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# Looking Beyond the Provision of Injecting Equipment to People Who Use Anabolic Androgenic Steroids: Harm Reduction and Behavior Change Goals for UK Policy

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## Abstract

Understanding of the choices and motivations of people who use anabolic androgenic steroids (AAS) for muscular enhancement has increased greatly in the past thirty years, along with understanding of a wide range of health harms associated with this form of drug use in the community. During this period the predominant public health intervention for this population in the UK has consistently remained the provision of injecting equipment to prevent blood borne virus (BBV) transmission. The study explored the health professionals' and other stakeholders' perceptions on: whether the current UK public health response is sufficient to address the needs of people who use AAS, and if not, what other needs they might have. This included an exploration of whether there were gaps in harm reduction strategies or other behavioral outcomes and interventions that were needed. Interviews with 27 stakeholders who provide support to people who use AAS in a variety of roles established consensus on the need for a range of interventions to reduce harm and risk in those that choose to use AAS, to prevent initiation, to motivate and support cessation, and to prevent relapse. Study findings indicate that while providing sterile injecting equipment remains essential, it should be considered a bare minimum. The challenge is to develop and deliver a range of harm reduction interventions that look beyond BBV prevention to provide appropriate support to who choose to use AAS at all points in their cycles of use and ultimately for those choosing the temporary or permanent cessation of use.

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anabolic androgenic steroids, image and performance enhancing drug use, needle and syringe programs, behavior change, harm reduction, interventions

**Introduction**

Anabolic androgenic steroids (AAS) have been prescribed for medical purposes since the middle of the 20th century, and have long been associated with “doping” to enhance sporting performance. Use outside of sporting and medical environments for muscle enhancement has been reported since the 1980s (Buckley et al., 1988; Johnson et al., 1989) and while understanding of prevalence is poor, globally the lifetime prevalence of AAS among males has been estimated at 6.4% (Sagoe, Molde, et al., 2014). Data from UK needle and syringe programmes (NSP) indicate that AAS use may be increasing with the numbers of this population accessing such services having grown substantially over the past 25 years (McVeigh & Begley, 2016; McVeigh et al., 2003).

In the same period, understanding of people who use AAS for muscle enhancement and their motivations, patterns of use and behaviors has increased substantially, and there is an ever-growing evidence base establishing the associated physical and mental health risks (ACMD, 2010; Pope et al., 2014). There is great variation in the characteristics, behaviors and motivations among those who use AAS (Begley et al., 2017; Christiansen et al., 2016; Greenway & Price, 2018; Murray et al., 2016; Zahnw et al., 2018). The overarching motivations are commonly reported as the desire to develop an attractive physique or to enhance physical strength and muscularity (Brennan et al., 2016; Sagoe, Andreassen, Pallesen, 2014). However, individual-level motivations are likely driven by a broad and complex range of factors across social, cultural, and societal levels that point to the importance of gyms and sports teams, workplaces, and community and societal norms and values on motivations (Bates et al., 2018).

***Interventions Responding to AAS Use in the UK***

In the UK, the policy response to community AAS use appears to have followed the model of intervention with people who inject psychoactive drugs that emerged in the 1980s based on prioritizing HIV prevention (Stimson, 2007) as part of the broader philosophy of harm reduction that supports pragmatic interventions that target the negative outcomes of substance use rather than the substance use itself (Des Jarlais, 1995). Advocates of harm reduction commonly recognize that alternatives to abstinence from substance use are acceptable choices, rejecting the moral and disease models of substance use (Marlatt, 1996) and supporting the rights of people who use drugs, including the right for health protection and medical treatment (Stimson, 2007). Critiques of this conceptualization of harm reduction have held that it is not necessarily a progressive approach and suggest it can promote moralistic attitudes toward drug use, rather than serve as a value-neutral standpoint (Keane, 2003). As the use of AAS in the UK became apparent in the 2 decades following the successful prevention of an HIV epidemic despite high levels of injecting psychoactive drug use, it is perhaps not surprising that such an approach was prioritized. Currently, interventions targeting people who use AAS are therefore largely restricted to the provision of injecting equipment in NSPs. This is reflected in guidance for health professionals working with people who use AAS (Independent Expert Working Group, 2017; National Institute for Health and Care Excellence, 2014; Public Health England, 2014) that focuses on reducing risk of blood borne viruses (BBVs), with little support for health professionals in any healthcare settings or for those seeking to support behavior change with people who use AAS, such as changes in patterns of use, prevention, or cessation.

