

Project Title:

Understanding and influencing global coach anti-doping education through the development of an International Framework

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Research Team

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Table of Contents

Research Team.....	1
Table of Contents.....	2
List of Figures	4
List of Tables	5
Glossary of Key Terms.....	5
Introduction	7
Research Design & Methods.....	12
Phase 1.....	15
Comprehensive audit and critical appraisal of global coach anti-doping education.....	15
Context.....	16
Phase 1a - Online Review of Coach Anti-Doping Provision.....	16
Research Design	16
Phase 1a Findings.....	17
Phase 1a Summary.....	26
Phase 1b - Survey of Coach Anti-Doping Education Provision.....	28
Research Design	28
Phase 1b Findings.....	30
Part i – Organisations’ Reports on their Provision.....	30
Summary – Phase 1b Part i – Organisations’ Reports on their Provision	47
Phase 1b - Part ii – Broader context around interventions	49
Summary – Phase 1b Part ii – Broader context around interventions	63
Phase 2.....	66
Collating examples of emergent practice in coach anti-doping education	66
Context.....	67
Research Design	67
Phase 2 Findings.....	69
Summary	104
.....	110
Phase 3.....	110
Investigation of coaches’ anti-doping capability, opportunity, motivation, behaviour	110
and education experiences/preferences	110
Context.....	111
Research Design	111
Research Findings	117
Summary	135

Phase 4.....	140
Creation of an International Framework for Coach Anti-Doping Education	140
Context.....	141
References	142
Appendix: Survey follow-up analysis	149

List of Figures

Figure	Title	Page
1	The Behaviour Change Wheel (figure taken from Michie et al., 2011).	10
2	Components of the research project.	12
3	Continental comparisons of education interventions provided by NADOs.	19
4	Frequency of different learning tasks used by NADOs within their interventions (i.e., those that were specifically for coaches/ASP and those that were athlete-centred but accessible to coaches).	21
5	Frequency of interventions with intended outcomes within each component of COM-B.	22
6	Frequency of different learning tasks used by IFs within their coach specific anti-doping provision.	25
7	Continental spread of additional interventions identified using information provided by NADOs.	31
8	Continental comparisons of delivery methods used by NADOs.	32
9	Frequency of different learning tasks used by NADOs within their reported coach anti-doping provision.	35
10	The intended outcomes of the NADOs' reported coach anti-doping provision mapped across the core components of COM-B (Michie et al., 2011)	36
11	Frequency of different learning tasks used by RADOs within their reported coach anti-doping provision.	39
12	Frequency of different learning tasks used by IFs within their reported coach anti-doping provision.	43
13	Frequency of different learning tasks used by CAs within their reported coach anti-doping provision.	46
14	A visual representation of the barriers to coach anti-doping provision across multiple levels of the sporting system.	57
15	Diagrammatic representation of who NADOs, RADOs, IFs, and CAs believe is best placed to deliver coach anti-doping provision.	60
16	A logic model of coach anti-doping provision.	70
17	The COM-B Model (Michie et al , 2011) mapped to the Theoretical Domains Framework (Cane et al., 2012) (Adapted with permission from Michie, Atkins & West, 2014).	112

List of Tables

Table	Title	Page
1	Proportion of NADO interventions providing content on topics listed in the ISE (WADA, 2021) identified within the online audit.	20
2	Proportion of IF interventions providing content on topics listed in the ISE (WADA, 2021) identified within the online audit.	24
3	Response rate per nudge.	29
4	Proportion of NADO interventions providing content on topics listed in the ISE (WADA, 2021).	34
5	Proportion of RADO interventions providing content on topics listed in the ISE (WADA, 2021).	39
6	Proportion of IF interventions providing content on topics listed in the ISE (WADA, 2021).	42
7	Proportion of CA interventions providing content on topics listed in the ISE (WADA, 2021).	46
8	Organisations' activities mapped against COM-B components and BCW intervention functions	86
9	Proportion of the sample representing different sports.	116
10	Proportion of the sample representing different ethnicities.	116
11	Frequency of behaviours reported by coaches (n=594; presented from most to least frequent, on average, within each subscale)	119
12	Coach (n=594) ratings for Capability (presented from most to least agreement, on average)	122
13	Coach (n=594) ratings for Opportunity (presented from most to least agreement, on average).	125
14	Coach (n=594) ratings for Motivation (presented from most to least agreement, on average).	128
15	Topics that coaches have learned about to date and would prefer to learn about in the future.	131
16	Number of coaches who had learned via each method to date and preferred to learn via each method in in the future.	133
17	Coaches' experiences to date and preferences for the future related to education providers.	134
18	Topics that coaches have learned about to date, compared across current level at which the coach works.	149
19	Topics that coaches would prefer to learn about in the future, compared across current level at which the coach works.	150
20	Methods via which coaches have learned about anti-doping to date, compared across current level at which the coach works.	151
21	Methods via which coaches would prefer to learn about anti-doping in the future, compared across current level at which the coach works.	152

Glossary of Key Terms

Term (in alphabetical order)	Definition/Explanation
ADO	Anti-doping Organisation
ASP	Athlete Support Personnel
BCW	Behaviour Change Wheel
CA	Coaching Association
CADE	Coach Anti-Doping Education
Code	World Anti-Doping Code
COM-B	Capability, Opportunity, Motivation - Behaviour Model
GSO	Government Sporting Organisation
HPCs	High Performance Centres
ICCE	International Council for Coaching Excellence
IF	International Federation
IFCADE	International Framework for Coach Anti-Doping Education
ISE	International Standard for Education
NADO	National Anti-Doping Agency
NF	National Federation
NOC	National Olympic Committee
Provision	Refers to information and education activities (e.g., programs, resources)
RADO	Regional Anti-Doping Organisation
WADA	World Anti-Doping Agency

Introduction

For many years, the primary focus of anti-doping research has been to identify the individual factors that influence decisions to dope, such as attitudes and beliefs (Backhouse, Whitaker, Patterson, Erickson & McKenna, 2016). However, there is growing evidence that doping behaviours are significantly influenced by a myriad of environmental (e.g., peers, club culture) and situational (e.g., injury, career transitions) factors (Backhouse et al., 2016). Undeniably, the context in which sportspeople find themselves has been shown to be an important part of understanding doping behaviours and this has prompted calls for anti-doping efforts to pay greater attention to addressing the 'dopogenic' system more broadly (Backhouse, Griffiths, & McKenna, 2017).

There are many components to consider within the dopogenic system at a local (e.g., team, sports clubs, home) and structural (e.g., national and international sport organisations, government policies, societal attitudes and beliefs) level. However, coaches have consistently been highlighted as a vital group in relation to athletes' doping decisions (e.g., Dubin, 1990; McLaren, 2016). Under global anti-doping policy (World Anti-Doping Agency [WADA], 2021), coaches are subject to sanctions if they violate anti-doping rules and are expected to undertake several preventive and deterrent roles and responsibilities, including compliance with anti-doping efforts (e.g., testing, investigations) and fostering anti-doping attitudes among their athletes. To enable coaches to fulfil these expectations, it is important that they are provided with effective and meaningful learning experiences.

Providing anti-doping education to coaches is compulsory for all WADA Code (Code) signatories (WADA, 2021). Despite this, the research field surrounding anti-doping education remains limited in span and scale (see Backhouse et al., 2016). In particular, very little is known about the anti-doping education being delivered across nations and sports because there are no central public records of the programs that have been developed and implemented by national and international anti-doping, sporting or coaching organisations. Previously, anti-doping intervention studies have largely been athlete-centred (e.g., Elbe & Brand, 2014) and the absence of evidence

related to ASP-based interventions leads to a poor understanding of whether anti-doping education is provided to these influential stakeholders and (if it is) how they experience these learning opportunities (e.g., the nature of the content, delivery mechanisms and the effects/impact). Exacerbating this, coach ambivalence to anti-doping, including education, has been found previously (Patterson, Duffy, & Backhouse, 2014; Patterson, Backhouse & Duffy, 2016; Patterson & Backhouse, 2018). Therefore, it is important to engage more deeply with coaches and coach-education providers to better understand current provision, including what factors increase the reach and impact of programs with coaching populations before further intervention development and evaluation studies are undertaken.

Despite the absence of coach anti-doping intervention studies, survey- and interview-based research with coaches provides some basic insights into their anti-doping education experiences. For instance, there is evidence to suggest that coaches typically learn about doping-related topics through formal education (e.g., Fjeldheim, 1992; Sajber, Rodek, Escalante, Olujić & Sekulic, 2013; Vankhaldo & Planida, 2013) and/or self-directed means (including searching the internet, reading books) (e.g., Engelberg & Moston, 2016; Mandic, Peric, Krzelj, Stankovic & Zenic, 2013; Rodek, Escalante, Olujić & Sekulic, 2012). Yet not all coaches are provided with, or are aware of, opportunities to learn about anti-doping (Allen, Morris, Dimeo & Robinson, 2017; Mazanov, Hemphill, Connor, Quirk & Backhouse, 2015; Vankhaldo & Planida, 2013); leaving many coaches with poor knowledge and limited confidence to undertake an anti-doping role (e.g., Allen et al., 2017; Patterson & Backhouse, 2018; Vankhaldo & Planida, 2013). Nonetheless, there are indications that many coaches would be keen to engage with learning opportunities related to anti-doping if they were provided (Laure, Thouvenin, & Lecerf, 2001; Vankhaldo & Planida, 2013). Therefore, investing in the development and delivery of anti-doping education programs for coaches is essential.

Given the current dearth of intervention-based research in the anti-doping field, the process of designing, implementing, and evaluating programs can be facilitated by the use of broader principles and conceptual frameworks, such as intervention mapping and programme theory. In this

vein, logic models have been highlighted as potential tools in relation to anti-doping education (Backhouse, Patterson & McKenna, 2012; Houlihan & Melville, 2011; Patterson et al., 2016). A logic model is a diagrammatic or tabulated representation of a programme/intervention, which responds to situations and needs within a population, and illustrates its inputs (e.g., people, expertise, costs), outputs (i.e., activities and target population/s) and desired outcomes (e.g., short, medium, and long-term) (Houlihan & Melville, 2011; Patterson et al., 2016). Logic models offer several benefits across the process of programme development and delivery, including clarifying goals (i.e., outcomes), identifying gaps in knowledge/logic and fostering collaboration/consensus between stakeholders (Dwyer & Makin, 1997; Kaplan & Garrett, 2005).

Logic models are typically created by synthesising information from various sources, including legislation, strategic plans, literature, and programme evaluations. Within the development process, stakeholder insights are vital (Dwyer et al., 2003; Houlihan & Melville, 2011). Indeed, a fundamental step in designing anti-doping education programs is consulting those who are responsible for the programme (i.e., developers and deliverers). Consulting these individuals is rare (Patterson et al., 2016; Patterson, Backhouse, & Lara-Bercial, 2018), despite the fact that they can provide insights into good practice (from which others can learn), as well as enabling us to understand the constraints or challenges of the system in which coach anti-doping education is provided (which ensures that future interventions and recommendations are feasible).

Beyond consulting individuals responsible for providing coach anti-doping education, it is crucial to gain insights from the direct recipients ('targets') of the programme – in this case, coaches. This places those the programme is intended to reach at the centre of provision and ensures that their voices and experiences are represented in the planned content and learning tasks (Backhouse & McKenna, 2012). With this approach, community ownership, implementation, and sustainability become a fundamental aspect of the intervention (Dwyer et al., 2003). Thus, actively involving programme recipients in the development process increases the likelihood that their needs and wants are considered, and subsequently met (Backhouse, McKenna, & Patterson, 2009; Dubin,

1990). In turn, this likely enhances the attractiveness, reach, and impact of anti-doping education programmes for coaches.

Complementing the use of logic modelling as a conceptual framework, this project will draw on the Behaviour Change Wheel (BCW) as a theoretical framework (Michie et al., 2011, see Figure 1). BCW is a meta-theory developed from nineteen theories of behaviour change; thus, it encompasses a multitude of factors that any one theory alone cannot capture, and it can be applied to any behaviour in any setting, including any population and different levels of systems. BCW consists of three layers that represent: 1) Sources of behaviour (capability, opportunity, and motivation), 2) Intervention functions (education, training, persuasion, coercion, restrictions, incentivisation, enablement, modelling, and environmental restructuring), and 3) Policy categories (guidelines, legislation, regulation, service provision, fiscal measures communication/marketing, and environmental/social planning).

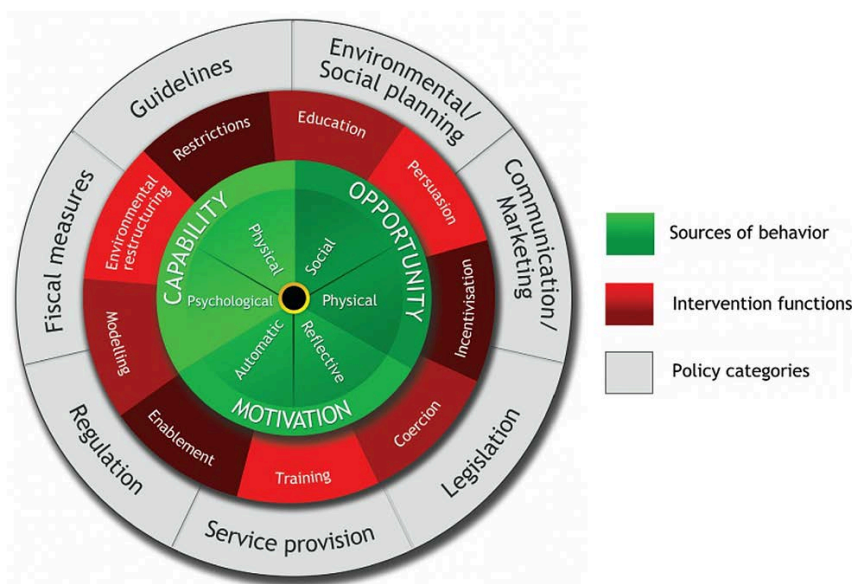


Figure 1. The Behaviour Change Wheel (Figure taken from Michie et al., 2011).

The inner layer of the BCW is the COM-B Model (Michie et al., 2011), and it suggests that for an individual to engage in a behaviour (B) they must have the physical (e.g., skills) and psychological (e.g., knowledge, decision making) capability (C), the social (e.g., support from others) and physical (e.g., time, facilities) opportunity (O), and the automatic (e.g., emotion, impulses) and reflective

(e.g., intention, goals) motivation (M) to undertake the behaviour over other competing behaviours. The COM-B model will be utilised within the project to aid our understanding of coaches' anti-doping behaviours (i.e., what they do and why they do it). The broader BCW, within which the COM-B model resides, will be used to identify how organisations might draw on different intervention functions and policy categories to influence coach capability, opportunity, motivation, and anti-doping behaviours. To date, BCW has been widely used in health-related research and within a systematic review assessing existing education programs to prevent steroid use (Bates et al., 2019). Researchers at Leeds Beckett University are currently using BCW in a body of work, including the exploration of coaches' and parents' anti-doping roles and determinants of whistleblowing on doping. The BCW is well-suited to the current project because it offers comprehensive coverage of influencing factors and was created with practical application (i.e., intervention design) in mind (Michie et al., 2014).

With regards to intervention design, this project recognises that WADA recently introduced an International Standard for Education (ISE; WADA, 2021), which provides specific guidance to Signatories on expectations for education. To complement this Standard, the current project aims to develop an International Framework for Coach Anti-Doping Education (IFCADE), through the following objectives:

1. Conduct a comprehensive audit and critical appraisal of global coach anti-doping education, including mapping, describing and analysing existing provision¹ for coaches across nations and sports;
2. Undertake systematic consultations with key stakeholders pertaining to coach anti-doping education worldwide, namely coaches, education providers and policy makers;
3. Collate a compendium of case studies of emergent practice in coach anti-doping education to share valuable lessons learned in engagement with this stakeholder group;
4. Create an International Framework for Coach Anti-Doping Education (IFCADE) and an implementation blueprint that are 'ready to use' by organisations (e.g., sporting, anti-doping and/or coaching) to develop, deliver, and evaluate their provision.

¹ Throughout this report, provision refers to information and education activities (e.g., programs, resources)

Research Design & Methods

Initial work using a logic model to investigate and inform coach anti-doping provision was undertaken in a UK context (Patterson et al., 2016). Having successfully ‘piloted’ the approach at a national level, it was employed within an international context to audit the provision of coach anti-doping education within High Performance Centres (HPCs) (Patterson et al., 2018). The latter project, commissioned by WADA in association with International Council for Coaching Excellence (ICCE), generated a logic model and continuum of emergent practice that can be used by HPCs to inform their coach anti-doping provision. To build on WADA’s initial investment and fully understand the global provision of coach anti-doping education and the context within which it exists, this project will consult a wider range of organisation representatives (including National Anti-Doping Organisations, NADOs; International Federations, IFs; and Coaching Associations, CAs) and a global sample of coaches. The project consists of the four components stated in Figure 2.

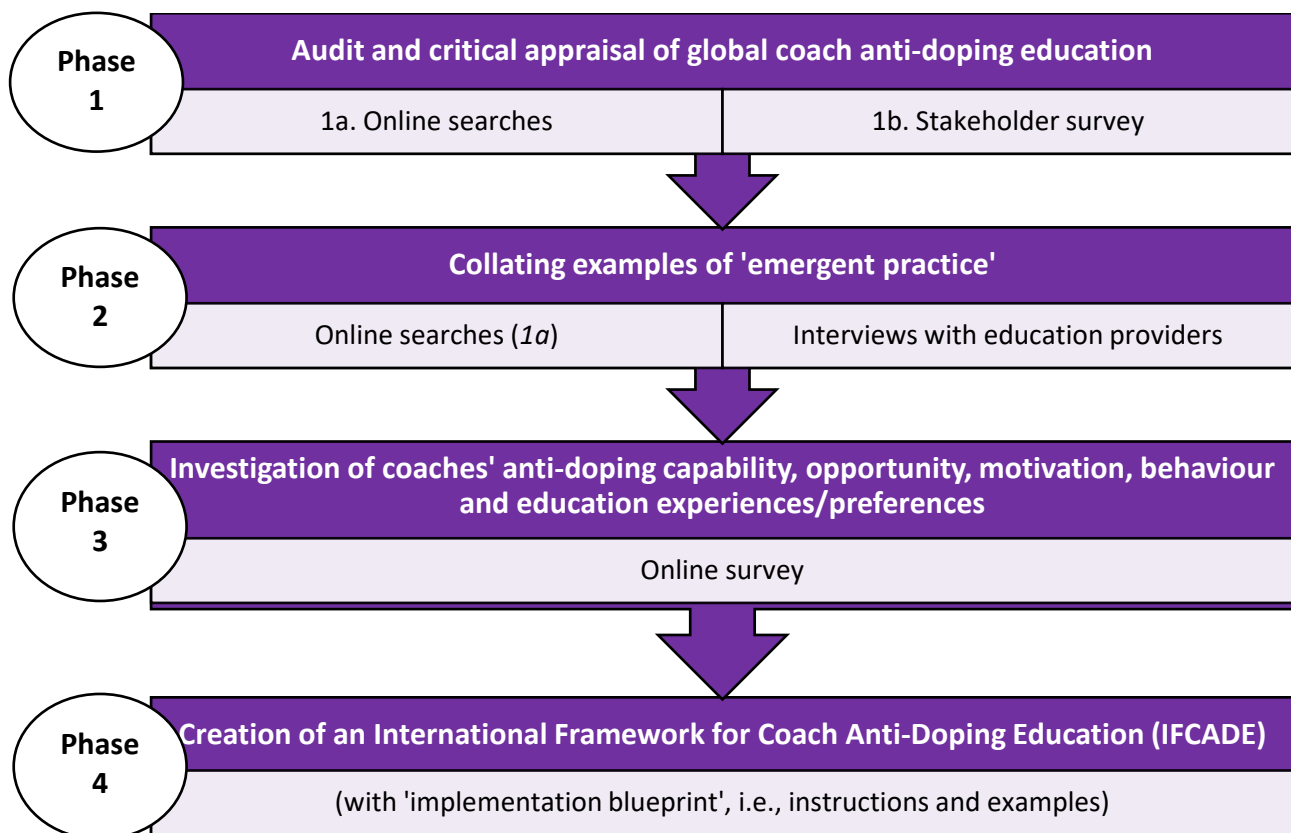


Figure 2. Components of the research project.

Phase 1: Audit and critical appraisal of global coach anti-doping education

The project began by auditing the current provision of coach anti-doping education globally, including that being delivered by NADOs, IFs, and CAs. By searching relevant organisation websites (Phase 1a), a database was created capturing information pertaining to (a) what interventions exist, (b) target audience (e.g., athletes, coaches), (c) content covered, and (d) delivery methods used. To check and elaborate on the information gathered throughout the online searches, a representative responsible for anti-doping education within each organisation was asked to review the audit results (Phase 1b). Where no, or limited, information could be located online, individuals were asked to provide any relevant details about their education provision. In addition to the information captured within the audit, organisations were asked how their coach anti-doping education was developed (e.g., evidence-informed, theory driven) and if/how they engage with WADA resources, such as Coach True, the Model for Core Programs Information/Education Guidelines and relevant social science research (e.g., Houlihan & Melville, 2011; Sullivan, 2013).

Phase 2: Collating examples of 'emergent practice' in coach anti-doping education

Informed by the audit, semi-structured interviews were undertaken (via Skype and telephone) with individuals from a selection of organisations to gain in-depth, contextualised insights into their education provision. This exercise enabled us to fully understand what is currently being done, if interventions are working, and where lessons can be learned from existing practice (i.e., knowledge-transfer between organisations).

Phase 3: Investigation of coaches' anti-doping capability, opportunity, motivation, behaviour, and education experiences/preferences

Coach consultations were undertaken to ensure that the recommendations for intervention proposed by the framework are informed by the preferences of the target population. A sample of N=594 coaches was recruited via a range of organisations (i.e., anti-doping, sporting, coaching) and key demographic details (e.g., sport, level of competition, age, experience, qualification level). Drawing on behavioural science (COM-B, Michie et al., 2011), the survey examined coaches'

behaviour and perceived capability, opportunity, and motivation in relation to anti-doping. This information was combined with insights into coaches' experiences of anti-doping education to date, and preferences for learning about anti-doping in the future, to develop appropriate and effective interventions via the Framework.

Phase 4: Creation of an International Framework for Coach Anti-Doping Education (IFCADE)

Based on findings from online searches, interviews, and surveys, an International Framework for Coach Anti-Doping Education (IFCADE) was drafted. The Framework provides recommendations for coach anti-doping education provision. Through logic modelling, these include target population(s), desired outcomes, activities ('outputs'), and resources ('inputs'). Alongside the Framework, an implementation blueprint and compendium of examples was developed to provide specific instructions on how organisations can use the Framework. Comprising all three components, the IFCADE document can guide organisations in the development, delivery, and evaluation of their coach anti-doping provision, including indicating what organisations might do in the shorter and longer term to enhance reach and impact.


Next steps

Working in partnership with WADA, the research team would like to enhance the attractiveness and usability of the Framework. They propose to do so by contracting professional design services and engaging in 'co-production' of the final IFCADE with a working group, comprised of five to ten anti-doping, sporting, and coaching organisation representatives. Though the research team planned to convene the working group during the two-year project, it was not possible due to a global pandemic. Once finalised, the IFCADE documents/resources can be made available by WADA on their ADeL platform, where all national and international sporting, anti-doping and coaching organisations will be able to access them and use them to inform their coach anti-doping education provision.



Phase 1

Comprehensive audit and critical appraisal of
global coach anti-doping education



**Objective: Conduct a comprehensive audit and critical appraisal of
global coach anti-doping education.**

MARCH 2019 – JULY 2019

Context

The first step of this programme of research involved undertaking a comprehensive audit and critical appraisal of global coach anti-doping education, including mapping, describing, and analysing existing provision for coaches across nations and sports. Although the provision of anti-doping education to coaches is compulsory for all Code signatories (WADA, 2015, 2021), very little was known about the anti-doping education being delivered across the globe. Therefore, Phase 1 of this project provided an opportunity to create a central public record of the coach-focused anti-doping programmes that have been developed and implemented by national and international anti-doping, sporting, or coaching organisations. This was achieved via two main activities: 1) searching relevant organisation websites (Phase 1a) and 2) asking organisations to review the audit results and/or provide further details of their education provision (Phase 1b). Using these methods, and utilising logic modelling as a conceptual underpinning (see Introduction for further details), a database was created that captures information pertaining to a) what education interventions/resources exist, (b) target audience (e.g., qualification level of coach, coach context), (c) mechanisms of delivery (e.g., face-to-face, online, by whom, timing, frequency, duration), (d) content covered by the programme (e.g., topics, learning tasks), (e) intended outcomes (e.g., develop coaches' knowledge and skills, influence coaches' anti-doping actions/behaviours) and (f) if/what monitoring and evaluation processes are in place.

Phase 1a - Online Review of Coach Anti-Doping Provision

Research Design

Existing coach anti-doping interventions were identified and reviewed via desk-based research. Specifically, we accessed the websites of NADOs (<https://www.wada-ama.org/en/code-signatories>), IFs (<https://www.olympic.org/sports>), and CAs (<https://www.icce.ws/members.html>) and details regarding existing coach anti-doping education were identified. Overall, this activity identified 141 NADOs, 34 IFs (28 Summer and six Winter Olympic sports), and 18 CAs. The initial review was undertaken during March 2019.

Phase 1a Findings

NADOs

What education interventions/resources exist?

Across the 141 NADO websites accessed, 47 NADOs (33%) had information readily available online about their anti-doping provision, in which coaches were represented within the target population. The provision of five NADOs (out of 47, 11%) was based solely on signposting coaches to WADA resources (e.g., Coach True). Thus, 42 NADOs reported providing additional anti-doping education provision for coaches. Of this 42 NADOs, 88 interventions were observed, with a range of between 1 and 6 interventions per organisation. Notably, the number of resources available differed across continents; the majority of interventions were provided by NADOs across Europe, while the provision across South America remained limited.

Who is the target audience (e.g., qualification level of coach, coach context)?

Of the 42 NADOs who identified coaches within their target population for anti-doping education provision, just under a third of the interventions (26/88, 30%) were aimed at coaches from all levels. One intervention (out of 88, 1%) was tailored to coaches at a specific qualification level (i.e., level 2 coaches) and one intervention (1%) was tailored to coaches in a specific sport (e.g., weightlifting). Another, 13 interventions (out of 88, 15%), targeted coaches and other ASP together (e.g., family members, managers, medical personnel, and teachers).

Thirty-eight interventions (out of 88, 43%) were aimed primarily at athletes but coaches were acknowledged as a secondary audience for these interventions. For example, athletes and ASP (12/38, 32%) or athletes and others (4/38, 11%) were the most common phrases used to identify the target audience for the intervention. Other athlete-focused target audiences included, but were not limited to: “athletes and coaches” (n=2), “athletes, support staff, and medical professionals” (n=1), “athletes, coaches, and fitness instructors” (n=1), and “youth athletes, athletes’ families, support staff, and sports fans” (n=1). Some interventions (6/38, 16%) reported a specific focus on athletes and support staff working in performance sport (i.e., high-level sport, National, and International),

while two interventions (out of 38, 5%) were specifically focused on youth sport. Interestingly, one NADO reported that while the target population for their intervention was “*Schools, Athletes / Teams, Coaches, Management, Parents, Health professionals, Tertiary education programmes*”, they identified the importance of this intervention for “*top tier athletes and support staff*”.

The remaining nine interventions (out of 88, 10%) did not specifically identify coaches as their priority target audience, but it is important to recognise that coaches would be included in the categorisation used by NADOs because seven organisations referred to “*all involved in sport*” as their target population (8%), one identified everyone working in a certain sport (1%), and one provided an intervention which targeted “*individuals who wish to become anti-doping trainers*” (1%).

What mechanisms of delivery are used (e.g., face-to-face, online, by whom, timing, frequency, duration)?

The 88 interventions that were identified across the 42 NADO websites (i.e., those that were specifically for coaches/ASP and those that were athlete-centred but accessible to coaches) were delivered using a variety of methods. We observed that globally, 20 NADOs disseminated various interventions using online resources. Of these 20 NADOs, 43 interventions (out of 88, 49%) were identified as webpages providing information and resources (e.g., downloadable materials including books, booklets, and posters), and 15 (17%) of them were e-Learning portals. Face-to-face interventions, including outreach programmes (2/88%, 2%) and workshops, seminars and lectures (27/88, 31%) were identified across 13 NADOs. The remaining nine NADOs appeared to use both online resources and face-to-face methods to disseminate various interventions.

Building on the earlier point around number of resources differing across continents, notable differences were found in the types of resources used by NADOs across different continents (Figure 3). Specifically, Asian NADOs tended to focus on face to face interactions, while European and North American NADOs predominantly used online resources.

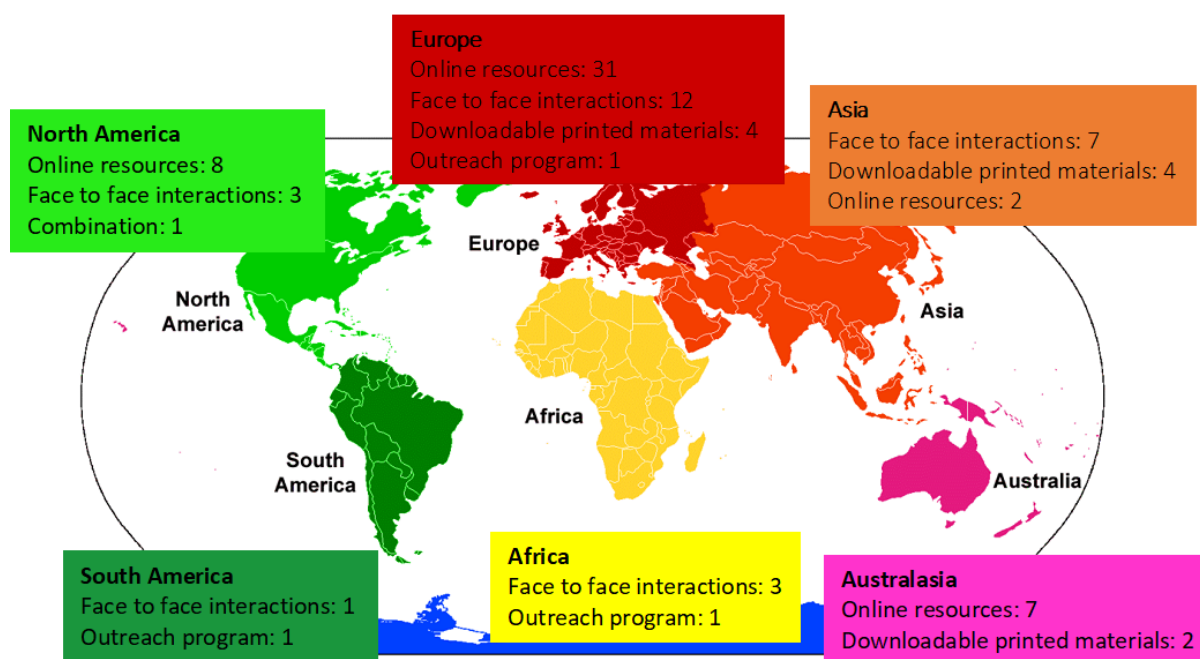


Figure 3. Continental comparisons of education interventions provided by NADOs.

