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Commentary

# The unintended consequences of emphasising blood-borne virus in research on, and services for, people who inject image and performance enhancing drugs: A commentary based on enhanced bodybuilder perspectives

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ABSTRACT

Blood-borne viruses (BBVs) are an established focus of drug research and harm reduction. While a focus on BBVs has been applied to people who inject image and performance enhancing drugs (IPEDs), research has demonstrated that there are significant differences between this group and people who inject other drugs. Furthermore, the literature on BBVs and IPED use has been misrepresented by the media and harm reduction programs, with significant consequences for how some people who inject IPEDs view academic research and health services. It seems time to ask, is our current approach to the issue of BBV among people who inject IPEDs the most appropriate, and are there ways that it could be improved to ensure that there are no unintended consequences? In this commentary I suggest ways research and harm reduction efforts could tackle the issue of BBV without exacerbating existing divides between people who inject IPEDs and the health and academic communities. These suggestions are based on the views of the enhanced bodybuilders with whom I am privileged to work.

## Introduction

It is well-established that people who inject drugs are at risk of BBVs. The provision of comprehensive harm reduction services, in particular needle and syringe programmes, are an effective method of preventing the transmission of HIV and other BBVs. The early implementation of these strategies was a key factor in averting an HIV epidemic in several countries (Stimson, 1996).

Obviously, the provision of needle and syringe programs that cater to people who inject IPEDs are vital and necessary services to ensure BBV prevention. These services should not only continue, but be expanded and improved so that they best cater to people who inject IPEDs who are in many ways different from the traditional clientele of these services (i.e. people who inject psychoactive drugs). But, beyond the provision of these services is it necessary to place as much emphasis on BBVs in IPED research and service provision as is currently the case? Indeed, do needle and syringe programs have to frame their services for people who inject IPEDs in terms of BBV prevention if a shift of focus could achieve the same outcome but without the unintended consequences described in this paper?

Literature on IPED harm reduction has a substantial focus on injecting practice, and particularly BBV risk (e.g. Aitken, Delalande, & Stanton, 2002; Crampin et al., 1998; Day, Topp, Iversen, & Maher, 2008; Hope et al., 2013, 2017; Ip, Yadao, Shah, & Lau, 2016; Larance, Degenhardt, Copeland, & Dillon, 2008; Rowe, Berger, Yaseen, & Copeland, 2017). This is understandable given that BBV transmission has historically been the primary focus of harm reduction efforts related to injecting practice. A focus on BBV is familiar territory for drug researchers, and is a well-trodden route to research and service funding. However, people who inject IPEDs are often different from those who are the traditional focus of drug research and service provision: people who inject psychoactive drugs. People who inject IPEDs typically have different injection practices, lifestyles, and motivations for use, and in many cases are much more methodical in their planned drug usage (Hope et al., 2015; Ip et al., 2016). Despite the published HIV prevalence levels amongst some people who inject IPEDs (Hope et al., 2013), perhaps a focus on the transmission of BBVs via injection is less appropriate when it comes to people who inject IPEDs, and a different approach to harm reduction is required.

## A new approach

BBV was not initially a focus of my research. Rather I have been primarily focussed on the risks of IPED use as they are discussed by bodybuilders (Underwood, 2017). However, I was inspired to explore this area after being asked to speak at a symposium on IPED injection hosted by a university group focused on BBV prevention. My extensive field notes and interview transcripts collected over three years of

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**Box 1**

*majority of users wouldnt even trust if they saw u open the needle package but rather open it themselves to be sure its a new one* [Joel]

*No one shares needles in the community. Even the really dumb kids who "learned" from YouTube guys get that needles range from free to almost free* [Ian].

*if i was out of clean needles for steroids id wait a day to get more, give me 8mg dilaudid* [an opioid pain medication] *and i wouldnt care what i used (as long as it was mine) the desperation factor isnt there* [with IPED injection] *which mitigates alot of risk or risky injection practices* [Jack].

