO to overcome bouts of anaemia, and other reports have suggested that the judge listed as many as 20 players involved in the “chronic use” of EPO.<sup>lix</sup> The court found this evidence compelling and in November 2004 Agricola was given a 22 month suspended jail sentence for supplying performance-enhancing drugs, barred from practising medicine for 22 months and fined 2000 Euros. Giraudo was cleared of all charges and a third defendant, Giovanni Rossano, a pharmacist accused of supplying drugs on false prescriptions, agreed a plea bargain and was fined 5000 Euros.

Though government and judicial inquiries into drug use in football have been few in number, where they have been undertaken, legally scrutinized evidence has been produced which indicates that organized and systematic doping programmes have occurred in elite European football. However, by their very nature, inquiries tend to provide us with depth rather than breadth of understanding and can therefore only point us towards the existence of relatively small pockets of drug taking in football. What is interesting about the Juventus trial is not simply that it provides almost incontrovertible evidence of a club-administered doping programme, but that the doping which it revealed is almost identical to that described in various player and manager testimonials. There are, therefore, good grounds for believing that such practices are more widespread.

### ***Evidence from Surveys***

An alternative way of assessing how widespread is the use of performance-enhancing drugs in sport is through athlete surveys. A number of such surveys have been

undertaken in different sports and different countries,<sup>lx</sup> but there has been, to date, just one comprehensive survey of drug use in professional football, conducted by ourselves and colleagues in 2003.<sup>lxi</sup> With the aid and support of the English Professional Footballers Association (PFA), reply-paid postal questionnaires were sent to the home addresses of all 2,863 members of the Association. 706 questionnaires were returned, giving a response rate of just under 25%. Such surveys are not without their methodological problems, for it is clear that athletes have a great deal, potentially, to lose from the truthful reporting of illegitimate activities. As Mottram notes, elite athletes are generally reluctant to discuss drug use in their sport and thus low response rates are to be expected.<sup>lxii</sup> However, we obtained responses from players of different kinds (e.g in terms of ages, playing division and frequency of first team appearances) suggesting that a representative sample was obtained. In an attempt to improve response rates the survey asked not about players' personal use of drugs but, less threateningly, asked them to estimate the prevalence of drug use in football and whether they personally knew players who used drugs. Whilst such surveys cannot be expected to give a precise indication of the extent of drug use in sport, it is important to bear in mind that the results will almost certainly underestimate, rather than overestimate, the real level of drug use.

A half of all players (49%) felt that there was no use of illicit performance-enhancing drugs in professional football. About a third (34%) felt that performance-enhancing drugs were being used by some players, though the great majority felt that their use was rare. In this regard, 23% of players felt that performance-enhancing drugs were used by under 2% of players; 8% felt that between 3-5% of players used such drugs

and less than 1% felt that performance-enhancing drugs were being used by 10% or more of their fellow professionals (17% of players expressed no opinion).

Almost 6% of respondents (39 players in total) indicated that they personally knew players who used performance-enhancing drugs. Those who personally knew players who used performance-enhancing drugs were spread across all four divisions, with 18% playing for Premier League clubs, 24% for clubs in Division One of the Nationwide League, 36% for Second Division clubs and 21% for clubs in Division Three. Of the players who indicated that they knew players who used performance-enhancing drugs, most (68%) indicated that the drug using players were at a previous club, though one in five indicated that the drug using players were at their current club, and 12% indicated that they knew drug using players at *both* their current and previous clubs. In all, four Premier League players two First Division players, four Second Division players and four Third Division players indicated they knew players at their current club who used performance-enhancing drugs.

The research also found that the use of recreational drugs is considerably more widespread than is the use of performance-enhancing drugs. Only 29% of players felt that recreational drugs were not used by professional footballers. Almost 28% of respondents felt that recreational drugs were used by fewer than 2% of players, 13% felt that between 3-5% of players used recreational drugs, 9% felt they were used by 6-10% of players while 4% felt that recreational drugs were used by more than 10% of players (18% of players expressed no opinion).