While some information on mechanisms of delivery (i.e., online or face-to-face) was available in the online review, limited information was available surrounding the location, timings, and frequency of these interventions. With regards to location, five NADOs reported delivering their intervention(s) at events (i.e., major sporting competitions, n=4; coach education events, n=1) and two NADOs reported delivering the face-to-face interventions across a range of locations (i.e., centres of high sports performance, sports facilities, educational spaces, n=1; high performance centres, technical centres, universities and educational centres, n=1). Three NADOs reported timings of their face-to-face sessions, and the duration of these varied from 2.5 hours (n=1), 3 hours (n=1) to 1 day (n=1). While this information is limited, it is important to note, that it may be difficult for organisations to state the exact duration of their interventions, particularly face-to-face sessions, as two NADOs reported tailoring the length and volume of the training to the target group.

What content is covered by the intervention (e.g., topics, learning tasks)?

Across the 88 interventions, NADOs' coach anti-doping education provision included a variety of topics. Table 1 shows that the topics often aligned with those identified in the ISE (WADA, 2021), with testing procedures and the Prohibited List being included the most. Topics outside of the

ISE that were covered in NADO interventions included: Operation of International and National Anti-Doping Organisations (n=6), general information such as what is doping (n=5), working with young athletes (n=1), sports nutrition (n=1), and other unethical behaviours (i.e., match fixing; n=1).

Table 1. Proportion of NADO interventions providing content on topics listed in the ISE (WADA, 2021) identified within the online audit.

Topics	Number of interventions which identified the ISE topics (N=88)
Testing procedures, including urine, blood, and the Athlete Biological Passport	40 (45%)
Substances and Methods on the Prohibited list	35 (40%)
Athletes', Athlete Support Personnel's, and other groups' rights and responsibilities under the Code	29 (33%)
Risks of supplement use	27 (31%)
Use of medications and Therapeutic Use Exemptions	26 (30%)
Anti-doping rule violations	22 (25%)
Consequences of doping, for example, physical and mental health, social and economic effects, and sanctions	21 (24%)
Principles and values associated with clean sport	19 (22%)
Requirements of the Registered Testing Pool, including whereabouts, and the use of ADAMS	14 (16%)
The principle of Strict Liability	6 (7%)
Speaking up to share concerns about doping	2 (2%)

Types of learning tasks

Using the words and phrases of the organisations, and the research teams reflections, online searches revealed 11 different learning tasks employed by NADOs within their coach anti-doping education provision (see Figure 4, overleaf). Learning tasks which included written text and visual images were identified as the most common forms of activity utilised by NADOs (40%). Beyond this, some NADOs used learning tasks such as videos (22%) and scenarios/role play (3%) to provide observable examples of behaviours for coaches to review and or imitate.

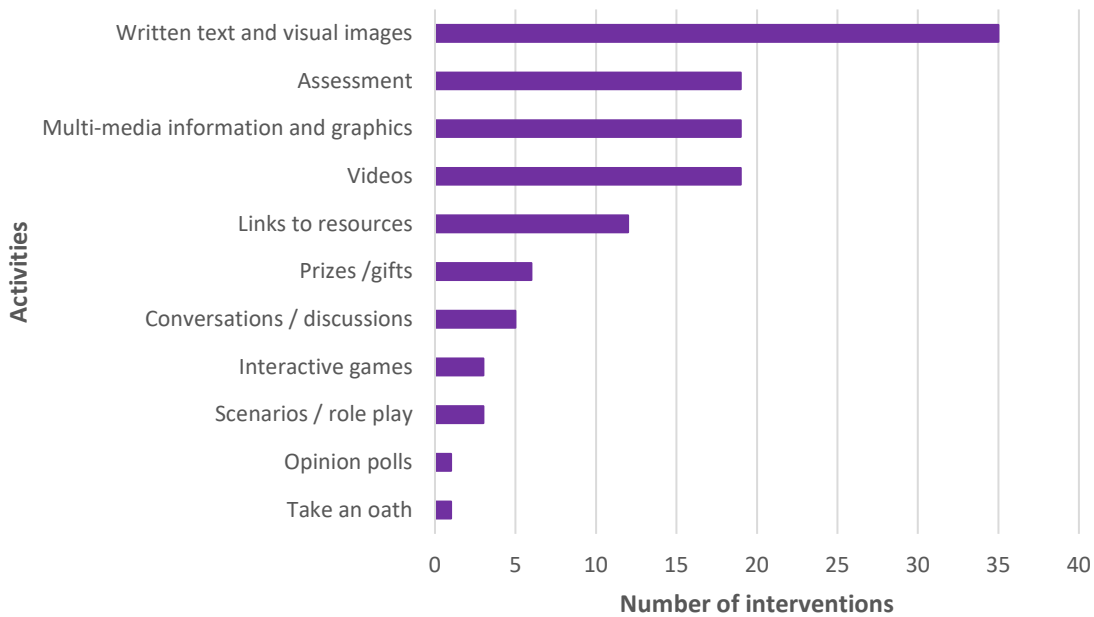


Figure 4. Frequency of different learning tasks used by NADOs within their interventions (i.e., those that were specifically for coaches/ASP and those that were athlete-centred but accessible to coaches).

What are the intended outcomes (e.g., develop coaches' knowledge and skills, influence coaches' anti-doping actions/behaviours)?

The outcomes were reported for 49 interventions (out of 88, 56%) across the 42 NADOs. For many NADOs, the main intended outcome(s) of providing coach anti-doping interventions was to develop coaches' knowledge (16/88, 18%) and/or awareness (11/88, 13%). Therefore, when the intended outcomes reported by NADOs were categorised using the Capability, Opportunity, Motivation - Behaviour Model (COM-B; Michie et al., 2008; Michie et al., 2014; Michie et al., 2011) as shown in Figure 5 (overleaf), the primary aim of many NADOs is to develop coaches' capability. Still within the capability component of COM-B, some NADOs intended to develop coaches' skill development (e.g., doping control, practical ideas; n=2), and influence coach decision making (n=2).

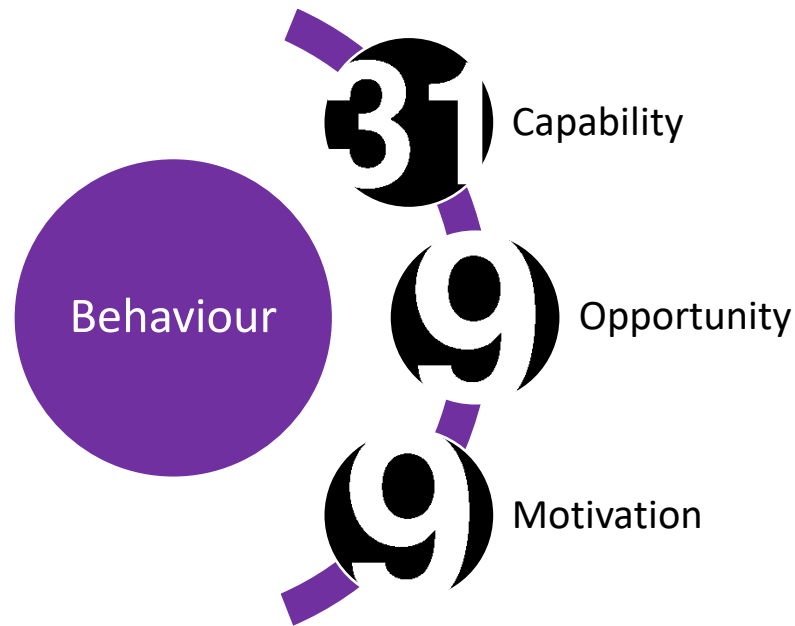


Figure 5. Frequency of interventions with intended outcomes within each component of COM-B.

Only nine interventions reported intended outcomes related to opportunity. For example, interventions aimed to address physical opportunity (i.e., environmental context and resource) by providing material resources in the coaches first language (n=1), as well as a platform for coaches to ask questions (n=1). With regards to social opportunity (i.e., social influences) one intervention intended to shape the organisational culture of sport.

Moving to the final component of COM-B – motivation – a small number of Interventions (9/88, 10%) aimed to develop coaches perceived social and professional role (n=5), facilitate the formation of anti-doping habits (n=2) and influence coaches’ optimism around anti-doping (n=1).

Are monitoring and evaluation processes in place?

Within the information available on NADO websites, only four organisations reported any form of monitoring and evaluation processes. Three of these referred specifically to the number of individuals who had accessed the interventions provided by the organisations. Whereas the fourth organisation, provided more specific details surrounding the development of coaches’ skills,

knowledge, intentions, beliefs about capabilities, and use of interventions such as the e-learning system provided by the NADO.

IFs

What education interventions/resources exist?

Thirty-four IFs (28 Summer and six Winter Olympic sports) websites were accessed, and a total of 19 organisations were identified as having some coach anti-doping education in place. Therefore, approximately 56% of the IFs reviewed had anti-doping information readily available on their websites for coaches. Ten (out of 19, 53%) IFs provided links to existing WADA resources, such as Coach True and the Coach's Tool Kit. Importantly, nine IFs reported coaches in their target populations. Across these nine organisations, 12 interventions were observed.

Who is the target audience (e.g., qualification level of coach, coach context)?

The nine IFs who identified coaches as a target population for their anti-doping education, varied in their description of the target audience. Just three interventions were aimed specifically at coaches (3/12, 25%), with one of these focused on coaches at a specific level of competition (i.e., level two) and the others appeared to target coaches at all levels. The remaining interventions (9/12, 75%) were aimed at ASP more broadly (i.e., ASP, n=2; coaches, trainers, managers, agents, and other support personnel, n=1) and both ASP and athlete populations together (athletes and ASP, n=3; athletes, officials, and athlete entourage, n=1; athletes, coaches, technical officials and administrators n=1; coaches, athletes, and other team delegation members, n=1).

What mechanisms of delivery are used (e.g., face-to-face, online, by whom, timing, frequency, duration)?

Of the 12 interventions identified, the largest proportion were delivered via online resources (8/12, 67%), with the remaining four utilising face to face interactions. Of the eight interventions using online resources, four included an online webpage, three provided an e-Learning tool, and one provided downloadable material (i.e., booklet). Face-to-face interventions were delivered at major

sporting competitions as part of an outreach programme (2/12, 17%), or as module on a coaching course (1/12, 8%), or a one-off coaching seminar (1/12, 8%). Limited information was provided about the delivery, timing, and frequency of these interventions.

What content is covered by the interventions (e.g., topics, learning tasks)?

The anti-doping education provision made available to coaches by IFs, included the majority of topics identified in the ISE (WADA, 2021; Table 2). Similar to NADOs, the most common topics covered were testing procedures and the Prohibited List. However, in the case of IFs, other topics such as clean sport principles, rights and responsibilities, and use of medications/supplements were also covered equally as much.

Table 2. Proportion of IF interventions providing content on topics listed in the ISE (WADA, 2021) identified within the online audit.²

Topics	Number of interventions which identified the ISE topics (n=12)
Testing procedures, including urine, blood, and the Athlete Biological Passport	7 (58%)
Principles and values associated with clean sport	5 (42%)
Athletes', Athlete Support Personnel's, and other groups' rights and responsibilities under the Code	5 (42%)
Substances and Methods on the Prohibited list	5 (42%)
Risks of supplement use	5 (42%)
Use of medications and Therapeutic Use Exemptions	5 (42%)
Consequences of doping, for example, physical and mental health, social and economic effects, and sanctions	2 (17%)
Requirements of the Registered Testing Pool, including whereabouts, and the use of ADAMS	2 (17%)
Anti-doping rule violations	1 (6%)
Speaking up to share concerns about doping	1 (6%)
The principle of Strict Liability	0

Other topics beyond the ISE identified by IFs were history and definition of doping (n=3); results management (n=2); competition manipulation (n=1); nutrition of players (n=1); symptoms, and vulnerability factors in doping (n=1).

² This analysis focuses on content provided by IF's independent of their signposting to WADA's Coach True resource.

Types of learning tasks

Across the 12 interventions made available to coaches, five different learning tasks were observed (Figure 6). The majority of IFs' provision included written text and visual images (58%) and or links to resources (50%). Very few organisations used videos (17%), multi-media information (8%), and quizzes (8%) to support coaches in performing anti-doping roles and responsibilities.

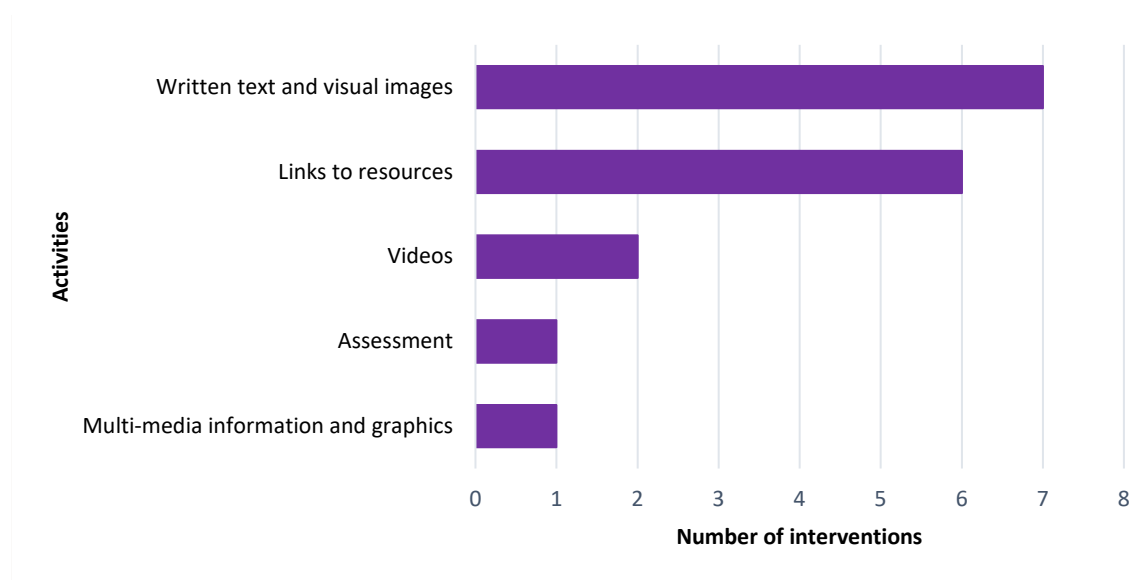


Figure 6. Frequency of different learning tasks used by IFs within their coach specific anti-doping provision.

What are the intended outcomes (e.g., develop coaches' knowledge and skills, influence coaches' anti-doping actions/behaviours)?

Intended outcomes were identified for only six (of the total 12, 50%) interventions provided across the nine IFs whose coach anti-doping education was observed. Results showed that the majority of interventions aimed to develop knowledge (n=4), which falls within the capability component of COM-B. The remaining two interventions were categorised as shaping coaches' (and other ASP) motivations, as they related to building anti-doping values (n=1) and protecting the integrity of sport and health of athletes (n=1).

Are monitoring and evaluation processes in place?

None of the IFs reported any form of monitoring and evaluation processes.

CAs

What education interventions/resources exist?

During the online review of 18 CA websites, only two (11%) CAs were identified as providing anti-doping resources for coaches. From these two organisations, three interventions appeared to be available to coaches across parts of Europe (n=2) and North America (n=1). Given the limited amount of information available for these organisations, all information related to the nature of the interventions (e.g., target population, delivery, content, intended outcomes and evaluation) is presented together.

All three interventions identified all coaches as their target population, revealing no further information on the qualification level of the coach or the coaching context (e.g., sport). Two interventions included online resources (66%), while the remaining intervention was a face-to-face workshop. The online resources provided written information and links to resources surrounding nutritional supplements (n=1) and substances and methods (i.e., Erythropoietin; n=1). With reference to the face-to-face intervention, no further information was provided surrounding delivery (i.e., by whom, timing, frequency, or duration). The intended outcomes were not reported online for any of the interventions. In addition, no monitoring and evaluation processes were identified.

Phase 1a Summary

By reviewing the websites of NADOs, IFs, and CAs, we have established that coaches do have access to anti-doping interventions. Specifically, 16% of all organisations surveyed (141 NADOs, 34 IFs, and 18 CAs) have online content readily available for coaches to view, download, or use. Beyond this, some organisations also provide coaches with access to face-to-face interventions. With regards to the content of the interventions available to coaches, many organisations appear to align the topics covered with those identified in the ISE (WADA, 2021). However, this online review showed that current global coach anti-doping education provision does not have adequate coverage of some of these topics, such as *“Speaking up to share concerns about doping”* and *“The principle of Strict*

Liability". Notably, the topics that are covered are predominantly taught/communicated via written text and visual images. This aligns with the intended outcomes of the majority of interventions, to increase coaches' knowledge and/or awareness. Indeed, the focus of current provision available to coaches (based only on information available on organisation websites) is somewhat narrowly focused on capability, when considered in relation to the COM-B model. At present, very few organisations intend to, nor utilise learning tasks that would likely address, the broader range of factors that may influence behaviour – namely, those included in COM-B beyond capability, which are opportunity and motivation. This is something we will look to explore further in the subsequent phases of the project, to ensure that we have not inappropriately drawn this conclusion simply due to the limited information that is available on organisation websites.

Other matters that require further investigation before drawing (potentially inappropriate) conclusions are that:

- Many organisations do not appear to identify coaches as a specific target population for their anti-doping education provision, with some organisations seemingly doing nothing for this key stakeholder group. We observed that a small number of organisations, mostly NADOs, currently provided a variety of interventions for this stakeholder group, and utilised different methods within these interventions.
- Building on the previous point, even among those organisations that do identify coaches as a target population of their anti-doping education provision, the tailored nature of these interventions to coaches and their environment (e.g., country or sport) was not often evident;
- The way in which coaches access anti-doping interventions appears limited across all types of organisations, including a reliance on online delivery despite coach education and development literature showing that this population values a diverse range of learning

opportunities in general (Lara-Bercial & Mallet, 2016) and for anti-doping specifically (Patterson et al., 2019);

- There is an urgent need for organisations to monitor and evaluate their coach anti-doping education; if this is already being done, there is a need for greater transparency around and reporting of such activities as information was only available from a handful of organisation websites.

Phase 1b - Survey of Coach Anti-Doping Education Provision

Research Design

Following the initial online review, NADOs (n=124; those whose contact details were available online), Regional Anti-Doping Organisations (RADOs; n=16), IFs (n=34), and CAs (n=18) were invited to provide feedback on the information we had captured relevant to their organisation. Specifically, organisations were emailed a Microsoft Word™ document containing an overview of the information we had obtained from their website, regarding their anti-doping education provision for coaches. In addition, organisations were asked to comment on:

- a) How their organisation's coach anti-doping education was developed
- b) If they or their organisation engage with WADA resources, such as Coach True, when developing coach anti-doping provision
- c) If they or their organization engage with the Model for Core Programmes Information/Education Guidelines provided by WADA when developing coach anti-doping provision
- d) If they or their organisation engage with reports from WADA's social science research programme when developing coach anti-doping provision
- e) If they or their organisation engage with any other sources (not identified in the previous questions) when developing coach anti-doping provision
- f) If their coach anti-doping provision offers an example of good practice
- g) Any barriers/challenges they might face when designing or delivering coach anti-doping education
- h) Any plans they might have regarding the development or delivery of coach anti-doping education in the future, and
- i) Which organisation they perceive should lead the design and delivery of coach anti-doping efforts

Individuals representing organisations were asked to complete a consent form and return this, along with the completed Microsoft Word™ document, directly back to the research team via email.

Overall, 79 organisations (41% response rate) provided clarification and further information about their coach anti-doping education provision. Responses came from 50 NADOs, four RADOs, 16 IFs, and nine CAs. From the responses, an additional 109 interventions were identified. It is important to note that initial survey response rates were low. To address this, the research team drew on their experience and expertise to employ various evidence-informed techniques ('nudges')³ to increase engagement (see Table 3 for insights into patterns of response). Two approaches that proved particularly effective were to speak to individuals via telephone and to offer individuals the opportunity to contribute without completing the full survey Word document (e.g., a limited list of questions was sent within an email). Researchers (Efverstrom et al., 2016) have reported response rates in anti-doping research range from 25-80% response rate and, specifically, online surveys received lower response rates. In survey research outside the anti-doping field, response rates are typically around 30% (Anseel, Lievens, Schollaert, Choragwicka, 2010; Fulton, 2018). Therefore, based on the fact we had received responses from 41% of our total population, and organisations from every continent were represented in those responses, a decision was made to end data collection. Data was collected between March – July 2019⁴.

Table 3. Response rate per nudge.

Nudge Type	Number of Organisations Contacted	Number of Responses	Cumulative Response Rate
Initial Email and Survey	192	4	4/192, 2%
Email nudge	188	2	6/192, 3%
Email and survey	186	15	21/192, 11%

³ For example, the research team provided personalised correspondence; advanced notice; timely reminders; customised deadlines and extensions where necessary; and used phrases such as “*deadline approaching*” in the prompts (Anseel, Lievens, Schollaert, & Choragwicka, 2010; Fulton, 2018; Schouten, Calinescu & Luiten, 2011).

⁴ The information contained in this report was most recently updated in August 2019.

Video Nudge	171	11	32/192, 17%
Image Nudge	160	13	45/192, 32%
Social Media Nudge	19	0	-
Email and short survey	147	21	66/192, 34%
Telephone nudge	126	12	78/192, 41%
Total		78	

Phase 1b Findings

The findings from the survey are presented in two parts: (i) the organisations' reports on their coach anti-doping education provision (first half of the survey), and (ii) information pertaining to the broader context around the development and delivery of interventions, such as engagement with guidance, social science findings and so on (second half of the survey). To mirror the structure of the online review, the information provided by NADOs, IFs, and CAs will be presented separately. An additional section on RADOs is also presented.

Part i – Organisations' Reports on their Provision

NADOs

Of the 50 NADOs who completed the survey, 62% (31/50) reported an additional 64 interventions which had not been captured during the online review. Seven (out of 50, 14%) NADOs did not identify any additional interventions to those originally captured during the online audit, a further 7 (out of 50, 14%) reported that they provided coach anti-doping information, but gave no further details surrounding the interventions they use, and five (out of 50, 10%) NADOs reported not having an anti-doping education provision for coaches. The remainder of this section discusses the additional 64 interventions identified by the 31 NADOs.

What additional education interventions/resources exist?

Figure 7 (overleaf) shows that NADOs across all continents have an anti-doping provision for coaches in place. According to this figure, coaches across Europe appear to have greater access to coach anti-doping education, as 52 interventions were reportedly in place. Twenty-four organisations outside of Europe returned information regarding their coach anti-doping provision.

However, only 11 organisations provided additional information to that we had already obtained via the online review process; in doing so, they described 12 interventions.

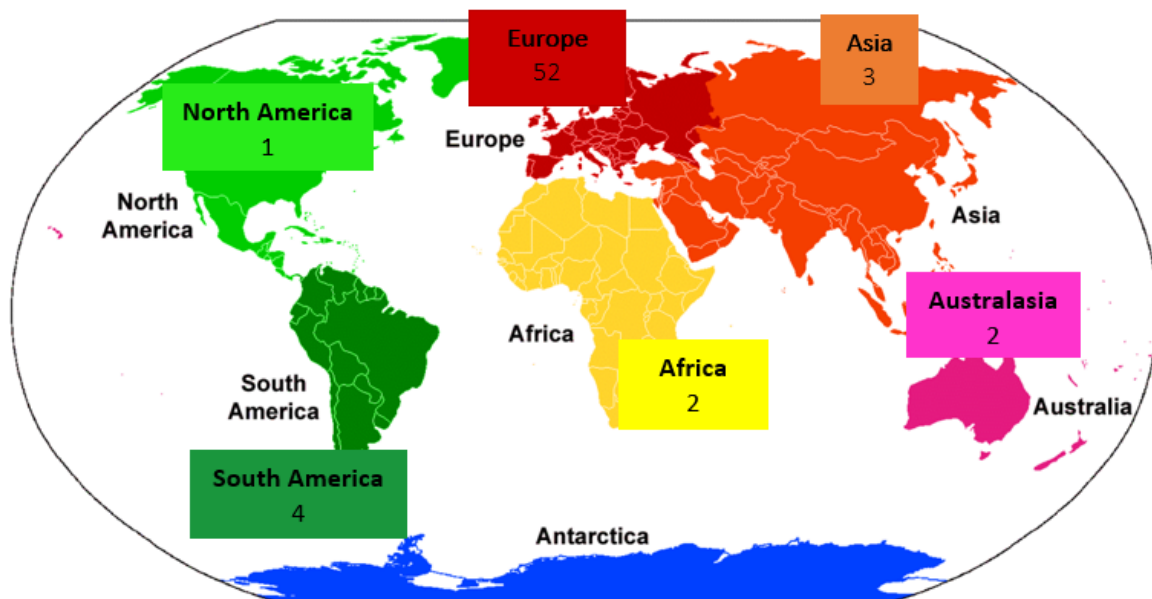


Figure 7. Continental spread of additional interventions identified using information provided by NADOs.

Who is the target audience (e.g., qualification level of coach, coach context)?

Coaches were identified as a target audience for 45 (70%) of the additional 64 interventions provided by NADOs globally. These interventions were predominantly aimed at coaches from all levels (15/45, 33%), and elite level coaches (14/45, 31%). Six interventions (out of the 45, 13%) were tailored to coaches across different qualification levels (e.g., ‘future coaches’, level 3 coaches) and one organisation reported tailoring their intervention (2%) based on the needs of “respective national federations (NFs)”. Three interventions (out of 45, 7%) were targeted at ASP in general, while two interventions (4%) were aimed at coaches and other specified ASP (e.g., Physical Education teachers, sports physicians). The remaining four interventions (out of 45, 9%) targeted ‘recreational’ and ‘youth sport’ coaches.

Fifteen per cent of interventions (10/64) were not specifically tailored to a coaching population, as they targeted athletes and ASP (n=9) or athletes alone (n=1). To elaborate, the

audiences for these interventions were: ‘athletes and ASP’ (n=5); ‘all athletes, coaches, and other ASP’ (n=1); ‘athletes, doctors, and coaches’ (n=1); athletes and coaches (n=1); school teachers, students, athletes, coaches, National Federation administrators (n=1); young athletes (n=1). Other interventions were reported to target sporting organisations (3/64; 5%) and sports clubs (1/64, 2%). The target audience was not reported for five interventions (8%).

What mechanisms of delivery are used (e.g., face-to-face, online, by whom, timing, frequency, duration)?

As stated previously, the majority of the new interventions were reported by organisations located in Europe. Across this continent, a diverse range of methods were employed to deliver interventions to coaches, but face-to-face methods were most dominant (Figure 8).

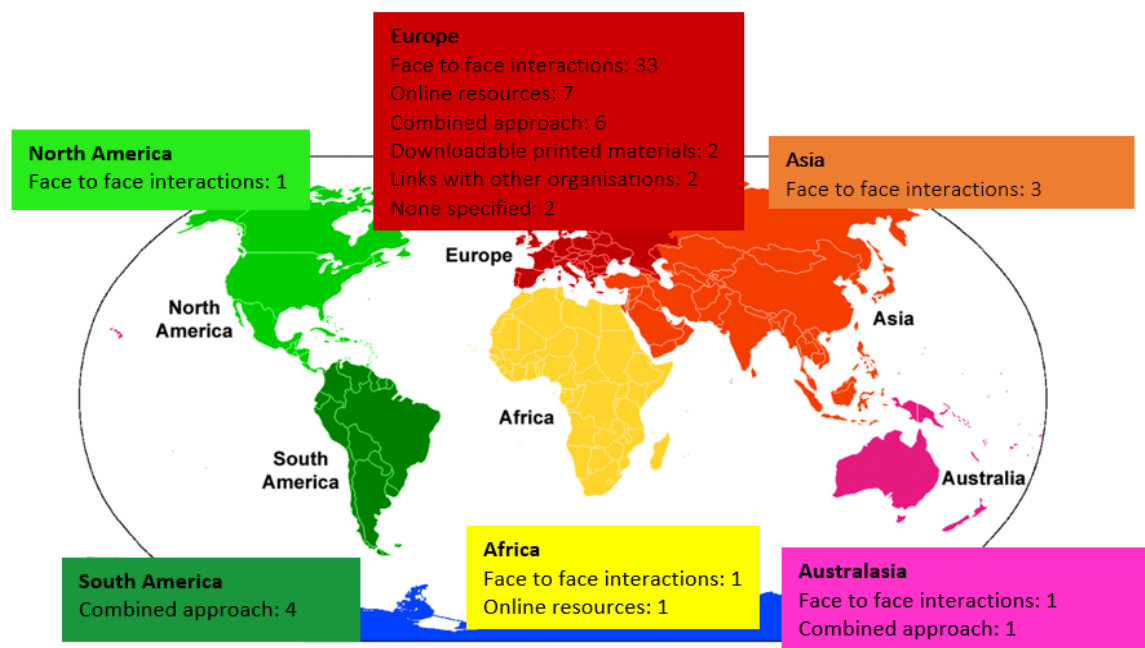


Figure 8. Continental comparisons of delivery methods used by NADOs.

Indeed, the majority (47/64, 73%) of the additional interventions identified via the survey consisted of face-to-face interactions (e.g., workshops, lectures). Specifically, 24 NADOs reported disseminating coach anti-doping interventions using face-to-face methods such as workshops (n=16), lectures (n=13), workshops and lectures (n=9), “seminars, lectures, workshops, and presentations” (n=2), conferences (n=1), meetings (n=1), outreach programmes (n=1), outreach programmes and

workshops (n=1), “workshop and presentation” (n=1), “workshops and seminars” (n=1), and seminars (n=1). While differences were noted in the terminology used by organisations to categorise the mechanisms of delivery used (e.g., seminar and workshop), it is important to note based on the information provided we cannot infer what the differences are between these approaches.