(primarily online) ethnographic research with enhanced bodybuilders contained virtually nothing on BBVs. While some bodybuilders will occasionally ask for advice on using IPEDs after contracting a BBV through a tattoo, or psychoactive drug injection, they never discuss BBV as a risk of IPED injection. Indeed, bodybuilders criticised a prominent IPED researcher for stating that BBVs were the main public health concern raised by IPED use.

Given the near silence on this issue, I decided, as ethnographers frequently do (Maher, 2002; Rabinow, 1977) to interrogate and violate this silence. I am privileged to have ongoing relationships with enhanced recreational bodybuilders (i.e. bodybuilders who do not compete in competitions and who inject IPEDs) including community experts who advise people who use IPEDs on harm reduction. So I approached them and entered into a dialogue about BBVs.

Until now most academics write *about* people who inject IPEDs, rather than *with* people who inject IPEDs. As a result, the priority given to BBVs in IPED harm reduction has never been questioned. This is understandable given the relevance and effectiveness of a focus on BBV in other drug injecting populations. However, I have found that enhanced bodybuilders not only have strong opinions about the place of BBV in IPED research and harm reduction, but also have suggestions on how research and harm reduction could be improved. This commentary is based on their views. Verbatim quotes (including original grammar and spelling) are provided in order to illustrate their views, ensure authenticity, and to illustrate possible barriers to engagement with consumers of IPEDs.

## Conflation and misrepresentation of BBV risk

Numerous authors have noted the actual or possible conflation of routes of transmission in their research on the prevalence of BBVs among people who inject IPEDs. For example, Aitken et al. (2002), conclude that factors other than IPED injection were associated with BBV exposure. Larance et al. (2008) suggest that their "findings confirm that BBV infection may be associated with factors other than IPEDs use *per se*". Hope et al. (2013) conclude that their "findings suggest that sexual risk and the use, particularly the injection, of psychoactive drugs are possibly the most important factors associated with BBV transmission among IPED injectors" and suggest that the transmission of BBVs through IPED injection is "possible".

Despite these acknowledgements of risk conflation, BBV prevalence figures have been misinterpreted by the media and those designing harm reduction campaigns (despite often good intentions). In particular, statistics on the prevalence of BBVs among people who inject IPEDs have been misrepresented as evidence of the risk posed by IPED injection. For instance, several enhanced bodybuilders drew my attention to sensational claims in some media and harm reduction materials such as "Steroid injectors are now as likely as heroin injectors to contract HIV through sharing injection equipment". This is presumably based on Hope et al.' (2013) research which reported a similar prevalence of HIV among people who inject IPEDs, as had previously been reported among people who inject heroin. While Hope et al. (2013) discuss the prevalence of BBV among people in the UK who inject IPEDs (and did not attribute this prevalence to the sharing of needles to inject IPEDs), their findings have been misinterpreted as evidence of the rates of BBV transmission through IPED injection, and have been generalised across all communities of people who inject IPEDs.

It is easy to misinterpret the existing research as evidence of the potential harms posed by IPED injection, when in reality it is focused on BBV prevalence, regardless of routes of transmission, among people who inject IPEDs. I initially did so myself. Therefore, researchers need to be extremely careful to emphasise the conflation of routes of transmission in these prevalence statistics. I have found that people who inject IPEDs read this literature and the accompanying media, and do sometimes see these conflations as deliberate misrepresentations of their practices and lifestyles.

## Differences in injection practices

Enhanced bodybuilders typically do not use IPEDs with other people. *If* they use with others they typically do not share needles, vials or any other equipment. They rarely even reuse their own needles, and wash their hands, swab vials and injection sites, and dispose of needles safely. These practices are widely promoted. For example, all of the many 'how to inject steroids' YouTube videos I have watched included the use of sterile equipment (the consumer is shown opening the wrapping), and the swabbing of vials and injection sites. While most videos ended with the conclusion of the injection, some also included safe disposal. Enhanced bodybuilders' injection practices are typically informed by little or no desperation to use IPEDs (unlike other drugs), thus greatly reducing the likelihood that they would engage in risky injection practices (Box 1).

