

# The symbiotic evolution of anti-doping and supply chains of doping substances: how criminal networks may benefit from anti-doping policy

Bertrand Fincoeur · Katinka van de Ven ·  
Kyle J. D. Mulrooney

© Springer Science+Business Media New York 2014

**Abstract** Doping in sport has been explored predominantly from a user-perspective, widely neglecting an analysis of the supply-side of the market for doping products. In this article, we aim to fill a gap in the existing literature by demonstrating that the supply chains of doping substances have evolved over the course of the past two decades, not least due to the zero tolerance approach of anti-doping policy. Specifically, adopting the case studies of (elite) cycling and recreational weight-training (RWT) and bodybuilding (BB), we outline how the supply chains for performance and image enhancing drugs (PIEDs) have shifted away from “culturally embedded dealers” and into new organizational structures independent from these sub-cultures. We maintain that the evolution of doping supply mirrors the evolution of doping use; whereas doping was previously the result of a socialization process, and PIED suppliers were a cultural product, consumption is now often a secretive practice and “social suppliers” are no longer prepared to take risks in (openly) supplying doping products. Consequently, the increasingly clandestine nature of doping practices has led consumers to increasingly consider the “black market” as a potential source for PIEDs. Most importantly, this shift in doping supply chains has led to greater inequality among

---

K. J. D. Mulrooney is an Erasmus Mundus Postgraduate Fellow of Doctorate in Cultural and Global Criminology (DCGC) programme of the European Union.

B. Fincoeur (✉)

Leuven Institute of Criminology, University of Leuven, Hooverplein 10, 3000 Leuven, Belgium  
e-mail: bertrand.fincoeur@law.kuleuven.be

K. van de Ven

School of Social Policy, Sociology and Social Research, University of Kent,  
Canterbury, Kent CT2 7NF, UK

K. van de Ven

Willem Pompe Institute, Utrecht University, Utrecht, The Netherlands

K. J. D. Mulrooney

Doctorate in Cultural and Global Criminology (DCGC), University of Kent, Canterbury, UK

athletes, increased health risks and the rise of suppliers devoid of sociocultural characteristics. We suggest that as the current anti-doping regime, focused predominantly on punishment and control, continues unabated these unintended negative consequences are likely to increase. As several countries have begun to rethink their position on the criminalization of drugs and drug users, it is time to rethink our approach to curbing the problem of doping in sports.

**Keywords** Doping · Anti-doping policy · Supply · Black market · Cycling · Weight-training · Bodybuilding

Since the late 1990s, the image of elite road cycling has been severely tarnished by repeated doping scandals and there is much evidence to support the claim that doping has been, and may still be, rampant in cycling. Since the Festina<sup>1</sup> affair in 1998 and the subsequent increase use of law enforcement against dopers, numerous cyclists have tested positive and confessed their practices as an act of atonement (e.g. Gaumont 2005; Hamilton and Coyle 2012; Millar 2012). After the stir caused by the Armstrong scandal in 2012, a variety of commissions published reports documenting a culture of doping in cycling (Commissie Anti-Doping 2013; Sénat français 2013). Additionally, the scholarly community has helped elucidate the hidden side of a profession in serious crisis (e.g. Brissonneau et al. 2008; Christiansen 2005; Hoberman 2002; Schneider 2006). Likewise, several scholars have explored the consumption practices of recreational weight-training (RWT) and bodybuilding's (BB) (e.g. see Bojsen-Møller and Christiansen 2010; Dunn and White 2011; Leifman et al. 2011; Monaghan 2001; Pope et al. 2012; Simon et al. 2006). However, the topic of doping has so far been analyzed predominantly from a user-perspective, widely neglecting an analysis of the supply-side of the market for doping products. While acknowledging several recent studies focusing on this topic (Donati 2007; Koert and Van Kleij 1998; Maycock and Howat 2007; Oldersma et al. 2002; Paoli and Donati 2014), a search in the Criminal Justice Abstracts (CJA) in October 2014, using doping and trafficking/ trade/ supply/ and market as keywords, revealed respectively three/ one/ eleven/ and six publications. Yet, only two were criminological relevant as the majority of hits were articles from the forensic sciences. In short, criminology as a discipline has yet to sufficiently explore the problem of doping, and in particular the role of those who supply performance and image-enhancing drugs (PIEDs)<sup>2</sup>.

<sup>1</sup> Three days before the start of the 1998 Tour de France French customs discovered a large haul of doping products (e.g. amphetamines and EPO) in the car of Willy Voet, the soigneur from the Festina team. The investigation that followed revealed a widespread network of doping involving many cycling teams of the Tour de France. This scandal was an important moment in anti-doping history as it revealed that PIED use was institutionalized within the structure of elite cycling (rather than just a few individual riders), the unwillingness of sport governing bodies to tackle this problem, and, for the first time, doping was redefined from a matter of sport issue to a law and order issue (as the French police intervened) (Waddington and Smith 2009). For more information on the Festina affair see Christiansen (2005) or The Guardian (2008).

<sup>2</sup> In this article, we define doping products as the prohibited products which are on the banned substances list established by the World Anti-Doping Agency. Originally, the term "performance enhancing drugs" (PEDs) was used to describe a wide variety of substances used by athletes to enhance their performance. While the term "PEDs" is still widely adopted, it is often used in reference to an elite sport context as the term goes hand in hand with "doping" which is reserved for (elite) sport. As the main goal of "non-athlete" using groups is often aesthetic modification (e.g. lose weight, increase muscle mass) and to a lesser extent, athletic enhancement (Pedersen 2010), the term performance and image enhancing drugs (PIEDs) is more suited to the context of RWT and BB sub-cultures.

In this article, we aim to fill a gap in the literature by demonstrating that the supply chains of doping substances and methods (hereinafter referred jointly as doping products) in both elite cycling and RWT and BB<sup>3</sup> sub-cultures<sup>4</sup> have changed over the course of the past two decades, not least due to the expansion of zero-tolerance anti-doping policy. We argue that there has been a growing concern about anti-doping since the 1960s and that supply-side interventions are increasingly being employed as the future of anti-doping policy (WADA 2009). Moreover, the expansion of anti-doping policy to include traffickers and the “athlete’s entourage” has greatly reduced the former major role of the cycling teams and “culturally embedded dealers” as providers of doping products. Consequently, current anti-doping policies are deterring “experts” from supplying doping products to athletes and as a result, are creating space for “non-experts” and drug traffickers. Throughout the article, we consider the negative implications that punitive anti-doping policies and the evolution of the supply chains may have for both society and athletes.

This paper is grounded in empirical data from two ongoing research projects which explore markets for doping products. The first project examines the doping market in Belgian and French elite cycling. This research relies on a multi-method instrumentation set, including both qualitative and quantitative research: (a) an analysis of policy documents and 14 cases concerning doping use and trafficking in Belgian and French cycling, initiated by anti-doping law enforcement agencies; (b) 81 semi-structured in-depth interviews with: policy-makers (representatives of national and international sporting federations, national anti-doping organizations and other international organizations), law enforcement officers, active and retired elite cyclists, and other stakeholders (team doctors, sports physicians, team managers); (c) surveys administered online to competitive cyclists focusing on the use and supply channels of doping products and individual attitudes towards anti-doping policy. In this article however, we draw only on the results from the qualitative research methods (interviews). The second project explores the ways in which PIED trafficking networks form and develop within and between the Netherlands and Belgium, with particular attention given to recreational weight-training and bodybuilding sub-cultures. This research relies on several multi-source qualitative research methods including: (a) an analysis of 65 PIED trafficking cases initiated by the criminal justice agencies of both countries; (b) ethnographic fieldwork conducted at bodybuilding sites (e.g. competitions, supplement shops) for a time-period of 2 years; (c) 30 semi-structured interviews with law enforcement officers, (non-)competitive bodybuilders, recreational weight-trainers

<sup>3</sup> Bodybuilding is the process of developing muscle fibers through a combination of weight-training, specific calorie intake, rest and often times the use of PIEDs. Someone who engages in this activity is referred to as a bodybuilder. In contrast to strength sports, bodybuilding takes as its goal the improvement of physical appearance and is not preoccupied with bodily strength as opposed to, for example, power-lifting (Monaghan 2001). In competitive bodybuilding, bodybuilders display their physique to a panel of judges, who assign points based on aesthetic appearance and presentation. In contrast, recreational weight-trainers are typically fitness-oriented persons who possess a functional attitude towards the body and adopt training methods from a variety of disciplines such as power-lifting, bodybuilding and/or Olympic weight-lifting. Therefore, one may distinguish between “physically” doing bodybuilding (specifically exercising and developing the body) and the generic social activity, consisting of formal organizations, rules and procedures, which is commonly known as “bodybuilding” (Monaghan 2001: 32).