Approaching a half of all players (45%) indicated that they personally knew players who used recreational drugs. Among Premier League players, 31% personally knew players who used such drugs, compared with 45% of players in the First Division of the Nationwide League, 44% of Second Division players and 52% of Third Division players. Of those who knew players who used recreational drugs, 15% indicated that the players who used such drugs were at their present club, 63% indicated the drug-using players were at a previous club while 23% knew players at *both* their current and previous clubs who used recreational drugs. In all, 16 Premier League players, 23 First Division players, 21 Second Division players and 39 Third Division players indicated they knew players at their current club who used recreational drugs.

These data provide clear evidence that performance-enhancing drugs are used in English professional football, though their use appears to be quite rare; by contrast, the use of recreational drugs is much more common. That player estimates of the proportion of footballers using performance-enhancing drugs are relatively low, and that players with personal knowledge of performance-enhancing drug users are spread across the divisions, suggest that in English football the doping of players as part of systematic, club-run, programmes does not occur, but rather those using performance-enhancing drugs normally act independently of their employers.

## **Discussion**

Three main questions arise from our examination of the data relating to the use of performance-enhancing drugs in European football. First, how does doping in football compare with that in other sports? Second, are there grounds for believing that performance-enhancing drug use in football varies from country to country? And

third, why is it that the scale of drug use in football as indicated by the testing programmes is much lower than that indicated by other sources?

### ***The Prevalence of Doping in Football Relative to Other Elite Sports***

According to WADA, just 1.46% of drug tests in football proved positive in 2005, compared to an average of 2.12% for international sports in general, suggesting that drug use is less prevalent in football than in many other sports.<sup>lxiii</sup> Moreover, a survey of 1,300 elite British athletes across nine sports (including football) conducted by the *Independent* in 1998, found that 54% of all athletes believed that up to 30% of competitors in their sport were using performance-enhancing drugs; 5% believed that between 30 and 60% were using drugs; and that 4% believed that over 60% of competitors were using drugs. In this survey, 20% of those from the sports of weightlifting and powerlifting admitted using anabolic agents, and 15% of those from rugby league admitted using testosterone.<sup>lxiv</sup> Whilst almost a half of all PFA members felt that there was no use of illicit performance-enhancing drugs in professional football, no weightlifters or rugby league players, and just 3% of track and field athletes responding to the *Independent* survey made a comparable claim. Indeed in a more recent *Independent* survey, 84% of footballers in England expressed the view that the sport had no problem at all with the use of performance-enhancing drugs.<sup>lxv</sup>

Cross-sport comparison therefore suggests that the use of performance-enhancing drugs in football, or at least English football, is rather more limited than it is in other sports. One explanation for this disparity is the structure of football relative to other sports. All sports require a combination of physical ability and technical skill, and

those sports which place a premium on the former rather than the latter are the sports in which the performance gains from the use of drugs are likely to be greatest.<sup>lxvi</sup> Thus participants in those sports which are based largely on physical strength and power – e.g. weightlifting, cycling, athletics – are most likely to use performance-enhancing drugs, whilst those sports which are primarily skill-based, such as golf or football, are likely to have lower rates of performance-enhancing drug use. Sepp Blatter has similarly argued that, “footballers have absolutely nothing to gain from taking drugs because – in contrast to other sports – they need a vast array of qualities and skills to succeed in the game, such as strength, endurance, speed, intelligence, tactical understanding and ball control.”<sup>lxvii</sup>