In the UK, NSPs are the predominant point of engagement for health professionals with people who use AAS. These services are often characterized by rapid exchange of injecting equipment with little

opportunity for ongoing therapeutic relationships between providers and clients. In limited locations additional interventions are offered through specialist AAS clinics, but these interventions vary greatly in nature and delivery and are often reliant on the experience and dedication of specific individuals (Kimergård & McVeigh, 2014). The UK's substance use service-based response to AAS therefore remains limited in ambition and scope, and predominantly focuses on BBV prevention.

Internationally a small number of preventative and predominantly educational interventions have been evaluated, marked by inconsistency in approach and intended outcome, and by limited effectiveness (Bates et al., 2017). Prevention has typically been based in schools, often with a focus on sports and the principles of "antidoping." In the past decade, new public health efforts such as in Belgium and the Scandinavian countries have followed the antidoping model associated with the zero-tolerance approach to steroid use in elite athletes, with those engaging in recreational use subjected to law enforcement measures and drug testing in gyms (van de Ven, 2016). The impacts of such efforts are unclear, and no formal evaluations have been published. Prohibitive interventions of this nature when targeted at people using AAS appear in contrast with the harm reduction approach to AAS in countries such as the UK and Australia and, while it is feasible for these two approaches to be delivered alongside one another, they appear to represent different assessments of what type of response is required. While it is encouraging to see new efforts to respond to AAS use outside of schools or NSPs, it has been questioned whether such policies can create drug free environments and may even be counterproductive in efforts to improve health (Christiansen & Bojsen-Møller, 2012; Thualagant, 2015) and there remains a lack of research examining their effectiveness. Similarly Service-based interventions in the UK have never been subject to rigorous evaluation and while there are indications of successful engagement and anecdotal evidence of beneficial interaction, this is often without a theoretical basis (Bates et al., 2014).

### ***Study Aims***

The study sought to gain insight from stakeholders with expertise and experience relating to AAS use on what they thought the goals of UK public health policy relating to AAS should be and the extent to which the current response supports these goals. This included exploring what behaviors and choices they should seek to change or influence and the types of interventions that are needed or should be prioritized. While studies frequently point to the need to engage with this population and to deliver interventions, the nature of what specific outcomes such interventions should seek to achieve has rarely been explored. In order to develop effective interventions, it is first necessary to clearly specify the behaviors that need to be targeted by them (Michie et al., 2014). Behavior change interventions include any intervention that aims to influence behavior. For people who use AAS behavioral outcomes could include the overall decision to use AAS or not, as well as all the other behaviors related to their AAS use such as the use of sterile injecting equipment, frequency or amount of AAS use, or the decision to access support from a health professional. This study therefore aimed to identify consensus on what behavioral outcomes interventions should seek to achieve. Having this clarity will support understanding of whether the current response to AAS use in the UK is sufficient or appropriate and will guide the development of additional interventions.

## **Method**

### ***Participants and Recruitment***

The inclusion criteria for participants were that that they had worked in a professional capacity with people who use AAS for muscular enhancement. This included engaging with this population about their AAS use, providing harm reduction interventions or peer support, or providing or commissioning

services. While people who use AAS were eligible to take part, their expertise was primarily sought in relation to their professional experiences of working with others. The aim of recruitment was to include as many relevant perspectives and experiences as possible relating to the needs of people who use AAS in the UK population. Identification of the occupational roles to be approached to participate in the study was supported through a socioecological framework to understand AAS use, which identifies important relevant environments and health services where engagement and support commonly takes place (Bates et al., 2018). Additionally, the first five participants took part in a focus group and were asked to recommend occupations that ought to be represented in the study. Potential participants were identified through the networks of the research team, at an AAS research conference and through a snowball approach where participants and contacts of the research team recommended others in their networks, and invited to take part through a recruitment email.

Thirty individuals with professional expertise relating to AAS were approached to take part. Three potential participants did not respond to the invitation so 27 participants took part through one focus group with five participants and 22 interviews. Participants were based in a range of locations in England, Wales and Scotland and represented a range of occupations including staff in substance use services and IPED clinics ( $n = 11$ ) and in public health departments ( $n = 6$ ), gym managers ( $n = 3$ ), fitness trainers ( $n = 3$ ), academics ( $n = 2$ ), one general practitioner and one probation officer. Of these, eight had used AAS themselves.

