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Comparing practices of track and field in the USA against a global model for integrated development of mass and high-performance sport

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Abstract

This study examines the current state of track and field in the United States of America (USA) against an ideal-type model for developing high performance sport integrated with mass participation. A questionnaire was developed for the following elements of the model: talent development; advanced athlete support; training centers; competitions; intellectual services; partnerships with supporting agencies; balanced and integrated funding and structures of mass and elite sport. Survey questions were validated by 12 international experts including executives from sport governing bodies, track and field coaches, academicians, and administrators. To determine the areas for improvement, 102 coaches completed the questionnaire. Possible advancements were further identified through semi-structured discussions with 10 track and field administrators. Results suggest possible enhancements at macro-level (e.g. new partnerships and incentives for greater support of mass and elite track and field), meso-level (e.g. additional sources and models for better coach education and facilities) and micro-level (e.g. advanced lifelong track and field guidelines for excellence of everyone).

Keywords: USA, track and field, high performance, mass participation, sport development

1. Introduction

The biennial World Athletics Championships, inaugurated in 1983, has been dominated by United States (US) teams. 12 times out of 18 competitions held, the US placed first in the overall medal count. At the World Junior Under 20 (U20) Athletics Championships, the story is the same. The US has placed first in the team medal count eight times over the course of the 17 competitions that have been held^[82]. Since the advent of the modern Olympic Summer Games era that began in 1896, the US track & field team has enjoyed unparalleled international success. Overall, the US team has won a total of 2,521 medals in the summer Olympics (1,022 Gold), 32 percent of which have been from track and field events^[82]. In that time frame, men's track and field has claimed for the US 667 Olympic medals, and since 1928, woman's track and field has contributed 130^[82]. After the share of the available Olympic track and field medals won by the US medals declined from 23 percent in the 1992 to 12 percent in the 2000 Olympic Games, Team United States of America (USA) reversed the trend and steadily increased the medal share each quadrennial since (19 percent in the 2004 and 2008, 22 percent in the 2012 and 25 percent in the 2016 Olympics). Further performance improvement is possible given that a medal shares above 30 percent occurred routinely from 1900 through to the 1932 Olympics^[82]. More importantly, this international success can be used to encourage greater US mass participation and help reverse the 30-year trend of declined sport participation and increased obesity, which reached about 40 percent of the US population and 147 billion dollars in annual medical costs^[4, 47].

The number of recreational runners and joggers in the US has increased by about 20 million dollars from 2008 to 2013, but it had been stagnant since 2013 at only 65 million in 2017, which is less than 20 percent of the country's population^[48]. As all children are taught some track and field concepts and elements in schools, better physical education and coaching could make a majority of citizens enjoy jogging regularly. The growth in mass track and field participation could be attributed to USA Track and Field (USATF) coaching initiatives, which

has help children learn run, jump and throw skills through track and field practices, clinics and events (RJT program). USATF partnered with the Hershey Company for a 2014 to 2020 National Youth Activity Initiative aimed at teaching children the importance of a healthy lifestyle through sport, as well as helping youths start their competitive careers. The Hershey Company has given 1,000 youth scholarships providing free USATF memberships to underserved children interested in pursuing track and field and putting on clinics and competitions overseen by USATF [33]. Such initiatives could help millions more across the US become regular participants by reducing instruction and event fees and with a community-oriented investment that provides accessible facilities.

The potential impact of this affordable sport on public wellbeing cannot be overestimated; track and field is the fifth most popular sport in the world ranked by 13 factors [1]. Showing global leadership in sport development through an increasing number of events, such as road races from 5Ks to marathons, track and field organizers could increase active sport participation in the US. As track and field remains the number one high school sport [83], educational programs could assist to make track and field a healthy lifelong activity for all people.