In addition to face-to-face interactions, online programmes (10/64, 16%) and downloadable/printable materials were identified (3/64, 5%), and two NADOs reported that they combined face-to-face methods with online and printed resources (2/64, 3%). Online interventions, identified by 11 NADOs, included links to resources (e.g., Coach True; n=8), e-Learning (n=4), webpages (n=3), webinars (n=1), social media (n=1), and links to an information sharing platform (e.g., Google drive, n=1).

Similar to the online review, limited information was provided surrounding the location, timings, and frequency of the interventions that were reported in the survey. Only three NADOs reported the timings of their interventions; one reported conducting a one-hour presentation, and the other two NADOs reported full-day events. Beyond this, two interventions were identified as taking place during other coach education courses.

What content is covered by the programme (e.g., topics, learning tasks)?

Though in the previous sections we were able to summarise 64 interventions provided by 31 NADOs, only 29 NADOs reported on the content of 53 interventions. Table 4 (overleaf) shows that most of these interventions identified content which aligned with the topics identified in the ISE (WADA, 2021). Supporting findings from the online review, compliance-related topics such as the testing process and substances/methods were most commonly covered. Similarly, as found in the online review, a significant omission from the topics listed was signposting coaches to whistleblowing practices.

Table 4. Proportion of NADO interventions providing content on topics listed in the ISE (WADA, 2021).

Topics	Number of interventions which identified the ISE topics (n=53)
Testing procedures, including urine, blood, and the Athlete Biological Passport	27 (51%)
Anti-doping rule violations	27 (51%)
Substances and Methods on the Prohibited list	24 (45%)
Use of medications and Therapeutic Use Exemptions	24 (45%)
Risks of supplement use	23 (43%)
Consequences of doping, for example, physical and mental health, social and economic effects, and sanctions	23 (43%)
Athletes', Athlete Support Personnel's, and other groups' rights and responsibilities under the Code	22 (42%)
Requirements of the Registered Testing Pool, including whereabouts, and the use of ADAMS	18 (34%)
Principles and values associated with clean sport	18 (34%)
The principle of Strict Liability	1 (2%)
Speaking up to share concerns about doping	0

A number of other topics (beyond those listed in the ISE) were reported by NADOs, including preventing doping (n=7); decision making (n=4); athletes' views on AD (n=3); vulnerability factors on athletes (n=3); spectator safety (n=1); competition manipulation (n=1); health and well-being (n=1); AD cases and examples of best practice (n=1); nutrition (n=1); body image (n=1).

Notably, five NADOs reported tailoring their provision to the audience and, this meant that limited information could be provided around the content of these interventions.

Types of learning tasks

NADOs reported using 14 different learning tasks to deliver their coach anti-doping provision (Figure 9, overleaf). The most common activity was the presentation of information in written form, supported by visual images (47/64, 73%). This was seen in both online (e.g., webpages) and face-to-face (e.g., presentations) interventions. Many organisations also reported that the written information provided in face-to-face interventions was supported with interactive elements such as discussions (22/53, 42%), exploring case studies (16/53, 30%), and role-play (8/53, 15%). Within Figure 9, the interactive tasks (e.g., sending a postcard; making a word cloud) used with athletes and

ASP by one NADO during outreach events were quite different to those reported by other organisations, so these were categorised broadly as ‘interactive activities’.

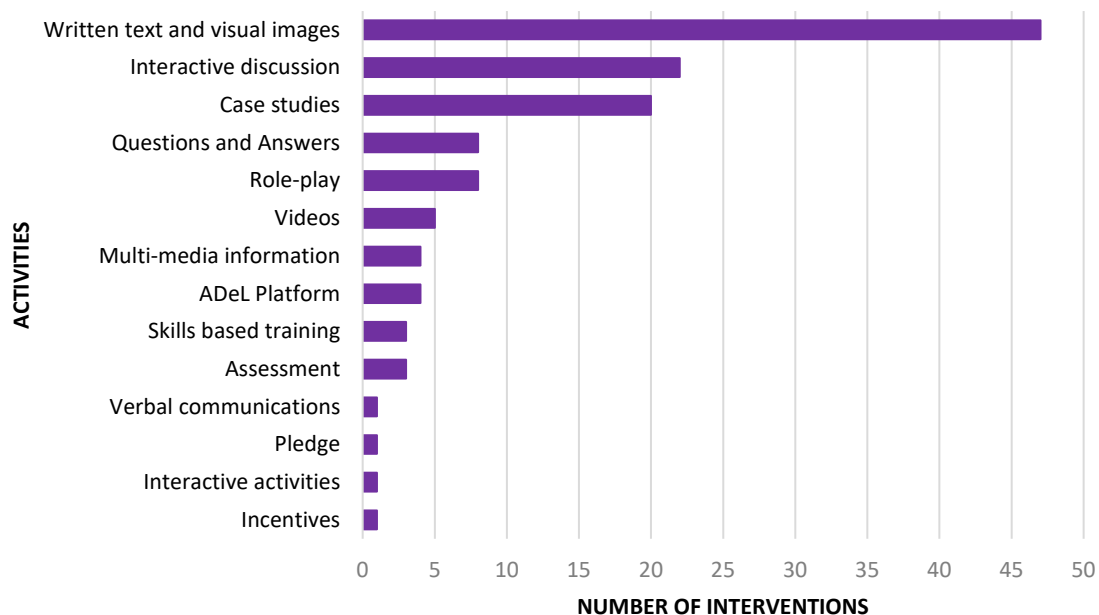
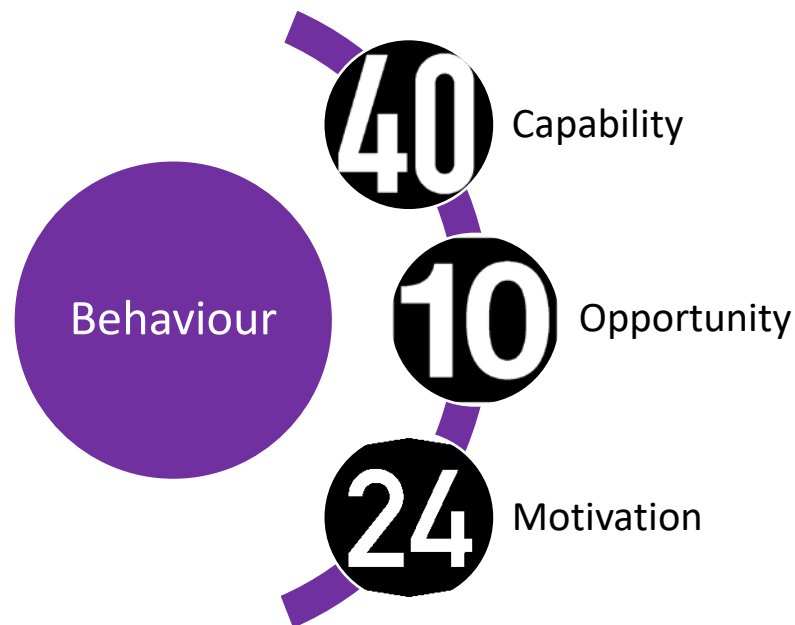


Figure 9. Frequency of different learning tasks used by NADOs within their reported coach anti-doping provision.

What are the intended outcomes (e.g., develop coaches’ knowledge and skills, influence coaches’ anti-doping actions/behaviours)?

The intended outcomes reported by NADOs were categorised using the COM-B model (Michie et al., 2008; Michie et al., 2014; Michie et al., 2011) and these are displayed in Figure 10. Corroborating the findings of the online review, the majority of NADOs reported that the intended outcome(s) of their coach anti-doping education was to develop coaches’ capability. This included developing knowledge (30/64, 46%), awareness (9/64, 14%), and influencing coach decision making (1/64, 2%). Twenty-four interventions (out of 64, 38%) were reported as intending to enhance coaches’ motivation. For example, interventions aimed to strengthen coaches’ beliefs and values (16/64, 25%), and enhance coaches’ *perceived* competence (8/64, 13%). Ten interventions which were identified as influencing a coach’s opportunity to engage in anti-doping roles and responsibilities included, enhancing the support provided to external sporting organisations (e.g.,

sports clubs; 4/64, 6%), providing mandatory training for coaches (4/64, 6%), providing social spaces to encourage discussions and share best practice (3/64, 5%), and ensuring tailored anti-doping



education is accessible to coaches (2/64, 3%).

Figure 10. The intended outcomes of the NADOs' reported coach anti-doping provision mapped across the core components of COM-B (Michie et al., 2011).

Are monitoring and evaluation processes in place?

Nineteen NADOs reported monitoring and evaluation processes across 28 interventions. Four different monitoring and evaluation methods were used by the NADOs; these were post-intervention feedback, knowledge assessment, completion rates, and research projects. The most common method was post-intervention feedback, which just over half of the NADOs (10/19, 53%) employed across fifteen interventions (out of 28, 54%). Unfortunately, limited information was provided around the types of questions asked during post-intervention feedback methods. However, one NADO reported "After the event we use feedback forms [which] consist of 3 parts: 1) Y/N questions, 2) evaluation and self-evaluation, 3) place for feedback and recommendations". The second most common method of monitoring/evaluation was knowledge assessment; used for nine

interventions (out of 28, 32%). One NADO briefly described their use of assessment, explaining that coaches were asked “*multiple choices questionnaire, and [presented with] six case studies for which they have to describe the most appropriate behaviour*”. Beyond this, a small number of NADOs reported monitoring and evaluation methods relating to the number of participants who completed the education (3/28, 11%) and number of sessions delivered (2/28, 7%). One NADO (out of 19, 5%) reported completing a ‘process evaluation’ of their intervention (1/28, 4%), this research project was supported by a research institution, yet, limited information was provided.

With regards to the management of monitoring and evaluation processes, the majority of organisations (17/19, 89%) reported that they undertook the evaluation of their interventions internally. In comparison, two NADOs reported that three interventions (one and two respectively) were evaluated and monitored by external organisations (e.g., NFs). One NADO commented on how helpful they found the monitoring and evaluation they undertake, saying “*we obtain useful feedback on the usefulness of all [of our] resources when individuals complete workshop feedback [and] this feedback is used in the development of future resources*”. Yet, no further details were provided by them, or other organisations, to indicate how the information gleaned from monitoring and evaluation processes is used to develop their provision.

RADOs

WADA created the RADO programme to strengthen the protection of clean sport across under-resourced and under-staffed countries (e.g., those with less funding and resources; WADA, 2020). Currently, 16 RADOs exist and they support 130 countries globally (<https://www.wada-ama.org/en/who-we-are/anti-doping-community/regional-anti-doping-organizations-rado>). It is important to note that RADOs are not expected to develop coach anti-doping education (Soublière, 2012). Nonetheless, they are required to support countries and organisations in their attempts to provide anti-doping protocols and processes (WADA, 2020). Therefore, we contacted all 16 RADOs (from the details provided on the WADA website; <https://www.wada-ama.org/en/who-we-are/anti->

[doping-community/regional-anti-doping-organizations-rado](#)), and asked about their coach anti-doping provision. Four RADOs provided information relating to the support they provide to countries whom WADA have identified as being at risk.

What additional education interventions/resources exist?

From the four RADOs who provided information relating to their coach anti-doping provision, all four reported having something in place; however, no further information was given from one RADO. The other three organisations reported providing interventions (n=10) and resources (e.g., funds, translation services; n=2) for coaches and NADOs.

Who is the target audience (e.g., qualification level of coach, coach context)?

The target audience was identified by two RADOs. One reported facilitating the training that is provided to coaches within their jurisdiction, by educating the “*education trainers, who deliver the coach anti-doping workshops*”, around best practices. The other RADO reportedly provided five interventions, which were all aimed at coaches working within elite sport; however, two of these (a network of collaborators and workshops held during training and events) were reportedly suitable for coaches working within recreational sport.

What mechanisms of delivery are used (e.g., face-to-face, online, by whom, timing, frequency, duration)?

Predominantly, organisations reported facilitating the delivery of face-to-face workshops (n=6) and lectures (n=3). Beyond this, RADOs reported that they supplied printed materials and guides (n=1) and promoted the use of social networks and relevant websites (n=1) to coaches across their jurisdiction. Only one RADO identified the use of online training.

What content is covered by the programme (e.g., topics, learning tasks)?

Overall, the coach anti-doping provision described by RADOs included the majority of topics identified in the ISE (WADA, 2021; Table 5, overleaf). As has been the case across NADOs (described in the previous section), ‘*Substances and Methods on the Prohibited list*’ and ‘*Testing procedures, including urine, blood, and the Athlete Biological Passport*’ appeared to be a major focus in RADOs’

coach anti-doping provision. Also corroborating earlier findings, the topics receiving least coverage were speaking up and Strict Liability.

Table 5. Proportion of RADO interventions providing content on topics listed in the ISE (WADA, 2021).

Topics	Number of interventions which identified the ISE topics (n=10)
Testing procedures, including urine, blood, and the Athlete Biological Passport	4 (40%)
Substances and Methods on the Prohibited list	4 (40%)
Anti-doping rule violations	2 (20%)
Consequences of doping, for example, physical and mental health, social and economic effects, and sanctions	2 (20%)
Risks of supplement use	1 (10%)
Requirements of the Registered Testing Pool, including whereabouts, and the use of ADAMS	1 (10%)
Use of medications and Therapeutic Use Exemptions	1 (10%)
Principles and values associated with clean sport	1 (10%)
Athletes', Athlete Support Personnel's, and other groups' rights and responsibilities under the Code	1 (10%)
Speaking up to share concerns about doping	0
The principle of Strict Liability	0

Types of learning tasks

Six different learning tasks were used by RADOs to deliver coach anti-doping education (Figure 11). Corroborating the approach taken by NADOs, the majority of RADOs' utilised written text and visual images (7/10, 70%).

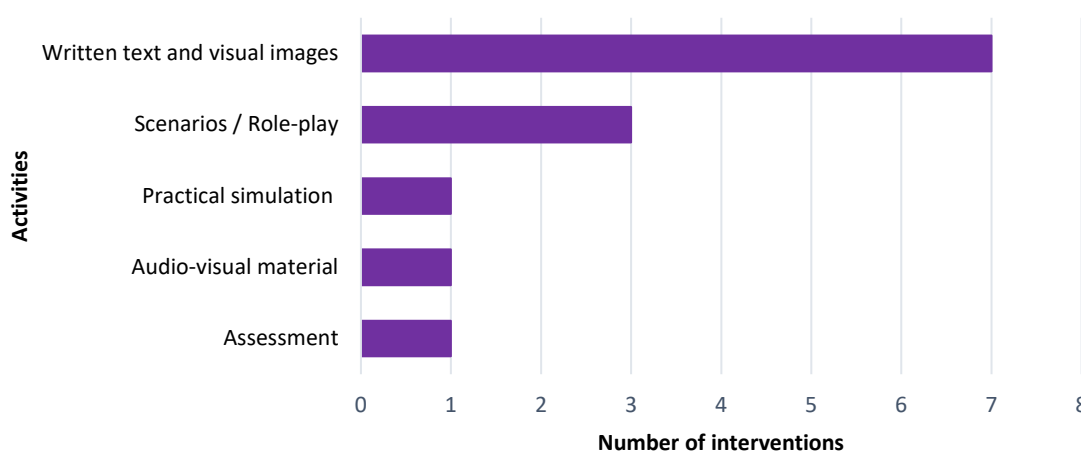


Figure 11. Frequency of different learning tasks used by RADOs within their reported coach anti-doping provision.

What are the intended outcomes (e.g., develop coaches' knowledge and skills, influence coaches' anti-doping actions/behaviours)?

Two RADOs reported the intended outcomes of their anti-doping interventions (n=7). According to this information, the main aims of RADOs' provision was enhancing coaches' knowledge (n=4) and awareness (n=2) of topics (i.e., doping control procedures, the prohibited list, roles and responsibilities, and TUEs). Thus, capability was the primary focus. One RADO reported a desire to influence coaches' behaviours using interactive learning tasks such as case studies and role-play.

What monitoring and evaluation processes are in place?

Two RADOs reported the evaluation processes they used across ten interventions; these included attendance monitoring (n=5), theoretical and practical evaluations (n=2; no further elaboration was provided), interactive quiz (n=1), self-evaluation (n=1), and a combination of an interactive quiz and self-evaluation (n=1). Limited information was provided on how the data captured via some of the evaluation activities is used to understand the impact of the coach anti-doping provision on the variables that organisations wish to change (e.g., coaches' knowledge). Furthermore, the limited information gleaned from organisations does not explain how the evaluations support the future development and delivery of their coach anti-doping education.

IFs

What additional education interventions/resources exist?

A total of 16 IFs responded to the online survey, and a further 24 coach anti-doping interventions were identified within the information they provided. It is important to note that one of the IFs reported that, at present, they do not have anything in place for coaches, but this is something they are keen to review in the future. Therefore, the following information is representative of 15 IFs.

Who is the target audience (e.g., qualification level of coach, coach context)?

The target population was identified across all 24 of the additional interventions outlined in the survey responses. The majority (20/24, 83%) of these interventions identified coaches as a target audience. These interventions were aimed at coaches in general (8/20, 40%) and elite-level coaches in particular (8/20, 40%; i.e., national coaches and above). Three interventions were designed for coaches from specific disciplines within the IF's sport (n=2) or coaching levels (e.g., Level One; n=1). One intervention approached support staff more generally and identified "*coaches, therapists, and doctors*" as the target audience. The remaining four interventions targeted athletes, but two IFs recognised that coaches were often present and, thus receive this information alongside their athletes. Notably, two IFs reported that the courses they provided (one discipline specific, and one elite-level focused) were *obligatory* for elite-level coaches.

What mechanisms of delivery are used (e.g., face-to-face, online, by whom, timing, frequency, duration)?

The majority (17/24, 71%) of the additional interventions were delivered face-to-face (e.g., presentations, workshops, outreach campaigns). Beyond this, there were 5 online interventions (21%; e.g., webinars, e-Learning, websites), one combination of face-to face and online interaction (4%; i.e., e-Presentation and symposium), and one printed handbook (4%). Limited information was provided about the delivery, timing, and frequency of these interventions.

Two IFs reported that they did not have a strategic plan centred on coach anti-doping education and, thus, the delivery of presentations was based on requests from NFs or other external organisations (e.g., event organisers). In addition, one IF conceded that while anti-doping was listed as a topic on their coaching course, due to organisational challenges (not specified), this content was not always presented on each course.

What content is covered by the programme (e.g., topics, learning tasks)?

The content provided within 12 of the additional 24 interventions was reported. Table 6 (overleaf) illustrates that when reviewing the topics covered by IFs against the ISE the most common

topics to feature in provision are “requirements of the Registered Testing Pool, including whereabouts, and the use of ADAMS”, “Use of medications and TUEs”, and “Substances and methods on the Prohibited list”. Less attention was paid to the principles and values associated with clean sport and the rights and responsibilities of stakeholders. This may be because 75% of these interventions were reportedly targeting elite level coaches (and athletes), where it may be perceived that they have already received information on these more general topics. This suggestion is reinforced by the finding that three interventions, which reported the content covered within their provision, and targeted coaches more generally or lower level coaches (i.e., Level One), appeared to cover the principles and values associated with clean sport (n=2), rights and responsibilities of stakeholders (n=1), and consequences of doping (n=1). Notably, four of the interventions provided by IFs provided content on speaking up, which is neglected in most other interventions observed in both the online review and survey.

Table 6. Proportion of IF interventions providing content on topics listed in the ISE (WADA, 2021).

Topics	Number of interventions which identified the ISE topics (n=12)
Requirements of the Registered Testing Pool, including whereabouts, and the use of ADAMS	8 (67%)
Use of medications and Therapeutic Use Exemptions	8 (67%)
Substances and Methods on the Prohibited list	7 (58%)
Anti-doping rule violations	6 (50%)
Risks of supplement use	5 (42%)
Testing procedures, including urine, blood, and the Athlete Biological Passport	4 (33%)
Consequences of doping, for example, physical and mental health, social and economic effects, and sanctions	4 (33%)
Speaking up to share concerns about doping	4 (33%)
The principle of Strict Liability	3 (25%)
Principles and values associated with clean sport	2 (17%)
Athletes’, Athlete Support Personnel’s, and other groups’ rights and responsibilities under the Code	2 (17%)

Types of learning tasks

Eight different learning tasks were reportedly used by IFs to deliver coach anti-doping education (Figure 12,overleaf). Once again, across the 24 interventions, the most prevalent activity reported was the use of written material and visual images (12/24, 50%). Though, some interactive learning tasks were included by some IFs.

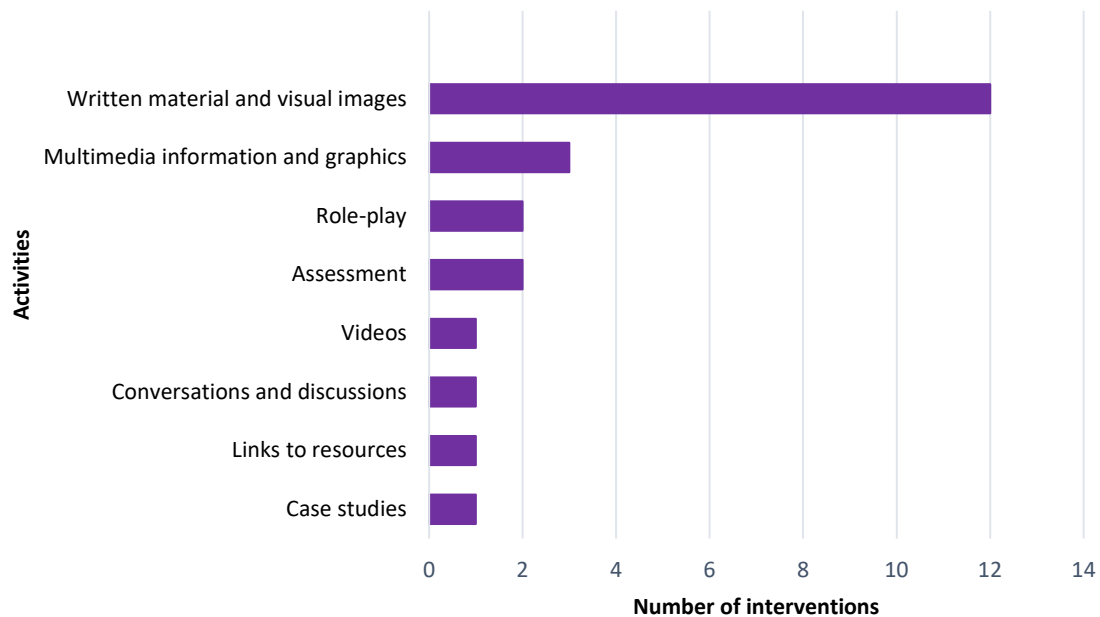


Figure 12. Frequency of different learning tasks used by IFs within their reported coach anti-doping provision.

What are the intended outcomes (e.g., develop coaches' knowledge and skills, influence coaches' anti-doping actions/behaviours)?

The intended outcomes of 22 (out of the total 24) interventions were identified. Eighteen (82%) of these interventions aimed to develop a coaches' capability (i.e., knowledge and decision making). Three interventions (14%) reportedly aimed to address the coaches' physical opportunity (i.e., environmental context and resource) by providing resources. The final component of COM-B – motivation – was acknowledged by a small number of interventions (2/22, 9%), where organisations reported aiming to develop coaches' perceived social and professional role (n=1) and influence group identity (n=1).

Are monitoring and evaluation processes in place?

Two IFs reported that monitoring and evaluation processes included the coaches' completion of the WADA ADeL assessment (i.e., completion of Coach True). Elaborating on this, one IF reported "139 coaches across all our disciplines have passed this online course". A third IF identified that they are looking to implement this method of evaluation as a pre-requisite for coaches at an elite-level (i.e., Level 3). No information was reported as to the effectiveness of the interventions in achieving their stated aims, nor regarding how the information gathered via monitoring and evaluation processes aids the ongoing development of provision.

CAs

What additional education interventions/resources exist?

Nine CAs provided further details about their anti-doping provision for coaches. Of these, three organisations reported that they provided coach anti-doping education but gave no further details, and one organisation identified that they did not provide coach anti-doping education. Notably, four organisations identified that they work closely with external partners (e.g., NADOs, National Olympic Committees [NOCs]), who are better placed to develop and deliver anti-doping education for coaches. Eleven interventions were identified across five organisations, and these will be the focus of the following sections.

Who is the target audience (e.g., qualification level of coach, coach context)?

Three CAs reported the target populations for their coach anti-doping interventions. One organisation reported that they provided three interventions which were all aimed at coaches working with athletes from 16+ (including train to compete and train to win athletes). The remaining two organisations provided five interventions (one and four respectively), and reportedly targeted coaches and sports teachers (n=1) and coaches (n=4). The organisation who identified coaches as the target population, specifically identified that two of the interventions (i.e., workshops) were obligatory (i.e., attendance once a year) for coaches working within elite sport, whereas this was optional for recreational level coaches.

What mechanisms of delivery are used (e.g., face-to-face, online, by whom, timing, frequency, duration)?

The eleven additional interventions reported were delivered using a variety of methods, including face to face interactions (5/11, 45%), online resources (2/11, 18%), a combination of face to face interactions and online resources (3/11, 27%), and hardcopy material (1/11, 9%). Of the five interventions using face-to-face interventions, CAs reported delivering presentations (n=4) or lectures (n=1). No further details were provided to identify the differences in the terminology used across organisations. Online resources included downloadable material (i.e., books, or a newsletter). The hardcopy material reported by one CA, included publishing articles about the subject in a coach magazine. Though limited information was provided about the delivery, timing, and frequency of the interventions, one organisation reported disseminating a newsletter and delivering anti-doping sessions four times a year.

What content is covered by the programme (e.g., topics, learning tasks)?

Two CAs reported the content they covered across three interventions (one and two respectively) and they included six of the topics identified in the ISE (Table 7, overleaf). Additional topics reported by the two CAs were the role of the NADO (n=1), the protection of children (n=1), and where to access further information (n=1).

Table 7. Proportion of CA interventions providing content on topics listed in the ISE (WADA, 2021).

Topics	Number of interventions which identified the ISE topics (n=3)
Substances and Methods on the Prohibited list	2 (66%)
Testing procedures, including urine, blood, and the Athlete Biological Passport	1 (33%)
Principles and values associated with clean sport	1 (33%)
Athletes', Athlete Support Personnel's, and other groups' rights and responsibilities under the Code	1 (33%)
Risks of supplement use	1 (33%)
Use of medications and Therapeutic Use Exemptions	1 (33%)
Consequences of doping, for example, physical and mental health, social and economic effects, and sanctions	0
Requirements of the Registered Testing Pool, including whereabouts, and the use of ADAMS	0
Anti-doping rule violations	0
Speaking up to share concerns about doping	0
The principle of Strict Liability	0

Types of learning tasks

Across the nine interventions for which information on learning tasks was provided, three approaches were observed (Figure 13). The majority of interventions (6/9, 67%) included written text and visual images. Two CAs reported using interactive learning tasks (e.g., paper-based games), and scenario/role-play based techniques, within their four interventions.

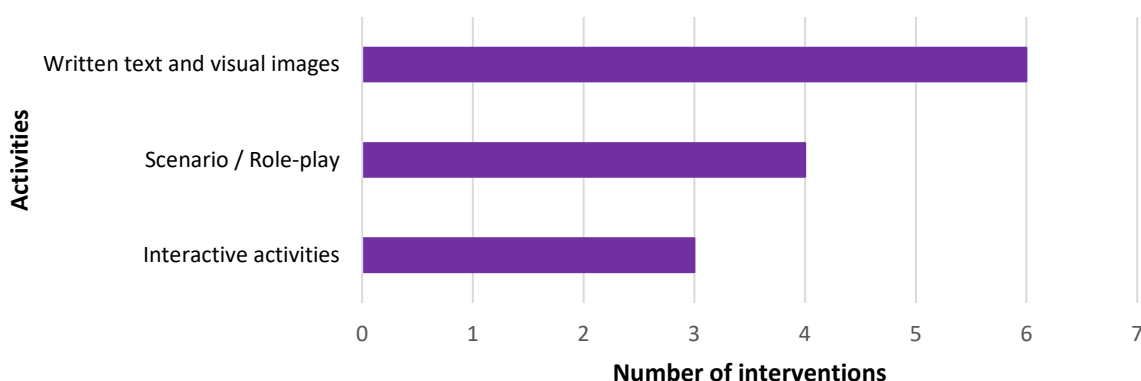


Figure 13. Frequency of different learning tasks used by CAs within their reported coach anti-doping provision.

What are the intended outcomes (e.g., develop coaches' knowledge and skills, influence coaches' anti-doping actions/behaviours)?

Two CAs reported the intended outcomes of three coach anti-doping interventions. Both organisations reported that one of their interventions aimed to “develop coaches knowledge” and build “awareness” (n=2); thus, capability continues to dominate the desired outcomes of interventions. The third intervention was reportedly used to “train coaches in how to deal with ethical situations, such as anti-doping issues”, which although not explicitly stated, may seek to provide coaches with relevant skills, which also falls within the capability component of COM-B.

Are monitoring and evaluation processes in place?

Limited information was provided about the evaluation of the eleven interventions. However, one organisation, who provided face to face interactions with coaches, reported that they disseminated a questionnaire annually to those who attended the presentation and asked them to feedback on the education and materials presented. Moreover, an organisation who provided three interventions using e-Learning materials asked participants to complete an evaluation following each of the interventions. No information was provided around how this information was used to support future coach anti-doping provision.

Summary – Phase 1b Part i – Organisations' Reports on their Provision

By gathering further information from NADOs, RADOs, IFs, and CAs via survey, we have established that additional coach anti-doping education is available globally. Specifically, organisations reported providing more opportunities for coaches to engage in face-to-face anti-doping education than we thought to be the case based on the online review (Phase 1a). While it is promising that more interventions are available to coaches than we previously established, our findings bring to the fore issues around awareness and accessibility of interventions. During our online review, we failed to identify information related to the 109 additional interventions reported by those who completed the survey. Therefore, organisations must not assume that coaches and

other stakeholders (e.g., NADOs, NFs) are aware of the programmes they provide and can readily access such resources (i.e., if we couldn't find them, coaches cannot find them). At present, very few organisations appear to be capitalising on marketing and advertising of their activities. Engagement with available tools, such as social media and web pages which list the provision available, would likely address the potential lack of awareness around programs. Therefore, this is something that we may explore the feasibility of and appetite for in future phases of the project.