Whilst such structural properties of different sports are clearly important factors influencing not just whether or not participants are likely to use performance-enhancing substances, but also the types of substances they use, the relative strength and skill requirements in a sport are not static, but vary over time. In this regard it is not the case, as Blatter claims, that “footballers have absolutely nothing to gain” from taking drugs for, in addition to the data on the use of performance-enhancing drugs discussed above, there is growing evidence to suggest that footballers use significant quantities and varieties of legal pharmaceutical products in search of improved performance. For instance, the survey of members of the English PFA found that 58% of players used vitamin pills, 37% used creatine and 24% used protein powders.<sup>lxviii</sup> Dvorak has stated that creatine is “widely used” by footballers in Italy, France, Portugal and Spain (interestingly the English league was not mentioned in this list) and has further commented that he has been struck by “how much medication is used at FIFA tournaments.”<sup>lxix</sup>

In the wake of the Italian judicial inquiry, two further “scandals” provided supporting evidence for this point. In April 2005, film footage was broadcast which showed Parma footballer Fabio Cannavaro using a drip on the eve of the 1999 UEFA Cup final. It was later claimed that the drip contained Neoton,<sup>lxx</sup> a drug cited in the Juventus trial. Juan Sebastian Veron indicated that the club made the substance available to all the players and he further suggested that “All the teams (in Italy) use it.”<sup>lxxi</sup> Secondly, in 2005 Florentine public prosecutor Luigi Bocciolini opened an investigation into the deaths of three former Fiorentina players whose deaths were suspected of being linked to their use of drugs. Suspicion stemmed from Guariniello’s investigation which revealed an apparently high incidence of cancer, leukaemia and disease of the nervous system amongst players who had appeared for top Italian clubs. In addition, former Fiorentina player Nello Saltutti, told Guariniello that before every match “they gave us medicines, telling us they were vitamins.”<sup>lxxii</sup> One such drug was Micoren, banned by the IOC in 2000. Despite warnings that prolonged use of micoren could have adverse effects on the arteries, Saltutti claimed to have used it approximately 300 times during a 500 match career. In 2003, at the age of 56, he died of a heart attack.

Whilst on the one hand a clear distinction should be drawn between these events and the illegal use of drugs to enhance sporting performance, their use demonstrates a perceived need amongst footballers to enhance physical performance, and a willingness on their part to use medical substances to obtain that goal. Moreover, the evidence quite consistently points towards the use of products which build stamina and improve cardiovascular fitness. It might be concluded, therefore, that whilst the

physical requirements of football mean that drug taking to enhance performance may not be as widespread as it is in sports such as cycling and weightlifting, this is not to say that footballers have no use for such substances. Moreover, recent developments in the way that the game is played – in particular, the increasing pace of the game and the increased number of games players at top clubs are expected to play in a season - suggest that the demands for these substances might well be increasing and thus that patterns of drug use in football may converge with those in other, more strength- and power-based, sports in future.

### ***The Use of Performance-enhancing Drugs in Football in Different European Countries***

The evidence reviewed here suggests that the use of performance-enhancing drugs and the administration of systematic doping programmes vary across Europe, but are particularly uncommon in England. Can such a contention be justified?

Waddington argues that the increased use of performance-enhancing drugs in sport is the product of the conjuncture of two social processes: the medicalization of social life in general and of sport in particular, and the “increasing competitiveness” (i.e. de-amateurization, politicization and commercialization) of sport.<sup>lxxiii</sup> However, the degree to which these two processes have converged appears to vary from sport to sport and from nation to nation. One notable aspect of the development of sports medicine has been the relative slowness with which it became established in England.<sup>lxxiv</sup> Moreover, research conducted into the contemporary provision of sports medicine in English professional football has indicated that football club doctors are most usually family doctors, recruited on the basis of family or personal connections

with the club. This research similarly pointed towards an “old boy’s network” of recruitment amongst physiotherapists at football clubs. Significantly, few of the medical staff working in professional football clubs have specialist qualifications in sports medicine or much experience of practising medicine in other sports contexts.<sup>lxxv</sup> In sum, this research indicates that the medical care of players has generally been viewed as a relatively low priority in English football. In this sense, it might be argued that, by comparison with the situation in some other European countries, English football has been relatively untouched by the broader medicalization process and, we suggest, this has had the unintended consequence of also limiting the extent of the application of sports medicine in general, and the use of drugs in particular, as part of the search for improved performance.