There are many health benefits for individuals of all ages who participate in run, jump and throw activities, including exposure to the outdoors, increased cardiovascular fitness, enhanced brain functioning, improved vision and sleep and stress reduction [84]. People who run can live longer, as research has demonstrated running can assist in preventing major chronic diseases such as diabetes, breast and colon cancer [43]. As our study shows, governments at the state and federal levels could be more socially inclusive by providing all citizens with equitable running opportunities, therefore improving public health.

Recognizing challenges in achieving its core objectives of increasing participation and achieving competitive success, this study examines the current state of track and field against an ideal-type global model for high performance (HP) sport development that integrates mass participation [75, 76, 77]. Referencing domestic and global practices, particularly from nations achieving success in sport and healthcare, this could provide information on what might be implemented as “best practice” in the US to advance performance and participation structures, processes and programs [78]. The authors built the model of integrated elite and mass sport development from past research. This formed the foundation of a questionnaire and an interview schedule for USATF coaches and administrators to generate a snapshot of perceptions of the current sport system and possibilities for its further development.

2. Theoretical Framework

The Smolianov and Zakus model developed in 2018 emerged from the integration of instruments that have been used to analyse and compare national elite sport systems [5, 18, 21, 30]. While the previous frameworks focused solely on elite sport, the model used in this inquiry was originally developed in reference to practices in the Soviet Union (USSR), where mass and elite sport were integrated [44, 55, 75]. The model has received scholarly validation [76] and shown to be a framework for program analysis that is not culturally bound. It has recently been utilized for further understanding of many sport systems, including US and Dutch swimming [69, 91], US volleyball [34], rugby [13], soccer [67], tennis [66], ice hockey [59],

and golf [65], as well as Nigerian football [39], Russian swimming [64] and the Zambian national sport system [68].

This study’s theoretical framework builds on the scholarship of Bravo, Orejan, Vélez and López de D’Amico (2012), De Bosscher and colleagues (2006), Digel (2005), Fetisov (2005), Platonov (2005 & 2010) and Smolianov and Zakus (2006), who discussed the foundation of broad sport participation leading to the development of elite athletic performances. Constructs such as affordable access to high quality coaching, facilities and events at both mass and elite levels of participation, as well as training and rewarding all participants based on multi-stage scientifically developed methodologies [25, 38, 44, 51, 85], are recognizable Eastern European practices. A key idea in this process of development from recreation to HP is that of levels of support and policy, identified as macro, meso, and micro, was adapted from Green and Houlihan [29] and De Bosscher and others [18, 19]. Macro-level elements refer in this study to socioeconomic, cultural, legislative, and organizational support for a national sport system by the whole society. The meso-level includes infrastructures, personnel, and services enabling delivery of sport policy. The micro-level consists of operations, processes, and methodologies for development of individual athletes. As the HP elements overlap at different levels [18], the magnitude and hierarchical relationship of the elements are summarized in Figure 1.

When HP and recreational sport are connected, goals of supporting agencies, ranging from fitness to competitive success and commercial objectives, can be achieved [25, 38, 74, 75, 76]. The developed model suggests a globally applicable theory of how to advance high performance sport (programs preparing athletes for nationally and internationally televised competitions) and benefit mass participation (physical education (PE), recreation and fitness programs). This is a significant challenge that faces sport developers due to insufficient conceptual and practical frameworks, often leading to poorly functioning sport systems [28].

The model detailed below is based on the literature mentioned above, as well as the following works of: Bloom (1985); Broom (1986, 1991); Buggel (1986); Clarke (2002); Clumpner (1994); Conzelmann and Nagel (2003); Dallis (2002); De Knop *et al.* (2004); Duffy *et al.* (2001); Gibbons *et al.* (2003); Greenleaf *et al.* (2001); Houlihan and Green (2008); Johnson and Ali (2002); Krüger (1984); Kuper and Sterken (2003); Larose and Haggerty (1996); Nys *et al.* (2002); Oakley and Green (2001); Riordan (1980, 1991); Sedlacek *et al.* (1994); Semotiuk (1990); Sturkenboom and Vervoorn (1998); Van Bottenburg (2000); Van den Berg (2001); Wells (1991).