<sup>4</sup> A sub-culture “implies that there are value judgments or a social value system which is apart from a larger or central value system. From the viewpoint of the larger dominant culture, the values, norms and behaviors of the subculture set the latter apart and prevent total integration” (Wolfgang and Ferracuti 1967: 99; cited in Abadinsky 2010).

(producers, dealers and/or users) and other stakeholders (e.g. physicians, lawyers, anti-doping authorities); (d) and a content analysis of Belgian and Dutch news articles concerning (recreational) PIED use and supply.

### The expansion of the anti-doping movement<sup>5</sup>

While the use of PIEDs is as old as sport itself (Yesalis and Bahrke 2002), the regulation of doping products did not begin to get underway until the second half of the 20<sup>th</sup> century. In the 1950s amidst a post-war context of increasing public health anxieties, sports doping as a health problem emerged (Dimeo 2009: 31) and several high profile doping deaths precipitated the development of the anti-doping movement. In the 1960's, for example, the death of the Danish cyclist Knud Enemark Jensen<sup>6</sup> during the Olympic Games in Rome sparked concern from both sports organizations and national governments. However, anti-doping remained restricted to a limited amount of sports and governmental bodies, each of which implemented their own anti-doping activities (Houlihan 2003: 161). As a result, there was no consistent anti-doping movement, rather each sports federation had its own definition of doping, list of prohibited products, disciplinary proceedings and sanctions for doped athletes (Latty 2007: 364). Nevertheless, from the 1970s onwards, the International Olympic Committee (IOC) continuously expanded its involvement in anti-doping (Waddington and Smith 2009: 181) and sports institutions in general progressively took the leadership role in anti-doping policy<sup>7</sup>.

Several prominent and successive doping scandals from the early 80's on have had deep running implications for the organization and evolution of the anti-doping movement. In 1998, for instance, the Festina Affair was a real thunderclap to the anti-doping world as it revealed a widespread and sophisticated system of doping use among elite cycling riders (e.g. Hoberman 2002; Waddington 2000). Subsequently, doping scandals have served as a window of opportunity for the reappraisal of the role of public authorities in the anti-doping movement and to implement a new anti-doping regime (Sallé et al. 2006). Shortly following the Festina Affair, the IOC organized the World Conference on Doping Sport where anti-doping officials made the decision to establish the World Anti-Doping Agency (WADA). Composed and funded equally by the sports federations and national governments, the WADA's aim is to globally harmonize anti-doping rules and to coordinate anti-doping efforts of sports organizations and governments<sup>8</sup> (Hanstad et al. 2008).

<sup>5</sup> We recognize that anti-doping consists of multiple actors and organization on a variety of levels and, often times, taking their own direction. However here we consider anti-doping as a "general movement", indicated by the broad strokes of development and policy trajectory throughout history and most recently, as advanced by the WADA.

<sup>6</sup> Throughout the literature on the history of doping it is often mentioned that Jensen died from his use of amphetamines and that this fatality prompted a more serious response from politicians and sporting bodies. While evidence suggests that the incident did prove something of a catalyst for firming up anti-doping policy, Møller (2005) has shown that the oft-repeated claim that Jensen's death was doping-related is in fact unfounded.

<sup>7</sup> At the national level, France and Belgium enacted anti-doping (criminal) legislation as early as 1965, however their anti-doping efforts remained rather symbolic (Brissonneau and Ohl 2010; Fincoeur et al. 2014).

<sup>8</sup> WADA produced the World Anti-Doping Code (WADC) to harmonize anti-doping regulations in all sports and countries. The WADC entered into force in 2004 and has since undergone several revisions.

Nevertheless, the continuity of doping infractions and high profile scandals has frustrated anti-doping officials. Acknowledging that testing alone is little more than a paper bullet, the WADA has called for and successfully accrued more powerful weapons in the doping fight (Møller 2013). For example, the WADA has increasingly escalated provocative surveillance programs (biological passport, and the whereabouts system) (Hanstad and Loland 2009; Kayser et al. 2007). In addition, there is a growing consensus amongst policy-makers and many scholars, that current anti-doping policy focusing squarely on the athletes and testing, has been tried and found wanting (Smith and Stewart 2008). Rather, a broader approach is being called for, inclusive of traffickers and the use of the criminal law (see Paoli and Donati 2014). Consequently, anti-doping policy has expanded from its original focus on the athlete and has sought to increasingly enforce its activities against the direct suppliers of doping products.

As both international sport bodies and governments have become aware of the participation of the athlete's entourage (e.g. physicians, coaches), several measures have been committed to target and sanction this group. On a global scale several international initiatives have been undertaken or are currently underway, which promote the involvement of law enforcement agencies in anti-doping activities. For instance, the 2005 UNESCO Convention against Doping in Sport calls for states to adopt measures against trafficking by athletes and, to this end, requires them to implement measures to control the production, movement, importation, distribution and sale of PIEDs. Likewise, in the White Paper on Sport, the European Commission (2007) recommends that the trade of illicit doping substances be treated in the same manner as trading in illicit drugs throughout the European Union. On the national level, several countries such as Belgium and France, have established specialized anti-doping police units, while other countries such as Sweden and Denmark have established anti-doping initiatives apart from elite athletics (Christiansen 2011) and in the public arena. Finally, sport authorities have also shown their determination to tackle the supply side of the market. For example, in 2008 the WADA signed a cooperation agreement with Interpol, exchanging liaison officers. In addition, the latest revised version the WADA code coming into effect in 2015, introduces a number of new anti-doping rule violations, which focus on the athlete's support personnel. This includes offences of complicity in a doping violation and prohibited association. As a result, it will become a doping offence for an athlete to associate with, for example, a coach or doctor who is either serving a ban or has been found guilty of a doping violation within the past 8 years.

Evidently, from the 1960s on there has been an increasing concern about (anti-)doping in sports and both the doping and the anti-doping industry have developed together in a symbiotic relation (Mazanov and Connor 2010). Indeed, anti-doping has been reformed from a historically sporadic and predominately independent movement to a more coherent and unified crusade, (Goode 2011) inclusive of global government, national government and sport authorities. More importantly, anti-doping mechanisms have evolved from the private regulation of sport and athletes via testing and surveillance to the public regulation of (illegal) drugs via the criminalization of PIEDs and PIED traffickers. As we will demonstrate below, the continuous expansion of anti-doping policy has had a major impact on the organization of the market for doping products.

## The evolution of doping supply chains mirrors the evolution of doping use

Since the 1998 Festina scandal, several scholars have extensively researched the risk factors for doping use and patterns of doping in cycling. One of their conclusions was that during the decades before Festina, doping use had become part of an elite riders' everyday life (e.g. Brissonneau 2007; Waddington and Smith 2009). In other words, doping was the product of a secondary socialization process (Berger and Luckmann 1986) through which the athlete learned step by step the standards, the know-how and the language of his/her environment. In this domain, cyclists were encouraged to 'over-conform' (Coakley and Pike 2009) to the norms and values of (elite) cycling sub-culture which embraced the consumption of a variety of PIEDs, including illegal ones, to "do the job". Furthermore, many cyclists also used several recreational drugs to de-compensate after major races (e.g. amphetamines) and the use of legal and illegal enhancers was widespread and accepted by the overwhelming majority of elite riders (Brissonneau et al. 2008). Therefore, cycling teams supported, encouraged and often even arranged doping products for their riders. Although acculturation was progressive and followed career stages (Brissonneau et al. 2008), doping products were easily available within cycling teams and most of the time was directly provided by the medical and para-medical staff. Doping products were thus not only culturally accepted and used, but also organizationally approved as they circulated freely within the cycling teams. Several interview participants acknowledged the normalization and widespread use of PIEDs within elite cycling and the role played by medical staff:

"I saw many times riders who injected themselves with EPO<sup>9</sup>. In our team, most of us did it. There was EPO in the fridge of the bus. It was very common to be in contact with that substance." (Thomas, rider)

"I took cortisone. Like everybody. I did not really consider it as vitamins but it was the basis. I was an elite rider. It was the minimum I could do for my job." (Frank, rider)

"Usually, the team physician provided the EPO. He gave us the explanation about how and when to take it, etc. EPO was injectable. Usually, I did it at home but if we had a race abroad for example, I took the EPO at the hotel to continue the treatment." (Richard, rider)

However, the post-Festina political and media surge and the subsequent expansions of anti-doping have deeply shaken the normalization process of doping use by elite riders. Indeed, our data suggests that the patterns of use and the perceived legitimacy of the doping activities within cycling has been modified as many teams and riders now appear to identify doping as contrary to several norms and values such as fair-play or sports ethics (Ohl et al. 2013). Even so, Waddington and Smith (2009): 154 point out that it is no coincidence that elite riders and other people within elite cycling have begun to emphasize and to articulate the values of fair-play "at a time when the

<sup>9</sup> Synthetic erythropoietin (EPO) is believed to have come into use in cycling in the 1990's. EPO use can increase VO<sub>2</sub>max by a significant amount, making it useful for endurance sports like cycling.



continuing revelations of drug use and the associated withdrawal of sponsors have come to constitute a major financial threat to professional cycling and to those whose careers are dependent on that continued sponsorship”. For instance, between 2005 and 2012, there were 92 elite cycling teams (UCI World Tour and Professional Continental Teams), 53 of which lost their sponsorship – 41 of them within 2 years – largely due to the successive doping scandals (Taverna and Aubel 2013). Yet in addition to motivations of (economic) self-preservation it is clear that anti-doping pressures have prompted the re-organization of doping practices within elite cycling.