An important caveat to this argument, however, is to note the international nature of football, and the increasing heterogeneity of English football in particular. The English football league is the most cosmopolitan in the world,<sup>lxxvi</sup> and particularly notable has been the influence not just of overseas players, but also overseas managers in recent times. If doping is more prevalent and more organized in some continental countries, then it follows that the recruitment by English clubs of players and managers from clubs in those countries in which drug use is more common and more organized may have some unintended consequences; in particular, it may lead to the increased use not only of legitimate sports medicine practice, but also to the increased use of illegal performance-enhancing practices.

### *Doping Control in Football*

Finally we might ask why it is that the scale of drug use in football as indicated by testing programmes is much lower than that indicated by other sources. Firstly it should be re-emphasized that drugs tests clearly do not reveal the true extent of doping in any sport. For instance, though we now know that illegal drug use was widespread during the 1998 Tour de France, not one rider tested positive for performance-enhancing drugs during the event.<sup>lxxvii</sup> However, whilst general criticisms can be made of the ability of doping control programmes to reveal the prevalence of drug use, particular criticisms can be made of the doping control programmes in football. These criticisms can be combined under the following headings: failures in testing procedure; attempts by clubs to circumvent drugs testing; and the inability of football administrators properly to enforce doping controls.

As revealed in the Juventus inquiry, during the 1990s there appear to have been specific instances of malpractice by testers which served to obscure the extent of drug use, or to cover up those positive tests which did occur. It is interesting to note that the re-opening of the Rome laboratory in 2000 coincided with an unparalleled number of positive tests in Italian football in the following season. Italian football now conducts an extensive doping control programme entailing three times as many tests as in English football,<sup>lxxviii</sup> including the testing of two players from each side after every Serie A match.<sup>lxxix</sup> As stringent as this testing programme appears, it is not mandatory for players to take these tests. Though regulators state that a test refusal will make a player ineligible for the national side, Lazio midfielder Rino Gattuso was selected to play for Italy in March 2005, just one week after declining to take a urine test.<sup>lxxx</sup>

Testing procedures in English football are similarly problematic. Though the Football Association rightly argues that football is the most tested sport (there were 1516 tests carried out between April 2004 and March 2005),<sup>lxxxii</sup> such is the scale of the professional game in England, and such is the distribution of tests throughout different levels of the game, that the testing programme appears to have only a limited deterrent effect. For instance, tests are rarely conducted after professional football matches, with only eight of the 380 Premiership matches in 2000-01 subject to doping controls.<sup>lxxxiii</sup> The survey of PFA members indicated that only about a third of professional footballers are likely to be tested during the course of a season, and that a substantial majority (60%) not unreasonably felt that they were unlikely to be tested in the next 12 months. This compares very badly with other sports in the UK. For instance, a Sports Council survey (1996) found that 77% of elite track and field athletes had been tested by in the UK and 37% had been tested by other agencies in the previous year.<sup>lxxxiii</sup> In line with these findings, former Liverpool manager Gerard Houllier noted that clubs are likely to be visited only two or three times a year, and he called for more frequent testing.<sup>lxxxiv</sup>

Concerns have also been expressed about the rigour of the testing procedures in English football. In October 2003, England and Manchester United defender Rio Ferdinand failed to present himself to doping control officers at the club's training ground. Ferdinand claimed that, due to the stress of moving house, he had forgotten that he had been required to provide a sample. Ferdinand was subsequently suspended from football for eight months for his failure to undergo the drugs test (failure to comply with testing is deemed an offence equivalent to testing positive for a performance-enhancing drug) but, more interestingly for present purposes, the

inquiry into this incident revealed how lax procedures had been. The Ferdinand case revealed that at this time there was no requirement upon testers to accompany footballers until they provided a sample. Rather, testers were forced to act through club medical officers who then presented players for testing.<sup>lxxxv</sup> Such an arrangement is unusual in sport, for it presents the opportunity for players, in collaboration with the club's medical staff, to avoid testing positive (e.g. through the administration of a masking drug). Thus, whilst doping control in English football may appear relatively comprehensive, the sampling and testing procedures have been such that users of performance-enhancing drugs could have evaded testing positive.