While obviously all injecting practices are potential routes for the transmission of BBVs, as a result of their injection practices people who inject IPEDs are less likely than consumers of other drugs to place themselves at risk of BBV infection. There may or may not be different risks associated with intramuscular injection as opposed to intravenous injection (this is beyond the scope of this paper). However, it is well established that people who inject IPEDs place themselves at less risk because of their considerably lower rates of needle sharing. Ip et al. (2016) reviewed 20 studies of needle sharing among people who inject IPEDs and found a prevalence ranging from 0 to 24%, averaging 3.5%.

While the established rate of needle sharing among people who inject IPEDs is low, and is in fact 10 times smaller than the rate of needle sharing found among people who inject psychoactive drugs (35% (Ip et al., 2016)), it is possible that even this low figure is overstating the amount of needle sharing for IPED injection. The reviewed studies (e.g. Larance et al., 2008; Perry, Wright, & Littlepage, 1992) focused on needle sharing in general, and not needle sharing for IPED injection specifically. One study reviewed was even focused on multiple drug use among people who inject IPEDs (DuRant, Rickert, Ashworth, Newman, & Slavens, 1993). Therefore, it is likely that much of the needle sharing reported was actually needle sharing to inject psychoactive drugs rather than IPEDs.

Enhanced bodybuilders argue that given the different injection practices of people who inject IPEDs, and particularly the low rates of needle sharing, a focus on BBV demonstrates ignorance with regards the practice of IPED injection (and therefore the actual likelihood of contracting a BBV through IPED injection). A focus on BBV, they suggest, demonstrates a mistaken generalisation across all people who inject

**Box 2**

*they put IPED users in the drug addiction corner. … they view IPEDs in the same category as heroin, coke, meth and other drugs. Therefore they expect the same risk factor* [Tom].

*Its funny too because, bodybuilders/aas users are actually the complete opposite of a junkie, we take care to dress well, eat well, smell good, shave, do regular health check up, bloodwork, exercise, and most of all we are all usually very self motivated driven people, and many if not most of us having an ocd trait of always wanting perfection or at least bettering ourselves in every possible way, so the fact we are labelled somewhat as junkies* [by the focus on BBV] *is so far from the truth* [Sebastian].

*I would probably go as far as to say as soon as needles are involved, the assumption is that disease is rampant and its a disgusting exercise. But I liken it to diabetes in a way. Someone needs a daily shot of insulin, they are given needles and a bottle of the compound. IPED users are supplementing testosterone and its derivatives while others supplement insulin. Both are hormones. Both need to be injected into the body …. Both are done in a very solitary way* [Tony].

drugs, and a likening of people who inject IPEDs with people who inject psychoactive drugs ('junkies'). People who inject IPEDs see themselves as fundamentally different from people who inject other drugs, and thus a focus on BBVs can cause them offense. Some enhanced bodybuilders feel that they more closely resemble diabetics who inject insulin, than people who inject psychoactive drugs. As there is not an equivalent emphasis on BBV transmission among diabetics, they question the appropriateness of a focus on BBVs with regards to IPED injection (Box 2).

## The unintended consequences of a focus on BBV

A focus on BBV has more than the potential to offend people who inject IPEDs, but also has significant consequences for how people who inject IPEDs engage with researchers and health services. Enhanced bodybuilders state that the focus on BBV in discussions of IPED research and harm reduction is too great. They conclude this on the basis of 1) the scientific literature (e.g. the number of papers published on IPEDs and BBV), 2) harm reduction materials and media focused on BBVs, and 3) the fact that I was asking them about it in order to engage in current debates. Enhanced bodybuilders suggest that a focus on BBV:

1) demonstrates ignorance of the range of risks involved in IPED use, and avoidance of the complexity of the topic of IPED harm reduction.
2) results in ineffective services:
   a information is provided that does not reflect the experiences and priorities of people who inject IPEDs; and
   b people who inject IPEDs are deterred from engaging with health services and academics.
3) increases existing divides between bodybuilders on the one hand, and service providers and academics on the other.