Another key finding from the survey that develops our initial understanding gained from the online review, relates to the desired outcomes of provision when mapped against the components of COM-B. While our findings from the survey support our earlier conclusions around organisations primarily aiming to increase coaches' knowledge and/or awareness (via the use of written text and visual images), our survey respondents also reported aiming to enhance coaches' motivations to perform clean sport behaviours (focusing on beliefs and values, and perceived competence). In hand with this, organisations reported greater use of interactive learning tasks, such as case studies and role play (and this increase in interactive activities is likely linked to the face-to-face delivery that hadn't previously been captured in the online review). Some organisations also targeted opportunity, through the provision of resource and support. Signalling that the focus of current provision available to coaches (based on information provided through survey responses) is promising for encouraging coaches' clean sport behaviours; given that COM-B proposes that coaches must have the capability, opportunity, and motivation to act. Yet, building on this point, a notable gap within the desired outcomes discussed is *behaviour*. Only one organisation of those surveyed specifically identified actions as a target for their provision, and this must be investigated in the future phases of this project to ensure that coach anti-doping programs are aspiring to change real-world, every-day coaching practice.

Another significant gap revealed by the survey (and online review) is the lack of monitoring and evaluation processes being employed across the range of organisations. In general, very few

organisations were able to describe the activities they undertake to establish if their provision is effective. Furthermore, very few (if any) organisations explained how they use the information gained in their monitoring and evaluation processes to enhance their provision going forward. This is something that the introduction of the ISE may address, given that it stresses the need for organisations to carefully plan and report on their activities, including monitoring and evaluation. With respect to the current project, this is something that we will keep in mind to explore in the next phases of the work (e.g., when interviewing stakeholders, drafting guidance and entering into discussions with the working group). Until more can be learned about monitoring and evaluation, we are left speculating as to the effectiveness and appropriateness of existing coach anti-doping education. The stand out findings from the survey that require further interrogation are: 1) the dominance of some topics (e.g., testing processes, Prohibited List) over others (e.g., speaking up, Strict Liability) and 2) if/how provision is tailored to specific sub-sets of the coaching population (e.g., 'all coaches', 'elite coaches', coaches of specific sports or with specific levels of qualification).

Phase 1b - Part ii – Broader context around interventions

Organisations were asked to provide details regarding how they had developed their coach anti-doping education to date, including if it was evidence-informed or theory-driven and if they engaged with resources provided by WADA (i.e., WADA Coach True/Coach's Tool Kit; Model for Core Programmes Information/Education Guidelines; reports from WADA's social science research programme). Additionally, organisations were asked to report their plans for further development of their provision, perceived barriers/challenges to designing/delivering coach anti-doping education, and their views on which organisation should lead the design and delivery of coach anti-doping efforts. In total, 36 NADOs, ten IFs, four CAs, and three RADOs provided information in relation to these areas of interest.

Sources of guidance for the development of coach anti-doping provision.

NADOs

Twenty-nine NADOs provided information relating to the development of their provision. Notably, one of the most common responses to this question (present for 24/29 NADOs, 83%) was for the organisations to describe partnerships, with sports organisations, research institutions, and non-sport related organisations (i.e., [substance support organisations], UNESCO). Beyond this, 14 NADOs (48%) reported drawing on anecdotal evidence, including stakeholder feedback and advice/resources from other organisations. Eleven NADOs (38%) reported the use of a combined approach of stakeholder feedback and research evidence (e.g., peer-reviewed publications, research databases, collaborative research projects). Two NADOs reported using empirical literature, and two NADOs reported using a compliance-oriented approach (e.g., Code). Interestingly, two NADOs reported that the early development of coach anti-doping education was driven by one approach however, in recent years they have begun to utilise a combination of evidence. They both went on to explain that this change was because of the accessibility of “*current literature*”, which enabled them to “*immediately start examining [their] own current practices up against the review, and see how [they] might improve [their] tools and programmes*”. Notably, the use of different sources of guidance did not seem to influence the nature of the intervention (e.g., workshops, e-learning) across all 29 NADOs who provided information.

Thirty-five NADOs reported whether or not they engaged with WADA resources, 21 (out of 35, 60%) reported using these, including the ADeL platform (e.g., Coach True) and any relevant documents (e.g., “*At a glance: Doping control process*”). Organisations reported that WADA resources helped them to generate learning tasks and identify topics which were relevant to coaches, thus enhancing coach anti-doping education. Though, one NADO reported that their use of WADA resources, such as Coach True, was limited due to the language barrier within their country.

Nineteen NADOs (out of 35, 54%) stated that they used the WADA Model for Core Programmes Information/Education Guidelines, and they were described by organisations as enabling them to identify target groups, relevant topics, and potential evaluation methods. However, one NADO reported that while they used the guidelines, they reported them as “*not useful*” because they lacked practicality and were not user friendly. Notably, 16 NADOs (out of 35, 46%) reported that they did not use the guidelines when developing their education. However, no information was provided which would identify why these NADOs did not engage with this material.

WADA’s social science research programme was accessed by 14 NADOs (out of 35, 40%), and was reported as providing support around target populations, case study development, and curriculum development. Yet, concerns were raised around the extrapolation of this research across other geographical regions, the value this work adds, and the lack of accessibility to coach specific research. Notably, one NADO reported that they would be interested in receiving these reports (indicating, that they did not know they were already accessible on the WADA website).

RADOs

Of the four RADOs who responded to the second part of the survey, two stated that they had some form of coach anti-doping provision in place, but they did not report how this was developed. One of these RADOs commented they “*facilitate [rather] than conduct direct training to coaches*”. A third RADO reported that they had “*no specific coaching programme*” and briefly mentioned that the workshops and lectures they delivered to coaches were developed using “*WADA guidelines*”. The fourth RADO reported that they developed values-based education in-house using evidence and theory, in particular goal setting theory (i.e., “*SMART (i.e., Specific, quantifiable, attainable, realistic, and timely)*”).

Only, three RADOs out of the four who responded to the survey (75%) reported on their engagement with WADA resources during the development of their coach anti-doping provision. Two RADOs (63%) reported using WADA resources such as Coach True in their original form or

translating these for coaches across their jurisdiction. One of these RADOs identified that their provision was underpinned by the Model for Core Programmes Information/Education Guidelines provided by WADA. The third RADO (33%) reported using Coach True, the Model for Core Programmes Information/Education Guidelines provided by WADA, and research which explores values-based education, to support the *“planning and development”* of their provision. WADA's social science research programme was not used by RADOs, although one RADO reported that they *“intend to get more involved in WADA's social science research programme [and are, therefore,] creating an internal strategy to develop a research project”*.

IFs

Eleven IFs (69%) provided general information relating to the development of their coach anti-doping provision. Of the 11 IFs, six (55%) reported that their education was developed in-house, three (27%) reported that they focused on the use of WADA resources (e.g., Coach True), and two (18%) reported a combined approach, developing their education in-house with support from external organisations (e.g., NADOs). Notably, the majority (n=4, 67%) of in-house provision was underpinned by information contained within WADA resources (e.g., references). However, the remaining two IFs did not reference WADA resources in the development of their provision. Instead, one IF reported using anecdotal evidence (e.g., interviews with athletes and coaches; multi-stakeholder workshops) to *“build the capacity of [NFs] to better address integrity education at a national level”*. The other IF provided no further information on the development of their education.

Responding to our specific questions about content development, ten IFs (63%) reported using WADA resources in their coach anti-doping provision, with several IFs (n=8, 80%) utilising the Coach True platform in its current form, i.e., they signpost coaches to WADA resources rather than embedding them into a wider provision of their own making. Aligned with their use of Coach True, four of the IFs (40%) reported that their education was underpinned by the Model for Core Programmes Information/Education Guidelines. Specifically, two IFs reported that education

guidelines provided by WADA were used *“in the development of [their] education programme as a whole to define target audiences, activities, and timelines”*; and also to *“determine which information should be provided to the coaches”*. With reference to WADA’s social science research programme, only one IF (10%) reported indirectly accessing this resource during collaborations with WADA.

CAs

Three coaching associations provided insights into the development of their coach anti-doping provision. One CA identified their education was developed in-house, while the remaining two CAs reported that their provision was developed in collaboration with other organisations (e.g., NADOs). Furthermore, theory was used to support the development of materials by one CA, whereas a combination of supporting evidence (e.g., theory and anecdotal evidence) was used to develop materials from another CA:

[Intervention] was developed through a working group / task force, which included experts in the field, from the NADO, coach developers, National Sport Organisation and Coaching representatives.

Three CAs shared information about the resources they engaged with during the development of their provision. Two of these reported that they did not currently engage with the WADA resources and guidelines; but, one of the CAs suggested that they plan to use these resources as they further refine their education approach. In contrast, the third CA reported that their provision was developed in collaboration with a NADO, so they suggested WADA resources, guidelines, and social science research were used: *“[The NADO] brings reports and studies important for [country] coaches, [and] also shares national issues for awareness”*. Other resources such as education providers and governmental organisations were identified as offering resources which were used in the development of one CAs provision.

Barriers/challenges to designing/delivering coach anti-doping education.

Thirty-three NADOs, three RADOs, 10 IFs, and five CAs reported the barriers and challenges they face when designing and delivering coach anti-doping education. Three main barriers identified by organisations were categorised as: 1) attitudes to coach anti-doping education, 2) resources for coach anti-doping provision, and 3) the complexity of the sporting system.

With regards to attitudes, there was a consensus that coach anti-doping education is not considered a priority. To elaborate, it was recognised that *“it is very difficult to get people devote time to the cause of anti-doping in sport”* (RADO 1), and there is *“no interest [from] the coaches to take an anti-doping course [and] no interest [from] federations to include anti-doping issues in their courses for technicians and / or support staff”* (RADO 3). Organisations reported coaches being difficult to engage with due to their perception that anti-doping is not relevant. For example, a European NADO (NADO 13) commented *“The barriers and challenges in delivering anti-doping education to coaches at recreational and youth level is many; coaches feel it is not relevant and are unwilling and/or afraid to give advice”* (NADO 13). Additionally, one IF reported *“most of the coaches, they have the tendency to say that team doctors should take care of this subject”* (IF 13).

Anti-doping organisations (i.e., NADOs and RADOs) felt that they were *“only seen as a punishing entity and not as a support”* (RADO 3) by sports organisations and coaches. Thus, survey respondents reported that coaches were reluctant to engage with them as *“prejudices and preconceptions transmitted about anti-doping organisations also represent barriers”* (South America, NADO 27). Furthermore, reluctance to engage with anti-doping organisations was not isolated to coaches, as an Australasian NADO explains it can be difficult to get ‘buy-in’ from NFs: *“Our main barrier is around getting in front of the coaches to deliver our content. Many sporting organisations see ‘anti-doping education’ as being relevant to their athletes but not as relevant to their coaches”* (NADO 21). These NADO reports were corroborated from the perspective of two IFs, who stated that

anti-doping provision was *“not the primary target of an international federation”* (IF 2) and, therefore, *“most of the education should be done at a national-level”* (IF 3).

In addition to the lack of “buy in” from key stakeholders, our survey respondents highlighted a number of challenges around resources, including budgets, staffing, time, technology, infrastructure (e.g., buildings), and technical expertise (RADOs, IFs, and CAs specifically). For example, one European NADO reported: *“Our own head count does not allow for a higher penetration in terms of number of coaches and frequency of contact”* (NADO 25), while one IF reported *“we are currently really stretched with human resources in our [anti-doping] unit”* (IF 12). CAs recognised their potential role in educating coaches in relation to anti-doping, but a lack of resources prevented their involvement: *“We do not provide anti-doping resources to the coaches, physical education and school sport teachers because we do not have them, even though we think that providing them would enhance the anti-doping drive”* (CA 5). When discussing the issues around limited resource, one RADO explained that high staff turnover does not help the situation, *“The main barriers are funds and lack of technical personnel ... when people are identified and trained, they move on very quickly. Hence, constant training and development is needed which is not always possible”* (RADO 1).

This point links nicely to our final theme, which is around the complexity of the sporting system. We interpreted a lot of what NADOs, IFs, and CAs stated as demonstrating the open system – which is characterised by dynamically changing inter-relationships and tensions – at play and influencing the delivery of anti-doping education to coaches. This is evidenced towards the end of the following quote: *“In previous years, when we received grants from UNESCO or WADA, we held seminars for coaches in remote regions too. Currently, we have no funds for this first of all because of the destruction of the [sporting organisation]”* (Europe, NADO 2). Furthermore, the impact of countrywide laws on anti-doping provision was highlighted by one CA: *“The changing laws in [a country, can] impact what may be legal or illegal, yet [these substances may] still exist on an*

anti-doping list” (CA 3). Beyond this, NADOs reported that the sporting system in certain countries was fragmented due to the geographical size of the country or population numbers and, thus, it was difficult to provide coach anti-doping education nationally. Accordingly, one IF identified that *“national level coaches are often volunteer and/or coach a number of athletes from other countries”* (IF 4) and, therefore, it was often difficult to reach these individuals. In cases when coaches could be reached, CAs believed that *“many [coaches] have already done anti-doping education for their sport going to international competition or coaching at the university level”* (CA 3) which may prompt them to limit their coach anti-doping provision. In addition, some CAs felt that responsibility for providing coaches with opportunities to learn about anti-doping lay with other organisations in the system, such as NADOs: *In [country] we have a separate agency for anti-doping called [NADO] in the ministry, the [CA] is another agency under the same ministry which handles courses for Coaches”* (CA 6).

To consolidate the insights gained regarding the challenges of providing anti-doping education for coaches, we have drawn on Brofenbrenner’s (1979) socio-ecological model (Figure 14). We elected this model to represent the findings because it recognises that focussing only on the individual (in this case the coach) when intervention mapping (logic modelling) is not appropriate. Thus, the model fits well with our primary theoretical framework, the BCW, as this also posits that factors beyond the individual will influence their behaviour (via its inclusion of intervention functions and policy categories). Situating the coach at the centre of the model, and identifying environmental influences within the additional four concentric layers, we can begin to gain an understanding of the holistic changes necessary to build capability and create opportunities for coach anti-doping education provision.

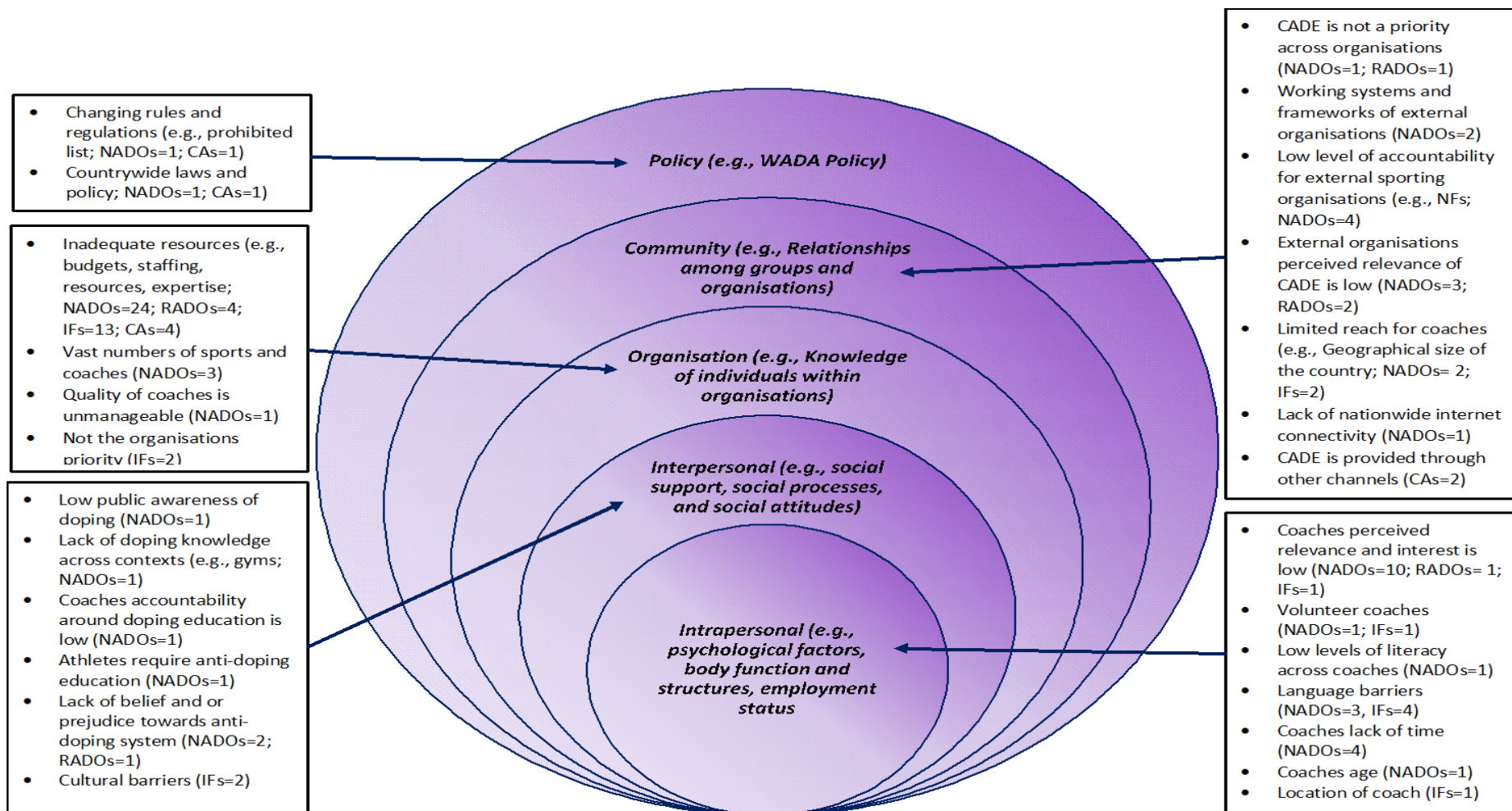


Figure 14. A visual representation of the barriers to coach anti-doping provision across multiple levels of the sporting system.

Note. CADE= Coach Anti-Doping Education.

Future plans for the development/delivery of coach anti-doping education.

Thirty-three NADOs, three RADOs, 10 IFs, and three CAs reported future plans for their coach anti-doping provision. To capture these plans we constructed three themes, which represent strategic activities to: 1) develop new and existing resources, 2) develop new and maintain existing relationships to manage complexity, and 3) effectively use assets.

NADOs, RADOs, and IFs reported a desire to develop their existing resources, as well as create new resources, in order to reach more coaches. In particular, NADOs reported plans to develop their online (n=7) and face-to-face education (n=6). While no specific details were provided around how they plan to develop these resources, three NADOs said they will include research studies because it will *“inform [their] education content, delivery, and target audiences”* (NADO 21). Only one NADO, who identified technology issues as a barrier, suggested that in future they aim to provide more printed materials for coaches. Across the ten IFs who highlighted their future plans, there was a desire to develop further resources to enable coaches’ *“better access to educational material/resources”* (IF 2), which contain *“appropriate content within each level of certification (as appropriate to level the coach is working at)”* (IF 1). Notably, besides providing resources for coaches, two NADOs reported that they plan to provide resources for external organisations (e.g., NFs) in order to support these organisations in the delivery of their coach anti-doping provision. Beyond this, one RADO intends to establish a system which recognises and promotes coaches who *“have taken the courses”* (RADO 3), and one NADO aims to create resources for the fitness industry, as they envisaged that this activity will help to shape (anti-) doping knowledge across various contexts.

In describing their plans to maintain their existing relationships, and build new ones, 22 NADOs, three RADOs, three IFs, and three CAs reported that collaborative efforts were vital. For NADOs, relationships with NFs were considered the most important (n=9), and it was suggested that this will *“increase their accountability”* (NADO 10) and *“educate them”* (NADO 14) on the importance

of anti-doping education. Other important partnerships included those between NADOs and non-sporting organisations (e.g., Universities; n=6), other NADOs (n=4) and sporting organisations (e.g., NOCs, n=3). Describing the need to build collaborations across NADOs to facilitate the sharing of resources and best practice approaches, one NADO reported:

We intend to link with a number of NADO's in order to develop a new coach's course that will focus upon any new research in the area of coaches' applied anti-doping knowledge and the role that they play in helping to educate athletes.

Across the three RADOs, collaborations with well-established NADOs, governmental organisations, and sporting organisations (e.g., NFs and CAs) were identified. Specifically, RADOs reported that they aimed to engage with relevant organisations to include *“doping issues in the training schools of coaches”* (RADO 3). IFs and CAs reported the need for sharing of information with stakeholders (e.g., NFs and NADOs), as it was observed *“most of the education should be done at a national-level, or even club-level, as the national organisations generally share the same language, a similar national culture, and often have closer access to the athletes and the coaches”* (IF 3). It was envisaged that all collaborations will *“ensure the education of coaches is not redundant”* (CA 3), encourage the uptake of *“new research in the area of coaches”* (NADO 3), and maximise the likelihood that anti-doping messages reach coaches; thus, *“raising awareness in reducing the risk of doping”* (CA 7). It was envisaged that future collaborations may also promote *“joint commitment [to anti-doping] by coaches”* (CA 1) and sporting organisations.

Building on the need to collaborate, some NADOs reported using existing collaborations and resources (e.g., doping control officers) to develop and deliver a provision to coaches (n=2). We considered these insights to be referring to the effective use of assets. Of the six NADOs who discussed issues that we categorised within this final theme, one NADO recognised the need to source alternative funding and another reported recruiting volunteers to deliver education

resources. Another NADO reported plans to conduct a strategic evaluation of their current provision to ensure effective strategies are implemented.

Which organisation should lead the design and delivery of coach anti-doping efforts?

Thirty-six NADOs, three RADOs, nine IFs, and four CAs reported who they felt was best placed to lead the design and delivery of coach anti-doping education. The suggestions are presented in Figure 15; here, the overall size of the circles represent the proportion of individuals who suggested a particular organisation should lead efforts, and overlapping circles represent instances where individuals suggested multiple organisations should work collaboratively.

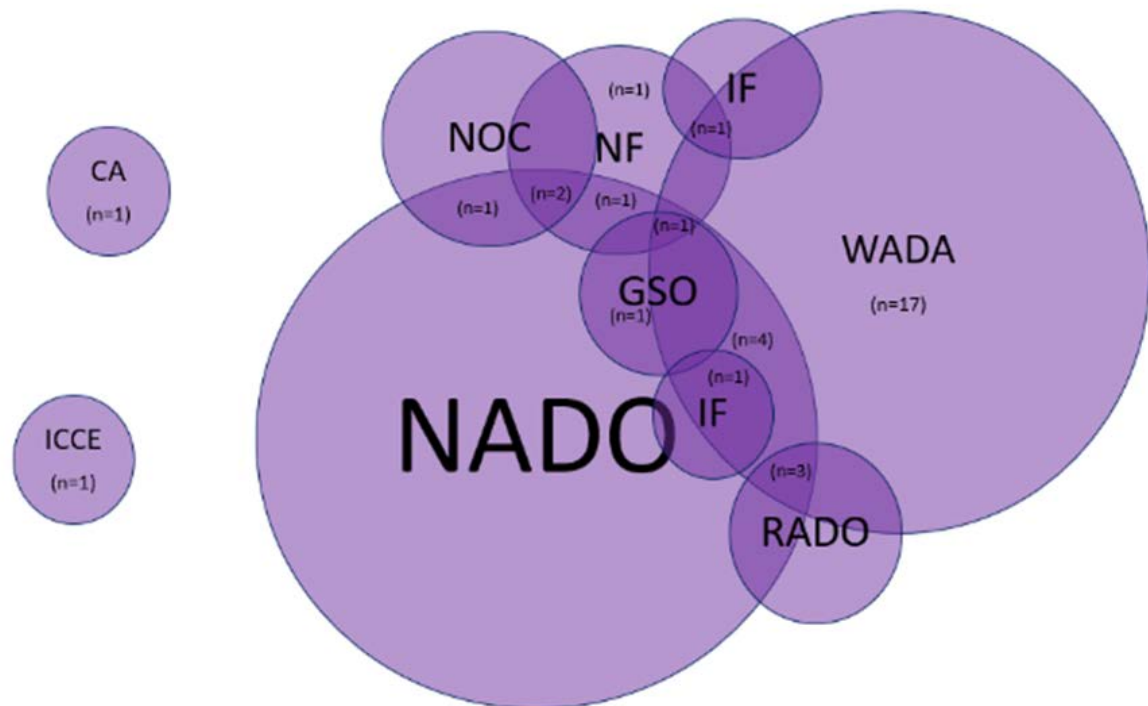


Figure 15. Diagrammatic representation of who NADOs, RADOs, IFs, and CAs believe is best placed to deliver coach anti-doping education.

Note. CA= Coaching association; IF= International Federation; GSO= Government Sporting Organisation; ICCE= International Council for Coaching Excellence; NF= National Federation; NOC= National Olympic Committee; RADO= Regional Anti-Doping Organisation; WADA= World Anti-Doping Agency.

Twenty-seven NADOs (out of 36) identified a specific organisation should lead, primarily naming themselves (n=14) or WADA (n=11). However, a need for collaborative efforts was emphasised by 24 of these NADOs, who recognised that organisations across the anti-doping

governance structure should work together. Two NADOs explained: *“on [an] international level, this should be WADA, whereas on [a] national level, NADOs should be in charge of the education”* (NADO 9). Furthermore, NADOs recognised that *“it is key to cooperate with other partners to get the best programme and impact (ministry for education, ministry of health, ministry of sport, coach education organisations, etc.)”* (NADO 4).

When outlining how they think various organisations can work together to develop and deliver coach anti-doping provision, NADOs appreciated the need for a central system to identify the resources and share best practices across organisations. For instance, one NADO commented *“In an ideal world the development of online and hard copy resources should be led by WADA in conjunction with those NADOs that can bring human and financial resources to the projects...a build once, use many philosophy!”* Yet, this NADO (among others) explained that the governance structure and collaboration across organisations must enable the creation of resources that are context-specific instead of “one size fits all”, otherwise organisations may continue to duplicate effort through the creation of their own resource, *“However, this may not always be the case and no doubt individual NADOs will continue to develop and deploy new programmes and resources that best are country specific”* (NADO 3). While this same concern around a lack of contextualisation was shared by another NADO, they emphasised that the sharing of resources and best practice was seen as especially important for those who may have limited access to resources:

Countries are different in many ways. This makes it difficult for a central organisation to develop programmes that are supposed to fit for all. The result in such efforts will in many cases be programmes too general not actually suitable nor relevant for anyone. On the other side, many countries don't have the resources to make their own programmes and tools. For these countries, I guess one-size fits all programmes are better than not having any preventive programmes. Many countries are doing a great job in developing and implementing preventive anti-doping programmes. However, since there are few or no

arenas to exchange and share ideas and programmes between nations, countries wanting to develop tools for a particular group will have to start on scratch instead of building on the ideas and experiences of other NADOs. (NADO 49).

This NADO suggested a sharing platform was necessary and this was echoed by one European NADO, who are currently in the process of developing a coach-tailored online education tool: *“It would also be great if WADA gathered education materials from different anti-doping organisations (ADOs) in one place, for ADOs to be inspired from” (NADO 47).*

Turning to the three RADOs who answered this question, the importance of, and challenges with, collaborative efforts were acknowledged again. The RADOs recognised that *“cultural contexts etc are different and do pose challenges” (RADO 2)*, explaining that, *“Developed countries, their NADO can lead the programme. [Whereas], for countries in the developing world, it will be more effective if it is delivered via a RADO or established NADO with the guidance from WADA” (RADO 1).* From the RADO perspective, the use of collaborative efforts was seen to promote the effectiveness of delivery, and evaluation processes: *“This is to ensure the correct people are directed to the programme and that it can be monitored accordingly” (RADO 1).*

Moving to the IFs, the majority (6/9, 67%) reported that WADA should lead the development and delivery of coach anti-doping education. The remaining three IFs identified a number of organisations who should work together to lead efforts. Specifically, partnerships between NADOs and NFs; WADA, IF, and NFs; and NFs, WADA, Governmental organisations, and NADOs were stated. Notably, IFs regularly reported the role of national organisations, including government and sports federations, in the delivery of coach anti-doping education. It was proposed that there is a *“hierarchy – and each level must play its part: 1) WADA; 2) International Olympic Committee / International Paralympic Committee / International Sports Federations; and 3) National Government / NADOs / National Sports Federations” (IF 12).* These collaborative efforts were seen to increase the likelihood *“that coaches [will] get the anti-doping education that they need” (IF 4).*

Lastly, the majority of CAs (3/4, 75%) believed that NADOs are best placed to lead the development and delivery of coach anti-doping education. The fourth CA identified the ICCE as the most suitable organisation. Reinforcing the insights from other organisations, two CAs reported that “*mutual collaboration is important*” (CA 7) as it allows for utilising the strengths of each organisation to enhance the design, development, and delivery of coach anti-doping provision. Representatives explained that NADOs are “*the experts in anti-doping education*” (CA 3) and “[CAs] *reach out to coaches working (CA 7)*” in all aspects of sport.

Summary – Phase 1b Part ii – Broader context around interventions

The information provided by organisations in the second half of the survey, surrounding the broader context to their interventions, enabled us to gain a deeper understanding of how the global provision of coach anti-doping education is supported (or not) by the context in which it exists. The main finding is that organisations engage with WADA’s current resources (i.e., Coach True, the Model for Core Programs Information/Education Guidelines and relevant social science research) to varying degrees. In particular, it seems that organisations are most likely to utilise existing programs (such as Coach True) and the Model Guideline documents. Those who utilised such resources provided by WADA reported positively, that they enabled them to identify relevant topics and target groups. Therefore, if WADA continue to develop their resources and make them available via the ADeL system, it is likely that (some) organisations will use (some of) them. This finding supports the original proposal to produce a final ‘product’ in the current project – the framework itself, with a compendium housed within it – as a document similar to the Model Guidelines that can be uploaded to ADeL.