A further point of concern is the extent to which clubs perform their own testing programmes. Evidence presented in the Juventus inquiry demonstrated that Juventus had an internal drug testing programme and Lazio has similarly stated that it regularly drug tested its entire squad.<sup>lxxxvi</sup> However, internally administered testing programmes appear to be even more widespread amongst English clubs. It has been claimed that "almost all of England's top clubs require players to give samples several times a season" and that "all test results are kept secret."<sup>lxxxvii</sup> The objection to clubs performing their own drug tests is that this information may enable them to shelter some players from official doping controls (as the East German state did prior to 1989), and indeed, two English clubs, Arsenal and Chelsea, have been sanctioned by the FA for their illegal testing of players.<sup>lxxxviii</sup>

Finally, it should be noted that various governing bodies of football have been criticized for their limited commitment to, and enforcement of, anti-doping policies. In particular, FIFA have clashed with WADA, the role of which is "to promote,

coordinate, and monitor at the international level the fight against doping in sport in all its forms.” Most analysts have seen WADA as a very significant development in anti-doping policy. Houlihan for instance sees it as, “play(ing) an important part in raising the level of confidence in drug testing procedures,”<sup>lxxxix</sup> but throughout its history FIFA, alongside cycling’s UCI, has been WADA’s “sternest critic.”<sup>xc</sup> FIFA has continually resisted WADA’s attempts to standardize doping procedures and penalties across sports and across national boundaries. FIFA argues that the imposition of mandatory suspensions is legally problematic as it fails to take into account the extent of the offender’s guilt, and thus contravenes the principles of Swiss sanction law.<sup>xcii</sup> The objection that bodies like the International Olympic Committee (IOC) have to this position is that such clauses mean that standardized minimum penalties cannot be enforced and indeed bans in football (12 months for Abel Xavier) seem to be shorter than in some other sports, e.g. athletics (24 months for Dwain chambers). IOC president Jacques Rogge has been critical of the lenient penalties in football, and when FIFA continued to refuse to sign up to the WADA code it came perilously close to being dropped from the 2004 Athens Olympic Games. Eventually, in May 2004, FIFA and WADA signed a “cooperative agreement” in which WADA agreed to fully respect FIFA’s stipulations of individual case management and flexibility when imposing sanctions, whilst FIFA accepted WADA’s right to refer football related cases to CAS. Whilst the differences between WADA and FIFA have largely now been settled, in 2006 WADA President Dick Pound was still citing cycling and “some elements within FIFA’ as the only problematic governing bodies in international sport.<sup>xcii</sup>

Inconsistencies between FIFA and other international governing bodies of sport are further compounded by FIFA's inability to gain compliance from national football federations. Sepp Blatter rebuked English FA chairman Geoff Thompson over his handling of the aforementioned Rio Ferdinand case,<sup>xciii</sup> and since this time FIFA has taken harder action against the national associations of France, Italy and the Netherlands who have been fined between £4500 and £6000 for failing to adhere to FIFA's minimum punishment for doping infringements.<sup>xciv</sup> Not only is FIFA out of step with the majority of the world sporting community over punishments for the illegal use of performance-enhancing drugs, but the considerable autonomy wielded by national governing bodies of football provides significant inconsistencies within football itself.