### *Data Collection*

To help them prepare for the interview, participants were informed in advance that they would be asked about what they thought were key behavioral outcomes to address through interventions to improve health and reduce risk among people who use AAS. Participants were encouraged to identify any outcomes that they believed to be important, and therefore a range of behaviors and interventions were discussed such as approaches to support people who use AAS to approaches designed to change their decision to use AAS or prevent initiation. The first five participants took part in a focus group to establish initial areas of consensus. Remaining participants completed interviews. Participants were initially asked the broad question of what they thought AAS public health interventions need to address. Following this an unstructured interview approach was utilized to support participants to lead the direction of the research.

Based on an initial thematic analysis of the findings of the unstructured focus group and interviews that included the first 13 participants, the interviews moved to a semistructured format as the study progressed. This allowed the initial identification of a broad range of perceptions in response to the research question, which were used to develop a semistructured interview script used with the remaining participants. By following up on early themes with subsequent participants, while still asking them to identify their own priorities, it was possible to get feedback on the initial findings and further develop these themes. This was important not only to act as a check upon the researchers' interpretation of the data, but also to explore whether participants agreed with what others had suggested or if they had different perceptions and experiences.

### *Analysis*

Thematic analysis was undertaken closely following the guidance developed by Braun and Clarke (2006) to support the identification of areas of consensus (and conflict) through the development of themes based on participant responses in a large dataset. While the analysis is described in a linear format here, in reality this was an iterative process where phases overlapped and were returned to throughout the analysis. An initial analysis was carried out of the focus group and interview data for the first 13 participants to inform the remaining interviews, but all data was analyzed in the same way.

**Figure 1.** Stakeholder identified policy goals to target through AAS public health interventions.

<p><b>Reducing harm and risk in those who choose to use AAS</b></p> <ul style="list-style-type: none"> <li>● Support AAS use “in moderation” to reduce risk of negative health outcomes: Discourage high doses and long periods of continuous use with no or only short “off cycle” periods</li> <li>● Support use of clean injecting equipment and practicing safe sex to reduce risk of BBV transmission through equipment provision and advice</li> <li>● Improve injecting skills to reduce risk of injury and infection</li> </ul>
<p><b>Reducing prevalence</b></p> <ul style="list-style-type: none"> <li>● Support cessation among those who want to stop (and support post cycle health). Motivate long term changes in AAS use among those who are not planning to stop, with the aim of supporting cessation</li> <li>● Reduce initiation of AAS by reducing motivation and desire to use AAS among those who are new to it or considering starting</li> </ul>

Following transcription, interview texts were read and notes made that acted as prompts for subsequent interviews. An inductive data driven approach was applied during coding to enable identification of any priorities in response to the research question. As such, an open coding approach was utilized and no coding framework was developed. Data was systematically coded within each transcript with a code identified for all data. Once codes from all interviews had been identified and grouped into initial themes, these were examined more closely and refined, and sub themes developed. Themes and sub themes were developed and refined, which involved revisiting the transcripts to check extracts and coding in the context of the wider interviews.

## Results

Through the analysis process two overarching themes relating to the research question were identified of reducing harms and risk, and reducing prevalence. A range of important policy goals to achieve through interventions were identified by stakeholders who work with people who use AAS, grouped under these two overarching areas (Figure 1). Other needs were identified, but there was less consensus on these or they represented specific subgroups beyond the scope of this study to explore. For example, within prison environments issues relating to the provision of injecting equipment, opportunities to intervene, and conduct BBV testing were highlighted as very important. Interventions in such a setting are likely to involve overcoming different challenges to those addressing these same priorities in community settings.

### *Supporting AAS Use in Moderation*

The most frequently discussed concerns to address were high doses of multiple AAS and other IPEDs used over long periods of time. For many people who use AAS, a range of substances will be used as part of their regime in often increasingly high amounts and, in some cases, it was described that some individuals are never off cycle, only reducing their use for short periods of time.

The number one concern I have is the amounts they use. They go for a sort of shotgun approach where they take loads of something, see if it works, then up the dose because they want it to work more quickly or to see more effect. That can go on for years. (Participant 12, substance use practitioner)

This was perceived as misusing AAS and linked to factors such as impatience, receiving bad advice, poor understanding about doses and mirroring peers. A common desire to increase muscle mass

quickly without prioritizing or understanding long term health risks was felt to be particularly important in motivating this misuse and willingness to take what were perceived by participants to be risks. Participants associated these risky patterns of use with increased risks of a range of health harms that they felt were important to prevent. They shared examples of concerning health problems among those they encountered that they associated with using AAS, including cardiac and fertility issues, addiction and mental health problems; although it should be noted that these conclusions were not seemingly based upon any clinical evidence of the causes of these health outcomes.