The micro-level elements one and two in Figure 1 indicate that successful systems for most sports, including track and field, try to identify talent and gradually develop participants into high performers. These follow hierarchical pools of athletes who are rewarded financially and have access to increasingly sophisticated and scientifically based multidisciplinary performance and career and lifestyle support.

Effective functioning of the micro-level requires element three in Figure 1, which includes easily accessible high-quality facilities, equipment and coaching for each age and level of participation. In each community, track and field could be part of a multi-sport hub including, but not limited to, the following: sports share resources; reduced travel time between home, training and school; access to medicine and cultural venues is maximized. Another important condition

for the micro-level is element four in Figure 1. This includes sufficient well-organized competitions at all levels and the integration of commercial tournaments into a plan of amateur competitions to gradually prepare athletes to achieve peak performance at major events. This element also implies that educational, scientific, medical, philosophical and promotional supports (element five in Figure 1) are available at each level of participation. Systems of education, accreditation, scientific and other support systems should be provided to all sport specialists, most importantly to coaches, as recommended by the United States Track & Field and Cross Country Coaches Association (USTFCCCA).

Provision of the meso-level services results from multiple partnerships (element six in Figure 1) who obtain sufficient resources, exchange expertise and achieve common goals to influence the environment of mass and elite sport, particularly mass media, sponsorship and society at large. These are areas in which policies may direct the type and nature of organizations required for a holistic sport delivery system. For a cooperative long-term functioning of all these elements, funding and structures of mass and elite sport systems must be balanced and integrated (element seven in Figure 1). Legislative, ideological, and systemic government inputs contribute to this goal.

Successful sport systems require macro-level societal support and balanced funding of elite and mass sport from many sources, particularly government departments and the nation's Olympic and other sports' National Governing Bodies (NGBs). Training and event infrastructures across all communities, as well as childcare facilities, schools, universities and places of work, should be coordinated to provide a pyramidal system of sport centers accommodating each participation level with a dual goal of maximizing participation and developing excellence. Progressive participant and coach rewards for fitness and elite performance are to increase the number of well-trained coaches at all levels. Subsidization of and incentives for recreational and elite sport ensuring diversity and availability for all are to provide a full spectrum of sport related activities funded for both recreation and HP. If competitive and recreational sport are connected on the above points of development, they can reach goals of supporting agencies, particularly commercial objectives, positive levels of health and fitness, various elements of social capital and community development, success in major global competitions and national pride.

4. Method

Studies reviewed used either predominantly quantitative^[18] or qualitative^[37] approaches, some without a specific comparison frame^[52]. In this study, both a highly structured and open-ended qualitative analysis tools were used. This included a survey of track and field coaches where open responses accompanied structured questions. After collection of the surveys, semi-structured discussions with administrators were conducted to add triangulation to the findings. Lastly, a content analysis of USATF's website and organizational documentation was conducted.

Previous theoretical framework and a comprehensive literature review were used for the development of a 54-item questionnaire. These statements were validated by twelve international experts, including academics who published on HP sport systems and on sport development and executives of sport governing bodies. The questionnaire was delivered online to 2,000 US track and field coaches and 102 surveys

were fully completed for a response rate of 5.1 percent. The sample size and response rate were common for a study of this nature. Similar samples were achieved in the US rugby, soccer, and tennis studies mentioned above^[67, 68, 73]. While the sample does represent a cross-section of track and field coaches at every level, there could be a bias towards those interested in critically thinking about track and field development. Having grass roots experience, most sampled coaches worked with competitive or elite athletes at high school and university levels, which ensured that the respondents were well informed about practices and dynamics of both the mass and elite systems of US track and field.