Based on our interviews, we have identified and comprised three models (ideal-types) of elite cycling teams (Fig. 1, see also Fincoeur and Paoli 2014) with respect to their involvement in and attitudes towards anti-doping. The first model, classified as “converted”, refers to cycling teams which are the most active in anti-doping and go above and beyond the expectations of anti-doping regulations. The economic survival of elite cycling, threatened by the repeated doping scandals, is of the utmost importance and fighting doping may be a pre-condition to being trusted by and to entice sponsors to invest money in elite cycling. Thus, the converted-model cycling teams are in favour of a zero-tolerance policy as a means to increase the (partly lost) credibility of elite cycling. Such teams carry out additional anti-doping tests among their riders and pay serious attention to the absence of previous doping activities before recruiting new riders. This first model has developed around (mainly French) cycling teams which in 2007 created the Movement for Credible Cycling (MPCC, [www.mpcc.fr/](http://www.mpcc.fr/)) as a means to defend “clean cycling” (see also Waddington and Smith 2009). For example, the MPCC promoted the “no needle policy” (rejection of the use of needles, even for legal recovery products, without a medical prerequisite) before the International Cycling Union (UCI) made the policy compulsory. In May 2011, the French sports newspaper *L'Equipe* published a list of “the index of suspicion” of all riders who participated in the Tour de France. The list very clearly indicated that the riders from the cycling teams

	<b>Converted</b>	<b>Opportunist</b>	<b>Resistant</b>
<i>Public attitude towards doping</i>	Strongly disagree	Formally disagree	Slightly disagree
<i>Internal policy</i>	Zero-tolerance Deterrence	Deterrence to passivity	Passivity to support
<i>Recruitment policy</i>	Very cautious to previous doping experience & to biological passport	Not particularly cautious to previous doping activities & to biological passport	Few cautious to previous doping experience & to biological passport
<i>Riders' supervision</i>	Strong	Fair	Weak
<i>Probability to have dopers within the team</i>	Weak	Fair	Strong
<i>Role played by the team physician</i>	Control/ Innovation	Follow-up	Supply/ Follow-up
<i>Involvement of former riders in the team management</i>	Reputation of « Mr Clean » or converted to anti-doping	No special policy	Presence of former dopers is not a problem

**Fig. 1** A typology of elite cycling teams in 2014

belonging to the MPCC are thought to be much “cleaner” than riders who are not. While individual doping scandals may still occur within the converted model, the cycling teams do not play any role as a supplier of doping products. On the contrary, these teams seek to actively deter their riders from using illegal enhancers.

The second model, categorized as “opportunist”, is composed of cycling teams which are formally supportive of anti-doping. These teams officially condemn doping however, no exceptional measures are undertaken to deter their riders from using and generally less concern is given to anti-doping. Thus, while these teams do not directly supply doping products to their riders they often tolerate doping practices, running the risk that their riders develop individual or small-scale doping activities independent from the team. For example Greg, an elite rider, indicates that cyclists who still want to use illegal PIEDs simply find alternative ways to obtain them:

“I used cortisone during my whole career. At the beginning [2000], the team physician prescribed it and made a TUE [Therapeutic Use Exemption]. From 2003 I think, the team physician stopped providing cortisone himself but we could obtain it from a personal physician and then he sent the TUE to the team physician. (...) The team physician was not stupid, he knew, but the team covered us.” (Greg, rider)

In addition, the 2006 Puerto affair which witnessed many athletes (including riders from different cycling teams) purchase doping products from a Spanish doctor (Fuentes), provides further evidence of this evolution (Soule and Lestrelin 2011). Therefore, “opportunist” teams may also be considered as a ‘market-driven model’; while anti-doping policy has undoubtedly reduced the role of team physicians in supplying doping products, it has also created the conditions for the development of an open market for doping products outside of the team. Currently we consider the opportunist model to be by far, the most prevalent.

The third model, designated as “resistant”, is the only type of team which may still actively support doping practices. While not a replication of organized doping teams such as Festina, “resistant” teams rarely condemn doping, consistently recruit former dopers and never control their riders. Such teams are no longer able to institutionally support large-scale doping practices yet they may offer doping products to a limited amount of riders. Given the sensitive nature of this topic, we collected limited data on this third model. Nevertheless, several interview participants had experience with “resistant” teams:

“I was the physiotherapist of the team during 2 years. I did not see a real doping system but I understood rapidly that our two leaders and X prepared for their season apart from the team. (...). The sporting manager and the sports physician were aware of that, of course. When these three riders went for a stage in W., a few days before the Tour, everybody knew why. But nobody spoke about it.” (Olivia, physiotherapist)

“As a physician, you know the teams where you could have a certain amount of freedom or not. Personally, if I was not so afraid to provide doping products to



my riders, I would know where to go. Conversely, if I am totally against doping, I would never accept to work for [team] V. For cycling teams to organize a real doping system for all their riders, today, with the anti-doping policy, is very difficult. But physicians who accept to do what an experienced rider asks them, for example to inject cortisone, it exists and it makes the difference.” (Enzo, physician)

The three models presented here outline patterns of use and potential supplying activities in elite cycling. More importantly however, our data also indicates a shift in the supply chains for doping products. While the normalization of doping consumption within cycling has been challenged, the sheer number of positive tests and (organized) doping scandals which have occurred since the beginning of the 2000s indicate the continued use of doping products by several elite riders (e.g. the ‘Blitz’ during the Giro 2001, the ‘Puerto Operacion’ in 2006, the Armstrong scandal in 2012, etc.). Thus, we suggest that the evolution of doping supply chains have mirrored the evolution of doping use. As consumption has become a secretive and more independent activity, supply chains have also become much more discrete and “unofficial”.

To map and better understand the organization of the doping market and its evolution in elite cycling, Fig. 2 outlines the structure of the supply market. Doping products may potentially be obtained from a variety of suppliers. We classify them on two axes, depending on their connection with cycling and with medicine. A close connection with cycling has been an important factor for creating a doping-prone environment, especially before 1998 when the practice was largely accepted within cycling culture. The close relation with medicine is reflected in many doping scandals which have uncovered the role of physicians as advisors, distributors and administrators of doping products. Combining the two axes, we identify nine supply channels for doping products. For example, a team physician has a close connection with both cycling and medicine. A team manager has a close connection with cycling but has no

Close connection to cycling	→ Very close	Team manager (Former-) mate	Soigneur / Masseur (team)	Team physician
		Other sportsmen Gym owners	Physiotherapist Trainer	Sports physician
	← Very far	Internet retailers Friends & Relatives	Pharmacist Veterinary	General practitioner
		Close connection to medicine		
		← Very far		→ Very close

**Fig. 2** A typology of PIED suppliers in relation to cycling

connection with medicine. A general practitioner has a close connection to medicine but does not belong to the cycling world – and so forth.

As outlined above, we are entering an era of anti-doping in which the pre-emptive, punitive approach historically focused on athletes, widens its net to target the suppliers of doping products and in particular, the athletes entourage. Subsequently, the “cycling family” (top row in Fig. 2: team managers, soigneurs, team physicians), which traditionally were responsible for the supply of doping products to riders, has progressively been replaced by suppliers with no connection to the team or elite cycling. Indeed, as the “opportunist” model indicates, the methods in which (illegal) PIEDs are attained have increasingly moved away from the team and into new organizational structures, independent from the teams and even cycling. Whereas doping was previously the result of a socialization process, it appears nowadays to often be the result of individual and secretive activities of riders who have found alternative avenues to obtain and consume illicit PIEDs, as teams are often no longer prepared to take risks in (openly) supporting organizational doping. Paul, a soigneur of an elite cycling team, provides evidence of this shift:

“A few years ago, it was just like as if there was no speed control. So everybody ran fast. The products circulated quite openly within the team. (...) Yes, I injected EPO to several riders. Why not? But what happened in 1998 has changed a lot of things. Now, nothing happens within the team. I am sure of it and it is a good thing. Today, if I supply any product to a rider, I would be immediately excluded by the team, there is no doubt about that.” (Paul, soigneur)

Subsequently, riders wanting to use illegal PIEDs must find external sources for doping products. In several Belgian PIED trafficking cases, connections were found with the health care sector, such as general practitioners and pharmacists (see also Paoli and Donati 2014). For example, Mike, a former elite rider, suggests that cyclists are now often acquiring their doping products from sports physician’s independent from the cycling teams.