A divide between bodybuilders and the medical and scientific communities has long existed and stems from a belief by bodybuilders that the medical and scientific communities are ill-informed about the risks and benefits of IPEDs. For instance, the scientific community initially denied that anabolic-androgenic steroids (AASs) were effective at building muscle, and continued to do so as recently as the year 2000 (Pope, Phillips, & Olivardia, 2002), whereas bodybuilders had known many decades earlier that these drugs were extremely anabolic. As people who use IPEDs have a poor record of engaging with primary health care services (Pope, Kanayama, Ionescu-Pioggia, & Hudson, 2004), healthcare providers need to make the most of each, and every, encounter. If there is a chance of increasing the divide between people who use IPEDs and the health community we need to tread very carefully (Box 3).

## A way forward: shifting focus whilst continuing to research and prevent BBVs

If the current emphasis on BBV has unintended consequences such as turning people who inject IPEDs off engaging with healthcare providers and researchers, perhaps it is time to rethink our approach. Enhanced bodybuilders have suggestions on how we could better engage with and provide for people who inject IPEDs.

Firstly, while enhanced bodybuilders have injection related concerns (discussed below), they are most concerned about the life-threatening, long-term risks of IPED use, namely heart health, cholesterol, liver function, blood pressure and high hematocrit levels. They suggest that these risks should be prioritised over BBVs in research and service provision.

Secondly, enhanced bodybuilders would like their experiences to inform discussions of, and support for, reducing injection-related harms. People who inject IPEDs experience post-injection pain, abscess and bacterial infection more frequently than they do BBV infection (Hope et al., 2015; Larance et al., 2008). Furthermore, the strategies that are promoted for the prevention of BBVs (e.g. swabbing vials and injection sites, and no sharing of equipment), are the same strategies that would be promoted to reduce the risk of abscess and bacterial infection. Thus, it is possible to prevent BBVs within a framework of preventing abscess and infection in general. By shifting focus from BBVs in particular, to infection in general, we can reduce BBV harm whilst conducting research and providing services that reflect the experiences and priorities of people who inject IPEDs. Additional practices (such as

**Box 3**

*The effect* [of a focus on BBV] *will be the same as it is for any "scary thing" that medical professionals don't care to understand. Lousy information, users driven further underground, more untreated side effects* [Ian].

*This* [focus on BBV] *is one of the big reasons why services are ineffective. Also it puts users off engagement when they are bombarded with irrelevant information but relevant information is not available due to a lack of knowledge* [Sean].

*I'd say it* [the divide between medical professionals and enhanced bodybuilders] *has lessened. TRT* [Testosterone Replacement Therapy] *wasn't even on the radar 15 or 20 years ago, now it's fairly mainstream, at least in the US. Guys now are much more likely to go to the doc to get blood work, and that was never done in the past. … If I heard a doctor harping on this* [BBV]*, I'd roll my eyes, and anything he said after that would be suspect* [Wally].

**Box 4**

> *There are problems with AAS use, but BBV's are quite low on that list. Sterile abscesses and infection (bacterial infections such as cellulitis and septic abscesses … that kind of lovely stuff) due to improper injection practices seem to be more widespread. I will make an educated guess that bacterial infections are probably the most common reason for an AAS user seeking medical attention at a hospital. … They could have a bigger impact on harm reduction through focusing on infection overall than BBV in particular, the latter would likely improve by default* [Mason].

filtering oil, warming oil and slow injection) can also be included to reduce the risk of swelling and post-injection pain. By demonstrating understanding of IPED injection risk as experienced by consumers we bridge existing divides with the IPED using community, rather than exacerbating these divides through a focus on BBVs (Box 4).