Survey respondents represented 24 states of the country covering each of the four major areas in the US track and field governance structure: Northeastern, Southeast, West, Central. While 11 percent of surveyed track and field professionals coached beginner/intermediate level athletes; 15 percent coached high school athletes; 37 percent coached Division I, II or III collegiate and university athletes; 6 percent coached masters or adult level athletes; and 20 percent coached elite level athletes. A relatively high proportion of the coaches reported having a bachelor's degree (50.99 percent), with 43.05 percent had a master's degree. In a similar survey among US swimming coaches, only 44 percent of the respondents reported having a bachelor's degree and 21 percent had a graduate degree^[69].

Of those who responded to the survey, 83 percent classified themselves as White, 11 percent of the respondents classified themselves as Black or African American, only 1.25 percent classified themselves as Native American, Alaskan or American Indian and only 5 percent identified themselves as Hispanic, Latino, Hawaiian or Pacific Islander. On average, respondents were 43 years of age and had 22 years of coaching experience. Of those who responded to the gender question 19 percent were female and 81 percent were male.

Survey instructions asked respondents to think about the current structures and systems of track and field in the US and to indicate how often the elements and practices were evident, from "never" (1) to "always" (5), on a Five-Point Likert Scale. They were also asked to elaborate on their responses through open written comments. Finally, semi-structured telephone interviews with thirteen regional administrators were conducted to gather further information regarding the challenges and advancement of US track and field. The interviews were based on the seven elements of the model.

5. Results

Survey responses are presented as both average scores and aggregated percentages of perceived current practices. Aggregated percentages of responses allow appreciation of the distribution of coach responses.

5.1 Element 1: Talent Search and Development

This is one of the most important areas for improvement: as can be seen from Table 1. Almost half (49 percent) of respondents had overall negative perceptions regarding this element and only 16 percent were positive. Eight out of ten items in this element within Table 1 (practices one, three, five, six, seven, eight, nine, ten) had more negative than positive perceptions revealing a shortage of well-educated and properly paid coaches who are able to attract and nurture track and field talent on mass scale. A significant challenge within the USATF system relates to coach competence. Seventy-seven percent of respondents indicated that coach expertise is never or rarely high across all participant ages and levels.

More than 40 percent of the respondents overall were uncertain of or not familiar with talent identification and development practices, particularly methods of introducing children to track and field from outside the sport's participation base. These results are not surprising as talent in US track and field is mostly identified through school and college competitions supported by the RJT program.

From 80 open responses on this element, 80 percent were related to expense issues, particularly expensive coaching and lack of training opportunities, while 19 percent connected the athlete attraction, retention and development problems with the lack of the sport's media exposure. As summarized by Coach 84: "The highest level of expert coaches rarely have anything to do with the athletes at the earlier stages of development. Many potential 'superstars' have already dismissed themselves from the sport before these experts get to work with them. Also, track and field in the US is only prominent during the Summer Olympics, ten days every four years. More TV programming is occurring, which is a move in the right direction, but all Diamond League meets, US Championships, and World Championships need to get more TV exposure."

Significant concerns arose in interviews with administrators, one of which is regarding the ability to pay coaches full-time salaries. Administrator J noted: "More emphasis on the developmental side of coaching and the opportunity for high school athletes to transition to the college and career levels. High schools are usually overlooked on the international level when opportunities arise because of lack of experience." Another concern was the lack of clear focus on the development of track and field. Administrator A said, "We need to make coaches Level 1 training more accessible. Many coaches are under trained. Volunteers are good, but they need to have good leadership and organizational skills to coach or assist."

5.2 Element 2: Advanced Athlete Support

While Table 2 shows that there were more negative (34 percent) than positive (20 percent) responses overall, the statements in this element received highly polarized ratings. Items six and seven within Table 2 indicated successful medical and doping control practices in servicing elite track and field athletes. Practices one, three and eight within Table 2 received the most negative responses in this element, reflecting lack of educational and career support, as well as need for more individualized lifestyle plans for physical and psychological health. Commenting on these items, Administrator A said: "Good counseling and mental health needs to be provided for the athletes... Having partnership by providing the athletes' flexible part-time work is good for their experience and support. It would be good to have more administrative, technology and financial jobs instead of Home Depot jobs."