“After Festina, I think that several teams understood that, for their own [economic] survival, it was not possible anymore to support doping. Personally, in my team, I can say that the staff never provided any stuff from 2000. I also have stopped EPO from that period. And those who wanted to still use products had to visit new suppliers but, if they did it, they didn’t tell it to the others.” (Mike, rider)

However, the expansion of anti-doping to include doping suppliers also appears to be deterring the ‘experts’ and in particular those who have a medical knowledge, from staying in the market. This includes not only the team and team doctors but also external physicians from whom riders seek PIEDs as an alternative to the team (right column in Fig. 2: sports physicians, general practitioners). Jacques, a physician, explained how the increased risks resulting from the anti-doping policy have deterred him from continuing to provide doping products to elite cyclists:

“Formerly, when I was a team physician, I understood that it was not desirable anymore to provide products to our riders. Still now, I don’t support the anti-

doping crusade but I wouldn't want that 30 riders, mechanics, trainers, etc., run the risk that the sponsor withdraws its sponsorship if new scandals occur. But even now, as a sports physician, I have stopped supervising elite riders. I have had several problems, I don't want to have new ones." (Jacques, team physician)

Likewise, in the case study of RWT and BB sub-cultures, several participants mentioned that Belgian physicians have become less accessible and when willing to prescribe, often only prescribe products which counteract the side effects of PIEDs. Moreover, the Dutch PIED trafficking cases found no connection between the health care industry and the PIED market. The data, with respect to the limited presence of health care professions in PIED trafficking, confirms findings from previous studies conducted in the Netherlands (see Koert and Van Kleij 1998; Snippe et al. 2005).

In our case-study of elite cycling, the expansion of anti-doping to include doping suppliers has led to several negative side-effects. First, the exclusion of medical experts may actually strengthen the role of non-experts within the doping market (left-down corner on Fig. 2). For example, a recent survey carried out among Belgian elite riders clearly demonstrated that cyclists increasingly consider the "black market" as the most important potential source of suppliers of doping products (Fincoeur et al. 2014). The following quotes confirm this finding:

"I don't understand how they [the anti-doping policy-makers] think about. Today, there are very few people in cycling who will take the risk to provide you something illegal. But do you really think that doping could be eradicated? Where will the riders go if they want to take something? Everybody knows today that you can obtain everything on Internet or in a fitness room." (Eric, rider)

"You cannot imagine what I sometimes see among young competitive riders. They come because they don't understand why they don't perform well. Then they show me what they have bought on Internet..." (Lionel, sports physician)

Further, in three PIED trafficking cases (two in 2006 and one in 2010) cyclists were found to have obtained their PIEDs through a "black market" source. For example in one case, a bodybuilder supplied PIEDs to several cyclists. Indeed, as the Balco affair indicated (Fainaru-Wada and Lance 2006), professional athletes may be (slowly) turning to the "black market" to obtain doping products as opposed to these previous "legal channels". Nevertheless, the risk that the "black market" is a growing supplier of doping products is still limited in elite cycling, as these riders often need high-level, educated experts, to use PIEDs in the most effective way.

Second, by shutting out medical experts and driving doping practices underground, anti-doping policy may be increasing the likelihood of health-related harms for athletes. For instance, the rise of "black market" sources brings with it a host of risks, from poor quality doping products to a general "hardening" of the market, while the retreat of cycling teams and medical experts removes protective measures such as medically supervised doping. Finally, as not every athlete has access to, or the finances available

to purchase doping products (access to better PIEDs and/or (medical) advice) on an individual basis, the new organization of the doping market may result in a more unequal playing field. For instance, several doping substances and methods may now be unavailable to some riders due to their complexity of usage, uncertainties about which expert to visit, or simply their economic status. Arthur, an elite rider, illustrates this problem:

“It is my second year as an elite rider. I earn 1600€ net per month... I must pay for my home, my electricity, my car, my food, my personal trainer, my physio-therapist, my dietary supplements... And that is only my ‘compulsory expenses’! After that, I still have 200€. The team is strongly supportive of anti-doping. Even if I wanted to use the most successful and undetectable products, if any, how could I afford it?” (Arthur, rider)

While the promotion of sports ethics and the protection of athletes’ health are the WADA’s professed goals, anti-doping policy appears to be unintentionally harming its own ideals. The supply chains of doping products in elite cycling have changed over the course of the past two decades, not least due to the expansion zero-tolerance anti-doping policy. As cycling teams have been largely excluded from the supply of doping products, consumption of PIEDs has not ceased but rather has become more clandestine. Consequently, the “cycling family” and “medical experts” are withdrawing from the market and demand may be progressively fed by the “black market” for PIEDs. The evolution of supply has mirrored the evolution of use resulting in a variety of negative consequences.

### **The “black market” for PIEDs: the muscle mafia and socio-cultural suppliers**

Adopting the case study of RWT and BB sub-cultures in the Netherlands and Belgium, in the following section we will explore the implications zero-tolerance anti-doping policy has had on this particular market for PIEDs. First, we critically evaluate several claims which have justified and facilitated anti-doping expansion to target PIED traffickers. Second, we examine the contours of the “black market” for PIEDs offering an alternative framework which seeks to account for diverse and multiple markets. Finally, we reflect on the negative consequences of zero-tolerance anti-doping familiar to elite cycling, which are also being felt in wider market for PIEDs.

The media, sport officials and other anti-doping authorities often suggest that the “black market” for PIEDs is driven by economically motivated individuals and in particular (“mafia-type”) organized crime. For example, the Director-General of the WADA David Howman recently stated that, “the biggest threat to sport is organized crime”, and that “those who are distributing drugs, steroids, HGH [Human Growth Hormone] and erythropoietin [EPO] and so on, are the same characters who corrupt athletes and pay money to fix games” (The Guardian, October 2014). Further Sandro Donati, a former coach of Italy’s national athletics sprint team and current WADA consultant, identified the PIED trade as a “mafia-type” organization during his speech at the 2005 “Play the Game” conference and suggested that “mafia families” are in full control of the “black market”. In addition, several PIED trafficking networks (e.g. the Balco scandal, operation Gear Grinder) have been uncovered, nourishing the belief that

PIED trafficking involves the participation of the athlete's entourage and, especially, the criminal underworld. Nevertheless, while driving policy, such totalizing claims of organized criminals and economically motivated actors have yet to be empirically substantiated and more importantly, contrary evidence exists (ACC 2011; Paoli and Donati 2014).

Characterizations of organized crime as "mafia-like", are often based on popular media stereotypes (e.g. the Godfather) (Paoli 2004; Finckenaer 2009) and seem to be the exception rather than the rule (Desroches 2007). Rather, the structure and formation of illegal drug markets are often shaped by a variety of factors including the types of drugs dealt within them, the characteristics of the users served by them, the social structures which sustain them, the cultural context in which the markets exist, and economic and market forces (e.g. technical innovations, drug policies) (Potter 2009; Coomber 2010; Sandberg 2012; Belackova and Vaccaro 2013; Taylor and Potter 2013). As indicated in our case study of elite cycling, PIED traffickers often appear to be part of a complex network of values and behaviours in which the production, supply and use of PIEDs is embedded in particular sub-cultures (e.g. cycling, bodybuilding, policing, military) (e.g. see Kraska et al. 2010; Maycock and Howat 2007). Following this line our research on the formation and development of PIED trafficking networks within RWT and BB sub-cultures highlights several socio-cultural factors, ultimately suggesting that PIED traffickers are cultural products (Ferrell et al. 2008).

The general fitness and lifestyle context in which PIEDs are embedded, is important for understanding PIED using and dealing cultures. For example, many PIED dealers are devoted to RWT or BB prior to becoming involved in dealing (see also Sandberg 2012) and within this sub-culture, a process of "cultural normalization" (Pearson 2001) has taken place. While the supply, purchase and use of PIEDs may be considered illegal by society at large, these activities are a normal feature of "the everyday life" of many bodybuilders (South 1999). As a result of the normalization of PIED use, the supply of these substances is considered an illegal, yet legitimate practice within bodybuilding and it is in this gap, referred to as the informal economy, in which PIED suppliers operate (Webb et al. 2009). Indeed, many of the participants in our study did not consider themselves as "real" dealers, but as someone who is simply helping out friends and acquaintances with their training needs. Subsequently, PIED dealers were often not far removed from an individual's PIED use (e.g. being part of their everyday life) and PIED networks were more likely to exist of "friends" or "friends of friends" (Coomber and Turnbull 2007; Kraska et al. 2010; Maycock and Howat 2007; Parker 2000; Taylor and Potter 2013).