This shift of focus from BBV to abscess and infection in general could inform research. While there is a considerable literature on BBVs among people who inject IPEDs (e.g. Aitken et al., 2002; Crampin et al., 1998; Day et al., 2008; Hope et al., 2013, 2017; Ip et al., 2016; Larance et al., 2008; Rowe et al., 2017) there has been much less attention given to abscess and bacterial infection, risks that can be life threatening (Callahan, 1998). Furthermore, the literature on abscess and bacterial infection consists mainly of case studies (Al-Ismail, Torreggiani, Munk, & Nicolaou, 2002; Gautschi & Zellweger, 2006; Rich, Dickinson, Flanigan, & Valone, 1999). While it is vital that BBV figures are still collected, by broadening our scope to include other injection-related harms we obtain a more accurate and holistic view of IPED harms as they are experienced.

## Conclusion

BBVs do exist amongst people who inject IPEDs, regardless of how they were transmitted into these communities. Therefore, this issue must be discussed. However, we can do so in ways that acknowledge IPED risks as they are experienced by people who inject IPEDs. Of course, safe injection practice should be a priority, especially given the existence of BBVs among people who inject IPEDs, but the promotion of safe injection practice does not need to be framed in terms of BBVs.

There is a need to recognise the diversity of people who use IPEDs, and the inadequacy of a one-size-fits-all approach to health promotion. The challenge we face is ensuring appropriate research and services while not alienating a section of the community, and fuelling existing suspicion and mistrust of the research and health communities. Our current blanket approaches to harm reduction can result in animosity and barriers to engagement which render research and services ineffective.

Subpopulations of people who inject IPEDs may include those who have unprotected sex with multiple sexual partners, have high levels of cocaine use, or currently inject, or have previously injected, psychoactive drugs (Hope et al., 2013). The use of IPEDs to combat weight loss during years of psychoactive drug use is not uncommon, often with little understanding of risk or risk management (Santos & Coomber, 2017). Clearly, BBV prevalence among people who inject IPEDs should be monitored, and robust harm reduction strategies including those to prevent the transmission of BBVs are needed to protect and promote the health of people who inject IPEDs who are engaging in high risk behaviours (Iversen, Hope, & McVeigh, 2016). However, these strategies should emphasise the high risk behaviours that place people who inject IPEDs at risk, which are not necessarily IPED injection *per se*.

Given the diversity of people who inject IPEDs, the views expressed in this paper may not represent all people who inject IPEDs. The highly variable behaviours and risk profiles of people who inject IPEDs are an area that has only of late been explored, using both qualitative (Christiansen, Vinther, & Liokaftos, 2016) and quantitative research (Zahnow et al., 2018). While the individual voices described in this paper may only represent a subsection of the community, the perspectives described were collected over numerous sites and were consistent. Furthermore, the individuals with whom I directly engaged may be best characterised as 'expert type' (Christiansen et al., 2016) IPED consumers. These community experts are vocal and influential members of IPED communities, to whom many other IPED consumers turn for guidance.

We have not availed ourselves of opportunities to promote safer drug use and harm reduction in *collaboration* with those who are currently being antagonised by our blanket approaches. Many of these are the "opinion formers" and innovators within the field and could contribute to nuanced harm reduction in collaboration with public health organisations. However, this would require greater understanding and dialogue between all stakeholders. It is hoped that this paper is a first step in this process.

Including the voices of people who inject IPEDs makes good sense not only in terms of building relationships with this community, but in ensuring effective policies and services that are well-received. By including their voices we may reassure people who inject IPEDs that the research and provider communities are ready to listen, thus giving them the confidence to speak up and take on the task of co-producing research, and contributing to the development and promotion of effective harm reduction messages and services.