No one really cares about risks because they're young and they don't see that as real to them. It's all about the here and now . . . what your mates are doing and what you feel compelled to do now. That's what we need to be addressing because it's the most common thing. (Participant 1, substance use practitioner)

Encouraging what participants commonly referred to as "moderate use" was therefore perceived as a clear priority. Moderation was not consistently defined but generally included efforts to address lowering doses and reducing the number of substances being taken as part of a cycle, as well as the length of the "on" cycle period. Participants who had the opportunity to do so gave such advice to those they engaged with, but identified difficulties in communicating these messages.

It's like nonstop cycles for some of them . . . never stopping in case they lose it. I know 100% that some of them think that if they stop for a bit, that all that muscle will just fall off them and it's like a sign of weakness. You can say to them to use a bit less, but that's not really in what they think are their interests or what they're being told by others. (Participant 17, fitness trainer)

### **Reduce Prevalence of AAS**

Many participants clearly felt that while "moderate" use was preferable to what they saw as common misuse, they frequently raised the need to address the overall decision to use AAS. This was based almost entirely on the perceived need to improve and protect health and social outcomes rather than for any moral or legal concerns. In the UK, AAS are controlled as a class C drug under the 1971 Misuse of Drugs Act. Personal possession of AAS is legal, but it is an offence to manufacture, import or supply AAS to others.

Some participants did highlight that AAS use can be unproblematic or beneficial. However in the context of the decisions that the majority of people who use AAS are making, the powerful influences on these decisions, and the unpredictability of the supply market; there was a common sense that they are at risk of poor health and that interventions are needed that go beyond advice on reducing risk and encouraging moderate use. Harm reduction advice was however very much still perceived as a priority for those who choose to use AAS.

Without wanting to over-simplify it, at the end of the day we want people to be using less. If they are going to do it then that's their choice and that's fine, and in that case we want them to do it as sensibly as possible and take care of themselves, but ultimately, we would want them to make that choice not to use steroids. We can see the potential for harm in so many ways. (Participant 15, substance use practitioner)

Participants with their own long-term experience using AAS highlighted that their advice to those considering starting was not to do so, for example:

If anyone asks for advice I'll tell them not to bother with it. If they decide to go ahead then of course I'll advise them as best I can, but my starting point is to try and persuade them not to. (Participant 13, gym manager)

### *Intervening to Encourage Cessation*

It was recognized that people who use AAS will vary in their motivations, decisions, and readiness to change their behaviors and, consequently, the aims and goals of any interventions and interactions are dependent on the individual and their circumstances. The timing of interventions to encourage cessation is important. It was commonly expressed that an individual who has recently made that decision to start using AAS may be more interested in and open to harm reduction information and advice around cessation. At this stage they were perceived to be more likely to make changes than after they have been using for a period of time, at which point they may have formed habits and perceptions that are difficult to change, particularly when they have started to see desired effects upon the body.

Someone newer to it, they're not as embedded in that lifestyle and behavior, they're not as committed to it and so it's easier for them to change their minds. (Participant 6, academic)

If they haven't already seen the benefits then that gives you a chance to talk about all these other things like diet, harms, side effects. (Participant 24, substance use practitioner)

Those with more experience may be less susceptible to messages of this nature, but any conversation about AAS was suggested to be an opportunity to start the processes that may eventually lead to cessation. However, the lack of engagement about AAS between health professionals and this population limits the opportunity for such conversations. Participants were concerned that many people simply will not have the opportunity to discuss their AAS use with a health professional, either because they do not engage with any about AAS or the focus of any engagement is around injecting equipment rather than for any wider discussion or advice.

People are coming to me to ask these questions because they have nowhere else to go. They don't feel there is anyone that they can talk to and ask questions. And that's a crying shame, a crying shame, and it can mean they end up listening to all sorts of bad advice from people who you don't really want to be advising them. (Participant 13, gym manager)

Participants used terms such as "planting a seed" to convey the potential for every interaction to have an impact upon future decision-making, even if they were not open to making changes at that time. They gave examples of how this could lead to later engagement,

If they're doing something that could be harmful then you need to take that chance you have with them and plant that seed in their mind that it might not necessarily be a good idea. They might not listen to you or accept it then, but later on, whether that's weeks or months, you've started that conversation. (Participant 26, substance use practitioner)

Strongly associated with discussion of cessation were concerns around the long-term health impacts of AAS use and the health of men after they stopped using. The effects on the body in this period can be a motivator to reinitiate use among those who choose to stop, or among those continuing to use the adoption of cycles with "off cycle" periods shortened or replaced by periods of reduced use, termed a "blast and cruise" cycle (McVeigh et al., 2015; Sagoe et al., 2015). Where men stop using AAS they may experience a number of changes such as to mood and libido. For many, it may only be when they stop taking these substances that they experience negative effects. Indeed, one participant noted,

For the vast majority of people for the time they are taking steroids, they're feeling pretty good. Everything that they don't like, it happens post cycle. (Participant 3, substance use practitioner)



Many examples were recounted of men that participants had known who had experienced poor health after deciding to stop using. In some cases, the impact on mental health can be severe.