It is important that the IFCADE takes this form, rather than only featuring as a final report uploaded in the social science grant area, because organisations were least likely to draw on the findings from research conducted within the social science grant program. Levels of engagement seemed to be affected by accessibility of the reports, both physically (i.e., where to find them on the

WADA website) and conceptually (i.e., how to translate the findings into something meaningful for their provision). Therefore, WADA could consider how to enhance signposting and communication of these findings to stakeholders in the future. This is especially important because a large number of organisations drew heavily from anecdotal evidence, stakeholder feedback, and experience when developing and delivering coach anti-doping education. While learning from practice is a vital part of program development, this should be balanced with theory and research to establish programs that are 'evidence-informed' and more likely to be effective (Craig et al., 2008) – and this is something that is stipulated specifically in the ISE. The effective signposting and communication of reports such as those published in relation to social science grant projects is a key learning point in the current project because without addressing this issue, the IFCADE will become just another 'book on the shelf'. Though, as outlined in the previous paragraph, we hope to mitigate this possibility by providing the final product via ADeL in a form that 'ready to use' by stakeholders.

In addition to providing support for the proposed form of the IFCADE, the survey insights also supported the general need and appetite for the IFCADE. Specifically, a significant positive finding was that many organisations plan to do more with their coach anti-doping provision. Furthermore, our original objective of bringing together emerging practice from around the globe and making examples available for all to access was supported by organisations highlighting the need for a central system to identify resources and share best practices across organisations. Indeed, organisations emphasised the need for greater collaboration, which is at the heart of the process we are engaging in to develop the IFCADE; this will come to fruition in later phases (e.g., consultations with education providers). There, we will pay particular attention to considering how to navigate the complex, and ever-changing, sporting system – which was described by respondents to the survey as one where multiple organizations with different agendas and various constraints are present. In particular, we must consider the respondents' varied views on who should lead anti-doping efforts, and which organisations should forge partnerships to maximise efficiency and effectiveness.

One final factor that we must give serious consideration to, based on the survey findings, is

how to ensure organisations can see the applicability of the IFCADE across various contexts. While our earlier insights had perhaps signalled that tailoring for coaches was limited across existing interventions, the information provided in the second half of the survey suggests that stakeholders view context as critical in coach anti-doping education. In particular, organisations do not like resources that feel like they are “one size fits all”. This issue crosses over into the difficulties that many organisations face trying to get sporting organisations and coaches to ‘buy in’ to coach anti-doping education (because a lack of context-specificity does not help this). The findings regarding the current attitude that coach anti-doping is not a priority have been experienced previously by the research team when speaking with organisational representatives (Patterson et al., 2016) and coaching populations (Patterson & Backhouse, 2018; Patterson et al., 2019). So, while organisations see value in establishing and maintaining relationships to facilitate the development of new and existing resources, we must be mindful that the successful uptake of IFCADE (and, by association, some components of the ISE) likely requires some stakeholders’ attitudes to be reframed and communities to be empowered through system change. Indeed, successful development and implementation of coach anti-doping education will require evolution beyond the individual (i.e., beyond the coach). Fortunately, all of these matters are accounted for in our adoption of the BCW, which emphasises the use of intervention functions and policy categories to target both the individual and the environment in which they are situated.

The insights provided by the survey have enabled us to develop some understanding of how the global provision of coach anti-doping education is supported (or not) by the context within which it exists. The next phase of this research programme will build on these insights by exploring the first-hand experiences of those responsible for anti-doping education.



Phase 2

Collating examples of emergent practice in
coach anti-doping education

Objective: Undertake systematic consultations with key stakeholders pertaining to coach anti-doping education worldwide.

SEPTEMBER 2019 – JANUARY 2020



Context

As previously stated, a key process within logic model creation is engaging with those in the field to whom programs are directly relevant (Dwyer et al., 2003; Houlihan & Melville, 2011). Accordingly, the current project will consult the target population of programs – coaches – as well as individuals responsible for anti-doping education – such as designers/deliverers or policy-makers/managers. This phase (Phase 2) of the project focused on the latter. By consulting these individuals, we aimed to gain a deeper understanding of the global landscape of coach anti-doping education. Specifically, we wished to gather information pertaining to the components of a logic model, including identifying the current inputs, outputs, and desired outcomes of anti-doping organisations (i.e., NADOs and RADOs), IFs, and CAs. To ensure that we understand the current climate surrounding coach anti-doping education at a global level, we ‘hand-picked’ individuals from different nations and sports. We also purposefully sampled individuals from organisations that represented a range of practice (i.e., some well-develop/establish programs and some without much in place). Information from this phase of the project will contribute to the development of a draft IFCADE and an implementation blueprint that are ‘ready to use’ by organisations (e.g., sporting, anti-doping, coaching).

Research Design

Informed by Phase 1, the research team selected personnel from a range of organisations (n=24) and invited them to take part in semi-structured interviews. The 24 individuals identified were contacted via email, and this correspondence included an Information Sheet and an Informed Consent Form, as protected Microsoft Word™ documents. These documents overviewed the nature of the project and emphasised all key ethical considerations (e.g., voluntary participation, data handling/storage). The final sample recruited for the interviews comprised 15 individuals from anti-doping organisations (i.e., NADOs and RADOs; n=11), IFs (n=3), and CAs (n=1). Due to the international nature of the participant group, the interviews were conducted online (e.g., Skype) (n=12) or over the telephone (n=3). On average, the conversations lasted approximately 50 minutes

($M=51.46$, $SD= 11.00$).

The interview guide initially focused on demographics (e.g., Please describe your current role within your organisation) to ensure that we were speaking to someone in a relevant position to provide insights. The main body of the conversation was around current coach anti-doping provision (e.g., What does your provision involve [e.g., education, training, other components]?) and perceived effectiveness of current practice (e.g., Do you believe your provision [education/training] has an impact on coaches' capability to engage with anti-doping?). When asking these questions, we were mindful of gaining insights specific to the components of a logic model (Dwyer & Makin, 1997, Kaplan & Garrett, 2005; Taylor-Powell & Henert, 2008; Thinking specifically about the education/training for coaches, how is this delivered by your organisation?). Across all interviews, questions were tailored to the interviewee based on the findings of Phase 1 (e.g., You said in your survey that your organisation provides [insert details from survey for each interviewee], could you please tell me more about this?).

With the permission of the participants, all interviews were audio recorded to facilitate verbatim transcription. Interview data was abductively analysed using thematic analysis (Braun, Clarke, & Weate, 2016). This method is made up of a six-staged iterative process of data analysis: (1) immersion, (2) generating codes, (3) searching for and identifying categories, (4) reviewing categories, (5) defining and naming categories, and (6) writing the chapter (Braun et al. 2016), and is an effective approach to identify patterns and themes within data. During data analysis, we drew on logic model frameworks (Dwyer & Makin, 1997, Kaplan & Garrett, 2005; Taylor-Powell & Henert, 2008), seeking to identify where participants had discussed their programme outcomes, activities, etc. In addition, we deductively searched the data for insights into components of the BCW (Michie et al., 2008; Michie et al., 2014; Michie et al., 2011), including COM-B outcomes, intervention functions, and policy categories. As a final step in the analysis process, we mapped the findings against the ISE (WADA, 2021), i.e., identifying activities that could be categorised as information

provision, awareness raising, anti-doping education and/or values-based education, where possible.

Phase 2 Findings

Figure 16 presents the findings, using a logic model framework (Dwyer & Makin, 1997, Kaplan & Garrett, 2005; Taylor-Powell & Henert, 2009). The main findings (and 'sub-themes') within each component of the logic model are discussed using the words and phrases of representatives from organisations integral to the provision of coach anti-doping education globally.

Situation/need	Inputs	Outputs		Outcomes			
		Activities	Participants	Short & Medium Term			Long Term
1. Clean sport and a healthy nation are important but if it's not present in our context, then there's nothing really to talk about. 2. The introduction of policy creates change, but a lack of specificity can undermine an organisation's actions. 3. Critical incidents encourage action. 4. Structures and tensions exist across a complex system. 5. Collaborations will reduce the burden on the sport community.	Partnerships Human resources Finance and logistics	1. Designing, developing, and delivering intervention resources 2. Conducting a needs analysis 3. Monitoring and evaluation procedures	Provision targets... 1. Elite level coaches 2. Recreational level coaches 3. Coaching and PE students 4. Coaches in fitness centres Additional activities target... 5. Other NADOs 6. Other sports organisations 7. Government 8. Public 9. Decision makers 10. Universities	Capability Knowledge Skills Decision making Behavioural regulation	Opportunity Environmental context and resources Social influences	Motivation Social professional role and identity Beliefs about consequences Emotions	Social Environmental Economical



External Factors
1) Attitudes to coach anti-doping education, 2) Resources for coach anti-doping provision, and 3) The complexity of the sporting system.

Figure 16. A logic model of coach anti-doping education provision.

Understanding the situation and/or needs

This theme provides an insight into the position of anti-doping education for coaches. We observed patterns of shared meaning as interviewees' accounts cluster around the uncertainty of whether or not coach anti-doping education is a significant issue within the sporting system and beyond. Organisation representatives reported that their mission was to encourage clean sport and promote a healthy nation. While encouraging, this mission appeared to be externally driven by International (e.g., Code; WADA, 2021) and National mandates (e.g., Government legislation) which predominantly focus on athletes. Furthermore, anti-doping education efforts were often considered a knee-jerk response to critical incidents (e.g., Anti-Doping Rule Violations; ADRVs) across a sport or country. In fact, doping was often not recognised as an issue across some sports, and this opinion appeared to act as a justification for a lack of provision. Nevertheless, coach anti-doping education was afforded by some organisations when coaches were identified as a target group by international and national organisations, and the implications of engaging an athlete's social network to shape athletes' behaviours were understood. However, the differences in practice across organisations elevated concerns that current global anti-doping provision lacks homogeneity, and the structure and tensions across the sporting system act as a barrier to coach anti-doping provision. Organisation representatives reported that establishing fruitful collaborations will reduce the burden on the sporting community and go some way to promoting effective coach anti-doping education.

Clean sport and a healthy nation are important but if it's not present in our context, then there's nothing really to talk about.

All interviewees recognised the importance of "*clean athletes [and] clean sport*" (Interviewee 13, NADO). Encouragingly, interviewees appeared to recognise the importance of educating coaches to support "*athletes to make the right decisions [by providing] advice and steer[ing] the athletes in a positive way*" (Interviewee 1, NADO). A representative from a NADO explained that "*the coach is critical for the athlete ... because the athlete they train eight or more hours with him or her, listening, and doing what the coach says*" (Interviewee 3, NADO) and,

therefore, concluded *“it is important ... to reach the coach [with anti-doping provision]”* (Interviewee 3, NADO). Indeed, stakeholders acknowledge that coaches, and other ASP, can influence athletes’ doping-related behaviours:

At the end of the day, we are trying to build a healthy society and the welfare of athletes is very much dependent on athlete [support] personnel. If you really look at all the major cases in the past, there's some degree of involvement of the athlete [support] personnel, the coach or whoever it is, even your doctor or what else, they have been involved in this, no matter who. (Interviewee 11, RADO)

NADO staff also stressed the importance of anti-doping education for public health. One stakeholder stated:

If you consider the public health considerations. There is a rather small number of elite-level athletes compared to the vast number of athletes in fitness sports and mass sports. So, this is quite obvious you have to think about the mass sport as well. I'm no friend of figures and estimates, how many athletes really dope in elite level sport? Even if you think it is a very high number, that is nothing compared to the [doping in] mass sports. (Interviewee 2, NADO)

Society’s use of drugs as a public health issue was identified by Interviewee 13, when they shared their organisations’ aims and objectives: *“I mean we are also focusing on the society, I mean on drugs, I mean leisure drugs. We want to mobilise and encourage everybody to stop using this stuff as it affects your health”* (Interviewee 13, NADO).

Stakeholders from other groups, i.e., RADOs, IFs and CAs, also appreciated the importance of clean sport and protecting public health. Yet, our findings suggest that specifically supplying anti-doping education was not the sole focus (or priority) of IFs and CAs. This was evidenced by some IF representatives reporting that doping was not an issue in their sport, and suggestions that coach anti-doping education may be more important for other more *“high-risk”* (Interviewee 2, NADO)

sports. Notably, this opinion appeared to act as a justification for the lack of provision amongst some of these organisations. Furthermore, these perceptions seemed to influence their assumptions surrounding coaches' engagement with anti-doping education, when provided. One interviewee said:

One of the things, fortunately, we like to say to the world that we are very clean. We have a very low rate of doping cases ... so if you're talking about the programme and discussing what happens on anti-doping control, or what measures there are worldwide to decrease doping, I don't think coaches will be interested in that. (Interviewee 6, IF).

Due to the stakeholders' mixed feelings about how important anti-doping efforts are, including how 'at risk' their context is, the provision of anti-doping education varied across the different types of organisations.

The introduction of policy creates change, but a lack of specificity can undermine an organisation's actions.

Coach anti-doping education existing, across organisations, was primarily driven by international and national legislation. Despite most organisation representatives reporting values relating to clean sport, this potential 'artificial driver' may be unhelpful when considering coach anti-doping provision. This is because the anti-doping prevention system appears to predominantly focus on athletes. Specifically, interviewees reported that legislation, proposed targets, and funding requirements were all positioned around the delivery of athlete-focused anti-doping education. Unless coach anti-doping education was specifically identified within appropriate compliance policies, and subject to funding requirements, stakeholders did not feel mandated to provide it:

It is all about how we're measured in terms of our effectiveness. We're government-funded, so we have to report on what we do and our activities. One of the main goals for us is how many athletes have we educated? Which then drives up educating athletes. So again, there's probably something in that too, say we had goals where we had to educate X amount of

coaches, then that would push our promotion and our activity about coaches, but we just don't have that. I suppose it's just more important for athletes, and that's what we're measured on, so we have to achieve that goal to get our funding. (Interviewee 5, NADO)

Based on these drivers, it is not surprising that athletes are the priority target group for most stakeholders. Promisingly, interviewee 11 concluded changes made to the Code in 2015, which acknowledge the role of ASP in clean sport, had driven the development of their coach anti-doping provision:

I think previously in the World Anti-Doping Code the focus was only on athletes: What do you take? And all these things. There was not much emphasis on the support staff the coaches or whoever it is, but now within the current Code, education, there are penalties and things for the coaches and support staff. That is coming [from where] it is now, but previously everything around anti-doping was athlete focused. So, all the programmes, all the training, everything was on the athlete. (Interviewee 11, RADO)

These changes to global policy had implications across all WADA code signatories. A representative from an IF said: *"it's a requirement in the World Anti-Doping Code, so it's something we have to take on"* (Interviewee 15, IF). Similarly, those embedded in sport at a national level (e.g., NADOs) reported how the introduction of ASP as a target population in the Code has shaped localised legislation and guidance and, as a result, their coach anti-doping provision:

Our ministry of education published ... a declaration to the universities ... So, they published this requirement that all universities must follow, and it included for the PE, the physical education universities, from where all the coaches in [the country] come from, all the coaches in [the country] have to have a physical education degree otherwise they cannot be a coach. So, when they are taking their degree and studying university, they must have all the content which is included in the requirement from our ministry. Included in this requirement was ... anti-doping educational activities, or avoiding doping. So, after this requirement was

published, we went to some places to be sure how it was going to work. (Interviewee 3, NADO)

Despite these opinions and promising actions following the changes to the Code, some interviewees acknowledge that coach-focused activities were an additional luxury when resources were available (e.g., funding, staffing). Whereas, others reported coach anti-doping education was often a by-product of coaches' attendance at athlete-focused events: *"sometimes for us, it's easier to go to train coach and athlete together. For example, for national teams, we have training seminars and the clubs attend this and, so, [the] coach is present"* (Interviewee 7, NADO).

Besides the changes in the Code, or introduction of legislation, the IF representatives commented that guidelines surrounding major international events sometimes encourage a push to reach elite-level coaches. This is captured in the following quote:

When we had the series finals in [country], we run, let's say, it's a programme for the education of coaches. So, the furthest we went was to deliver a webinar and a level two coaching course. The webinar was delivered by the NADO of that country, and also in our high-performance courses we ask all the coaches to complete the online courses and online anti-doping education. (Interviewee 6, IF)

Within the discussions, interviewees acknowledged that the level of coach anti-doping provision globally lacked homogeneity. For instance, stakeholders reported differences when they spoke to coaches about anti-doping education across organisations: *"They said, 'we did training in [IF]', but they did something else. Then [another IF] does something else. So, the harmonisation is different across IFs"* (Interviewee 11, RADO). A representative from an IF went on to underscore the implications of these challenges, reporting:

You can see [the differences] through the [athlete] education. Some athletes would come to do the outreach, and you would see those that had a good strong education. They could

respond, they could do the quiz, and yeah in a few minutes the quiz was done, and they were all happy, and they would gather their gadgets and their prizes. And then you'd see the [other] countries where they would just have no idea ... and they'd bring their coaches, and they'd bring their physio, and they'd bring everyone, you know the whole team because obviously, they hadn't received that same level of awareness. (Interviewee 9, IF)

One reason for these differences was reportedly down to the fact that despite the introduction of policy interventions, anti-doping education *"is not regulated ... [and] if you don't give the same thing [information], some of the information they [(e.g., athletes and ASP)] might receive, maybe from somewhere else and may not be up to the WADA standard"* (Interviewee 11, RADO). Similarly, a representative from a European NADO discussed the current lack of guidance on what is expected within coach anti-doping provision: *"What is education? Is it enough if I just send them out an email with here is the WADA code, here is the international standard. What does education have to look like?"* (Interviewee 2, NADO). There was a sense among interviewees that WADA should acknowledge the lack of resources in anti-doping education and provide guidance around what is expected of different types of organisations (e.g., size, funding). Importantly, all of the interviews took place prior to the ISE becoming effective (in Jan 2021). It was acknowledged that the introduction of the ISE will be *"a step forward for anti-doping education ... [and] it's probably going to enhance or increase the level of anti-doping education that's given internationally"* (Interviewee 15, IF). In support, one RADO representative identified that in order to establish clean sport, it is imperative that *"the same information gets filtered through for everybody, so then they are all on an equal platform [only then can we] ensure that it's the same standard"* (Interviewee 11, RADO).

Critical incidents encourage action.

While policy was important in shaping organisations' coach anti-doping provision, stakeholders' actions were also driven by critical events (e.g., ADRVs). For instance, when a country and/or sport received unwanted attention around the topic of doping, there was *"an instant demand from the participants to know more about [doping and anti-doping]"* (Interviewee 2, NADO).

This was echoed by a NADO representative, who reported that following critical incidents, NFs became more committed to anti-doping education, and requested more support from the NADO:

We see with [sport] here the national federation had a little bit of an issue a couple of years ago, which did really put [the country's sport] in a position where they were committed to act in terms of prevention and education and also in terms of tests so, they even ordered more test pools, than we would be able to provide. So that is the situation, where the environment put anti-doping on their agenda, they acted with a lot of commitment. (Interviewee 14, NADO)

Importantly, this interest was not just initiated by stakeholders within sport, as one NADO representative reported that when “*some athletes were caught using banned substances from vitamins from drinks, the [government] were also very concerned, and they organised activities around testing for the athletes*” (Interviewee 13, NADO).

In the absence of a ‘scandal’ some stakeholders reported the appetite for anti-doping within sports as lacklustre. To illustrate, interviewees discussed coaches’ perceived roles following attendance at athlete-focused education, and coach engagement in sessions (e.g., face-to-face provision):

I think that the general perception is that it's for athletes, and that anti-doping only applies to athletes. I think a lot of coaches I've spoken to have told us, [who] have been exposed to more if they've been to a workshop or whatever, they see their role in being, “yes I'll go to doping control if they ask me to”. (Interviewee 5, NADO)

We noticed that the interests of the coaches are not that high. We do get coaches, but it's more the parents and athletes that we get to attend those sessions (Interviewee 1, NADO).

Structures and tensions across a complex system

Interviewees described that the structure and tensions across the sporting system act as a

barrier to coach anti-doping education. One aspect of the complex socio-cultural context that came through strongly related to an organisation's inputs and activities being driven by an individual's or organisation's priorities. One RADO representative explained: *"the funds are there to [support coach anti-doping education] ...[but] the presidents and secretary generals say there are competing priorities such as sending their athletes, maybe 50, 60 athletes to a competition"* (Interviewee 11, RADO). Indeed, stakeholders reported that they *"struggle to put resources into anti-doping [as a whole]"* (Interviewee 15, IF) and, therefore, they often felt they had *"to convince [individuals at] the top-level structures of federations because if they don't buy into the whole idea [of education], then it's harder for the people on the more basic level to cooperate with us"* (Interviewee 2, NADO). This tension is further exacerbated in contexts where coach anti-doping education was not seen as a priority by those providing funding (i.e., government organisations). For example, interviewee 12 identified that participants (e.g., governments, decision-makers, and the public) may be resistant to their activities based on the perceived relevance to their country's needs:

One must also understand for example, if a country is coming out of war, or they just got independence, such a young country, and we are trying to push anti-doping on one of the poorest countries in the region, they think, "we have other priorities". (Interviewee 12, RADO)

The individual nature of priorities brings to the fore evidence indicating the complexity of the global anti-doping system. The structure was described by organisation representatives as a network of *"separate entities"* (Interviewee 11, RADO) and one interviewee shared that:

There isn't one person with the ability to connect all the dots. WADA is actually responsible ok, and the NADOs actually take charge of the education, and then there are NFs, but in the country itself you have the Government, you have the NOCs, and so who is the one connecting all these points together? (Interviewee 12, RADO)

Questions around which organisation has the power to influence stakeholders' clean sport

attitudes and behaviours were evident, and interviewees provided differing experiences when trying to influence coaches' engagement with anti-doping education. One IF representative drew from experience and asked us to recognise that *“NADOs are in a better place to conduct anti-doping education ... because they have the language, they know the reality of the country, and they're onsite”* (Interviewee 15, IF). In contrast, one representative from a NADO points to the necessity to increase buy-in from IFs as *“the IF has absolute power”* and they go on to say that *“if [the IF] says all coaches have to do this in terms of doping, they will do it, they have to do it”* (Interviewee 11, RADO). Taking this further, and amplifying it with the national legislation across countries mentioned in a previous theme, the system is challenged as:

It is our obligation to provide education, but this is a grey area because it is not defined in national legislation, and WADA will not interfere with national legislation. [WADA] can provide guidelines and give us recommendations but it is not mandatory or defined the way by which we will provide this information. (Interviewee 4, NADO)

Interviewees agreed that while anti-doping education has a place in organised sport, and that any provision is better than nothing, one stakeholder concluded that *“from speaking across the board globally, the thing that's coming through really strongly is that it is a very complex environment, with a lot of different structures, and things like that that have tensions”* (Interviewee 9, IF). One interviewee recognised *“sport, in general, is a dynamic thing. Things are not the same for too long, and that's also a challenge for us, you need to keep on changing, keep developing”* (Interviewee 1, NADO). Reflecting further on tensions across the sporting system, one NADO representative concluded: *“it will always be this way, so you have to pave your own way in your country [or sport] and see what is the best way to swim in the stormy weather”* (Interviewee 4, NADO).

Collaborations will reduce the burden on the sport community.

To overcome the difficulties identified in the earlier subthemes, stakeholders called for

collaboration across organisations: *“Collaboration is key, so learning from each other [NADO] and WADA but it all needs to be consistent”* (Interviewee 1, NADO). Specifically, stakeholders felt that establishing anti-doping networks will enable them *“to be more efficient in [their] anti-doping work”* (Interviewee 4, NADO). Thus, alleviating *“the burden”* (Interviewee 4, NADO) across the sporting community. For instance, *“better communication with [international and national organisations, would encourage] ... cooperation and sharing of information”* (Interviewee 4, NADO). Indeed, one RADO representative reported that they currently *“bring experts from either regional or international”* (Interviewee 11, RADO) organisations to support their anti-doping education provision. Even CA staff were able to identify the positive implications of these interactions, which included organisations having access *“to the best people, and the best sport organisations and federations ... to support [them], in order to give [coaches] the kind of [anti-doping] information and knowledge which is updated [and relevant]”* (Interviewee 8, CA).

Furthermore, recognising and utilising the strengths of each organisation within the system can play a fundamental role in clean sport. A representative from a NADO, recalled how developing collaborations with NFs has increased their opportunity to reach coaches, thus, reducing the burden on the sport community:

The way we have structured it is, we have got the NFs from 2014, and we partnered with them in terms of education, and they signed to the anti-doping rules which were developed. One of the requirements within those rules was that the federations have an obligation to partner with us to undertake anti-doping information to their tech holders [e.g., coaches]. Therefore, through that structure, we are able to penetrate through the federations. So, ... the federation officials are able to mobilise the coaches and make it mandatory for them to come and participate in the sessions. (Interviewee 10, NADO)

Inputs

Within logic models (Taylor-Powell & Henert, 2008), inputs are the actual or anticipated

necessary resources used to address the situation and needs identified. Interviewees across all organisations discussed developing partnerships and using human resources and financial infrastructure to support their coach anti-doping provision.

Partnerships

Given the importance that organisation representatives placed on collaborations across the sporting system and beyond, it was encouraging (and unsurprising) that they reported a number of partners with whom they work to design, develop, and deliver coach anti-doping education. These partnerships included NFs, universities and research institutions, coaching bodies, and government ministries. Some stakeholders used these partnerships to support the provision of anti-doping education across other organisations:

We also joined recently [Anti-doping focused organisation] ... it is one organisation that discusses certain things. You can see territory also, coverage or certain countries in [continent] ... It helps us to discuss certain things to improve our positions, attitudes, or get an idea of how to do something. (Interviewee 4, NADO)

We had an education officers training course in [country]. We got officers from all member countries, so we had a one-day programme, we taught them how they can actually deliver awareness programmes to students and other people. (Interviewee 11, RADO)

In addition to meeting their own desires to work collaboratively, the interviewees' use of partners will fulfil the requirements of the upcoming ISE. Specific to this, stakeholders reported that partnerships enabled their organisations to develop effective education plans (e.g., *"We have agreements with NFs, [which enable us to] create future education plans and testing plans"*; Interviewee 7, NADO), and access and review materials and guidelines (e.g., *"information from WADA website"*, Interviewee 3, NADO). In addition, partnerships in the academic field or with other research institutions provided support for evaluation and research purposes: *"We have cooperation with [Universities and researchers]. They provide us with valuable feedback as well and keep us on a*

good track what new developments in science are” (Interviewee 2, NADO). While the majority of partnerships were established with sport organisations, government ministries, and research institutes, one organisation reported engaging the media to support the delivery of information to coaches: *“We use social media, use television and radio in local dialects to pass as much information as possible”* (Interviewee 10, NADO).

Human Resources

Beyond partnerships, our findings showed that a necessary input was the hiring of full-time and part-time staff to design, develop, and deliver content and resources. The number of staff employed across the various organisations differed; specifically, NADOs appeared to employ more staff for anti-doping education than other types of organisations. Though NADOs typically had more staff, they still faced human resources challenges as they had concerns around staff turnover, and the influence this has on their education provision:

I kind of worry [it] is not sustainable sometimes. The anti-doping set up in most countries are pretty small in terms of headcount, in terms of positions available, and people do not have a proper career path. So, after some years, they may leave, and the whole story starts all over again. (Interviewee 12, RADO)

Further human resources concerns came to light when several organisational representatives reported that anti-doping education is not their sole responsibility. One stakeholder explained, *“right now I have three job descriptions.”* (Interviewee 2, NADO) and another said, *“[I’m] not only working in anti-doping. And so, commitment and time spent [focusing their efforts on such activities] is not there”* (Interviewee 12, RADO). This situation has implications on an organisation’s provision because staff have limited time to dedicate to anti-doping education activities. To address some of the human resources challenges, a small number of NADO representatives reported recruiting auxiliary staff to deliver coach anti-doping education:

We recruit them as volunteers ... we facilitate them with transport, we facilitate them in

terms of subsistence, allowing them to take a hotel, and have a meal. If they want to take a taxi they can. We have identified them as volunteers. (Interviewee 10, NADO)

Though the organisation still had to spend some money on these people, through costs of travel and/or other expenses (e.g., food, drink), the expenditure is less than if they were paying contracted staff.

Finances and logistics

As we know from the previous phase of this project (1b), money can be a significant constraint for organisations. In the interviews, stakeholders enabled us to gain a deeper understanding of their circumstances by identifying financial (e.g., *“cost of hiring conference facilities”*, Interviewee 10, NADO), infrastructural (e.g., offices and workspaces), and technological resources (e.g., internet access, phone lines, websites, mobile apps) which were relevant to their coach anti-doping provision. Notably, it was acknowledged that, despite their best intentions, at times the physical and virtual resources the organisations had access to were not fit for purpose. A representative from a NADO acknowledged, that *“the setting of a specific training [session], or a place and time, very often gives you the limits of what is possible”* (Interviewee 14, NADO). These issues are further exacerbated by the structures and tensions present across the system (which we described in depth earlier), as they go on to say *“we might get [30 minutes] to one hour, where it is like ‘look, of course, it is very important you come, but I can only give you 30 minutes because we have so many other things’”* (Interviewee 14, NADO).

Due to this, an organisations provision may be jeopardised, i.e., the activities they wished to undertake [outputs] and the outcomes they hoped to achieve may or may not be possible. The expectation that an individual who has not been exposed to adequate anti-doping education can support clean sport is not appropriate. Interviewee 14 reflects on how financial and logistical constraints have implications on coaches’ clean sport behaviours:

If you get 30 minutes with a coach who has never heard anything, and he will never hear

anything again it is really hard to really get across what is important ... the issue is frequency. Are we seeing them often enough? What we are seeing is they know very little, they hear something every now and again, but they tend to forget. We see that with athletes as well. I think there should be a higher frequency and repetition of training. (Interviewee 14, NADO)

Outputs

To inform the logic model, a large portion of the interview was spent discussing the activities organisations undertake, focused on the design, development, and delivery of coach anti-doping education. The interviewees proposed a range of activities, including developing and delivering interventions, conducting a needs analysis and relevant research to support their provision, and monitoring and evaluation processes. In addition, this theme, captures information pertaining to the participants whom organisations target to promote coach's anti-doping (or clean sport) behaviours, in an attempt to create or contribute to their desired outcomes. While, coaches were the predominant target audience, interviewees discussed engaging a number of other stakeholders (e.g., researchers) across multiple organisations and systems to enhance their coach anti-doping provision.