## **Conclusion**

The use of performance-enhancing drugs in football is a problem the significance of which has not previously been fully recognized by the game's administrators. Whilst Dvorak *et al.* argue that "any estimation of the problem can be considered as merely an unscientific hypothesis or speculation,"<sup>xcv</sup> it is not the case that all estimations are equally speculative. Whilst FIFA medical officials base their estimation of the scale of drug use in football solely on the basis of drug testing results, our triangulation of sources is likely to provide a more accurate assessment. Whilst we recognise that there are considerable methodological difficulties with each of the data sources drawn upon here, the fact that they provide relatively consistent and coherent evidence leads us to believe that we can have a relatively high level of confidence in the accuracy of our depiction of this phenomenon. Moreover, it should be re-iterated that as Yesalis

*et al.* note, it is almost certainly the case that the sources used are likely to lead to an underestimate, rather than an overestimate, of drug use in the sport.

We should, however, be circumspect in our claims for we think that there are both empirical and theoretical grounds to think that the use of performance-enhancing drugs in football is not as widespread as it is in other sports. However, it is worth reflecting on the factors which FIFA's Chief Medical Officer, Jiri Dvorak, and others have forwarded as possible explanations for the relatively low use of performance-enhancing drugs in football.<sup>xvii</sup> It will be recalled that Dvorak *et al.* suggest that the stringent nature of the drug testing programme, the perception amongst footballers that such drugs are ineffective ways of improving performance, and the success of educational campaigns which have fostered a drug-free culture in football may all contribute to the occurrence of relatively few positive tests in the game. However, our analysis indicates that footballers do not see the drug testing programme as particularly stringent, and that footballers actively seek out substances which they think will increase their physical capabilities. The prevalence of recreational drug use in the game would also suggest that football does not have a "drug-free culture." Indeed the most likely explanation for the apparent lack of drug use in football is the very explanation that Dvorak *et al.* dismiss out of hand; that is to say, the existing testing programme is simply not very effective at detecting drug use.

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## Notes

- <sup>i</sup> Mottram, *Drugs in Sport*, cover notes.
- <sup>ii</sup> Ama, Betnga, Ama Moor and Kamga, "Football and Doping."
- <sup>iii</sup> BBC Radio 4, "Monkey Glands and Purple Hearts", 8 March 2004.
- <sup>iv</sup> Joy, *Forward Arsenal*, 32-33.
- <sup>v</sup> *Hansard*, 27 April 1939
- <sup>vi</sup> Matthews, *The Way It Was*, 216-218.
- <sup>vii</sup> Blatter, "FIFA's Commitment."
- <sup>viii</sup> *The Times*, 19 Oct. 2005.