More than half (54 percent) of the 39 coaches who provided open responses on element two agreed that more funding and personnel support is needed. Coach 96 said: "The accessibility to training knowledge at reasonable costs makes it difficult to acquire new knowledge. Groups such as the USATF and USTFCCA try to provide educational opportunities, but also emphasize live sessions that are only offered a few times a year and when travel costs are around \$1,000-2,000 per year, this is a limitation on a sport driven by low pay for coaches and volunteers. Web-based programs may limit coach-to-coach interaction, but would greatly improve accessibility and drive greater improvements in the sport. We are also held back by tradition. Many coaches

simply repeat what they did and hope for similar success rather than actually taking the time to learn the science behind the planning. There are new online platforms and methods that provide more interaction which should be provided to US track and field coaches." Also, in response to this, Administrator C said: "For collegiate athletes, the institutions should provide them with the proper education and life skills... Athletes should be taught to create their own plan..."

5.3 Element 3: Training Centers

Table 3 shows that four times more respondents (44 percent) were negative than positive (10 percent) regarding track and field facilities in the US. Within Table 3, element three had one of the lowest rated practices with 60 percent of negative responses, especially in statement three, which relates to training centers' affordability.

This issue is not as much of a problem for elite athletes, who according to statement one, are provided with priority access to high quality equipment and facilities, but it prevents many participants from becoming competitive athletes. Coach 17 expressed the common issue: "Training centers are expensive and not readily available to upcoming athletes." Coach 22 also summed other respondents' views: "Training centers are a waste of USATF money. More could be accomplished if athletes were able to receive support to use their collegiate facilities and services. The current two training centers are not enough to aid but a few elite athletes that use them. They are also located in isolated areas that are not as accessible as a place in a large metropolitan area."

Item seven within Table 3, with 43 percent of negative and only 8 percent of positive responses, indicated that track and field training centers should be located closer to other sport facilities so that athletes participate in and learn from other sports. Administrator A said: "...USATF can actually provide housing for these athletes and train year-round with schooling provided." This response indicated the administrators' knowledge of how best sport clubs and governing bodies worldwide build partnerships with nearby schools, colleges, and universities in order to provide all the necessary infrastructure around training facilities. This has also been detailed by Ridpath and others^[54], where centralized training centers in the US could be made more efficient and productive in reaching the masses of track and field participants. Lowering the cost of participation for the middle and lower classes was the main theme of open responses to this element; out of the 43 open responses, more than half were about funding and availability of training centers.

Given the number and spread of track and field facilities across geoclimatic zones of the United States, it is paradoxical that items six and seven in Table 3 had 42 percent and 43 percent of negative responses respectively. Obviously, cooperation among clubs and their training centers can improve, which could be better lead by USATF. When talking about statement seven, Administrator A said, "...Club charges are not connected to any fees that USATF charges. With USATF club membership and individual membership, general liability and insurance for practice and sanctioned events are provided." Administrator C suggested that all national, regional and local training centers should be available to athletes at affordable costs with the governmental support in the US, saying that, "...track at the youth level should be based on participation and not viewed as a specialized sport..." and that "...we should grow the sport at the youth level to the best of our abilities and better support our national and Olympic athletes."