It is easy to forget that when we publish research about people who inject IPEDs, that we are often talking directly to people who inject IPEDs, and not just about them to other academics and service providers. If researchers were careful to 1) take a broader perspective on injection risk; 2) highlight the fact that BBV prevalence among people who inject IPEDs does not necessarily reflect the prevalence of BBV transmission through IPED injection, and to 3) emphasise the conflation of routes of BBV transmission, preferably in the publicly available abstracts and not just in the body of the paper, this would help prevent the sensationalist misrepresentation we are currently seeing in some media and harm reduction materials. But perhaps most importantly these efforts would go a long way towards overcoming boundaries between academics and service providers on one hand, and people who inject IPEDs on the other, boundaries that we must overcome if we are ever to stand a chance of having a meaningful impact with regards IPED harm reduction.

While we are a long way from developing appropriate services to suit the many types of people who use IPEDs, I suggest that we have nothing to lose, and potentially a lot to gain, from following the suggestions of the enhanced bodybuilders who inspired this commentary, many of whom are extremely influential within IPED communities. Shifting the focus of IPED harm reduction and research from BBVs, to infection in general, whilst also including other injection risks (e.g. sterile inflammation, post-injection pain), would demonstrate an understanding of IPED injection practices, and the risks of IPEDs *as they are experienced by people who inject IPEDs*.

## Conflicts of interest

None.

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## References

Aitken, C., Delalande, C., & Stanton, K. (2002). Pumping iron, risking infection? Exposure to hepatitis C, hepatitis B and HIV among anabolic–androgenic steroid injectors in Victoria, Australia. *Drug and Alcohol Dependence, 65*(3), 303–308. https://doi.org/10.1016/S0376-8716(01)00174-0.

Al-Ismail, K., Torreggiani, W., Munk, P., & Nicolaou, S. (2002). Gluteal mass in a bodybuilder: Radiological depiction of a complication of anabolic steroid use. *European Radiology, 12*(6), 1366–1369.

Callahan, T. E. (1998). Necrotizing soft tissue infection masquerading as cutaneous abscess following illicit drug injection. *JAMA, The Journal of the American Medical Association, 280*(16), 1384 l.

Christiansen, A. V., Vinther, A. S., & Liokaftos, D. (2016). Outline of a typology of men's use of anabolic androgenic steroids in fitness and strength training environments. *Drugs: Education, Prevention and Policy, 24*(3), 295–305. https://doi.org/10.1080/09687637.2016.1231173.

Crampin, A. C., Lamagni, T. L., Hope, V. D., Newham, J. A., Lewis, K. M., Parry, J. V., et al. (1998). The risk of infection with HIV and hepatitis B in individuals who inject steroids in England and Wales. *Epidemiology and Infection, 121*(2), 381–386. https://doi.org/10.1017/S0950268898001265.

Day, C. A., Topp, L., Iversen, J., & Maher, L. (2008). Blood-borne virus prevalence and risk among steroid injectors: Results from the Australian Needle and Syringe Program Survey. *Drug and Alcohol Review, 27*(5), 559–561. https://doi.org/10.1080/09595230801956132.

DuRant, R. H., Rickert, V. I., Ashworth, C. S., Newman, C., & Slavens, G. (1993). Use of multiple drugs among adolescents who use anabolic steroids. *The New England Journal of Medicine, 328*(13), 922–926.

Gautschi, O. P., & Zellweger, R. (2006). Methicillin-resistant Staphylococcus aureus abscess after intramuscular steroid injection. *The New England Journal of Medicine, 355*, 713.

Hope, V. D., McVeigh, J., Marongiu, A., Evans-Brown, M., Smith, J., Kimergård, A., et al. (2013). Prevalence of, and risk factors for, HIV, hepatitis B and C infections among men who inject image and performance enhancing drugs: A cross-sectional study. *BMJ Open, 3*(9), https://doi.org/10.1136/bmjopen-2013-003207.

Hope, V. D., McVeigh, J., Marongiu, A., Evans-Brown, M., Smith, J., Kimergard, A., et al. (2015). Injection site infections and injuries in men who inject image- and performance-enhancing drugs: Prevalence, risks factors, and healthcare seeking. *Epidemiology and Infection, 143*(1), 132–140. https://doi.org/10.1017/S0950268814000727.