More often than not because the person is feeling so bad and so down for that long period of time, what happens is they'll jump back on. Because jumping back on will feel like a remedy to them. (Participant 4, general practitioner)

Good post-cycle health was therefore discussed as an important intervention to support, although opinions on how this should be done were mixed. In particular, discussions focused on the appropriateness and need for the use of post-cycle therapies (PCT) to manage the impact of prolonged use of AAS and associated drugs on testosterone production. The availability of PCT was suggested to be perceived by some as a way of mitigating the negative effects of AAS, which may distract from efforts to encourage moderation. Raising awareness of, and increasing access to, PCT was similarly identified by some professionals as important to support recovery and reduce health harms. However, others discussed concerns about the amount of substances that some men use throughout their cycle as problematic, and how additional substance use in PCT may contribute to this problem. Education on what to expect following cessation and increasing access to appropriate medical care were offered as alternatives. These quotes from two substance use practitioners demonstrate the conflicting opinions:

It would be really great if they were told about what they might experience, about post-cycle therapy as an option and how to go about doing that. I think that would reduce a lot of worry potentially and a lot of problems. (Participant 9, substance use practitioner)

It's like another barrier is gone. Some of them think that you don't have to worry about long term problems because PCT will sort you out, which is stupid obviously. You have to be careful promoting it as an option or it's just something else to put in your body and all the problems that brings. (Participant 7, substance use practitioner)

### ***Preventing Initiation***

Most of the discussion on reducing prevalence focused on targeted efforts with men who had already started using AAS, but several participants also raised the importance of prevention at an earlier stage in the decision-making process. It was recognized that prevention is a complex topic, particularly as AAS and broader issues of appearance and body image related problems are likely to have many potential influences and risk factors. The points raised in these discussions often moved away from AAS specifically into a broader spectrum of issues such as body image, mental health, and peer pressure. Prevention was perceived by some as needing to go beyond a focus on AAS decision-making and include the environments that boys and young men experience. There was a sense that this was a problem that goes further than the use of anabolic steroids. One public health commissioner summed this up as:

It's just normal now for these guys to be thinking about steroids, wanting to get bigger and leaner, needing to do it. How do you expect to stop them doing it if you don't also try and make these bigger changes that actually get to the bottom of why they want to do it? It will always be an uphill battle. (Participant 10, public health commissioner)

Gym-based participants raised issues of normalization and acceptability of steroids and related body image attitudes among their clientele, pointing to the influence of these on decision-making.

Difficulties in providing both prevention and harm reduction messages in this context were identified with the implication that interventions need to consider the cultural and environmental influences acting on men.

A lot of the time you're fighting against the tide really. It can feel like you on one side saying "do a bit less" and a million voices on the other saying do "more more more." (Participant 14, gym manager)

It's about changing a culture of wanting to be something you're not, and the pressure to look a certain way. And that could have loads of benefits and for some then maybe that would include making them think again later about steroids. (Participant 16, public health commissioner)

### *Reducing BBVs and Injection-Related Injuries*

A need to focus on provision of injecting equipment was commonly raised. Many participants were aware that HIV had been identified among this population, which was a clear priority to tackle for commissioners. Some service providers recounted examples of clients for whom hepatitis B and C had been identified and who had poor awareness, who were perceived to generally associate BBVs with people who use psychoactive drugs. Sharing of needles among injectors was perceived to be rare, although several participants suggested they had come across cases where this happened and provision of injecting equipment and advice regarding its sharing was still seen as important. Sexual health behaviors were mentioned by a small number of participants in the context of BBVs.