5.4 Element 4: Competition Systems

Responses about this element were quite uncertain (44 percent being neutral) and more negative (36 percent) than positive

(19 percent). The main concern regarding the competition system according to 36 percent of coaches was USATF and its support mechanisms do not sufficiently assist in local and developmental events. Coach 49 provided an indicative answer: "Unless there are open sections of collegiate meets it is very difficult for post-college athletes to find sufficient meets to participate in." Coach 40 agreed: "USATF is concerned mostly with the very young athletes and then the most elite. There is not much support in the middle ranges." If track and field wants to expand and become more of a well-known organization, they need to start becoming more available for all athletes not just certain age ranges." However, are these realistic given limited financial resources? Administrator F believed so: "Money from income collected at the elite level is not evident in amateur competitions." Coach 84 agreed and suggested: "If some of sponsorship from big events (i.e. national championships, etc.) was saved for lesser competitions, these lesser events would have a higher chance for success, thus more of them could take place and more competitors could participate, so more chance of the best athletes staying in the sport and progressing would be greater."

This element's statement with the highest neutral responses (59 percent) was regarding event sponsorship incomes used to develop competitions for all participation levels, indicating that more than half of responded coaches do not know or are blase about this practice. Coach 53 stated: "We need more sponsorship and opportunities to compete for emerging elite athletes." Administrator G responded: "There is not much sponsorship money coming from the youth leagues, there just isn't any interest for that small of a target market."

5.5 Element 5: Intellectual Services

This is another element with divided responses (23 percent positive, 28 percent negative), where best practices and methods need to be better shared and promoted across the country. The most critically viewed aspect (only 9 percent positive, 38 percent negative) was that all specialists engaged in the development of track and field are well educated for their roles (item one in Table 5). The related systemic issue indicated by respondents (38 percent negative, only 19 percent positive) was that research results are not well communicated to coaches (item four in Table 5), particularly at the development level. As indicated by Coach 69, they believed that "the governing body focuses on the elite and Olympic athlete more than the grassroots level... and that there are segmented evidence-based coaching guidelines for grassroots, schools, and college" without the necessary pathway from recruitment to excellence. Better delivery of research results is needed through innovative educational programs and publications, as the actual research was indicated to be fostered by USATF on all important aspects of track and field development (35 percent positive versus only 14 percent negative for item two in Table 5).

However, coming from a high school perspective, Coach 63 said: "Very seldom do I witness the USATF actively trying to foster the types of things in this section. If one would consider age group money grabs by the USATF as a way to foster love of our sport I would disagree. Even at the age group level, USATF and AAU are all about how many entries they can get and not about developing athletes and providing for those athletes who have separated themselves from the competition."

Coach 50 agreed with the other respondents: "Need a better system for coaching education, especially for youth coaches. There are no required certifications for high school coaches or younger. Not even college. Some coaches are good. Some figure it out. Others are stubborn and obviously have no clue what they are doing." Administrator E confirmed: "Specialists

are not always on the same page and thus can end up actually hurting the sport." Administrator A suggested to better use the existing resources: "...a rigorous official's certification and training program in each association, including young official grants are available from the officials committee. The grants are 500 dollars for up to fifteen young certified officials to gain experience and mentor a master or national official. Officials ensure that the sport of track and field, long distance running, and cross country, are safe [and] competitions are fair and professional."

5.6 Element 6: Partnerships with Supporting Agencies

Much improvement is needed in communication and coordination of all possible partners contributing to US track and field development: Table 6 demonstrates this element is divided amongst respondents; 42 percent negative, 14 percent positive, 45 percent of neutral views. Items one and six within Table 6 had the most negative responses, indicating that there is no support for track and fielding development from various levels of government and there is little media coverage of track and field events. Administrator A expressed concern: "All the above need vast improvement. The government does not promote fitness and health as it should. The RJT program is USATF's a good launch for the past three to four years and the children are appreciating it. Unfortunately, the downsizing of physical education and credentialed physical educators are hurting our society and causing a blind spot for potential athletes to be recognized due to no programs. That is why the club system is so important. We need to identify volunteers willing to be trained as coaches and are passionate about development. That is why the associations, all 57, must market and make these opportunities available to the schools." Administrator I stressed the importance of supporting track and field by educational sector: "Not only track and field but any sports can help any athlete improve their academics in school."