Hope, V. D., McVeigh, J., Smith, J., Glass, R., Njoroge, J., Tanner, C., et al. (2017). Low levels of hepatitis C diagnosis and testing uptake among people who inject image and performance enhancing drugs in England and Wales, 2012-15. *Drug and Alcohol Dependence, 179*, 83–86. https://doi.org/10.1016/j.drugalcdep.2017.06.018.

Ip, E. J., Yadao, M. A., Shah, B. M., & Lau, B. (2016). Infectious disease, injection practices, and risky sexual behavior among anabolic steroid users. *AIDS Care, 28*(3), 294–299. https://doi.org/10.1080/09540121.2015.1090539.

Iversen, J., Hope, V. D., & McVeigh, J. (2016). Access to needle and syringe programs by people who inject image and performance enhancing drugs. *The International Journal of Drug Policy, 31*, 199–200. https://doi.org/10.1016/j.drugpo.2016.01.016.

Larance, B., Degenhardt, L., Copeland, J., & Dillon, P. (2008). Injecting risk behaviour and related harm among men who use performance- and image-enhancing drugs. *Drug and Alcohol Review, 27*(6), 679–686. https://doi.org/10.1080/09595230802392568.

Maher, L. (2002). Don't leave us this way: Ethnography and injecting drug use in the age of AIDS. *The International Journal of Drug Policy, 13*(4), 311–325. https://doi.org/10.1016/S0955-3959(02)00118-4.

Perry, H. M., Wright, D., & Littlepage, B. N. (1992). Dying to be big: A review of anabolic steroid use. *British Journal of Sports Medicine, 26*(4), 259–261. https://doi.org/10.1136/bjsm.26.4.259.

Pope, H. G., Kanayama, G., Ionescu-Pioggia, M., & Hudson, J. I. (2004). Anabolic steroid users' attitudes towards physicians. *Addiction, 99*(9), 1189–1194. https://doi.org/10.1111/j.1360-0443.2004.00781.x.

Pope, H. G., Phillips, K. A., & Olivardia, R. (2002). *The Adonis complex: How to identify, treat and prevent body obsession in men and boys.* New York: Simon and Schuster.

Rabinow, P. (1977). *Reflections on fieldwork in Morocco.* Berkeley: University of California Press.

Rich, J. D., Dickinson, B. P., Flanigan, T. P., & Valone, S. E. (1999). Abscess related to anabolic-androgenic steroid injection. *Medicine and Science in Sports and Exercise, 31*(2), 207–209.

Rowe, R., Berger, I., Yaseen, B., & Copeland, J. (2017). Risk and blood-borne virus testing among men who inject image and performance enhancing drugs, Sydney, Australia. *Drug and Alcohol Review, 36*(5), 658–666. https://doi.org/10.1111/dar.12467.

Santos, H. G., & Coomber, R. (2017). The risk environment of anabolic-androgenic steroid users in the UK: Examining motivations, practices and accounts of use. *The International Journal of Drug Policy, 40*, 35–43. https://doi.org/10.1016/j.drugpo.2016.11.005.

Stimson, G. V. (1996). Has the United Kingdom averted an epidemic of HIV-1 infection among drug injectors? *Addiction, 91*(8), 1085–1088.

Underwood, Mair (2017). Exploring the social lives of image and performance enhancing drugs: An online ethnography of the Zyzz fandom of recreational bodybuilders. *International Journal of Drug Policy, 39*, 78–85.

Zahnow, R., McVeigh, J., Bates, G., Hope, V., Kean, J., Campbell, J., et al. (2018). Identifying a typology of men who use anabolic androgenic steroids (AAS). *The International Journal of Drug Policy, 55*, 105–112. https://doi.org/10.1016/j.drugpo.2018.02.022.