How many gyms do you go in where they've got no idea about any harms at all to do with their substance use? Like you mention HIV and they look at you blankly like what, how can I possibly have that? (Participant 1, substance use practitioner)

Many service providers gave examples of clients they encountered with poor injection techniques and commented that basic advice around injecting could be very beneficial. There was concern that those not engaging with NSPs could have very poor knowledge and injecting skills. For example, one noted:

A lot of them inject with the wrong needles in the wrong places. Most of the guys who come in know about injecting because they've been in before, so it's easy to be blasé about it, but then someone comes in for the first time because they're in pain or something and it's because they're doing it wrong, sometimes for a long time. (Participant 25, substance use practitioner)

Several participants suggested that BBVs were an infrequent problem in comparison with other health conditions associated with long term use and risky patterns of use among clients who they encounter. Providing advice relating to sexual health and injecting practice and identifying where BBV testing was required were discussed by those involved in service delivery as standard harm reduction practice, but some suggested that focusing on BBVs should not lead to other more common health harms being overlooked.

In the grand scheme of things, blood borne viruses . . . they're way down in terms of how likely you come across them . . . a couple of cases compared to the things like liver damage, testosterone levels being down. (Participant 3, substance use practitioner)

Additionally, a smaller number of participants discussed a subgroup of individuals who engaged in a range of risky behaviors including binge drinking, psychoactive drug use and unsafe sex. It was suggested that in addition to their AAS needs their attendance in substance use services provided an opportunity to explore these other behaviors and provide relevant support. High levels of sexual

activity and low rates of condom use were linked to concepts of masculinity and poor awareness and concern of risks, suggesting that condom provision alone in services may be insufficient.

Some of them, particularly the younger guys, there is a whole package of things going on that ring the alarm bells. It's your typical group of lads who are going out and drinking a lot, cocaine, amphetamines, getting into fights, picking up girls. For lots of them the gear is just one thing that they do. (Participant 22, probation officer)

## Discussion

The priorities identified provide clear objectives for behavior change interventions targeting people who use AAS from the perspectives of those who work with them, and highlight that current UK public health approaches are only tackling some of what stakeholders in this study perceive to be important policy goals. The increasing evidence base on physical and mental health harms associated with AAS use (Pope et al., 2014) and examples of treatments given in response to these (Bates et al., 2019) supports the needs identified here to not only tackle the risk of BBVs, but to reduce risks of poor health outcomes associated with long term use. The findings suggest that health professionals and other stakeholders who work with people who use AAS believe that an expanded approach is required that is designed in response to the needs of this population; one that includes interventions to support them to manage their risk through moderation and support their health following cessation, as well as interventions to motivate cessation and prevent initiation. These two overarching categories of harm reduction and reducing prevalence are of course not mutually exclusive. Pragmatic interventions that recognize people's choice to use AAS and aim to reduce their risk and harm when doing so can be delivered simultaneously to approaches to reduce prevalence, including primary prevention and approaches to encourage cessation.

### *Developing an Evidence-Informed Public Health Response to Anabolic Steroid Use*

To deliver interventions that can achieve the outcomes highlighted in this study, approaches are required that can better engage with people who use AAS and address their needs. The findings of this study resonate strongly with the perceived needs of this population identified in research over 2 decades earlier in the UK. Certainly, concern over choices regarding dosage, cycle length and BBVs are not new (Korkia & Stimson, 1994; Morrison, 1994; O'Connor, 1995). In this same period concerns about prevalence and normalization within different environments have increased and evidence on the health harms from using these substances has grown substantially. While not subject to formal evaluation, there appears little to suggest therefore that the current public health response to AAS use is responding to the needs identified in this study.

This should perhaps not be surprising considering that this approach is predominantly based around reducing BBVs and largely delivered through NSPs and substance use services with little AAS expertise. Such an approach does not appear to be informed by evidence on the needs of this population and seems unlikely to bring about changes in patterns of use or to reduce prevalence. Even regarding the intention to reduce BBV transmission through NSPs, it is difficult to assert whether such services have helped to avert an epidemic of BBVs among the steroid using population (and beyond) or have failed to stop transmission or behavior changes.

While the provision of sterile injecting equipment remains an essential part of health care for people who use AAS, there is a clear need to provide a greater range of interventions relevant to different populations with different needs. There is great diversity among people who use AAS that limits the effectiveness of any one intervention approach alone and over focus on BBVs may deter engagement with health services for AAS injectors (Underwood, 2019), while overlooking the needs of those who only use oral AAS (van de Ven et al., 2020). Additionally, many people who use AAS may acquire their injecting equipment online or

via secondary distribution of equipment provided in NSPs by peers (Begley et al., 2017; Glass et al., 2019) and seek advice and support from peers rather than engaging with NSPs. The emphasis on BBVs and injection equipment provision in services targeting people who use AAS may therefore limit the opportunity for engagement with health professionals on other important issues and many prefer to seek advice and information from their peers rather than health professionals (Harvey et al., 2019).