Item three in Table 7 had 37 percent of negative and only 13 percent of positive responses on whether the roles of club and community programs in track and field development were sound. Administrator C suggested: "I believe those involved in the track and field community are strong supporters. However, the base number of those involved and supporting USATF currently is smaller than desired. We need a way to more widely broadcast track meets to a larger audience to grow the fans and support of the sport." Better local and national partnerships with media organizations seem to be as important for track and field as closer cooperation with other sports, as suggested by Administrator C for further growth of the sport: "There is a current decline in youth football and track could be the sport where they land if there is opportunity. Track is a relatively safe environment for athletic participation. Promoting to the parents of youth athletes is key."

5.7 Element 7: Balanced and Integrated Funding and Structures of Mass and Elite Sport

Table 7 statements were overall perceived negatively by 40 percent and positively by 19 percent of the respondents. This element reflected some of the most positive and negative aspects of track and field development. The sport has great potential to positively influence national well-being, as track and field participants are viewed diverse as general population (statement eight in Table 7 with 69 percent of positive responses). However, the three statements with zero positive responses in Table 7 indicate lack of economic support of the sport so that all social classes could benefit from it and make the country healthier. USATF is not seen to be effective in fostering both mass participation and high performance and in developing track and field athletes on every level.

While the USATF revenue (together with mass participation, membership and Olympic performance) has been growing in previous ten years, about three quarters of the expenses in 2016 to 2017 year benefited elite participants^[86, 87]. The increasing revenue could benefit both the masses and the elite through a better coaching education and expanded RJT program. One of the most critically viewed aspect (item five in Table 7 with 67 percent of negative responses) was that specialized sport schools, similar to IMG academies, are not available and affordable to all talented athletes. Networks of such public schools-colleges are the backbone of the Chinese, Russian, and other HP sport systems, which provide education, room and board and all sport related services for free in each region and province to athletes with potential of representing the country. Coach 102 had a strong stance on this issue: "USATF does fairly good work with elite level athletes. I say fairly because it does not help sponsorships and gives minimal financial support to athletes. Grassroots is hit or miss... The middle-aged children (middle and high school) are caught between USATF and school events, with the majority participating in school events. Again, at that level, I don't think the USATF needs to be involved, especially if it diverts resources away from the junior and senior national programs."

Coach 57 agreed: "USATF's focus on elite, podium possible athletes narrows the focus way too much. Funding is so focused on the podium athletes that we lose out on the next tier, which is a massive amount. USATF depends on the college and high schools to develop elites instead of helping develop the pipeline. They just wait for elites to show up." Administrator C voiced a possible solution: "I believe statements one and three are examples of the governmental support in the US. These seem to be small adjustments for a select few that could better develop our most elite athletes... Track at the youth level should be based on participation and not viewed as a specialized sport. We should grow the sport at the youth level to the best of our abilities and better support our national and Olympic athletes." Another best international practice which could be better implemented to positively influence both HP and mass track and field and national health is reflected in item six in Table 7 (64 percent of negative responses), a multi-stage system of elite track and field qualification could be integrated with a system of fitness tests for mass participation.

6. Discussion and Conclusions

While the analyzed literature and data showed that US track and field has great potential for improving both international success and national health due to the mass appeal, variety of disciplines and the unique features of the sport allowing anybody achieve competitive success if coached well^[32]. The dominant message from this study was that sufficient public and private resources are still to become available for systematic and fair development of US track and field participants. Respondents proposed improvements to most aspects of the current practices, as only one of the seven elements of this investigation, the intellectual services, received an average score of three on a five-point scale while other elements had lower scores. Throughout all seven elements, the coaches' responses consistently demonstrated that more funding is required for sufficient key provisions, from coaching and athlete development methodologies, to facilities and competitions and promotion for the sport, particularly for mass participation.