Moreover, PIED traffickers supply to a niche market, in which cultural knowledge is essential for entry. For instance, the instrumental nature of PIEDs requires that sellers be aware of the type of product being sold, the value(s) of its use and the differentiation of goals for consumption (e.g. see Monaghan 2001; Snippe et al. 2005). In RWT and BB sub-cultures specifically, participants pointed out that they often had to provide a host of "supplementary services" such as nutritional advice, medical advice, cycle schedules and post care treatment. As a result of the demand for cultural knowledge, dealers within RWT and BB sub-cultures are often individuals who have gained a high status in the bodybuilding community through their coaching ability (training, nutrition and PIEDs), the size of their body and/or their own personal success within bodybuilding (Monaghan 2001; Maycock and Howat 2007; Kraska et al. 2010).

Finally, economic incentives appear to be a minor motivational factor for selling PIEDs. Rather many traffickers in the RWT and BB markets appear driven by motivations stemming directly from their “cultural embeddedness”. For instance, several dealers mentioned that they supply PIEDs as a means of quality control and/or to “help friends, sport buddies and/or fellow athletes” reach their (athletic/cosmetic) goals (see also Koert and Van Kleij 1998; Kraska et al. 2010). Aside from benevolent rationales, when profit was mentioned, motivation often came forward from participation in bodybuilding. For instance, several participants mentioned that they sold PIEDs to be able to offer their clients “a complete package” and/or to sustain their own consumption (e.g. to reach high levels of bodybuilding). As such, securing a profit is a means to an end as opposed to a business opportunity (Kraska et al. 2010). Conversely, economic opportunities seem to be inhibited by the very nature of RWT and BB sub-cultures. For example, several dealers stated that they were unable to achieve financial gains as additional tasks associated with PIED trafficking and/or their own personal financial investment in bodybuilding prevented them from growing their business (see also Bouchard et al. 2009; Hammersvik et al. 2012).

The supply of PIEDs with RWT and BB sub-cultures illustrates “cultural reciprocity”, whereby the economic transaction is less significant and forms only one aspect of an enduring contract between both parties (Mauss 1967; Carrier 1990; Gus 2008). However, as Mauss (1967) points out “gifts” are never free. While dealers may not seek profit and are often willing to provide additional services, successful clients are physical proof of a suppliers’ expertise, coaching abilities, and products. When customers become successful, the suppliers and often their “gyms” gain status as well. Thus, dealers expect some form of reward for their inconvenience and risk (Coomber 2013) which frequently transcends direct material gains (e.g. selling above the costs) and instead is often symbolic (e.g. status, acknowledgement of expertise or social acceptance) (Mauss 1967).

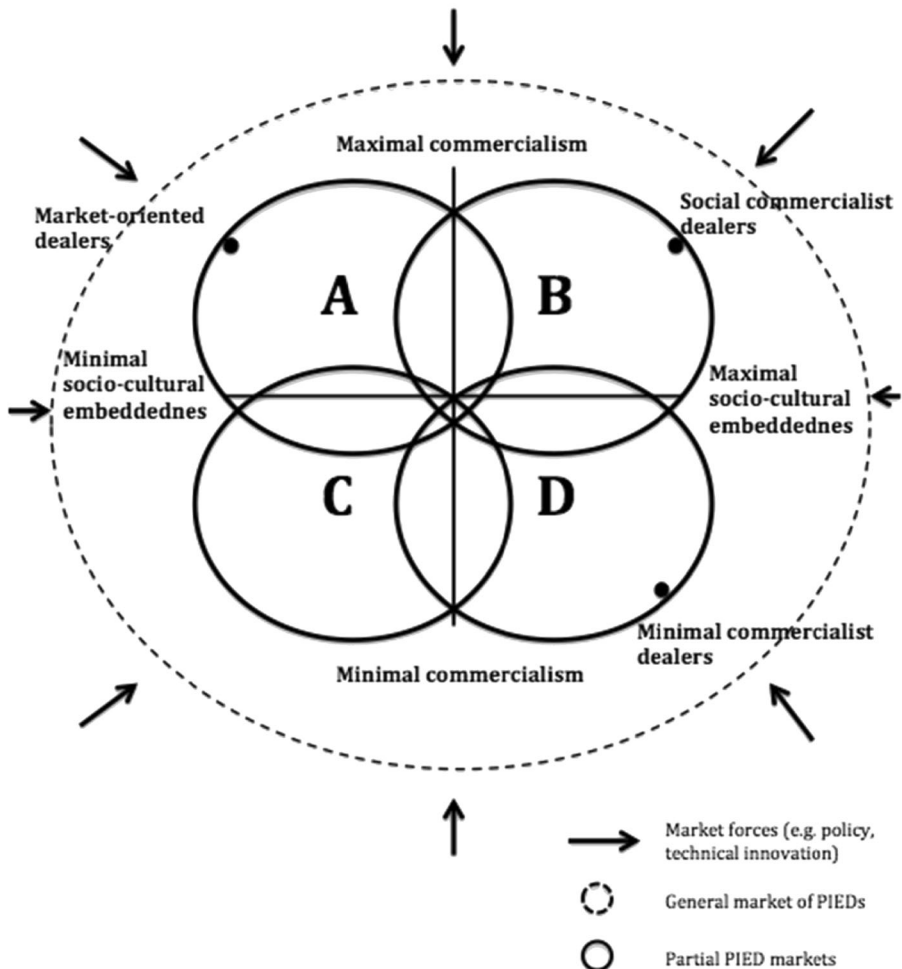
Our findings suggest that formation and development of RWT and BB PIED trafficking networks is deeply embedded in specific sub-cultural processes and practices. Said another way, in the context of RWT and BB sub-cultures, PIED traffickers are cultural products. While these findings may not be extrapolated to explain the characteristics and motivations behind all PIED trafficking networks, we may draw some general inferences from our data with respect to anti-doping claims, the empirical realities of the “black market” for PIEDs, and negative consequences relative to elite cycling.

It is clear from the extant literature that bodybuilders form one of the first and largest using groups in the PIED market (De Boer et al. 1996; Kanayama et al. 2010; Paoli and Donati 2014). For example, Paoli and Donati (2014) found that while bodybuilders represent 31% of the users in Italy, they account for 55.2% of the entire PIED market. Given such high consumption rates, it would not be unreasonable to suggest that RWT and BB’s are an ideal target market for “organized crime” and most of all, economically rational dealers. Yet, our research found no indications of “organized crime”, nor that economic incentives were the primary motivator. Indeed, the anti-doping movements’ efforts to paint PIED traffickers with the same brush is empirically bankrupt and consequently misguided.

More importantly, our research contributes another empirical case study of the proximate realities of PIED dealing networks on which local anti-doping policy may



be built. In contrast to anti-doping assertions, our findings outline the need to replace such totalizing claims with an exploration of multifarious attributes and motivations of PIED trafficking networks. We therefore suggest that future research on PIED trafficking networks document the specific characteristics of traffickers and their motivations to sell PIEDs in relation to market forces and the cultural context in which the markets exist (Potter 2009). Grounded in findings from the extant literature on PIED markets as well as our own research, we have developed a typology of PIED dealers (see Fig. 3)



**Fig. 3** A typology of PIED dealers based on their cultural embeddedness and commercialist interests. (The term “general market” refers to the PIED market as a whole and includes many private (accessible for a select group), semi-open (accessible for a select but less private group), or open (accessible for anyone) markets. A general market is created when there is a demand and supply for a certain good or service and refers to the general identity of sellers and buyers. A partial market is a specific market which has its own unique culture. For example, in the RWT and BB market for PIEDs in the Netherlands and Belgium, market consumers must have a certain level of (cultural) knowledge in order to be able to contact sellers. Thus, while PIEDs are a sellable good which may have a strong position in the general market, partial markets have particular characteristics or customs that determine the market behavior of sellers and buyers. For more information see Aspers (2011) or Sandberg (2012))

which aims to account for multiple dealer types and motivations, and in particular the ways in which socio-cultural, economic, and market forces work together in the development, formation and sustainment of PIED markets.