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- <sup>ix</sup> Dvorak, Graf-Baumann, D’Hooghe, Kirkendall, Taennler and Saugy, “FIFA’s Approach;” Dvorak, McCrory and D’Hooghe, “FIFA’s Future Activities.”
- <sup>x</sup> Yesalis, Kopstein and Bahrke, “Difficulties in Estimating,” 45.
- <sup>xi</sup> Dvorak, McCrory and D’Hooghe, “FIFA’s Future Activities,” 58.
- <sup>xii</sup> Mottram, *Drugs in Sport*, 357.
- <sup>xiii</sup> Yesalis, Kopstein and Bahrke, “Difficulties in Estimating,” 45.
- <sup>xiv</sup> *Ibid.*, 56.
- <sup>xv</sup> Goode, *Between Politics and Reason*, 14.
- <sup>xvi</sup> Dvorak, Graf-Baumann, D’Hooghe, Kirkendall, Taennler and Saugy, “FIFA’s Approach”, 5. The distribution of positive tests, however, is probably not unrelated to the global distribution of FIFA/WADA accredited laboratories, two-thirds of which (20 out of 33) are in Europe.
- <sup>xvii</sup> Houlihan, “Doping in Sport,” 225.
- <sup>xviii</sup> FIFA, *Activity Report*, 79.
- <sup>xix</sup> Cashmore, *Making Sense of Sport*, 143.
- <sup>xx</sup> Dvorak, Graf-Baumann, D’Hooghe, Kirkendall, Taennler and Saugy, “FIFA’s Approach,” 4.
- <sup>xxi</sup> *FIFA Magazine*, June 2005: 68. Cocaine is a stimulant and therefore technically a performance-enhancing drug. However it is more widely used as a recreational drug, both within and outside of sport.
- <sup>xxii</sup> WADA, *Adverse Analytical Findings*.
- <sup>xxiii</sup> Dvorak, Graf-Baumann, D’Hooghe, Kirkendall, Taennler and Saugy, “FIFA’s Approach,” 4.
- <sup>xxiv</sup> UK Sport, *Anti-Doping Report 2001/2002*.
- <sup>xxv</sup> *The Guardian*, 24 December 2004.
- <sup>xxvi</sup> *The Times*, 20 October 2006.
- <sup>xxvii</sup> Dvorak, Graf-Baumann, D’Hooghe, Kirkendall, Taennler and Saugy, “FIFA’s Approach,” 5.
- <sup>xxviii</sup> Malcolm, “White Lines,” 18.
- <sup>xxix</sup> BBC Sport, 9 May 2001. “Testing times for football,” <http://news.bbc.co.uk/sport>.
- <sup>xxx</sup> BBC Sport, 9 May 2001. “Dutch launch drug probe,” <http://news.bbc.co.uk/sport>.
- <sup>xxxi</sup> *The Observer*, 31 March 2002.
- <sup>xxxii</sup> Dubin, *Commission of Inquiry*, 349-350.
- <sup>xxxiii</sup> *The Observer*, 17 October 1999.
- <sup>xxxiv</sup> *The Observer*, 31 March 2002.
- <sup>xxxv</sup> *Ibid.*
- <sup>xxxvi</sup> *Independent*, 8 October 2004.
- <sup>xxxvii</sup> *The Observer*, 31 March 2002.
- <sup>xxxviii</sup> *Channel 4*, 21 January 2006. “Marseille doping scandal rocks Milan,” <http://www.channel4.com>.
- <sup>xxxix</sup> *The Guardian*, 30 June 1999. Dugarry was subsequently acquitted of a doping offence due to a testing technicality (*The Observer*, 17 October 1999).
- <sup>xl</sup> *Mosnews*, 3 May 2005. <http://www.mosnews.com/>
- <sup>xli</sup> *International Herald and Tribune*, 9 December 2006.
- <sup>xlii</sup> Dubin, *Commission of Inquiry*.
- <sup>xliii</sup> Australian Parliament, *Drugs in Sport*.
- <sup>xliv</sup> Spitzer, “Sport and the Systematic Infliction of Pain,” 112.