Activities

Intervention resources

In support of our findings from Phase 1, provision included face-to-face methods (e.g., lectures, seminars, workshops, outreach events), hardcopy (e.g., booklets, handbooks), and online resources (e.g., websites, apps). Though we noted differing levels of engagement in each of these activities, no patterns were identified across the types of organisations (i.e., anti-doping organisation, IF, CA). Further reinforcing our observations of heterogeneity in provision across organisations, it appeared that some organisations specifically develop in-house resources to meet the needs of their participants (e.g., *"We prepare brochures which are for us mandatory, it's a prohibited list, then international standards, we put it on the web, and we provide information during*

lectures or our usual communications of what we have and what we can offer”; Interviewee 4, NADO), whilst others take ‘off-the-shelf’ programmes/products as they are (*“We just get the information leaflets and pamphlets from the RADO. For example, if [RADO] sends us some information, I disseminate it, as in give it to the coaches”*; Interviewee 13, NADO).

In line with the BCW, organisations appeared to use several intervention functions, which can be mapped across the COM-B components (Table 8). The intervention functions, were used across face-to-face and online resources, and included within a variety of learning tasks (e.g., scenario/role-play-based activities, social media posts, videos and written text and visual images).

Table 8. Organisations' activities mapped against COM-B components and BCW intervention functions

COM-B Component	Intervention Function & Definition (Michie et al., 2014)	Example(s)
Capability	Education – Increasing knowledge and understanding	<i>“We created brochures because there are people who are totally ignorant about such things” (Interviewee 12, RADO).</i>
	Training – Imparting skills	<p><i>“We give them cases where they have to try to figure out what is going on and what should they take care of in a specific situation. We try and make it hands-on, so they have to look up medications etc” (Interviewee 14, NADO)</i></p> <p><i>“We try to filter out what are the critical points in their career, what did we learn from past cases, what are the points where they themselves can get into doubt, even if they have a positive attitude on the whole anti-doping work. We try to role-play through with them because I think it’s way better if you made up your mind years before you actually come into this situation, because in the situation you have pressure, you have other things on your mind and you maybe won’t react clear, but if you have thought about all these things in a safe environment and made up your mind already, then the decision comes easier to you and you don’t feel pressurised.” (Interviewee 2, NADO)</i></p>
Opportunity	Environmental restructuring – Changing the physical or social context	<p><i>“Our e-learning stuff, you know it’s technical, pretty dry because it is what it is ... so we use it as kind of a follow up to do in your own time as you pick it up and you put it down, you can email us in between sections if you want to, to ask more questions about what you’ve just learnt, that sort of thing that’s really not that rich real time discussion.” (Interviewee 5, NADO)</i></p> <p><i>“We are including [coach anti-doping education] in the curriculum of our universities anti-doping content.” (Interviewee 3, NADO)</i></p> <p><i>“Our webpage must allow visitors to find resources easily ... it is important to have a good webpage which is easily readable, and documents are easily searchable and so on.” (Interviewee 4, NADO)</i></p>

	<p>Enablement – Increasing means/reducing barriers to increase capability (beyond education and training) or opportunity (beyond environmental restructuring)</p>	<p><i>“After they have the information, I have to remind them to repeat it because sometimes you have the information, but you don’t spread the information. So I have to remind the coach, I have to tell them to say to all of their athletes it doesn’t matter the age of the athlete they have to say it all the time, it is one thing because all the information it is good but it is not everything we have to remember what did you talk to your athletes this week about anti-doping, ‘oh nothing’, ‘why nothing my friend?, you have to say something’, or ‘did you take any supplements this week? Where did you buy, is it clean or not?’ this kind of thing they have to remember the Code to use and apply the information.”</i> (Interviewee 3, NADO)</p>
	<p>Restriction – Using rules to reduce the opportunity to engage in the target behaviour (or to increase the target behaviour by reducing the opportunity to engage in competing behaviours)</p>	<p><i>“The completion of the [WADA] ADeL course was obligation to the coaches, so my friend if you want to go to [the Games], you have to do this course”</i> (Interviewee 3, NADO)</p>
Motivation	<p>Coercion – Creating an expectation of punishment or cost</p>	<p><i>“In the end, when you remind them they can go to jail, they can go to prison ... it’s again coming back to the preventive strategy”</i> (interviewee 2, NADO).</p> <p><i>“We tell them that they also can go to jail by doing this, especially when they’re in a position of authority”</i> (Interviewee 4, NADO).</p>
	<p>Education – Increasing knowledge or understanding</p>	<p><i>“Information on absolutely everything from the beginning”</i> (Interviewee 7, NADO) allows coaches to <i>“actually relate to what is happening”</i> (Interviewee 11, RADO), and shape <i>“their opinions and their way of thinking on certain topics and issues”</i> (Interviewee 2, NADO).</p>
	<p>Incentivisation – Creating an expectation of reward</p>	<p><i>“During the outreach sessions we normally have giveaways. We have a very well designed and branded water bottle ... everybody who comes to the tent walks away with a giveaway which is branded and has a key message, ‘if you are taking the water, the key message is stay clean and drink right’ and, therefore, it reminds them every time I went to this outreach and this is what the message was, the message is very clear.”</i> (Interviewee 10, NADO)</p> <p><i>“Coaches can collect credits for completing the modules”</i> (Interviewee 8, CA)</p> <p><i>“They get the e-learning badge, and a certificate of completion as for their coaching resume”</i> (Interviewee 5, NADO).</p>

	<p>Modelling – Providing an example for people to aspire to or imitate</p>	<p><i>“We use examples coaches of [clean] Olympic champions, World Champions because they respect these people” (Interviewee 7, NADO)</i></p> <p><i>“The coach will say ‘my fellow coaches we must point athletes in the right direction, we have a responsibility’” (Interviewee 10, NADO).</i></p>
	<p>Persuasion – Using communication to induce positive or negative feeling or stimulate action</p>	<p><i>“In many presentations I talk to them about the risk [of doping], so the risk is the possibility of an event, or the fact that it can do damage, so it is a good way to convince them [doping is not good] because in fact it is terrible” (Interviewee 3, NADO).</i></p> <p><i>“We use two or three slides saying if you are involved in doping this is what your risks are. So making really clear that the risks are really high in terms of suspension in terms of destroying the person’s career, you know all that” (Interviewee 6, IF)</i></p>

Needs analysis

To assist the development of in-house resources, several stakeholders reported conducting a needs analysis. This allowed them to select whom to target with materials, what content is relevant across coaching contexts (e.g., performance level), and account for any social norms and social influence (e.g., culture) that may act as an enabler and/or barrier to practice and, therefore, coaches' clean sport behaviours. This is illustrated in the following quote:

You know, an elite level coach and then some of our, our top-level secondary school teams, for example, they are under heaps of pressure. The coach is under pressure to win for the school. The school's under pressure to win from the parents. So, they're under pressure from everybody and, you're under pressure to win. So, like at that level, it's quite different, like a professional team who might seem a whole lot more relaxed about it, but they know there's a lot on the line, and they also know that they may be more likely to be tested. So, I think in a way, we need to do a needs analysis, as across the levels, the context is quite different ... We prioritise face to face education here based on cultural preferences ... most of them are kinaesthetic or audio learners ... so, having someone there face to face, that can actually respond in real-time, give them tools, give them praise maybe for what they've done or just, you know, actually relate to them on a face to face basis, they really engage with that kind of thing. (Interviewee 5, NADO)

When discussing the need to undertake a needs analysis in order to tailor coach anti-doping education, all organisation representatives appreciated that the content provided to lower-level coaches must not be a replication of that which is provided within the elite context: *"if you are coaching at the top levels, the more specific the curriculum is, then it slightly varies when it gets lower and lower"* (Interviewee 2, NADO). So, as per the ISE, several interviewees reported tailoring and targeting provision *"based on the kind of personnel"* (Interviewee 10, NADO) they were working with. One NADO representative indicated that coaches of all levels would receive anti-doping education in a similar format (e.g., workshops), but the specific content would differ according to the

coaches' context (e.g., elite v. recreational sport):

At an elite level, we would ask: You're going to the Olympics, and there is a substance that right now isn't prohibited, but there are rumours that it will be on the list in one year or maybe in six months. And, basically, will you do it or not? Or will you recommend it or not? At the lower level, it's more about recommending nutritional supplements. Or how do you react when your athlete is injured and things like that? (Interviewee 2, NADO)

Though the upcoming ISE does not stipulate which components (i.e., awareness, values-based) should be incorporated in programs for which segment of the performance pathway, organisations appear to already have preferences in their approach. For example, the following quote indicates that this stakeholder focuses on values-based education with lower-level coaches:

We kind of have two approaches to education, we have a very strong values-based component, and we a more technical anti-doping education. So, two arms I'd guess you'd say. The values-based stuff that we do is for our secondary schools. To sort of 18-year-olds students and also their coaches, teachers and parents, any other support people they have. Then our more traditional anti-doping education, we check them ... when people get onto our performance pathway. From, you know, under 16, under 17, these sorts of people, and then all the way through to professional level. (Interviewee 5, NADO)

By implementing a needs analysis, organisation staff were able to select whom to target with new resources and what content was deemed relevant. Similarly, this approach highlighted the need for organisations to implement different delivery methods to engage, reach, and target coaches clean sport behaviours. While a small number of stakeholders looked to the WADA guidance to gain information around delivery methods, there is currently no “*mandatory or defined way by which [organisations are asked to] provide this information*” (Interviewee 4, NADO).

Needs analyses were supported by additional activities such as conducting research and developing a plan. For instance, stakeholders reported: “*We have social scientists in [our country]*”,

(Interviewee 7, NADO), and “we have to work on an organisational level, that is a big preparation of education plan which we do for each year ... each year we prepare this plan to be ready for the upcoming year to start with the activities” (Interviewee 4, NADO).

When discussing needs analysis, interviewees revealed that they consider broader issues in society, and how these issues are acting as barriers to clean sport. In particular, a number of stakeholders suggested that doping-related behaviours (e.g., supplement use) are prevalent across some cultures and the associated social norms will impact the effectiveness of their coach anti-doping education. For example, a representative from a NADO explained how the prevalence of supplement use in their society caused them difficulties:

In our culture, we have a history of using natural things. It's good. You know, if you have the flu, you drink certain tea of grass, if you have pain in your ear, you put aloe part plants in your ear. Everything from nature is healthy, you know, especially the older coaches ... So, people, in general, are not really convinced why they should not always use supplements. They don't see the danger in supplements. They don't see the danger. You know, the green stuff is good. Everything organic is good. Those are the biggest challenges we feel we have, and we haven't figured it out yet. (Interviewee 1, NADO)

Expanding on this, a representative from a CA commented that it takes time to change social norms/perceptions, “it comes slowly to [the people of our country] to be challenged in your learning and to be inspired. We need further understanding, and we need to change the mind-set” (Interviewee 8, CA). Thus, identifying the importance of addressing any social norms and social influences (e.g., culture) when developing programs/resources, and the implications this may have on continued coach anti-doping provision.

Monitoring and evaluating procedures

Beyond the initial planning, development, and delivery of coach anti-doping education, organisation representatives reported activities related to monitoring and evaluation. Similar to our findings in Phase 1, monitoring and evaluations activities predominantly consisted of receiving and

reviewing anecdotal feedback:

You can actually experience that by seeing their enthusiasm and actions and the way that they ask questions and sometimes they get surprised by some of the things that we give them. (Interviewee 3, NADO)

People come to us and say hey, we'd also really love it if you'd come and talk to our under 16 and under 14 coaches, and or we'd like if you came and did an outreach with our next 15 tour. If they do something like that, it tells me that, you know, they actually do value our involvement, and they want more people educated. (Interviewee 5, NADO)

Despite reporting monitoring and evaluation processes, interviewees provided minimal information about how this information supported the further development of their resources. One stakeholder reported: “*adjust[ing] the presentation, information*” (Interviewee 1, NADO) based on the coaches feedback of face-to-face workshops. The reluctance to act on feedback may be because some stakeholders recognised the limitations of current evaluation methods, and the difficulty in identifying the impact their provision is having on coaches’ capabilities and motivations:

If you use the internet or social media or whatever it is, it is easier to reach coaches, but the problem is, I believe, you do not know if the coach is watching the video, or reading and understanding what it says, I don't know, we will never know. (Interviewee 3, NADO)

Moreover, other organisation staff, appear to assume that a snap-shot survey of coaches’ knowledge following engagement with anti-doping education is “*creating an impact on [coaches]*” (Interviewee 10, NADO) and subsequently changing their behaviours “*as far as their coaching is concerned*” (Interviewee 10, NADO). As suggested throughout Phase 1, there is a need to explore and develop appropriate means of monitoring and evaluation coach anti-doping education.

Participants

Coach provision target groups

The target population for the provision of most organisations was coaches at the elite level. Representatives from IFs discussed prioritising the elite context, commenting: *“For us, it would have to be something we could use with elite coaches more than the junior and the kids' coaches, and I think it's going to be the same thing for all IFs”* (Interviewee 15, IF). This approach may be because activities are driven by mandates and critical events (i.e., upcoming international competitions), which include coaches who are operating in high-performance environments, and working with athletes competing on an International level. One interviewee reported that *“it is mandatory in the professional coaches system, [coaches] have a curriculum”* (Interviewee 14, NADO). Interviewees suggested elite level coaches were more engaged in the topic of anti-doping, which may bolster the organisations' decisions around relevant target populations:

In high performance sport they are probably more active, we don't have any measurement so I cannot say that, but I would say it's necessary for them to have knowledge on it, and so they're the ones attending mostly, more so than those who are not really working [within a] high performance [setting] (Interviewee 8, CA).

Yet, there are some challenges to engaging with elite coaching populations. For instance, one interviewee commented: *“The elite level environment is not the best environment for prevention because other attitudes and other goals may be in conflict with what we try to establish”* (Interviewee 2, NADO).

In addition to elite coaches, NADOs appeared to recognise that coaches working across lower levels of sport are a key target population. For instance, a representative from a NADO raised concerns about the knowledge of coaches who are not included within a formal education pathway and identified *“that parents who have been coaching”* (Interviewee 1, NADO) are an important target population. In addition, one interviewee recognised that coach education is important for

clean sport and, therefore, it is important to “*educate the coaches in fitness centres*” (Interviewee 2, NADO) and other contexts. This supports our Phase 1 finding, where many organisations had resources in place for ‘all levels’ of coaches.

While IF staff recognised the importance of supplying education to individuals beyond the elite context, they raised concerns around their ability to reach coaches because the “*audience is so broad*” (Interviewee 15, IF):

We have [a variety of stakeholders, and] the risk is so different between all of them. [Each of them] are so different. Their age is so different. Their level of education is so different. Their backgrounds are so different. So, trying to get resources which fit all [of them], is definitely a challenge. (Interviewee 15, IF)

Corroborating these concerns, challenges to tailoring provision were reported across all organisations; many of whom identified that there are times when money, lack of expertise, and limited human resources may restrict who they deem a target population. Reinforcing some of our earlier findings, partnerships and collaborations were viewed as important to ensure organisations can reach “*people who are studying coaching, or studying to be PE teacher*” (Interviewee 5, NADO) to share information “*before they graduate, and begin working with athletes*” (Interviewee 3, NADO).

Target groups of additional activities

Beyond coaches, interviewees reported working with a range of stakeholders to support their coach anti-doping provision. In essence, interviewees felt responsible for engaging external participants (e.g., government organisations, decision-makers, universities) when coordinating meetings and discussions, providing and evaluating coach anti-doping education, and developing partnerships to ensure compliance with necessary mandates which, ultimately, establish clean sport and a healthy nation. Take the example of a stakeholder who recognises that coach education can play a fundamental role in clean sport, however, understands there is a lack of homogeneity across

anti-doping education and, thus, perceives that collaborations will reduce the burden on the sport community. The inputs created by the organisation (e.g., staffing, online video-calling software) will likely have a positive influence on the organisations' ability to conduct meetings with other NADOs, facilitate discussions with education recipients, and establish partnerships with research institutes and other sport organisations. Thus, enabling the creation of more standardised coach-focused anti-doping provision, which is tailored to relevant contexts (e.g., sports and countries). Put simply, the engagement with a range of participants from different backgrounds who play differing roles (e.g., researchers, critical friends) and have diversified knowledge (i.e., practical and theoretical) helps to address the situations and needs identified within the logic model (see Figure 16). Thus, it can be seen that both education recipients (e.g., coaches across all levels) and external partnerships are recognised as important when seeking to promote clean sport and a healthy nation.

Outcomes

In our audit of current coach anti-doping education (Phase 1), we identified that the aim of most interventions is to enhance coach capability, namely knowledge and awareness. The survey responses developed our understanding further, by illustrating that some organisations are (reportedly) going beyond this to address coaches' motivation and opportunities. Despite this, it was clear from both exercises (the audit and survey) that very few previous interventions targeted actual behaviour of coaches. We recognise that organisations have autonomy over their desired outcomes, due to the current lack of strict guidance/regulation around what anti-doping education for coaches should entail, whom exactly this should target, and via what methods, etc. However, a priority of this phase of the project was asking interviewees to identify and explain the intended outcomes of their coach anti-doping provision because a) the cornerstone of any intervention is its outcome(s) (as they should direct all activities/output and input) and b) failure to articulate desired outcomes will impede the effectiveness of interventions.

Several different short and medium-term outcomes of coach anti-doping education were discussed, and these appeared to address all three components of COM-B (i.e., enhancing coaches' capability, motivation, and opportunity to perform their anti-doping roles and responsibilities). Specifically, interviewees reported that in the short-term and medium-term, their activities (e.g., designing, developing, and delivering education) aimed to develop clean sport knowledge, awareness, and skills (Capability), as well as shape attitudes prevailing to clean sport (Motivation) and enhance coaches' access to resources (Opportunity). Organisations reported that coach anti-doping education can have long-term effects on clean sport because a capable, motivated workforce, can directly and indirectly lead athletes away from doping behaviours. When discussing the long-term outcomes of their coach anti-doping provision, interviewees acknowledged the wider social impact of these activities.

Beyond coach outcomes, this theme also includes the broader outcomes that interviewees expected to achieve by engaging in additional activities related to the design, development, and delivering of education (e.g., partnerships, research activity). In this vein, organisations provided insight into how the development of partnerships and the sharing of resources (discussed in earlier sections), would promote short-, medium-, and long-term effects in relation to coaches' clean sport behaviours. While these outcomes were not the primary aim of the discussions, they are presented within this report as they are relevant to understanding the work organisations undertake in this area.

Short- and medium-term outcomes of coach anti-doping provision

Capability

Addressing capability, the interviewees reported reinforcing and extending coaches' physical and psychological capabilities. For psychological capability, which comprises knowledge, decision making and behavioural regulation, various types of provision (e.g., booklets, online sources) were used to extend coaches' awareness and knowledge of clean sport (e.g., *"It's also, a tool where coaches can learn, where coaches can read about issues happening around the topics"*, Interviewee

8, CA). However, differences were noted in the types of knowledge that organisations' education targeted. Specifically, some interviewees spoke about topic-specific information (e.g., *"the prohibited list, ADRVs, the international standards"*, Interviewee 4, NADO), while others spoke more generally about anti-doping knowledge: *"we created a brochure to tell them what anti-doping is all about"* (Interviewee 12, RADO). Regardless of the exact focus, in the short-term knowledge was seen as important, and many interviewees reported positive outcomes for knowledge (or knowledge seeking) following their education. For example, a RADO representative commented that their provision which focused on developing knowledge was successful because *"once [they] put the information out, many people [came] and said they did this, or they don't know this, so they want to know about it"* (Interviewee 11, RADO).

Notably, face-to-face delivery methods (e.g., workshops) were often used to focus on developing decision making and physical skills in the short-term (e.g., checking medications). This is illustrated in the following quote:

We give [coaches] cases where they have to try to figure out what is going on and what should they take care of in a specific situation, so we do try and make it hands-on as well, so they do have to look up medications. (Interviewee 14, NADO)

In an attempt to encourage medium-term outcomes in coaches' decision-making processes, one NADO representative reported that face-to-face discussions enabled them to inform coaches about the social impact (bringing in social opportunity) of their decisions and, where necessary, support them to make more effective decisions across their coaching practices:

We get them to think about, you know, how the decisions that [they] make really matter, and the decisions that [their] athletes make really matter. Then we go on about how can we basically support [them to] make better decisions, and what [they] need to think about.
(Interviewee 5, NADO)

In addition, specific learning tasks such as “*dilemma situations ... role-plays, and interactive apps*” (Interviewee 2, NADO) were used across multiple methods (e.g., online, face-to-face) to encourage coaches to “*to try to think about how [they] would react in [certain] situation[s]*” (Interviewee 2, NADO), and coaches were asked questions such as “*Would you recommend this substance to your athletes?*” (Interviewee 2, NADO).

Motivation

Though the majority of provision seemed to prioritise enhancing coaches’ capability (e.g., knowledge, skills, decision making), interviewees described outcomes which are theoretically related to motivation when discussing face-to-face education. For example, interviewees reported that their provision aimed to shape coaches’ clean sport attitudes. Specifically, organisation staff hoped to help coaches reach the conclusion that doping is not acceptable and they should act to prevent it by encouraging them to become self-aware (e.g., thinking about their actions) and reflect on their behaviours (e.g., weighing up what is right and wrong):

I think on a general level it’s to get people to think. I made my peace with the idea that we can’t change the world some years ago, so I think with our coaches programme and our fitness centre programme and also the school programme, you can only try to get people to think about their actions and maybe help them to develop certain behaviour. (Interviewee 2, NADO)

Something that we do here in [our country], it’s very local. For example, in terms of these energy drinks, what is the impact? And how does it have an impact? All these things. Some of the coaches we come across say, “We didn’t know that” ... It has been promoted as a commercial product, so people think okay, and that it’s very good. [However, providing] information [on] things like that, then they say, “I didn’t know that”, and so their whole perception changes. (Interviewee 11, RADO)

Interviewees identified that the activities they undertook encouraged coaches to consider

the consequences of their actions, and how they might *“spread [clean sport messages] to their athletes”* (Interviewee 10, NADO). To illustrate, one NADO representative reported that during their discussions with athletes, they collected examples of things which coaches have said which may lead them to dope, such as *“you need to lose five or 10kg in the next couple of weeks if you want to be selected or you need to gain X amount of size in the next little while”* (Interviewee 5, NADO). These examples were then relayed to coaches, who were asked to consider the implications of their communication with athletes, and *“how [they might] make it clear to their athlete, what their expectations are and what their values are ... so that [their words are] not perceived in the wrong way”* (Interviewee 5, NADO). Thus, learning tasks specifically aimed to enhance coaches’ reflective processes (i.e., the part of motivation that is deliberate and conscious).

The automatic part of motivation (related to emotional reactions, reflex responses and habits) was also targeted, through learning tasks such as case studies, where coaches are given the opportunity to rehearse their actions. Moreover, one stakeholder spoke about using *“storytelling aspects of education ... When we talk to coaches, and we say, look if this happened to your athlete, like (a) how would you know that it happened? And (b) what would it actually mean for you?”* (Interviewee 5, NADO). This activity, and others like it, such as one NADO using inclusive language (e.g., *“my fellow coaches”* Interviewee 10, NADO), were utilised in an attempt to evoke an emotional reaction within coaches and establish a group identity, which in turn, aimed to enhance motivation.

A fundamental part of motivation (both reflective and automatic) is social and professional role/identity. Here, interviewees reported that coaches were often unaware of their role within clean sport. Thus, education and training which focused on *“their roles, their responsibilities”* (Interviewee 5, IF), can ensure coaches *“realise that actually, they are very, very important because they're the first point of contact for athletes, and they're probably the ones that have the biggest influence on them”* (Interviewee 15, IF). Although organisation representatives acknowledged that most coaches were supportive of anti-doping efforts, they identified difficulties when engaging

individuals who have been part of the sporting system for many years. They perceived these individuals as being less responsive to anti-doping education and assumed that older generation of coaches “*may have a different mind-set or thoughts on [their role in anti-doping]*” (Interviewee 2, NADO). This competing mind-set may be due to the perception that “*doping was seen as rather common and normal in the last [few] decades*” (Interviewee 2, NADO), and, thus, the environment a coach is situated in may discourage their motivation to engage in anti-doping learning opportunities.

Opportunity

Enhancing the physical opportunity of coaches, a number of interviewees provided outreach programs, social media posts, newsletters, and mandatory workshops within a coach’s environment. These activities provide a prompt/cue to coaches to facilitate their interest and engagement in the topic and/or remind them they have a “*responsibility] to [inform] all of their athletes ... [and] remember to use the Code and apply the information [effectively]*” (Interviewee 3, NADO). Indeed, embedding coach anti-doping provision within education courses was an opportunity (i.e., environmental context and resources) that was widely acknowledged to encourage the development of coaches’ motivation (e.g., attitudes and social professional role) and capability (e.g., knowledge and skills) around anti-doping behaviours:

If we can address [coach anti-doping provision] from an institutional level, whereby those ASP who are professionally undergoing education to work with athletes, so the coaches, the doctors, the pharmacists, the clinical officers, the sport administrators, have an anti-doping unit, and it becomes part of that course, by the time they graduate and start implementing their professional endeavours in sports, they actually [will] have this [anti-doping] information. That way they don’t find out when they get to the field, and we start telling them about anti-doping, and they did not know about it. (Interviewee 10, NADO)

Another strategy to enhance physical opportunity for coaches was developing materials in coaches’ native languages. This activity was seen as an “*opportunity for coaches in [the respective countries] who possibly do not speak English [to access provision], so to achieve equality across the*

sport community” (Interviewee 4, NADO).

Addressing social opportunities, interviewees reported that during face-to-face sessions, coaches were encouraged to “share ideas” (Interviewee 15, IF) with their peers. This approach was considered “powerful because coaches [had an opportunity to reflect on] what they’ve done and understood it was not always right” (Interviewee 5, NADO). Furthermore, videos and social-media messages were used to promote a sense of collective responsibility and co-ordinated action, empowering coaches across all levels of sport to take steps to support athletes’ when “making decisions and steering their athletes in a positive way” (Interviewee 1, NADO).

Long-term outcomes

Coach anti-doping education and training were seen to have long-term outcomes for clean sport. Interviewees discussed how “the ultimate aim [of their training and education] is to equip a coach with [the] skill-set, so that he [or she] is able to think [about] his [or her] behaviour, and be a good influencer for his [or her] athletes” (Interviewee 2, NADO). Thus, empowering the coach was seen not only to enhance coaches’ capabilities, motivations, and opportunities to promote clean sport, but also shape the social influences and environmental context surrounding athletes: “It is better to spread the message with 10,000 people. I talk to them here, then tomorrow they talk to 200 people, and then 20, and then eventually we have 10,000 spreading the message” (Interviewee 3, NADO). Furthermore, interviewees recognised that coach anti-doping education was able to enhance the capabilities and motivations tied to athletes’ clean sport behaviours: “If we go and talk to coaches, it’s because we want the athletes to be educated and have the motivation and interest in [clean sport]” (Interviewee 15, IF). Overall, there was optimism among organisation representatives that having coach anti-doping education in place would result in positive outcomes for clean sport and a healthy nation: “[although we] might not be able to totally eradicate [doping], we can always [find ways to] minimise it” (Interviewee 11, RADO).

Beyond the coach, the interviewees reported that building partnerships with various organisations (e.g., governments, anti-doping organisations, sport organisations) would

eventually/potentially result in positive economic (e.g., sharing resources), environmental (e.g., reaching coaches), and social (e.g., collective action) outcomes for global coach anti-doping provision. Notably, the interviewees spoke about how forged partnerships with other stakeholders (e.g., government organisations) to share experiential knowledge, scientific knowledge, and opinions would maximise productivity around coach anti-doping education. Specifically, organisations would be able to develop a better, more nuanced understanding of the delivery of coach anti-doping education. Thus, providing “*more efficient education to sports communit[ies]*” (Interviewee 4, NADO), and reaching coaching populations more readily.

Changes to the organisations' practices were envisaged, such as forming working groups and international and national collaborations aimed at eliminating gaps in resources, reducing the heterogeneity in provision, and fostering clean sport and healthy nations. These practices would encourage knowledge exchange, sharing of resources (e.g., materials and classrooms), and enhanced funding opportunities. This is illustrated in the following quote:

We are trying as much as possible to give resources to those [organisations e.g., government ministries] who share resources [e.g., funding] with us so that they can understand our mandate and what we are supposed to do. [This encourages them] to give us enough resources. (Interviewee 10, NADO)

The interviewees indicated that the inputs and outputs they managed influenced the opportunities for coaches to engage in anti-doping education and shaped their anti-doping behaviours. For instance, when discussing human resources, they stated that increasing the number of volunteers and enhancing the training these individuals receive will enable further dissemination of coach anti-doping education and, consequently, extend reach:

If I have educational agents, let's say I can have 20 educational agents. It is [then] much easier for me. We can have them in different regions of [the country], so it will just be easier [to reach more coaches]. (Interviewee 10, NADO)

Beyond building capacity in the workforce, interviewees discussed creating international and

national legislation which promoted the mandatory completion of coach anti-doping education. It was reported that without legislation, the burden on the sporting community is enhanced: *“When it is not mandatory, [and] when it is only a recommendation, then you have to put a lot of energy to get to a certain level of organisation to organise an event or educational workshop”* (Interviewee 4, NADO). However, it was acknowledged that creating legislation around this issue was difficult to implement, and would not provide all the answers:

Making it mandatory, I think that is one way, but how [do we] impose the obligation? It is hard [to know] because for instance, in swimming maybe [there are] 5000 coaches ... I think it is one solution, but it is not the only solution. (Interviewee 3, NADO)

Encouragingly, the collaborations organisation staff had created were seen as a means of establishing formal legislation, as certain organisations had more leverage to apply restrictions to coaching practices for those who do not complete training and education:

Through the lever of [our] NOC, who can enforce certain activities within NFs ... as they have a contract with each federation ... and particularly [support] the funding of [these] federations, they can make it compulsory for the individual to complete the e-learning before you get the [coaching certificate]. We don't have that lever, and cannot enforce power because there is nothing that we can withhold if you don't do it, in that way. (Interviewee 14, NADO)

Summary

An important finding from phase two was the discourse around where anti-doping features in the global agenda. Many organisation representatives recognised the value of including coaches as a population for programs. Coaches were acknowledged as key influencers in relation to clean sport, and broader public health. Yet, there are some serious challenges when it comes to actually developing and delivering a coach anti-doping provision. Primarily, it appears to boil down to two, seemingly related, issues: 1) a lack of resource and 2) a lack of buy-in. Stakeholders described a situation where it is not possible to reach everyone because there is not enough man-power or financial backing. Notably, the availability of funds seems to be connected to deeper-rooted issues of socio-political capital – including the need to “dance to the tune of” to whoever “pulls the purse strings”. Here, the problem is that if the person in charge of the money does not see anti-doping as a priority (i.e., they perceive little risk of experiencing doping issues/scandals in their context), or they are only interested in activities that target athletes, they will not allow the individuals responsible for coach anti-doping education to spend money on it. Thus, in a situation where there is limited resource available, and ‘structure and tensions’ in the sporting system, it can be difficult to have coaches feature in anti-doping programs.