In Fig. 3, minimal and maximal cultural embeddedness refers to the understanding, participation and/or integration of the seller in the lives and environment of consumers and vice versa. Whereas, minimal and maximal commercialism refers to the economic interests of the PIED dealer. For example, dealers in the bottom right corner of category D represent the bulk of those found in our study of RWT and BB sub-cultures. These dealers can be best described as “minimally commercial dealers” (Coomber and Moyle 2013) for whom profits is not the primary motivation, but rather are involved in trafficking due to the social and cultural setting they inhabit. In contrast, the top left hand corner of category A represents the dealer typology put forward by much of the anti-doping movement. These dealers can be best described as “market-oriented dealers” for whom securing profits is paramount as their involvement in trafficking derives predominantly from economic incentives (e.g. organized crime). Paoli and Donati (2014) would consider these to be “generalist dealers” - suppliers with no distinctive profession or occupation - who are willing to sell PIEDs to whomever is interested to purchase. Essentially, these are but two ideal types and multiple variations in levels of “cultural embeddedness” and economic motivation will exist. For example, our data also identified “social-commercialist dealers” (Hough and Natarajan 2000) which would occupy the top right corner of category B. Such dealers are a hybrid in that they are economically motivated and sell large quantities of PIEDs, yet retain a deep embeddedness in RWT and BB sub-culture. It is imperative to note that PIED dealers may come in a variety of “types” and that they may be motivated by a plurality of factors, often simultaneously. Thus, the aim of this figure is not to confine PIED dealers to specific categories but to advance and allow for thick descriptive accounts of multiple dealer characteristics and motivations.

Finally, the case study of RWT and BB sub-cultures revealed findings relative to the unintended negative consequences found in elite cycling. As cycling teams and external physicians have largely been pushed out of the elite cycling market for doping products, so too are “minimal commercialist dealers” being excluded from the Belgian and Dutch PIED markets. Increased law enforcement appears to be successfully deterring “minimal commercialist dealers” as the stakes of participation in the RWT and BB PIED market become too high for culturally embedded dealers. Yet, the demand driven market for PIEDs can easily cope with repressive anti-doping policies and supply simply adjusts distribution methods and distributors (May and Hough 2004; Decorte 2010). Indeed, as the PIED market becomes more lucrative and subject to increasing attention from the authorities, minimal commercialist dealers are being replaced by more overtly criminal types driven by profit, willing to take risks and prepared to use violence or the threat of violence to protect their market share (Potter 2009).

In fact, there are some indications of the presence of a “new” type of dealer, devoid of the socio-cultural attributes of “minimally commercial dealers” in the Dutch and Belgian market (De Hon and Van Kleij 2005). For example, several Dutch/Belgian authorities and bodybuilders mentioned that dealers with no specific connection to the fitness industry, are increasingly selling PIEDs through gyms and on the Internet<sup>10</sup>.

<sup>10</sup> The Internet is playing a growing role in the selling and buying of PIEDs (Dutch Health Commission 2010; Cordaro et al. 2011) and has a profound impact on the nature of PIED dealing (Kraska et al. 2010).

Throughout the course of our research we noted a shift in the RWT and BB market from “minimally commercial dealers” and “social-commercialist dealers” to more “market oriented dealers”. Notably, the withdrawal of “minimal commercialist dealers” have implications for consumer health. Similar to the oversight role played by cycling teams and external physicians in the elite cycling case study, many PIED dealers in the RWT and BB sub-cultures serve as gatekeepers, ensuring the quality of PIEDs, and as makeshift doctors, providing medical advice and overseeing their clients consumption. Conversely, market-oriented dealers bring with them a host of increased risks such as loss of expert advice (e.g. cycles), PIEDs of bad quality and a “hardening” of the market (De Hon and Van Kleij 2005).

## Conclusion

The “war on doping” has been a response to the genuine crisis of doping in sport and the inability of anti-doping to curb the problem through traditional measures (McNamee and Tarasti 2011). Despite the high number of tests administered and an ever expanding program of surveillance, sport remains rife with doping scandals and yet the catch rate remains relatively low at 2–3% (Mottram 2011). However in the face of failure, anti-doping has not conceded defeat, but rather justifies its existence by net widening. Indeed, much of anti-doping expansion is endogenous; filling or creating categories. As Cohen (1985) points out regarding the legitimacy of “delinquency professionals”, when rehabilitative penal reform was called into question, this is the dilemma of the rule enforcer (Becker 1963) in crisis; “be assured, we are doing our job, things are under control, but unless we are given more resources, things will get completely out of hand”. To achieve legitimacy it is in the best interest of anti-doping to enlarge the system (Cohen 1985; Foucault 1977; Rothman 1971). In particular, the expansion in focus from the doping practices of athletes to the machination of what is presented as a global criminal mafia that is in control of the PIEDs market has served to both justify failure and re-enforce the need for a larger and more potent anti-doping movement. As Mitsilegas (2003: 83) states:

[...] this common concept [organized crime] paves the way for increased international judicial and police cooperation, and potentially, for an extension of law enforcement powers. This has been achieved through a potent securitization process at a global level, which, exploiting the ‘emotional kick’ of the organized crime imagery and terminology (Levi 1998: 336) portrayed crime as an ever-growing phenomenon and a global, multifaceted security threat.

Thus, whether or not organized crime is really involved, labelling it as such gives way to implement harsher measures and sanctions. By raising sport doping to the level of a social problem, the anti-doping movement has transcended the boundaries of elite sports and penetrated into the social body. Certainly, the expansion to include traffickers of PIEDs has resulted in stronger relations with national and global governments and police organizations, increased powers of investigation and sanctions for the WADA and ultimately a more powerful anti-doping movement.

We maintain that the expansion of anti-doping from the private world of professional athletics into the arena of social policy, or more specifically, the drug policies of

individual nations, is a dangerous step backwards which may have grave repercussions for both sport and society. Our case studies of elite cycling and RWT and BB sub-cultures illustrates that the current anti-doping policy is leading to several negative consequences. Indeed, much of the anti-doping movements' expansion is iatrogenic; mopping up the casualties created by its own operations (Cohen 1985; Mulrooney 2012). For example, the 2011 Australian Crime Commission report suggested that:

“The ease with which these drugs [PIEDs] can be obtained, and the wide user base, results in an extremely broad supply base. Although criminal individuals and groups are consistently identified as possessing and using performance and image enhancing drugs, they are just one section of the broader market. The *ready availability of these drugs reduces opportunities for organized crime* groups to control or have significant influence in this market.” (p.70; emphasize added).

However, the increased law enforcement against “minimal commercial” dealers and the athlete’s entourage becomes a self-fulfilling prophecy as it creates the conditions for market-oriented dealers. By pushing “culturally embedded” dealers out of the market, such as the cycling team and bodybuilders and “medical experts” (e.g. physicians), anti-doping enhances opportunities for monopolization and the risk exists that minimally commercial suppliers will be replaced by “non-experts”, “real dealers”, or “organized criminals”. Similar displacement effects have long been well established in other “illegal” drug markets (e.g. Caulkins and MacCoun 2003; Decorte 2010; Dorn and South 1990; May and Hough 2001). Under such conditions, claims of organized crime and economic rationalism begin to look more likely.

Additionally, the withdrawal of “culturally embedded” dealers decreases many protective factors such as medical advice, expert guidance, and access to clean PIEDs, while the increase in dealers devoid of cultural attributes increases many risk factors, such as poor quality PIEDs, market hardening, and unequal access to PIEDs. The latter consequence is particularly important in relation to elite cycling as the changing nature of supply chains has restricted access for some, leading to greater inequality on the playing field. In the name of sports ethics and the protection of the athletes’ health, current anti-doping policy is ironically leading to several unintended negative consequences that did previously exist (ACC 2011; Paoli and Donati 2014) and making the problem of doping in sports worse through prevention and intervention founded in zero-tolerance.

The “war on drugs” has left a trail of evidence which suggests that the criminalization of producers, suppliers and users of illegal drugs has not limited consumption nor supply (Baker 2014; Costa 2008; Global Commission 2011). Rather, a zero tolerance drug policy has led to geographical displacement (drug/consumers), the stigmatization and marginalization of users, a large criminal market, high levels of incarceration and death and disease (Beckett 1997; Costa 2008; Jensen et al. 2004). While the “war on doping” has yet to reach the extent of the “war on drugs”, a similar policy trend can be noted; a shift to law enforcement mechanisms at the expense of public health (Fincoeur et al. 2014; Mulrooney and Van de Ven 2013), the displacement of criminal activities to other countries with a lax regulation (Koert and Van Kleij 1998; Paoli and Donati 2014), the presence of more dangerous experimental PIEDs (Kayser et al. 2007; Smith and Stewart 2008), the exclusion and marginalization of PIED users (Coomber 2013) and evidence of a growing criminal “black market” (Paoli and Donati 2014).

If the current anti-doping regime, dominated by punishment and control continues unabated, these unintended negative consequences are likely to increase. At a time when many states (e.g. Colorado and Washington) and countries (e.g. Uruguay and Portugal) are re-forming zero-tolerance drug policies in favour of health based models (e.g. see Greenwald 2009; Hughes and Stevens 2007), anti-doping appears headed in the opposite direction. It is time to rethink our approach to curbing the problem of doping in sports. At the very least, anti-doping should remain within the confines of professional sport. Ideally, we suggest that athletes, sport and society would be best served by an anti-doping movement which directs its power and attention towards education, prevention, and harm minimization.