As with psychoactive drugs, including alcohol, providing a variety of interventions will help better meet the needs of the full spectrum of AAS use and those who use these substances. Some additional harm reduction work may be best placed within NSPs, such as support on injecting skills and injuries (Underwood, 2019). However, we must consider whether NSPs have sufficient reach with this population to deliver the broader types of messages and interventions discussed here and consider other ways to reach and engage with people who use AAS to deliver them. We need to identify other opportunities where this population engage with health professionals, as well as influencing the important environments where AAS are used, discussed, normalized, and sold. Importantly, any interventions need to be developed through meaningful engagement with people who use AAS if they are to be acceptable, credible and effective (Underwood, 2019). They need to be broadly appealing to, and meet the needs of, the different sub-populations with their varying patterns of AAS use, motivations and risk factors (Christiansen et al., 2016).

As an alternative to traditional NSPs in the UK, specialist steroid clinics have long been suggested as ways to reach this population with harm reduction messages and health care (Kimergård & McVeigh, 2014; Morrison, 1994), but it must be recognized that access to such services is the exception rather than the norm. While there is anecdotal evidence of beneficial interactions and successful engagement in UK steroid clinics, they have never been subject to rigorous evaluation. There remains therefore a lack of evidence to show any influence on decision-making or behavior, or whether clinics can provide a net health gain. While interventions that support the effective use of AAS will undoubtedly be popular with those who have access to them, publicly funded interventions will need to demonstrate (cost) effective health promotion or health protection. In the current economic climate, investment in promising harm reduction approaches with this client group are at risk of withdrawal if effectiveness cannot be demonstrated. Demonstrating impact should therefore be a priority for those developing and implementing interventions.

Public health policy must look at addressing social circumstances and the root causes of health problems to create healthy environments and cultures (Davies et al., 2014). Such principles are highly relevant to the broader social and cultural influences that create environments where AAS can be normalized and supported, and where powerful influences are exerted (Bates et al., 2018). Preventative efforts to change attitudes and norms around AAS were discussed in this study in the context of such environments. Zero-tolerance approaches informed by antidoping principles and supported by law enforcement, as seen in countries such as Belgium and Denmark this century (van de Ven, 2016), arguably seek to achieve this. However, such prohibitive approaches may undermine efforts to increase engagement between health professionals and people who use AAS and therefore may not sit well alongside a harm reduction approach such as that in the UK. However, some combination of approaches to changing this “dopogenic environment” (Backhouse et al., 2018) through prevention and harm reduction work in gym and sporting environments, social networks and education settings appears complimentary to a harm reduction and service-based public health approach and reflects the priorities identified here. Such attempts will undoubtedly be challenging, and results will not be immediate, but they appear necessary if long term changes are to be made.

### *Complications and Evidence Gaps in Developing Harm Reduction Interventions*

The greatest consensus on harm reduction in this study was around changing patterns of use to reduce the amounts of AAS taken through lower doses, shorter periods of use and use of fewer substances

simultaneously. Developing clear messages on promoting this idea of “moderation” is complicated by several issues. While some manage their use with periods of “off cycle” recovery and lower dosages (Brennan et al., 2016) and logically this appears sound advice for health professionals to give, the extent to which AAS use in moderation protects individuals is at present unclear. While there is evidence indicating that longer-term use and higher doses of AAS may be associated with increased risk of some negative health outcomes (Bjørnebekk et al., 2019; Kanayama et al., 2013), the risks of harms are not well quantified in terms of different doses, substances, or cycles. Providing specific advice around what constitutes moderate use is therefore challenging. Additionally, the nature of the illicit manufacturing of most AAS means strength may vary (McVeigh & Begley, 2016), which complicates any attempts at managing risk or controlling what one is taking. Additionally, interventions seeking to promote such “moderate” use will need to overcome factors such as the lack of concern for health, risk taking tendencies and impatience of many people who use AAS (Christiansen et al., 2016). Therefore, while encouraging moderation is supported in this study as a sensible and positive harm reduction approach, work to determine how best to define this is required.