The issue of where anti-doping is on the agenda would in some ways be addressed if there was greater mandate for coaches to be reached. Organisations themselves suggested they will comply with direct orders if issued. The compliance-driven approach reported by our interviewees, including their prioritisation of athlete-focused provision, aligns with our previous research with individuals responsible for anti-doping education (Patterson et al., 2016). When considering the timeframe between the two studies (interviews conducted in 2013 versus 2019), it would seem that not much has changed. However, it is interesting that interviewees in the current study talked about the impact the 2015 Code had on their provision, suggesting that the emphasis it placed on ASP had given these populations a place on their agenda, in theory (but, perhaps not in practice – as discussed in the previous paragraph). Some interviewees suggested that greater regulation in future

would help their cause when seeking funding/support within their organisations. With this in mind, we are hopeful that the ISE will further enhance the standing of ASP on the agenda of organisations through its requirement for ASP to be considered when identifying a target pool for education. It would be worthwhile for WADA to consider how it will describe the relationship between the ISE and the IFCADE created in this project (e.g., will the IFCADE be signposted in the ISE, or supplementary documents, as a tool to help the organisations bring the requirements of the ISE to fruition). Additionally, it might be beneficial for WADA to consider expanding the mandatory target groups (from RTP athletes and athletes returning from a sanction) in the future.

Though an increase in mandated activity for coaches is a potential avenue to overcome the challenge of 'buy in' and allocation of resource, it does not overcome the over-arching barrier of limited resource being available. Therefore, even if organisations were more strongly instructed to target coaches, it might not be possible for them to do so if there is no opportunity for them to secure greater fiscal investment for their provision. The matter of establishing new sources of funding for anti-doping education, or anti-doping efforts more broadly, is beyond the scope of this project. So, we will focus our attention on the main solution suggested by interviewees, which was greater coherence and cooperation between relevant agencies in the design, development, delivery, and evaluation of programmes. This suggestion supports the survey findings in Phase 1b, where collaboration was seen as fundamental to future plans and overall management of coach anti-doping education at a global level. Building on this, insights from the interviews demonstrate that partnerships have already been established to facilitate more efficient (i.e., cost-effective) working. In particular, these partnerships were seen as a means to enhance reach and quality of provision. Positively, the interviewees' suggestions for collaboration align with ISE recommendations to cooperate with and recognise the work of other Code signatories.

While it is positive that the importance placed on collaboration by interviewees is recognised in the ISE, a key point of learning from the interviews was that individuals responsible for coach anti-doping education feel there is a lack of clarity surrounding the role of each organisation

identified in relation to (coach) anti-doping education within policy directives. If we look to the policy this is referring to, the 2015 Code stated that several organisations, including those represented by some of the stakeholders interviewed here (i.e., NADOs, IFs), have a responsibility to “*promote anti-doping education*”. And, that is exactly what some organisations reportedly do; for instance, IFs appear to predominantly signpost coaches towards WADA resources. However, some organisations (typically NADOs) went beyond this to *develop* and *deliver* coach anti-doping interventions. According to the interviewees, each organisation can offer something to the provision of coach anti-doping education, but there is a need to clarify what each organisation should offer to ensure that everybody is taking collective responsibility through collaboration rather than using collaboration to ‘pass the buck’. Notably, changes approved for the 2021 Code address some of the interviewees concerns related to structures and tensions, as the statement for IFs (and NOCs/NPCs) has been amended to “*promote anti-doping education, including requiring National Federations to conduct anti-doping education in coordination with the applicable NADO*” (p. 108). A specific component of the ISE that may also prove helpful in clarifying the contributions of different organisations is the directive around the agreement of roles and responsibilities in advance for events-based education. Perhaps WADA might consider expanding this in the future to cover the general terms of partnerships to ensure that all parties are clear on it’s, and others’, remit (i.e., activities, target groups).

Amongst some of the benefits outlined above, greater collaboration will undoubtedly help to address the heterogeneity in coach anti-doping provision across the globe. Yet, it is important that we do not lose the diversity of practice entirely, because context-specific programs are needed. What is necessary from the IFCADE then, is to ensure that all programs meet a minimum standard requirement of what is acceptable to support the coaching workforce, while allowing flexibility in the way that education is tailored and targeted for its audience. Phase 1 of this project signalled a lack of tailored provision, whereby many interventions available were for ‘all coaches’. Even when a sub-set of the population were targeted, i.e., elite coaches, it was unclear how activities were designed to

meet the specific needs of this group. This finding was reinforced by interviewees, as they described interventions that are primarily aimed at coaches from elite level coaches or all levels, and several organisation representatives reported that the same content was used across populations. The importance of learning opportunities being 'bespoke' to the target audience cannot be over-emphasised; all available evidence in coach education and development suggests the need to recognise 'who is in the room'. Specifically, research highlights the need for learning experiences to provide coaches with the time and space to assimilate and accommodate new knowledge through references to both their existing knowledge and to the practical environment in which the coach will apply it (Lara-Bercial & Mallett, 2016). There are some positive signs that some organisations are already giving tailoring some thought. For instance, one organisation described delivering values-based education to coaches working in non-elite contexts.

Within the IFCADE, we must find a way to encourage more organisations to contextualise their education provision to coaches' real-world practice (e.g., situations individuals may face, methods of delivery that are most accessible). Organisations already undertake some needs analysis activities that would help them develop and deliver education that is suited to a coach's context. Positively, these actions support the guidelines stipulated in the ISE related to planning an education program. However, it is unclear if the needs analysis activities that the organisations currently engage in are actually helping them to enhance their provision, as little insight was given into what this process involved. Generally, it seemed as though individuals drew on their experiences to think through what might be appropriate for some sub-sets of the coaching population over others. The needs analysis process could be much more detailed and systematic than this, paying attention to the specific demands of the sport, the background of the coaches (e.g., experience, qualifications) and the coaches' employment status (e.g., part-time, full-time, paid/volunteer, job remit). All of these factors might affect coaches' ability to access education and/or undertake anti-doping actions (Patterson et al., 2019).

In the next phase of the current project, we will investigate some of these factors via the

consultation (survey) with coaches. Within the consultation, we will also utilise behavioural science, in the form of the COM-B model, to engage in a behaviour diagnosis; this will illustrate what coaches do (B) in relation to promoting clean sport and what factors influence their actions/inaction (COM). This process is fundamental to designing interventions that are 'fit for purpose'. Yet, organisations are unable to undertake this type of comprehensive analysis to inform their coach anti-doping provision due to limited resources, including expertise. The research team hopes to address this issue in the future by making the survey they use in this project available to stakeholders within/alongside the IFCADE. In addition to aiding the needs analysis process, the survey developed by the research team can act as a tool for monitoring and evaluation. Specifically, the survey could be used at regular intervals over a period of time to track any changes in behaviour(s) or influencing factors among coaches. These intervals could be event contingent, such as before/after an education experience (such as a workshop or online programme). Alternatively, organisations may choose to disseminate the survey on an annual basis to provide general information to report back to WADA in relation to the effectiveness of its Education Plan (as per the ISE requirements).

Making a tool available to organisations is vital, given their current approach to monitoring and evaluation lacks rigour. As a positive, it is promising that some organisations engage in activities to evaluate and monitor their provision. Several appear to be achieving the first step in monitoring by establishing the reach/uptake of their interventions – i.e., counting the number of coaches engaging/attending. Some stakeholders are also gaining insights into the effectiveness of their education via knowledge assessments – which aligns with most organisations' aims to develop coaches' knowledge. Yet, there is also a reliance on anecdotal evidence such as feedback forms, which the organisations themselves appear to have little faith in (so little, that they do not actually act on the feedback to make any adaptations to provision). It is clear from the interview findings that further support with evaluation will be needed for implementation of the ISE. Within any such support, it will be crucial to ensure that all monitoring and evaluation activity is directly related to the desired outcomes of an organisation's education program(s)/resources. Essentially, the desired

outcomes should be devised based on the needs analysis (i.e., the interventions should aim to address any current 'deficiencies' or areas of concern); hence, why, going back to an earlier point, we are suggesting that the survey we develop in this project can be used within both needs analysis and monitoring and evaluation processes.

Though the current approach to needs analysis and monitoring/evaluation among organisations might be less than desirable, a clear positive from the interview findings is that the desired outcomes across global provision currently cover all three influencing factors within the COM-B model, namely coaches' capability, opportunity and motivation. Reinforcing the findings from Phase 1b, efforts to enhance capability were most common. In particular, organisations targeted knowledge and awareness through written text and visual images. To enhance opportunity, organisations made resources available and, where possible, tried to increase access to these by integrating them into the coach's education/development pathway and providing them in the coach's native language. For motivation, organisations used interactive learning tasks to encourage coaches to reflect on their own position in relation to clean sport (i.e., do they think it is OK to dope, what can they do to stop doping) and consider the consequences of not acting. While coaches may be prompted to reflect on the consequences of not acting, behaviour is still being neglected in the education described by interviewees (as we suggested in Phase 1). Organisations assume that behaviour is influenced as a consequence of targeting other outcomes, but this is not guaranteed. Therefore, outcomes of coach anti-doping should focus greater attention on promoting anti-doping behaviour with coaches – and this will be kept in mind when developing IFCADE in the remainder of this project.

Phase 3

Investigation of coaches' anti-doping capability, opportunity, motivation, behaviour and education experiences/preferences

Objective: Undertake systematic consultations with key stakeholders pertaining to coach anti-doping education worldwide.

SEPTEMBER 2019 – JUNE 2021

Context

Coach consultations are necessary to ensure that the recommendations proposed by the Framework and its accompanying documents are informed by the needs of the target population. The main purpose of the survey was to examine coaches' perceived capability, opportunity, motivation, and behaviour in relation to anti-doping. Drawing on behavioural science (COM-B, Michie et al, 2011), this theoretically driven phase of the research will aid our understanding of coaches' anti-doping behaviour (i.e., what they do) and the factors that influence it (i.e., why they do/don't do it). This 'behavioural diagnosis' contributes a vital piece of the puzzle in developing appropriate and effective interventions (Michie et al., 2014), so it forms an important component of creating the international framework.

From a logic model perspective, a second purpose of the coach consultations was to determine how coaches had previously learned about anti-doping (methods - e.g., face-to-face, online, by whom, timing, frequency, duration; content - e.g., topics, learning tasks) and investigate their preferences for learning about anti-doping in the future (e.g., what, how, when).

The coach perspective, captured via an online survey, will be combined with insights from the previous phases of the project to create the International Framework for Coach Anti-Doping Education. This Framework will provide guidance to Code signatories for the development, delivery, and evaluation of coach anti-doping education.

Research Design

Survey development

Development of the first part of the survey – examining coaches' perceived capability, opportunity, motivation and behavior (COM-B) in relation to anti-doping – was guided by contemporary literature in scale development (e.g., De Vellis, 2017), anti-doping scale development

(e.g., Stanger et al., 2020) and COM-B/Theoretical Domains Framework (TDF) scale development (e.g., Michie et al., 2011; Cane et al., 2012).

The first step in the process was item generation. Here, a series of statements were drafted related to the concepts of interest. Specifically, items were written to capture insights related to coaches' anti-doping behaviours, as well as their capability, opportunity, and motivation. Within capability, opportunity and motivation, items were framed in relation to the 14 Theoretical Domains of the TDF. The TDF simplifies 33 theories and 128 constructs that may explain behaviour into 14 domains underpinned by psychological theory (Cane et al., 2012). The domains can be mapped against the components of the COM-B model (Figure 17) to add an extra layer of depth (i.e., wider range of influencing factors) when investigating determinants of behaviour (Cane et al., 2012).

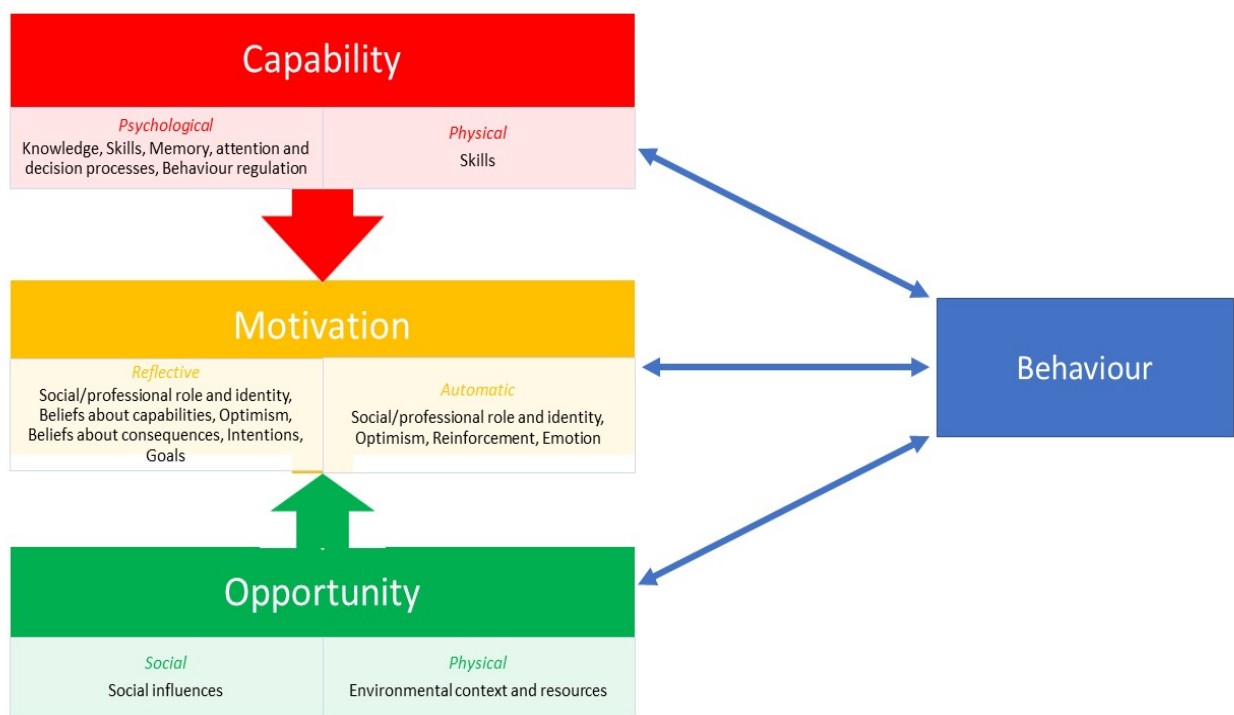


Figure 17. The COM-B Model (Michie et al., 2011) mapped to the Theoretical Domains Framework (Cane et al., 2012) (Adapted with permission from Michie, Atkins & West, 2014).

Items were initially generated based on the research team's previous interview studies with coaches (e.g., Patterson & Backhouse, 2018; Patterson & Backhouse, in preparation) and a systematic review of coach-related anti-doping literature (Barnes, Patterson & Backhouse, 2020).

The team also cross-referenced the item pool with several COM-B/TDF scales in health sciences to ensure their ideas aligned with previous work utilising the same theoretical underpinnings.

Between September 2019 and January 2020, the pool of items was extensively reviewed by the research team, resulting in three rounds of refinement.

The next step in the process was to have experts in the fields of anti-doping, coaching, and behaviour change provide feedback on face and content validity. During April and May 2020, twelve individuals were approached via email to invite them to participate in this process. The final sample (n=9) had equal representation across the areas of interest (n=3 each in anti-doping, coaching and behaviour change) and balanced representation of sex (n=6 females and n=6 males). On average, experts were 37.8 years old (range 27-62 years, SD = 11.7 years) and had an average of 11.5 (\pm 8.4) years of experience in the primary area of expertise (i.e., anti-doping, coaching, behaviour change). When asked to rate their familiarity with the population for whom the survey was intended (from 1 = not at all to 5 = extremely), experts' average rating was 4.3 (\pm 0.71) – indicating that they were well-positioned to complete the task.

During recruitment, all potential participants (experts) were provided with an information sheet and were asked to read this before agreeing to take part. If experts agreed to help, they were asked to sign a consent form. Both the information sheet and consent form explained the nature of the research (i.e., aim and background), expectations placed on the individual (i.e., time it will take to take part) and their rights (i.e., voluntary participation, right to withdraw, data handling).

Upon giving their consent, experts were sent an evaluation document which contained definitions of key constructs (i.e., the factors of interest) and a list of items that related to each construct. Experts were asked to rate the extent to which each item was representative of the definition on a 7-point scale (-3 not at all to +3 very). Experts were also provided with space to add any further comments on each item. Once completed, experts returned the evaluation document directly back to the Lead Researcher.

Descriptive statistics (e.g., mean, standard deviation) were calculated on the expert feedback responses to evaluate the extent to which participants perceived each item was representative of the definition of the constructs. Any qualitative comments were also checked. Based on these two forms of data, the research team updated the survey. Specifically, fourteen items were removed due to having an average rating of 2 or below (in terms of how representative of the construct definition they were) and/or because the qualitative data provided by experts strongly signalled the need for deletion. On a small number of occasions (n=4) new items were developed based on expert suggestion and team discussion. In addition, 22 items were amended, mostly to enhance clarity. Notably, across the four C, O, M and B components, 87 items were maintained in their original form. The final survey comprised 80 items across capability (19 items), opportunity (20 items), motivation (41 items) and behaviour (40 items).

Questions related to coaches' experiences of and preferences for anti-doping education were informed by previous research conducted by the team (e.g., Patterson, Backhouse & Lara-Bercial, 2019).

Once finalised, the survey was uploaded to the online platform Qualtrics, which is GDPR compliant and has achieved ISO 27001 certification⁵. This platform allows the researcher to provide an anonymous link which cannot be traced to a server and is mobile friendly, which is helpful considering the target population may be smart device users. The survey was checked by all members of the research team for errors prior to being published. The first page of the online survey provided important information to potential participants, including an explanation of the study aims, expectations of participants (e.g., length of time to complete, overview of topics) and participants' rights (i.e., voluntary participation, right to withdraw, data handling). At the end of this page, participants were asked to provide informed consent (i.e., answer 'Yes') in order to proceed to the main body of questions.

⁵ See <https://www.qualtrics.com/security-statement/> and <https://www.qualtrics.com/support/survey-platform/getting-started/qualtrics-gdpr-compliance/>

Coach sample and recruitment

Beginning in August 2020, all organisations from the audit phase of this project (i.e., NADOs, RADOs, IFs, CAs) were contacted via email and asked to disseminate information related to the survey among their members/contacts. Drawing on the experiences gained in phase one, the research team provided personalised correspondence; advanced notice; timely reminders; and used phrases such as “deadline approaching” to increase participant engagement. To reduce the burden on each organisation, the prompts clearly identified a link to the survey which organisations could disseminate easily via email or other online platforms (e.g., adding a link to their website, featuring the survey in their newsletter). In addition, all correspondence included a ‘gatekeeper’ information sheet, emphasising that coaches should not be pressured to participate in the survey.

As stated in the application for funding, we were seeking a sample of N=300 coaches based on previous coach-based, survey research (Patterson et al., 2018). Within this sample, we hoped to achieve representation across a range of organisations (i.e., anti-doping, sporting, coaching) and key demographic details, such as nation, sport, level of competition, age, experience, qualification level and status (i.e., part-time/full-time, volunteer/paid).

The drive for education reform following the implementation of the ISE caused some challenges to recruitment (e.g., as many organisations felt it was not an appropriate time to contact their coaches as they had recently completed a number of questionnaires, etc). Despite this, we were able to recruit a sample of N=594 coaches from 68 countries and over 36 sports (see Table 9, overleaf). Participants’ average age was 33.7 (± 12.4) years and they had 17.9 (± 11.5) years of experience as a coach. Almost 70% (n=412) of the sample were male and 18% (n=107) were female⁶. The majority of coaches were of a White ethnic origin, including White British, White Australian, White American, White Canadian and Other White background (see Table 10, overleaf).

⁶ n=5 prefer not to say, n=2 prefer to self-describe and n=68 did not answer this question.

Table 9. Proportion of the sample representing different sports.

Sport	n (593)	%
Rugby Union	225	37.9
Athletics	152	25.6
'Other'	36	6.1
Equestrian	19	3.2
Handball, Rowing	16	2.7
Weightlifting	13	2.2
Judo, Triathlon	12	2.0
Football	11	1.9
Basketball, Skating	10	1.7
Cycling, Volleyball	6	1.0
Tennis	5	0.8
Boxing, Fencing	4	0.7
Archery, Skiing, Table Tennis	3	0.5
Badminton, Biathlon, Golf, Gymnastics, Hockey, Ice Hockey, Karate, Sailing, Shooting, Wrestling	2	0.3
Aquatics, Baseball/Softball, Canoeing, Curling, Luge, Modern Pentathlon, Taekwondo	1	0.2

Table 10. Proportion of the sample representing different ethnicities.

Ethnicity	n (518)	%
White British	166	27.9
Other White background	158	26.6
Other (not stated)	48	8.1
White Australian	25	4.2
Black African	21	3.5
White American, White Irish	17	2.9
White Canadian	10	1.7
Hispanic and Latino, White and Black African	8	1.3
Other Asian background, Other Mixed background	7	1.2
Pacific Islander, White and Asian	5	0.8
Chinese, Indian	3	0.5
Black Caribbean, Pakistani	2	0.3
Aboriginal Australian, American Indian, Black British, Maori, Other Black background, White and Black Caribbean	1	0.2

The highest level at which coaches had worked included international (n= 220), national (n=125), regional (n=73) and club (n=169)⁷ and coaches currently worked at international (n= 113), national (n=120), regional (n=71) and club (n=254) levels⁸. Of the coaches who provided information on how many hours per week they coached (n=124), 40% (n=50) stated 10 hours or less, 25% (n=31) stated 11-20, 17% (n=21) stated 21-30, 10% (n=12) stated 31-40 and 8% (n=10) stated 40+ hours.

Data analysis

Prior to all analysis, data was downloaded from Qualtrics then cleaned and screened (including missing data being managed). Descriptive statistics (e.g., means, standard deviations, frequencies) were generated. Additionally, preliminary follow-up analysis was conducted to explore responses across subsets of the sample (e.g., level of athletes being coached).

Research Findings

Behaviours

Focussing on what coaches *do* to promote and support clean sport, the behaviour scale comprised three subscales: Creating a clean and caring environment (10 items), Reducing the risk of intentional and inadvertent doping (11 items), and Performing practical anti-doping tasks/duties (5 items). All items were rated based on the frequency at which coaches performed them, from 1 = never to 5 = very often.

Average ratings for each item presented in Table 11 demonstrate that many coaches reported undertaking a range of clean sport behaviours. Behaviours categorised as 'creating a clean and caring environment' were undertaken most often. Specific behaviours that coaches reported engaging in often and very often included demonstrating their values (Mean = 4.40/5, SD = 0.76) and

⁷ n=6 selected 'Other' but did not provide further information.

⁸ n=35 selected 'Other' but did not provide further information.

giving open and honest feedback to support their athletes' long-term development; with 90% and 86% of coaches reporting they do these actions often (n=219/594, n=259/594) or very often (n=315, n=250), respectively.

Specific to doping, many coaches worked to reduce the risk of intentional and inadvertent doping, including reminding athletes to carefully monitor what they put in their bodies (Mean = 3.69, SD = 1.13, 64% often/very often), as well as stating that doping is against the rules (Mean = 3.68, SD = 1.39, 63% often/very often) and not accepted in their environment (Mean = 3.65, SD = 1.37, 62% often/very often). Some behaviours within this subscale were performed less frequently, such as encouraging athletes to comply with anti-doping processes (Mean = 3.07, SD = 1.42, 35% never/rarely) and teaching athletes how they can minimise the risks of inadvertent doping associated with nutritional supplement use (Mean = 2.97, SD = 1.34, 35% never/rarely). However, the least performed behaviours all fell into the practical anti-doping tasks/duties category. Given that the timescale on the behaviour scale was 12 months, behaviours such as attending anti-doping workshops (Mean = 2.73, SD = 1.34, 27% never), prompting athletes to attend anti-doping education workshops (Mean = 2.67, SD = 1.38, 32% never) and accompanying athletes through doping control (Mean = 2.04, SD = 1.40, 57% never) might not have been possible/as frequent due to the global pandemic having a significant impact (i.e., a reduction) on sporting, and anti-doping, activity. This was confirmed by a number of coaches using the open space provided at the end of the behaviour scale. Notably, some coaches also stated that these behaviours were undertaken by others. For example, *"I have not personally scheduled anti-doping training or anything similar because I know my sport's high-performance manager and director schedule these events."*⁹

⁹ Based on this finding, we recommend a qualifier question be added for each behavior. This would establish if there is a lack of opportunity to perform these behaviors, rather than coaches having not performed them where the opportunity arises.

Table 11. Frequency of behaviours reported by coaches (n=594; presented from most to least frequent, on average, within each subscale).

	Mean	SD	Never 1	Rarely 2	Sometimes 3	Often 4	Very often 5
Demonstrated my values (e.g., respect, honesty, discipline) in my actions	4.40	0.76	5	7	48	219	315
Gave open and honest feedback to my athletes that supports their long-term development	4.24	0.81	7	11	67	259	250
Discussed my values (e.g., respect, honesty, discipline) with my athletes	4.20	0.93	9	25	77	209	274
Listened carefully and supportively to my athletes if they had an issue that they wanted to raise	4.19	0.93	15	19	66	234	259
Offered support (e.g., advice, guidance) to my athletes when they seemed to be going through a difficult time	4.18	0.84	5	16	87	245	241
Asked my athletes about their lives outside of sport (e.g., family, friends, school, work)	4.12	0.87	6	13	115	227	233
Encouraged my athletes to ask me questions or seek my support whenever they need it	4.12	0.99	15	32	75	218	254
Encouraged my athletes to engage in other activities (e.g., other sports, education, work, travelling, social life) to help maintain a balance with sport	4.03	0.94	15	17	110	245	207
Implemented a code of conduct with my athletes to establish expected standards	3.78	1.23	56	37	82	224	195
Observed my athletes' behaviours and asked how they are if I noticed any changes (e.g., mannerisms, mood)	3.64	1.11	34	54	140	227	139
Reminded my athletes to carefully monitor what they put into their bodies (e.g., food, supplements, medication)	3.69	1.13	35	56	126	221	157
Reminded my athletes that doping is not accepted in our environment	3.68	1.39	71	59	92	139	233
Informed my athletes that doping is against the rules of sport (e.g., the World Anti-Doping Code)	3.65	1.37	73	54	99	149	219
Taught my athletes about enhancing their performance in permitted ways so they do not feel the need to engage in doping to improve or perform at their best	3.55	1.28	70	50	113	206	155

Prompted my athletes to check that any nutritional supplements they use do not contain banned substances	3.36	1.36	93	61	122	175	143
Discussed with my athletes their use of nutritional supplements (e.g., assessing the need, risks, and potential effects/consequences)	3.32	1.12	48	76	190	195	85
Discussed with my athletes the consequences of doping (e.g., bans, health risks, loss of funding)	3.31	1.40	96	82	108	158	150
Prompted my athletes to check that any medications they use do not contain banned substances	3.26	1.37	99	71	134	156	134
Discussed with my athletes the potential risks of medications (e.g., some may be permitted out of competition, but not in competition)	3.15	1.27	85	93	157	166	93
Encouraged my athletes to comply with anti-doping processes (e.g., testing, submitting Whereabouts information, reporting/investigations)	3.07	1.42	128	80	119	155	112
Taught my athletes how they can minimise the risks of inadvertent doping associated with nutritional supplement use (e.g., using Informed Sport)	2.97	1.34	124	86	149	151	84
Attended anti-doping education workshops	2.73	1.34	162	82	173	109	68
Prompted my athletes to attend anti-doping education workshops	2.63	1.38	188	85	144	114	63
Scheduled anti-doping education workshops for my athletes (to be delivered by others)	2.16	1.33	283	92	106	68	45
Provided information to anti-doping authorities if/when I have become aware of doping	2.10	1.45	336	59	60	75	62
Accompanied my athletes when they were selected for doping control and observed the testing process	2.04	1.40	339	63	77	59	56

Sub-scales: Creating a clean and caring environment (10 items), Reduce the risk of intentional and inadvertent doping (11 items), Perform practical anti-doping tasks/duties (5 items)

Capability

Table 12 indicates that a large proportion of coaches have the capability to engage in anti-doping behaviours. The highest ratings of agreement were for knowledge, including knowing how and where to find information on anti-doping (Mean = 5.67/7, SD = 1.55), with 85% of coaches (n=504/594) agreeing to some extent (including slightly agree, agree, strongly agree) and knowing their anti-doping roles and responsibilities as outlined in the WADC (Mean = 5.55, SD = 1.56, 81% agree to some extent).

For skill, a large proportion of coaches reported having the practical (Mean = 5.44, SD = 1.50, 79% agree to some extent) and interpersonal skills (Mean = 5.41, SD = 1.42, 78% agree to some extent) to undertake anti-doping actions. This is despite mixed reports in relation to coaches having been trained to undertake anti-doping actions (Mean = 4.01, SD = 1.83, 41% disagree to some extent).

One area of capability that perhaps requires some attention in the future is behavioural regulation; defined as “anything aimed at managing or changing objectively observed or measured actions” (Michie et al., 2014, p. 88). Some coaches reported that they do not reflect on the effectiveness of their actions (Mean = 4.01, SD = 1.83, 39% disagree to some extent) nor do they keep track of how often they undertake anti-doping actions (Mean = 3.92, SD = 1.95, 23% disagree to some extent).

Table 12. Coach (n=594) ratings for Capability (presented from most to least agreement, on average).