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- <sup>xlv</sup> Spitzer, *Doping in der GDR*, 351.
- <sup>xlvi</sup> Grayson and Ioannidis, "Drugs, Health and Sporting Values," 247.
- <sup>xlvii</sup> *The Times*, 1 December 2004.
- <sup>xlviii</sup> *The Independent*, 1 December 2004.
- <sup>xlix</sup> *Sports Illustrated*, 7 December 2005. "Justice of the pieces," <http://www.SI.com>.
- <sup>1</sup> Donati, *Anti-doping*.
- <sup>li</sup> *The Times*, 27 November 2004.
- <sup>lii</sup> Grayson and Ioannidis, "Drugs, Health and Sporting Values," 247.
- <sup>liii</sup> Donati, *Anti-doping*.
- <sup>liv</sup> BBC Sport, 31 January 2002. "Juventus doping trial opens," <http://news.bbc.co.uk/sport>.
- <sup>lv</sup> *Independent*, 1 December 2004.
- <sup>lvi</sup> BBC Sport, 31 January 2002. "Juventus doping trial opens," <http://news.bbc.co.uk/sport>.
- <sup>lvii</sup> Donati, *Anti-doping*.
- <sup>lviii</sup> *The Times*, 1 December 2004.
- <sup>lix</sup> *Independent*, 1 December 2004; *Independent on Sunday*, 27 March 2005.
- <sup>lx</sup> Scarpino, Arrigo and Benzi, "Evaluation of Prevalence of Doping;" Anshel, "A Survey of Elite Athletes." See also Waddington, "Changing Patterns of Drug Use."
- <sup>lxi</sup> Waddington, Malcolm, Roderick and Naik, "Drug Use in English Professional Football."
- <sup>lxii</sup> Mottram, *Drugs in Sport*, 370.
- <sup>lxiii</sup> WADA, *Adverse Analytical Findings*.
- <sup>lxiv</sup> *Independent*, 9 December 1998.
- <sup>lxv</sup> *Independent*, 12 April 2006.
- <sup>lxvi</sup> Malcolm, "White Lines," 19.
- <sup>lxvii</sup> *FIFA Magazine*, March 2004, 3.
- <sup>lxviii</sup> Waddington, Malcolm, Roderick and Naik, "Drug Use in English Professional Football."
- <sup>lxix</sup> Dvorak, "There is Nothing to Gain," 18-19.
- <sup>lxx</sup> *International Herald and Tribune*, 30 April 2005.
- <sup>lxxi</sup> "Veron in Cannavaro Video." <http://www.ergogenics.org/neoton.html>.
- <sup>lxxii</sup> *Guardian*, 3 March 2005.
- <sup>lxxiii</sup> Waddington, *Sport, Health and Drugs*, 127-128.
- <sup>lxxiv</sup> Waddington, "The Development of Sports Medicine;" Malcolm, "Unprofessional Practice."
- <sup>lxxv</sup> Waddington, Roderick and Naik, "Methods of Appointment"; Waddington, "Jobs for the Boys."
- <sup>lxxvi</sup> Maguire and Pearton, "Global Sport."
- <sup>lxxvii</sup> Waddington, *Sport, Health and Drugs*, chapter 9.
- <sup>lxxviii</sup> *The Times*, 19 October 2005.
- <sup>lxxix</sup> *The Observer*, 31 March 2002.
- <sup>lxxx</sup> *Independent on Sunday*, 27 March 2005.
- <sup>lxxxi</sup> *The Guardian*, 18 June 2005.
- <sup>lxxxii</sup> *The Observer*, 31 March 2002.
- <sup>lxxxiii</sup> Sports Council, *Doping Control in the UK*.
- <sup>lxxxiv</sup> *The Guardian*, 25 February 2004.
- <sup>lxxxv</sup> *The Guardian*, 19 October 2004; *Independent on Sunday*, 30 November 2003.
- <sup>lxxxvi</sup> BBC Sport, 21 April 2001. <http://news.bbc.co.uk/sport>.
- <sup>lxxxvii</sup> *The Observer*, 23 March 2003.

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<sup>lxxxviii</sup> *The Observer*, 23 March 2003; *The Guardian*, 9 September 2005.

<sup>lxxxix</sup> Houlihan, *Dying to Win*, 172.

<sup>xc</sup> *The Guardian*, 4 March 2003.

<sup>xc<sup>i</sup></sup> *FIFA Magazine*, September 2004, 68; Dvorak, Graf-Baumann, D'Hooghe, Kirkendall, Taennler and Saugy, "FIFA's Approach," 10.

<sup>xc<sup>ii</sup></sup> *The Guardian*, 19 September 2006.

<sup>xc<sup>iii</sup></sup> *The Guardian*, 17 December 2003.

<sup>xc<sup>iv</sup></sup> *FIFA.Com*, 28 September 2004; *The Guardian*, 19 October 2004.

<sup>xc<sup>v</sup></sup> Dvorak, Graf-Baumann, D'Hooghe, Kirkendall, Taennler and Saugy, "FIFA's Approach," 4.

<sup>xc<sup>vi</sup></sup> Dvorak, McCrory and D'Hooghe, "FIFA's Future Activities," 58.