Similarly, research is needed around advice and the provision of PCT. Following cessation some men will suffer symptoms such as low mood and loss of libido associated with hypogonadism (Kanayama et al., 2015; Rasmussen et al., 2016). Experiencing these symptoms, or concern about them, may be a cause of AAS reinitiation or continued use to mitigate their impacts (Kanayama et al., 2009). Where symptoms are experienced, they may require treatment. For some, PCT to minimize anticipated losses or to mitigate adverse symptoms is an important part of their AAS cycle and providing access to PCT has been suggested to be a harm reduction approach (Griffiths et al., 2017), and recommended by some participants in this study. The study highlights however the mixed views among practitioners on the benefits and harms of PCT, and the ethics and practicalities of recommending that healthcare providers prescribe additional drugs or promote self-medication in response to symptoms of poor health associated with AAS use requires far more consideration and debate. There is little evidence for clinicians to inform any decision to prescribe drugs as part of PCT, or for practitioners to promote self-medication using additional substances that may have to be purchased through the illicit market and present similar issues regarding unknown quality, strength, and potential harms as those discussed previously. Comparison can be drawn to psychoactive drug use where practitioners would not be expected to recommend that additional illicit drugs are purchased as part of their drug repertoire.

### *Study Limitations*

While participants considered the needs of all people who use AAS, the nature of participants' experiences meant that findings relate in the main to those attending services that target AAS use. As is frequently the case with research with those who use psychoactive drugs, it must be recognized that many people who use AAS do not attend any services of this nature and may have different profiles and needs not fully represented in studies. A strength of the study was that the participants represented stakeholders with a range of experiences and areas of expertise and the inductive approach to data collection and analysis supported participants to express their beliefs and perceptions regarding what they felt to be the greatest needs. However, it is unclear whether the priorities identified here are representative of the perceptions of the large number of stakeholders with interests and experiences in this area. It is also unclear whether any other key perspectives were overlooked.

While 8/27 participants had experience using AAS, the findings represent the views of stakeholders who work with people who use AAS rather than the population to be targeted with any intervention. While these stakeholders have expertise and experience relating to AAS use, their perceptions may not represent the experiences or views of this population. In their recent scoping review exploring what types of support people who use AAS want, Harvey and colleagues (2019) identified that information and advice such as on health harms, side-effects, dosages and injecting practices were commonly

reported as desirable. However, the same review also identified intervention preferences of people who use AAS that were not commonly identified in our study as important interventions to provide, such as the prescription of AAS by medical professionals and providing access to blood tests to monitor health. It is likely therefore that the views of stakeholders expressed in this study will differ from the beliefs of people who use AAS. There may be differences not only in their beliefs about any specific interventions that are needed, but about overarching policy goals, if indeed any public health response is believed to be needed. Exploring these policy goals with people who use AAS and comparing their beliefs with those of stakeholders will help us to develop the deeper understanding necessary to identify what AAS policies and interventions might be needed. Additionally, exploring implementation factors such as the acceptability and feasibility of any approaches with people who use AAS will support our understanding of the context that any response is to be delivered in.

Finally, while many of the findings are generalizable internationally, their context in the unique situation of the UK with regard to the legal status of AAS, as defined under the 1971 Misuse of Drugs Act, and policy focus on harm reduction service provision must be recognized. While NSPs are widely available internationally and in some countries are accessed by people who inject AAS, in many UK NSPs people who inject AAS are now, and have been for a number of years, the largest client population (Kimergård & McVeigh, 2014) and NSPs remain the main point of contact between this population and healthcare professionals. While the priorities identified in this study may be universal, how this can be achieved will vary internationally by policy focus and levels of engagement with different health services.

## Conclusion

This study identifies goals for UK public health policy targeting AAS use from the perspective of a sample of health care professionals and stakeholders. These provide a platform for the development of guidance for practitioners and the development of interventions to influence decision-making among people who use AAS. Research to follow up these findings with people who use AAS will provide further perspectives on what is needed and what can be achieved through a public health response. The similarity of needs identified by stakeholders here to those in studies from over 20 years previous suggests that public health interventions to date in the UK, primarily delivered through NSPs, are insufficient to achieve the goals outlined here. The UK has successfully delivered injecting harm reduction interventions to those who inject AAS. However, the principles and practices were developed for people who inject psychoactive drugs. Apart from a relatively small number of specialist NSP services, in many cases people who use AAS will receive little more than a sterile injecting equipment transaction. These services remain essential, but should be considered a bare minimum and the challenge from the perspective of stakeholders is to develop and deliver a range of harm reduction interventions that look beyond BBV prevention to provide appropriate support at all points in the cycle of AAS use and ultimately for those choosing temporary or permanent cessation. There is a clear belief among health professionals of the importance of broadening thinking and identifying other approaches to influence and provide support to those who choose to use AAS, address the wide range of associated health harms, and to bring about sociocultural changes that may reduce prevalence.

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