	Mean	SD	Strongly disagree 1	Disagree 2	Slightly disagree 3	Neither 4	Slightly agree 5	Agree 6	Strongly agree 7
I know how and where to find information on anti-doping	5.67	1.55	21	26	20	25	71	235	196
I know my anti-doping roles and responsibilities as a coach, as outlined in the World Anti-Doping Code	5.55	1.56	14	31	37	28	88	217	179
I know the anti-doping rules and regulations as they apply to my sport	5.49	1.57	16	39	26	23	111	214	165
I have the necessary practical skills (e.g., using online resources) to undertake anti-doping actions	5.44	1.50	12	31	29	54	101	223	144
I have the necessary interpersonal skills to undertake anti-doping actions	5.41	1.42	11	25	25	67	116	223	127
My knowledge of anti-doping rules and processes in my sport is up to date	5.40	1.47	9	40	29	35	115	245	121
I know how to check if any product (e.g., medication, supplements) contains a banned substance	5.07	1.84	36	53	43	40	86	200	136
I have practiced using anti-doping resources (e.g., the World Anti-Doping Agency's 'App', National Anti-Doping Organisation website, GlobalDRO, Informed Sport)	4.81	1.87	47	60	30	78	93	178	108
I am aware of when the Prohibited List is updated and where to find any updates	4.79	1.92	47	70	38	52	101	170	116

I can recall the anti-doping rules and processes in place in my sport	4.76	1.75	42	53	40	69	131	185	74
I plan when I will undertake anti-doping actions ahead of time (e.g., deciding in advance to speak to your athletes during pre-season)	4.58	1.82	52	57	34	111	111	148	81
I have practiced initiating anti-doping conversations	4.34	1.95	73	75	41	80	111	141	73
I have been trained how to undertake anti-doping actions	4.01	1.82	103	85	54	79	80	122	71
I regularly reflect on the effectiveness of my anti-doping actions	4.01	1.83	75	84	53	124	112	101	45
I keep track of how often I have undertaken anti-doping actions	3.92	1.95	92	96	44	112	92	101	57

Opportunity

Table 13 demonstrates that many of the items related to the physical and social environment in which coaches are situated received mixed reports from coaches (with 4 representing neither agree nor disagree on the scale), including what other coaches and ASP around the coach do.

The highest levels of agreement were related to coaches having relationships with their athletes that enabled them to undertake anti-doping actions (Mean = 5.44, SD = 1.42, 80% agree to some extent) and coaches perceiving that their athletes are receptive to them talking to them about anti-doping (Mean = 5.29, SD = 1.34, 74% agree to some extent).

Least agreement was related to coaches being prompted to undertake anti-doping actions. This included physical prompts (e.g., posters, emails) Mean = 3.79, SD = 1.89, 41% disagree to some extent) and prompts from those in positions of authority (e.g., managers, superiors) Mean = 3.76, SD = 1.86, 43% disagree to some extent). Building on the latter, several coaches reported that people in positions of authority do not remind them of their anti-doping role and responsibilities (Mean = 4.07, SD = 1.90, 37% disagree to some extent) or talk about how important anti-doping is (Mean = 4.20, SD = 1.90, 35% disagree to some extent).

Table 13. Coach (n=594) ratings for Opportunity (presented from most to least agreement, on average).

	Mean	SD	Strongly disagree 1	Disagree 2	Slightly disagree 3	Neither 4	Slightly agree 5	Agree 6	Strongly agree 7
My relationship with my athletes enables me to undertake anti-doping actions	5.44	1.42	14	26	11	70	109	239	125
My athletes appear receptive to me talking to them about anti-doping	5.29	1.34	11	20	13	111	115	234	90
My organisation provides opportunities for me to learn about anti-doping (e.g., education)	4.86	1.82	42	54	39	68	105	181	105
Other athlete support personnel in my environment undertake anti-doping actions	4.72	1.69	29	59	33	128	98	171	76
Doping cases in sport prompt me to undertake anti-doping actions	4.72	1.69	34	51	43	102	131	157	76
I have enough time in my coaching role to engage in anti-doping actions	4.68	1.69	23	68	62	84	111	178	68
Anti-doping protocols (e.g., reporting processes) are clear in my coaching environment	4.67	1.77	34	68	50	79	119	166	78
Policies are in place to direct me in undertaking anti-doping actions	4.62	1.81	43	70	35	95	108	165	78
Coaches I surround myself with talk about how important anti-doping is	4.43	1.77	43	69	58	114	104	141	65
Coaches in my environment undertake anti-doping actions	4.38	1.71	41	74	36	149	107	137	50
Other athlete support personnel in my environment talk about how important anti-doping is	4.36	1.77	43	84	43	120	110	137	57

People in positions of authority in my environment (e.g., manager, superiors) talk about how important anti-doping is	4.20	1.90	63	90	52	102	100	120	67
People in positions of authority in my environment (e.g., manager, superiors) remind me of my anti-doping role and responsibilities	4.07	1.90	67	97	57	115	79	121	58
There are physical prompts in my environment (e.g., posters, emails) that encourage me to undertake anti-doping actions	3.79	1.89	84	126	35	113	93	108	35
People in positions of authority in my environment (e.g., manager, superiors) regularly prompt me to undertake anti-doping actions	3.76	1.86	81	117	57	121	85	92	41

Motivation

Several items within this component of the COM-B model received higher ratings (i.e., more agreement) than any others (see Table 14). In particular, two items with average ratings above any other factors were that coaches see undertaking anti-doping actions as something that is both a professional responsibility (Mean = 6.14, SD = 1.09, 93% agree to some extent) and aligned with their personal values (Mean = 6.11, SD = 1.10, 92% agree to some extent).

Beyond this, coaches generally agreed (to some extent) with items that related to positive consequences of undertaking anti-doping actions. These included undertaking anti-doping actions protecting the integrity of their sport (Mean = 5.76, SD = 1.10, 87% agree to some extent), leading to athletes making informed choices (Mean = 5.72, SD = 1.10, 84% agree to some extent) and minimising likelihood of athletes doping (Mean = 5.70, SD = 1.14, 88% agree to some extent).

Complementing this finding, many coaches disagreed with statements that related to negative consequences being associated with coaches undertaking anti-doping actions. These included undertaking anti-doping actions leading to people thinking negatively about the coach (Mean = 2.26, SD = 1.50, 80% disagree to some extent) and making coaches feel anxious (Mean = 2.75, SD = 1.63, 67% disagree to some extent).

Table 14. Coach (n=594) ratings for Motivation (presented from most to least agreement, on average).

	Mean	SD	Strongly disagree 1	Disagree 2	Slightly disagree 3	Neither 4	Slightly agree 5	Agree 6	Strongly agree 7
It is my professional responsibility as a coach to undertake anti-doping actions	6.14	1.09	6	5	4	29	63	220	267
Undertaking anti-doping actions is consistent with my personal values	6.11	1.10	5	7	3	34	66	220	259
I consider myself to be an important part of promoting and supporting a “clean sport” culture	5.90	1.23	8	8	10	46	85	219	218
I undertake anti-doping actions with the aim of protecting the integrity of my sport	5.76	1.31	10	13	6	69	77	229	190
I believe that undertaking anti-doping actions will ensure my athletes make informed choices	5.72	1.10	3	8	11	51	117	269	135
I believe that undertaking anti-doping actions will minimise the likelihood of my athletes doping	5.70	1.14	4	10	12	49	126	253	140
I am confident in undertaking anti-doping actions	5.53	1.37	12	17	16	72	104	230	143
I plan to undertake consistent anti-doping actions (i.e., my actions will remain the same over time)	5.51	1.33	9	16	12	92	98	228	139
Adhering to the anti-doping rules and regulations is central to my identity as a coach	5.46	1.47	12	25	15	91	95	195	161
I find it easy to adhere to the anti-doping roles and responsibilities of coaches, as outlined in the World Anti-Doping Code	5.45	1.47	13	28	16	75	100	215	147
I undertake anti-doping actions with the aim of protecting the reputation of my club (or equivalent	5.39	1.53	16	26	15	106	80	191	160

immediate environment)									
I believe that doping in sport can be prevented	5.35	1.67	22	45	36	21	88	238	144
Engaging in anti-doping actions is under my control	5.25	1.44	9	32	25	97	111	214	106
Whenever I undertake anti-doping actions, I feel I am making a difference	5.21	1.33	12	8	22	139	135	179	99
I am competent in undertaking anti-doping actions	5.17	1.57	19	41	30	63	115	229	97
I would feel guilty if I did not undertake anti-doping actions, as I would not be fulfilling my responsibilities	5.15	1.67	23	43	23	97	87	189	132
Undertaking anti-doping actions gives me a sense of pride	5.09	1.50	14	31	15	158	93	174	109
I undertake anti-doping actions with the aim of protecting my own reputation as a coach	4.95	1.69	29	39	30	125	103	147	121
I intend to engage in anti-doping related conversations with my athletes over the next month	4.83	1.66	26	50	35	116	113	166	88
Undertaking anti-doping actions makes me happy	4.84	1.44	16	30	11	216	102	140	79
I receive positive recognition from others for undertaking anti-doping actions	4.79	1.43	20	27	23	195	112	159	58
I have received positive feedback (from others) on the effectiveness of my anti-doping actions	4.33	1.51	38	40	22	275	65	113	41
I am not optimistic that doping in sport can be successfully prevented	3.92	1.90	57	136	80	59	102	108	52
I worry about undertaking anti-doping actions in case I give the incorrect information	3.57	1.78	75	153	65	88	111	77	25
I do not think it is possible for me to prevent my athletes from doping	3.23	1.83	113	159	86	67	80	59	30

I experience negative reactions from others (e.g., disapproval) when I undertake anti-doping actions	3.00	1.71	142	154	41	160	30	49	18
Undertaking anti-doping actions is not a priority for me	2.88	1.71	148	168	82	79	55	45	17
Undertaking anti-doping actions makes me feel anxious	2.75	1.63	153	193	51	105	40	41	11
I am unable to undertake anti-doping actions	2.43	1.58	211	188	42	84	30	28	11
I believe that undertaking anti-doping actions will lead to people thinking negatively about me	2.26	1.50	231	199	48	59	20	28	9

Education experiences and preferences

Topics featuring within education

Beyond establishing coaches' anti-doping behaviours and the factors influencing them, the survey aimed to gain an understanding of coaches' experiences of learning about anti-doping. Table 15 shows a comparison of topics that coaches had learned about in the last 12 months ('current') and topics they would like to learn about in the future ('preferred'). It shows that most topics had been learned about by approximately two thirds of the coaches; Speaking up to share concerns was the exception – which half the coaches (55%) had learned about.

Follow-up analysis was conducted to compare the average ratings of agreement (from 1 = strongly disagree to 7 = strongly agree) across coaches working at different levels of competition. This showed that more coaches were exposed to these topics if they worked at higher levels of competition. For example, the average rating for club level coaches was 4.74 (± 1.91) for consequences of doping compared to 5.72 (± 1.32) for coaches currently working at international level (see Appendix for full details). This is corroborated by the finding that 53% ($n=52/98$) of coaches who agreed (to some extent) that they had not learned about anti-doping before were currently working at club level (although, all levels were represented).

Table 15. Topics that coaches have learned about to date and would prefer to learn about in the future.

Topic	Current (n=535-7)	Preferred (n=515-7)
Consequences of doping (inc. physical, mental, social, financial and legal)	386 (72%)	435 (84%)
Values associated with clean sport (e.g., ethics, principles, reasons we have anti-doping rules in place)	358 (67%)	392 (76%)
Rules and regulations (e.g., athlete and ASP rights/responsibilities, Strict Liability, ADRVs)	354 (66%)	455 (88%)
Substances and methods (e.g., the Prohibited List, supplements, medications/Therapeutic Use Exemptions)	349 (65%)	467 (90%)
Testing procedures (e.g., the conduct of urine and blood tests, the Athlete Biological Passport, Whereabouts and the use of ADAMS)	318 (59%)	436 (84%)
Speaking up to share concerns about doping (e.g., expectations, processes, consequences)	296 (55%)	401 (78%)

Looking to the preferred column of Table 16, coaches would like to learn more about every topic in the future, particularly rules and regulations, substances and methods, testing procedures, and speaking up to share concerns. No obvious differences appeared to be present when comparing average ratings of coaches working at different levels of competition; therefore, coaches across all levels of competition show the same level of interest in learning more about each of these topics in the future.

Drawing on the qualitative data provided using open spaces provided, several coaches suggested connecting anti-doping to athlete health and welfare and/or long-term development. For example, one coach said, *“Start with education on sportsmanship, integrity and long-term development and health”*. Another added, *“I think this is a critical piece of a student athletes well-being needs, to be integrated into a global athlete development process that coaches use.”* They, amongst others, drew particular attention to the emphasis that should be placed on nutrition and supplementation:

Supplementation and "performance edges" need to be discussed openly and destigmatized. What is safe, legal, and ethical v. what is not. This can be heavy lifting to construct in terms of a usable model. PD [professional development] around how we build this into our programming I think would be beneficial, and change the lens of anti-doping to safe, and ethical athlete development.

[I] Always advise on water as a drink from a very early age - weekly I say this. Even energy drinks which have now become mainstream are not needed if you maintain a healthy diet. Also, I have become aware of food poverty recently and energy drinks help them to cover their need for food - this is truly I believe the beginning of athletes wanting external enhancements even though it is so little- after all it's only a drink - but it's where the idea of enhancement (a form of doping) is normalised.

I think that at a local level there should be more focus on how to be a healthy person/athlete without the need to fold to the branding on the shelves and on social media. Most teenagers/young adults' personal diets can be improved to show them that they don't need to take supplements and what they need can be gained from healthy food sources and still be as convenient as a supplement. As they progress through their ages, they are able to understand more about making sensible choices.

This coach suggested that nutrition could be covered with coaches who are working with young athletes, to instil the messages early in their development. Then, *“as they hit 16+, then start to follow on from this a more in-depth approach to doping control and what the risks are and what is available out there as resources.”*

Delivery methods

Table 16 shows the current and preferred anti-doping education methods. It highlights that electronic materials (65%), and e-Learning (60%) were the methods that higher proportions of coaches had learned via over the last 12 months¹⁰. Approximately half the coaches had learned through conversations with colleagues (55%) and/or printed materials/resources (51%). Most likely due to the pandemic, face-to-face/in-person learning had been experienced by the fewest coaches; with only a third (36%) being exposed to this in the last 12 months.

Follow-up analysis, comparing the average ratings of agreement (from 1 = strongly disagree to 7 = strongly agree) across coaches working at different levels of competition, showed that more coaches were exposed to most of these methods if they worked at higher levels of competition (see Appendix for full details). This is corroborated by the finding that 60% (n=42/70) of coaches who agreed (to some extent) that they had not learned about anti-doping before were currently working at club level (although, all levels were represented).

Table 16. Number of coaches who had learned via each method to date and preferred to learn via each method in the future.

Method	Current (n=527-31)	Preferred (n=512-7)
Electronic materials (e.g., e-newsletters/emails, videos)	342 (65%)	440 (85%)
e-Learning (e.g., Coach True)	317 (60%)	464 (90%)

¹⁰ It is important to note that the survey took place during a global pandemic, related to the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). At this time, many countries placed restrictions on in-person interactions, and many sports’ operations were significantly impacted. Anecdotally, we can report that there was an increase in online activity across many organisations, who were seeking to maintain some level of interaction with their members/staff, etc.

Through conversations with colleagues/peers (e.g., other coaches, team doctor)	294 (55%)	409 (79%)
Printed materials/resources (e.g., posters, leaflets)	270 (51%)	367 (72%)
Face-to-face/in-person (e.g., workshops/seminars)	192 (36%)	370 (72%)

In terms of future educational preferences, Table 16 demonstrates that coaches would like more opportunities to learn via every method. That said, the increase required was greatest for face-to-face/in-person learning (a difference of 36% between current and preferred) and e-Learning (30% difference). No obvious differences appeared to be present when comparing average ratings of coaches working at different levels of competition. Similar to topics, this means that coaches in all contexts show the same level of interest in receiving future anti-doping education via these specific methods.

Providers of learning opportunities

When comparing the organisations that currently provide anti-doping education and coaches' preferred providers for future education, National sports federations/governing bodies were the predominant source of anti-doping education for those who had received it (61%), and they were also the preferred source of anti-doping education for almost all coaches (94%). This signals an increase in activity is required for these organisations (33% difference). Similar increases were desired across all other organisations, as the values indicated that a higher proportion of coaches would prefer anti-doping learning opportunities to be provided than the proportion of coaches who currently receive anti-doping education from these sources. The largest difference between current and preferred values was for coaching organisations (40%).

Table 17. Coaches' experiences to date and preferences for the future related to education providers.

Method	Current (n=532-5)	Preferred (n=513-8)
National sport federation/governing body	327 (61%)	483 (94%)
NADO	289 (54%)	446 (86%)
WADA	255 (48%)	424 (82%)

International sport federation	246 (46%)	424 (83%)
Coaching-related organisation (national or international)	206 (39%)	409 (79%)
Higher education institution (e.g., College, University)	119 (26%)	291 (57%)

Although coaches were calling for all organisations to provide more learning opportunities, these should be carefully coordinated based on insights provided by some coaches in the open spaces provided. For example, one coach reported that there “*Seems to be one too many sources for anti-doping information and go to for fact-finding*”. Another coach explained this can be overwhelming/confusing:

I find that there are so many organizations delivering so much information that I don't know where to turn. For my sport I would really like for information to come through one channel e.g., my sport filters the most important information.

Reinforcing the findings from topics and methods, many coaches (n=43/83, 52%) who agreed (to some extent) that ‘None of these organisations provided me with opportunities to learn about anti-doping’ were currently working at club level; signalling that these coaches are reached less often with anti-doping learning opportunities than coaches in other contexts.

Summary

One of the main purposes of this component of the project was to establish what coaches do and what factors currently may influence their behaviours. Data showed that many coaches are already undertaking several behaviours that have the potential to positively influence athletes. Mostly, this involves creating a clean and caring environment, through actions such as coaches demonstrating their values and giving open and honest feedback to support their athletes’ long-term development. Many coaches also engaged in actions that would address intentional and inadvertent doping, and this included advising athletes that doping is against the rules and is not accepted in their environment. As these, and several other behaviours considered to be ‘addressing intentional and inadvertent doping’ (e.g., discussing ways to reduce the risks of supplement use) were reported

'sometimes' (rather than often/very often), organisations may wish to work with coaches to increase the frequency at which they are performed.

In addition, organisations may wish to support coaches to engage more frequently (or, at all) in some of the 'practical anti-doping tasks/duties', e.g., attending anti-doping education workshops, prompting athletes to attend anti-doping workshops. Though, it is possible that the current infrequency of these behaviours was related to the global pandemic. The data on delivery methods that coaches experienced in the last 12 months supports this idea, and shows that it is likely coaches had been engaging with (and encouraging their athletes to engage with) other learning opportunities beyond in person workshops. Due to this insight, and the coaches' preferences for more online and electronic activities in the future, it would be beneficial to broaden the scope of this behavioural statement away from a narrow focus on workshops towards a more holistic/comprehensive exploration of engagement with all learning about anti-doping.

In terms of the factors that may underpin coach behaviour, two key elements of capability appeared to be in place, as perceptions of knowledge and skill were relatively high. Many coaches reported being aware of how and where to find information, as well as knowing their responsibilities as outlined by the WADC. In addition, they reported being equipped with the practical and interpersonal skills to act. The latter finding was interesting given that many coaches had not received training on how to undertake anti-doping actions, nor had practised initiating conversations with athletes about anti-doping or using resources (e.g., GlobalDRO). This could be something that future learning opportunities could address. However, perhaps the most significant area of capability to address in future is behavioural regulation. Specifically, organisations could support coaches with self-monitoring and reflecting on their anti-doping actions. These actions have been found to be influential in maintaining behaviour(s) (Michie et al., 2009). Therefore, this could help with habit building, which some organisations suggested was a target outcome for their coach education and is essential if coaches are to make a consistent contribution to clean sport efforts.

Coaches may be more inclined to track their anti-doping behaviours if they were in some way accountable within their environment. Findings from the opportunity items of the survey indicated that the contexts in which coaches worked were generally conducive to them undertaking anti-doping actions. For instance, coaches had a positive relationship with athletes, other ASP around them seemed to engage in action, and both policies and protocol related to anti-doping were in place. However, in terms of bringing anti-doping to the fore of the coaches' minds and ensuring actions are embedded in regular practise, more prompts may be beneficial. Such prompts should include physical cues (e.g., posters, emails) and conversations with influential others (e.g., managers/superiors). Cues because they play a role in helping an individual repeat a behaviour in a consistent context when aiming towards behaviour automaticity, i.e., habit formation (Lally & Gardner, 2013).

The prompts should focus on reminding coaches to undertake actions and discussing the potential effectiveness of actions once they have been undertaken. They do not need to aim to convince coaches that actions are required, because data from the motivation component of the survey indicated that coaches already recognise this. Indeed, it was positive to see how strongly coaches agreed with anti-doping being not only part of their professional responsibility, but also aligning with their personal values. These findings corroborate previous research that has found coaches have an anti-doping attitude and recognise their potential role in doping prevention efforts (Barnes et al., 2020). Building on their role perceptions, another favourable finding within the motivation component of the survey was that coaches were largely of the view that undertaking anti-doping actions would have positive consequences (e.g., athletes making informed choices, reducing the likelihood of athletes doping). Despite this, some coaches do not appear to actually experience the positive consequences that were included in the survey; namely, positive emotions (pride, happiness) and positive recognition/feedback from others. These factors may be addressed if the earlier recommendation related to coaches reflecting and significant others conversing with coaches are acted upon. Indeed, supporting earlier points, both internal (e.g., satisfaction) and

external (e.g., confirmation from a significant other than you are progressing towards/achieving your goals) rewards/recognition are pivotal to habit formation (Lally & Gardner, 2013).

To complement the COM-B elements of the survey, coaches provided insights into their experiences and preferences for learning about anti-doping, including topics, methods, and providers. These questions revealed that coaches had learned about a broad range of topics via a multitude of methods across several providers. One topic that perhaps requires further attention in the future is “Speaking up to share concerns”; especially as the finding that this had been studied least by coaches aligns with the findings from earlier organisation insights. In terms of methods, coaches showed an interest in more e-Learning and electronic materials than in previous coach research (Patterson et al., 2019). This bodes well for WADA’s recently updated ADEL platform, which is based online, and may be reflective of the way that technology has been used well during the last 18 months due to the pandemic. Lastly, coaches generally wanted more learning opportunities from all providers. Nonetheless, it was clear that they wanted information sources to be streamlined and national sports federations/governing bodies to be the main provider/coordinator. This is important because people bring overloaded with choices can have a negative impact on their thoughts, feelings and behaviours (e.g., they may be disengage, their confidence in – and satisfaction with – the sources can decrease) (Chernev, Böckenholt & Goodman, 2015). However, given that national federations are not a direct signatory of the Code, the effective involvement of these organisations can only be achieved if NADOs and IFs fulfil their Code prescribed responsibility to promote anti-doping education amongst these organisations.

A consideration...

It is important to note that, as the coaches represented many countries, only half the sample (n=328/556, 55%) identified English as their first language. Though individuals who also do not have English as their first language featured in the expert review group during survey development, it is possible that some of the items in the survey could have been misinterpreted given their complexity

and volume. In addition, one organisation that was approached to aid recruitment of coaches reported that it would be difficult for them to share the survey since it was only available in English. They stated that *“although quite a number of coaches, especially at international level, speak and understand English, it would not be well perceived and received by our governance and by the sport community to send out a survey in English only”*. Positively, this organisation was so supportive of the project that they offered to help translate the survey into their native language. Unfortunately, this offer was received late in the recruitment process and therefore could not be taken up. However, the research team would be keen to explore the possibility of translating the survey into multiple languages (e.g., French, Spanish) at a later date (when statistical analysis to ‘validate’ it has been completed) if it meant that more organisations could benefit from its use.




Phase 4

Creation of an International Framework for Coach Anti-Doping Education

Objective: Create an International Framework for Coach Anti-Doping Education (IFCADE) and an implementation blueprint that are 'ready to use' by organisations (e.g., sporting, anti-doping and/or coaching) to develop, deliver, and evaluate their provision.

MARCH 2020 – JULY 2021



Context

The overall purpose of this project was to create an International Framework for Coach Anti-Doping Education (IFCADE) to provide recommendations for coach anti-doping education provision. Building on earlier WADA-commissioned research (Patterson et al., 2018), the Framework drew on logic modelling as a conceptual underpinning. Consequently, it outlines target population(s) (e.g., coaches), desired outcomes (e.g., short, medium and long-term), activities ('outputs', e.g., processes, events and actions) and resources ('inputs', e.g., people, expertise, costs).

A framework is a real or conceptual structure intended to serve as a support or guide for the building of something that expands the structure into something useful.

To bring the Framework to life, an 'implementation blueprint' is embedded in the document to provide guidance on *how* the Framework can be used by organisations to inform their coach anti-doping education provision. In essence, organisations are presented with guidance to support them through a process of programme development, delivery and evaluation. True to the nature of this project, this guidance is both theory-informed (using the Behaviour Change Wheel) and evidence-based (using the insights from Phases 1 to 3).

The Framework (provided in a separate document) should be seen as 'recipes' and 'ingredients' from which organisations can choose to make a 'simple sandwich' (i.e., basic provision) or a Michelin-star 4-course meal (i.e., a more complex, multi-component approach). It can be considered by WADA to integrate as part of their resource suite for stakeholders, provided in support of their Code implementation requirements. It may also be of use to other organizations, such as ICCE, to align or integrate content in order to complement their own coach education support and pathways.

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Appendix: Survey follow-up analysis

Table 18. Topics that coaches have learned about to date, compared across current level at which the coach works.

Topic - Current	Club (n=225-6)	Regional (n=65)	National (n=107-8)	International (n=104-6)
Consequences of doping (inc. physical, mental, social, financial and legal)	4.74 (1.91)	5.31 (1.53)	5.34 (1.47)	5.72 (1.32)
Values associated with clean sport (e.g., ethics, principles, reasons we have anti-doping rules in place)	4.52 (1.94)	5.28 (1.56)	5.32 (1.55)	5.48 (1.51)
Rules and regulations (e.g., athlete and ASP rights/responsibilities, Strict Liability, ADRVs)	4.50 (1.93)	5.03 (1.66)	5.14 (1.56)	5.60 (1.34)
Substances and methods (e.g., the Prohibited List, supplements, medications/Therapeutic Use Exemptions)	4.36 (1.96)	5.03 (1.70)	5.03 (1.54)	5.51 (1.32)
Testing procedures (e.g., the conduct of urine and blood tests, the Athlete Biological Passport, Whereabouts and the use of ADAMS)	4.00 (1.94)	5.00 (1.72)	4.94 (1.66)	5.36 (1.48)
Speaking up to share concerns about doping (e.g., expectations, processes, consequences)	4.13 (1.92)	5.00 (1.65)	4.70 (1.75)	5.18 (1.47)
<i>I have not learned about anti-doping before</i>	2.84 (2.01)	2.63 (2.04)	2.21 (1.78)	2.13 (1.81)

Table 19. Topics that coaches would prefer to learn about in the future, compared across current level at which the coach works.

Topic - Preferred	Club (n=212-4)	Regional (n=63)	National (n=103-5)	International (n=104-6)
Consequences of doping (inc. physical, mental, social, financial and legal)	5.64 (1.22)	5.73 (1.19)	5.50 (1.62)	5.57 (1.39)
Values associated with clean sport (e.g., ethics, principles, reasons we have anti-doping rules in place)	5.31 (1.46)	5.54 (1.22)	5.29 (1.60)	5.24 (1.61)
Rules and regulations (e.g., athlete and ASP rights/responsibilities, Strict Liability, ADRVs)	5.67 (1.10)	5.78 (0.94)	5.65 (1.32)	5.59 (1.38)
Substances and methods (e.g., the Prohibited List, supplements, medications/Therapeutic Use Exemptions)	5.87 (0.98)	5.84 (0.54)	5.69 (1.42)	5.85 (1.27)
Testing procedures (e.g., the conduct of urine and blood tests, the Athlete Biological Passport, Whereabouts and the use of ADAMS)	5.67 (1.15)	5.52 (1.13)	5.54 (1.54)	5.67 (1.42)
Speaking up to share concerns about doping (e.g., expectations, processes, consequences)	5.37 (1.32)	5.68 (1.09)	5.56 (1.50)	5.36 (1.59)
I have not learned about anti-doping before	2.42 (1.73)	2.30 (1.77)	1.90 (1.43)	2.27 (1.90)

Table 20. Methods via which coaches have learned about anti-doping to date, compared across current level at which the coach works.

Method - Current	Club (n=223-5)	Regional (n=63-4)	National (n=107-8)	International (n=102-5)
Electronic materials (e.g., e-newsletters/emails, videos)	4.15 (2.03)	4.86 (1.81)	4.67 (1.92)	5.22 (1.60)
e-Learning (e.g., Coach True)	4.07 (2.08)	5.06 (1.86)	4.85 (1.94)	5.30 (1.82)
Through conversations with colleagues/peers (e.g., other coaches, team doctor)	3.81 (1.98)	4.34 (1.88)	4.68 (1.76)	4.90 (1.72)
Printed materials/resources (e.g., posters, leaflets)	3.72 (1.96)	4.25 (2.00)	4.44 (2.02)	4.50 (1.98)
Face-to-face/in-person (e.g., workshops/seminars)	3.25 (2.04)	3.56 (2.11)	3.84 (2.24)	4.27 (2.19)
<i>I have not learned about anti-doping before</i>	2.67 (1.91)	2.27 (1.78)	1.95 (1.51)	1.89 (1.54)

Method - Preferred	Club (n=212-8)	Regional (n=63)	National (n=103-4)	International (n=103-5)
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Electronic materials (e.g., e-newsletters/emails, videos)	5.49 (1.42)	5.68 (1.29)	5.72 (1.30)	5.70 (1.42)
e-Learning (e.g., Coach True)	5.73 (1.13)	5.89 (1.25)	5.92 (1.07)	5.88 (1.22)
Through conversations with colleagues/peers (e.g., other coaches, team doctor)	5.28 (1.44)	5.48 (1.26)	5.40 (1.60)	5.53 (1.40)
Printed materials/resources (e.g., posters, leaflets)	5.09 (1.53)	5.23 (1.37)	4.89 (1.75)	4.80 (1.84)
Face-to-face/in=person (e.g., workshops/seminars)	5.01 (1.62)	5.13 (1.50)	5.34 (1.59)	5.25 (1.73)
<i>I do not wish to learn about anti-doping</i>	2.09 (1.49)	2.19 (1.79)	1.66 (1.35)	2.17 (1.82)

Table 21. Methods via which coaches would prefer to learn about anti-doping in the future, compared across current level at which the coach

works.