## References

- Abadinsky H (2010) *Organized crime*, ninth edn. Wadsworth CENGAGE Learning, Belmont
- Aspers P (2011) *Markets*. Polity, Cambridge
- Australian Crime Commission (2011) *Organised crime in Australia 2011*. ACC, Canberra
- Baker N (2014) *Drugs: international comparators. Reducing drugs misuse and dependence*. Home Office, UK
- Becker HS (1963) *Outsiders*. Free Press, Glencoe
- Beckett K (1997) *Making crime pay: law and order in contemporary American politics*. Oxford University Press, Oxford
- Belackova V, Vaccaro CA (2013) “A friend with weed is a friend indeed”: understanding the relationship between friendship identity and market relations among marijuana users. *J Drug Issues* 43:289–313
- Berger P, Luckmann T (1986) *La construction sociale de la réalité*. Méridiens Klincksieck, Paris
- Bojsen-Møller J, Christiansen AV (2010) Use of performance- and image enhancing substances among recreational athletes: a quantitative analysis of inquiries submitted to the Danish anti-doping authorities. *Scand J Med Sci Sports* 20:861–867
- Bouchard M, Alain M, Nguyen H (2009) Convenient labour: the prevalence and nature of youth involvement in the cannabis cultivation industry. *Int J Drug Pol* 20(6):467–474
- Brissonneau C (2007) Le dopage dans le cyclisme professionnel au milieu des années 1990: une reconstruction des valeurs sportives. *Déviance Soc* 31(2):129–148
- Brissonneau C, Ohl F (2010) The genesis and effect of French anti-doping policies in cycling. *Int J Sport Pol Polit* 2(2):173–187
- Brissonneau C, Aubel O, Ohl F (2008) *L'épreuve du dopage. Sociologie du cyclisme professionnel*. PUF, Paris
- Carrier JG (1990) Gifts in a world of commodities: the ideology of the perfect gift in American society. *Soc Anal* 29:19–37
- Caulkins JP, MacCoun R (2003) Limited rationality and the limits of supply reduction. *J Drug Issues* 33:435–466
- Christiansen AV (2005) The legacy of Festina: patterns of drug use in European cycling since 1998. *Sports Hist* 25(3):497–514
- Christiansen AV (2011) Bodily violations: testing citizens training recreationally in gyms. In: McNamee M, Møller V (eds) *Doping and anti-doping in sport: ethical, legal and social perspectives*. Routledge, London, pp 136–141
- Coakley J, Pike E (2009) *Sport in society: issues and controversies*. McGraw Hill, Boston
- Cohen S (1985) *Visions of social control*. Polity Press, Cambridge
- Commissie Anti-Doping (2013, July 7). Meedoen of stoppen. Eindrapport van de Commissie Anti-Doping Aanpak: onderzoek naar de dopingcultuur in het Nederlandse wegwielrennen bij de heren. Retrieved from <http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2013/07/01/meedoen-of-stoppen.html>
- Coomber R (2010) Reconceptualising drug markets and drug dealers - the need for change. *Drugs Alcohol Today* 10:10–13
- Coomber R (2013) How social fear of drugs in the non-sporting world creates a framework for doping policy in the sporting world. *Int J Sport Pol* 6(2):171–193
- Coomber R, Moyle L (2013) Beyond drug dealing: developing and extending the concept of ‘social supply’ of illicit drugs to ‘minimally commercial supply’. *Drugs: Educ Prev Policy* 21(2):157–164

- Coomber R, Turnbull P (2007) Arenas of drug transactions: adolescent cannabis transactions in England - Social supply. *J Drug Issues* 37(4):845–866
- Cordaro FG, Lombardo S, Cosentino M (2011) Selling androgenic anabolic steroids by the pound: identification and analysis of popular websites on the Internet. *Scand J Med Sci Sports* 21(6):247–259
- Costa AM (2008) Making drug control ‘fit for purpose’: building on the UNGASS decade. United Nations Office on Drugs and Crime, Vienna
- De Boer A, Van Haren SF, Hartgens F, De Boer D, Porsius AJ (1996) Onderzoek naar het gebruik van prestatieverhogende middelen bij bodybuilders in Nederland. Nederlands Centrum voor Dopingvraagstukken, Rotterdam
- De Hon O, Van Kleij R (2005) Een inventarisatie van de kwaliteit van illegaal verhandelde dopinggeduide middelen en de gezondheidsrisico’s bij gebruik. Nederlandse Centrum voor Dopingvraagstukken, Capelle aan den IJssel
- Decorte T (2010) The case for small-scale domestic cannabis cultivation. *Int J Drug Pol* 21:271–275
- Desroches F (2007) Research on upper-level drug trafficking: a review. *J Drug Issues* 37:828–845
- Dimeo P (2009) The origins of anti-doping policy in sports : from public health to fair-play. In: Møller V, McNamee M, Dimeo P (eds) *Elite sport, doping and public health*. University Press of Southern Denmark, Odense, pp 29–40
- Donati A (2007) *World traffic in doping substances*. World Anti-Doping Agency, Lausanne
- Dorn N, South N (1990) Drug markets and law enforcement. *Br J Criminol* 30(2):171–188
- Dunn M, White V (2011) The epidemiology of anabolic-androgenic steroid use among Australian secondary school students. *J Sci Med Sport* 14:10–14
- Fainaru-Wada M, Lance W (2006) *Game of shadows: Barry bonds, BALCO and the steroids scandal that rocked professional sports*. Gotham, New York
- Ferrell J, Hayward K, Young J (2008) *Cultural criminology: an invitation*. SAGE Publications Ltd., London
- Finckenaer JO (2009) Organized crime. In: Tonry M (ed) *The Oxford handbook of crime and public policy*. Oxford University Press, Oxford, pp 273–303
- Fincoeur B, Paoli L (2014) Des pratiques communautaires au marché du dopage. Evolution de la distribution des produits dopants dans le cyclisme. *Déviance Soc* 38(1):3–27
- Fincoeur, B., Frenger, M., & Pitsch, W. (2014). Does one play with the athletes’ health in the name of ethics. *Performance Enhancement & Health*. Online first
- Foucault M (1977) *Discipline and punish: the birth of the prison*. Pantheon, New York
- Gaumont P (2005) *Prisonnier du dopage*. Grasset, Paris
- Gezondheidsraad (Dutch Health Council) (2010) *Dopinggebruik in de ongeorganiseerde sport*. Gezondheidsraad, Den Haag
- Global Commission (2011). *War on drugs: report of the Global Commission on drug policy*. Retrieved from <http://www.opensocietyfoundations.org/sites/default/files/global-commission-report-english-20110624.pdf>.
- Goode E (2011) Sports doping as deviance: anti-doping as moral panic. *International Network of Humanistic Doping Research*, Aarhus
- Greenwald G (2009) *Drug decriminalization in Portugal: lessons for creating fair and successful drug policies*. Cato Institute, Washington
- Gus A (2008) ‘Gifts vs. commodity’ debate revisited. *Anthropol Notebooks* 14(1):81–102
- Hamilton T, Coyle D (2012) *The secret race: inside the hidden world of the tour de France: doping, cover-ups, and winning at all costs*. Bantam, New York
- Hammersvik E, Sandberg S, Pedersen W (2012) Why small-scale cannabis growers stay small: five mechanisms that prevent small-scale growers from going large scale. *Int J Drug Pol* 23(6):458–464
- Hanstad DV, Loland S (2009) Elite level athletes’ duty to provide information on their whereabouts: justifiable anti-doping work or an indefensible surveillance regime? *Eur J Sport Sci* 9(1):3–10
- Hanstad DV, Smith A, Waddington I (2008) The establishment of the world anti-doping agency: a study of the management of organizational change and unplanned outcomes. *Int Rev Sociol Sport* 43(3):227–249
- Hoberman JM (2002) A pharmacy on wheels: doping and community cohesion among professional cyclists following the tour de France scandal of 1998. In: Møller V, Nauright J (eds) *The essence of sport*. University Press of Southern Denmark, Odense, pp 107–127
- Hough M, Natarajan M (2000) Introduction: illegal drug markets, research and policy. In: Hough M, Natarajan M (eds) *Illegal drug markets: from research to policy*. Criminal Justice Press, Monsey, pp 1–18
- Houlihan B (2003) *La victoire à quel prix? Le dopage dans le sport*. Council of Europe, Strasbourg
- Hughes C, Stevens S (2007) The effects of the decriminalization of drug use in Portugal. *The Beckley Foundation Drug Policy Programme*, United Kingdom
- Jensen EL, Gerber J, Mosher C (2004) Social consequences of the war on drugs: the legacy of failed policy. *Crim Justice Pol Rev* 15(1):100–121



- Kanayama G, Hudson J, Pope JHG (2010) Illicit anabolic-androgenic steroid use. *Horm Behav* 58(1):11–21
- Kaysers B, Mauron A, Miah A (2007) Current anti-doping policy: a critical appraisal. *BMC Med Ethics* 8:1–10
- Koert AWA, Van Kleij R (1998) Handel in doping. Een verkennend onderzoek naar de handel in dopinggeduide middelen in Nederland. NeCeDo, Capelle aan de IJssel
- Kraska PB, Bussard CR, Brent JJ (2010) Trafficking in bodily perfection: examining the late-modern steroid marketplace and its criminalization. *Justice Q* 27(2):159–185
- Latty F (2007) *La Lex Sportiva : Recherche sur le droit transnational*. Martinus Nijhoff Publishers, Leiden
- Leifman H, Rehnman C, Sjoblom E, Holgersson S (2011) Anabolic androgenic steroids—use and correlates among gym users - an assessment study using questionnaires and observations at gyms in the Stockholm region. *Int J Environ Res Public Health* 8:2656–2674
- Levi M (1998) Perspectives on ‘organised crime’: an overview. *Howard J Crim Justice* 37(4):335–345
- Mauss M (1967) *The gift: forms and functions of exchange in Archaic societies*. The Northon Library, New York
- May T, Hough M (2001) Illegal dealings: the impact of low-level police enforcement on drug markets. *Eur J Crim Pol Res* 9(2):137–162
- May T, Hough M (2004) Drug markets and distribution systems. *Addict Res Theory* 12(6):549–563
- Maycock BR, Howat P (2007) Social capital: implication from an investigation of illegal anabolic steroid networks. *Health Educ Res* 22(6):854–863
- Mazanov J, Connor J (2010) Rethinking the management of drugs in sport. *Int J Sport Pol Polit* 2(1):49–63
- McNamee M, Tarasti L (2011) Ethico-legal aspects of anti-doping legislation. In: McNamee M, Møller V (eds) *Doping and anti-doping in sport. Ethical, legal and social perspectives*. Routledge, London
- Millar D (2012) *Racing through the dark: the fall and rise of David Millar*. Orion, London
- Mitsilegas V (2003) From national to global, from empirical to legal: the ambivalent concept of transnational organised crime. In: Beare ME (ed) *Critical reflections on transnational organised crime, money laundering, and corruption*. University of Toronto Press Incorporated, Toronto, pp 55–87
- Møller V (2005) Knud Enemark Jensen’s death during the 1960 Rome Olympics: a search for truth? *Sport Hist* 25(3):452–471
- Møller, V. (2013). Who guards the guardians? *Int J Hist Sport*. Retrieved from <http://dx.doi.org/10.1080/09523367.2013.826652>
- Monaghan LF (2001) *Bodybuilding, drugs and risk*. Routledge, Abingdon
- Mottram DR (2011) A historical perspective of doping and anti-doping in sport. In: Mottram DR (ed) *Drugs in sport*. Routledge, London, pp 21–34
- Mulrooney KJD (2012) Delinquency professionals: the influence, extension and adoption of the culture of control. *The Oñati Socio-Legal Ser* 2(1):1–48
- Mulrooney KJD, Van de Ven K (2013) The framing and managing of the doping threat: the WADA and the widening net of anti-doping [conference paper]. International network of humanistic doping research conference, Aarhus
- Ohl, F., Fincoeur, B., Lentillon-Kaestner, V., Defrance, J., & Brissonneau, C. (2013). The socialization of young cyclists and the culture of doping. *Int Rev Sociol Sport*. Online first
- Oldersma F, Snippe J, Bieleman B (2002) *Doping en handel: Onderzoek naar aard en omvang van dopinghandel en ontwikkeling van indicatoren*. Bureau Intraval, Groningen
- Paoli L (2004) The history of organized crime. In: Fijnaut C, Paoli L (eds) *Concepts, patterns and control policies in the European Union and beyond*. Springer, Dordrecht, pp 21–46
- Paoli L, Donati A (2014) *The sports doping market*. Springer, New York
- Parker H (2000) How young Britons obtain their drugs: drug transactions at the point of consumption’. *Crime Prev Stud* 11:59–81
- Pearson G (2001) Normal drug use: ethnographic fieldwork among an adult network of recreational drug users in inner London. *Subst Use Misuse* 36(1–2):167–200
- Pedersen IK (2010) Doping and the perfect body expert: social and cultural indicators of performance-enhancing drug use in Danish gyms. *Sport Soc: Cult Commer Media Polit* 13(3):503–516
- Pope HG, Kanayama G, Hudson JI (2012) Risk factors for illicit anabolic-androgenic steroid use in male weightlifters: a cross-sectional cohort study. *Biol Psychiatry* 71:254–261
- Potter G (2009) Exploring retail-level drug distribution: social supply, ‘real’ dealers and the user/dealer interface. In: Demetrovics T, Fountain J, Kraus L (eds) *Old and new policies, theories, research methods and drug users across Europe*. Pabst Publications, Lengerich
- Rothman DJ (1971) *The discovery of the asylum: social order and disorder in the new republic*. Little Brown, Boston
- Sallé L, Lestrelin L, Basson JC (2006) *Le Tour de France 1998 et la régulation du dopage sportif : reconfiguration des rapports de force*. *Staps* 73:9–23
- Sandberg S (2012) The importance of culture for cannabis markets. *Br J Criminol* 52:1133–1151

- Schneider A (2006) Cultural nuances: doping, cycling and the tour de France. *Sport Soc* 9:212–226
- Sénat français (2013). Rapport fait au nom de la commission d'enquête sur l'efficacité de la lutte contre le dopage. Retrieved from <http://www.senat.fr/rap/r12-782-1/r12-782-11.pdf>
- Simon P, Striegel H, Aust F, Dietz K, Ulrich R (2006) Doping in fitness sports: estimated number of unreported cases and individual probability of doping. *Addiction* 101:1640–1644
- Smith, A.C.T., & Stewart, B. (2008). Drug policy in sport: hidden assumptions and inherent contradictions. *Drug Alcohol Rev*, 1-21
- Snippe J, Ogier C, Naayer H, Bieleman B (2005) Stimulerende zaken opgespoord. Evaluatie wetswijziging bestrijding doping in de sport. Intraval, Groningen
- Soule B, Lestrelin L (2011) The Puerto Affair: revealing the difficulties of the fight against doping. *J Sport Soc Issues* 35(2):186–208
- South N (1999) Debating drugs and everyday life: normalisation, prohibition and 'otherness'. In: South N (ed) *Drugs: cultures, controls and everyday life*. Sage, London
- Taverna N, Aubel O (2013) Vulnérabilités et risques organisationnels liés au dopage dans le cyclisme professionnel [conference paper]. the Association des Chercheurs en Activités Physiques et Sportives (ACAPS), Grenoble
- Taylor M, Potter GR (2013) From “social supply” to “real dealing”: drift, friendship, and trust in drug-dealing careers. *J Drug Issues* 43:392–406
- The Guardian (2008, July 9). The Festina affair. Retrieved from <http://www.theguardian.com/sport/gallery/2008/jul/09/tourdefrance.cycling>
- The Guardian (2014, October 7). Organised crime controls 25% of world sport, says World Anti-Doping Agency [video]. Retrieved from [http://www.theguardian.com/sport/video/2014/oct/07/organised-crime-sport-world-anti-doping-agency-video?utm\\_content=buffer90d54&utm\\_medium=social&utm\\_source=twitter.com&utm\\_campaign=buffer](http://www.theguardian.com/sport/video/2014/oct/07/organised-crime-sport-world-anti-doping-agency-video?utm_content=buffer90d54&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer).
- WADA (2009). 2009 Annual Report. Retrieved from [https://www.wada-ama.org/en/resources/finance/annual-report#.VE\\_hJb64l0s](https://www.wada-ama.org/en/resources/finance/annual-report#.VE_hJb64l0s)
- Waddington I (2000) *Sport, health and drugs. A critical sociological perspective*. Spon Press, London
- Waddington I, Smith A (2009) *An introduction to drugs in sport : addicted to winning?* Routledge, London
- Webb JW, Tihanyi L, Duane Ireland R, Sirmon DG (2009) You say illegal, I say legitimate: entrepreneurship in the informal economy. *Acad Manag Rev* 34(3):492–510
- Wolfgang ME, Ferracuti F (1967) *The subculture of violence: toward an integrated theory in criminology*. Tavistock, London
- Yesalis C, Bahrke M (2002) History of doping in sport. *Int Sports Stud* 24(1):42–76