At the micro-level, responses indicated that there is need for better qualified coaches particularly at earlier ages and levels of participation. The guidelines for lifelong fitness and health given to coaches and taught at school should include the different track and field disciplines with requirements in

running, walking, jumping and throwing, as detailed by Smolianov and Smith's study in 2019. Australian and Eastern European methods of talent search at schools are starting to appear in the US, together with the Eastern European long-term athlete development guidelines in the form of the American Development Model (ADM)^[73]. Some of the most comprehensive coaching textbooks (e.g., Matveev; Platonov)^[44, 52] are still to be translated into English, while Australian and Canadian coaching methodologies and training systems could be better understood and exploited.

To advance athlete support, the benefits of training and systematic rewards should be extended to less experienced athletes. Most of the current support track and field athletes receive is based on which university a student-athlete attends. This should be more the responsibility of the US Olympic Committee and the USATF, especially the post-career transition utilizing International Olympic Committee-Adeco resources in partnership with universities and employing organizations on national and local levels, providing paths similar to what is offered by the military in most successful sport nations and the US Army where athletes receive education and training for a broad variety of professions and receive support for part or full time training and competitions. Smolianov and colleagues, Reid and colleagues and De Bosscher and colleagues^[17, 53, 73] agree that we could learn from successful, particularly small sport nations, to allocate resources more effectively to talent development and personalized athlete support. US coaches, with help from sport scientists and advisors, can advance best international athlete training, education, and employment methods, particularly athlete care practices from Eastern Europe, France, and Germany, providing, for example, individualized parametric training^[78] in addition to periodization. The USATF could show national and global leadership in mass athlete services, which benefit national health by further expanding long-term athlete development guidelines as part of the ADM currently created for all sports under the US Olympic Committee. This is further developed by Fitnessgram physical testing programs currently spreading across the US schools and internationally.

The ADM for all sports integrated with Fitnessgram could integrate track and field test exercises and recommended performance results for each age from six to over 70 years old, as recommended by Matveev and Smolianov and Smith^[44, 71]. The 2017 Aspen Institute Project Play Report stressed that there are over 120 sports played in the US but children who show potential are focused on one sport while other children are excluded. Higher number of sport options will encourage more athletes for life. All track and field disciplines should be offered to participants as part of physical education, fitness tests, and after school. Also, children should not overdo activities, where age appropriate programs with simple local facilities are needed^[54, 80], which is particularly easy to provide for track and field and could be led by USATF.

At meso-level, respondents agreed that training centers are too expensive or the requirements to join are so high that only few meet the standards. This is supported by 2017 The Aspen Institute Project Play Report that schools should open their playing fields and facilities, particularly in evenings, weekends and summer months. Using best practices of integrating facilities and services at multi-sport schools and colleges in China and Russia^[9] and at IMG academies in the US, USATF could help better connect clubs, schools, universities, community centers, and commercial partners for further advancement of mass and elite track and field. Fostering public-private cooperation to develop programs at underutilized public schools, parks, and sport and recreation facilities has great potential for more effective and efficient

use of tax and donation dollars, as described by Pennington in 2009 to be used across the country.

The most important advancement of intellectual services is to provide better education to more coaches. Good coaches decrease anxiety levels while increasing self-esteem, thereby prolonging an athlete's career. A lower percentage of kids who played for trained coaches quit the following year, compared to 26 percent for untrained coaches [80]. All participants should be provided with access to high quality instruction, advancing practices of Finish schools where all teachers have master degrees and from sport schools growing across the world in Australia, Canada, United Kingdom, China and Russia, based on the best practices of the former Eastern Bloc countries detailed by Riordan, Smolianov and colleagues [55, 56, 73] for coaches to have master degrees specializing in their sport. For this, US coach education and certification should be more accessible, affordable and required from beginner level participation.

Coaches and administrators were quite critical about competition systems. Instead of developing events at all levels and making them more commercially attractive, major tournaments supporting charities with questionable effects on mass participation and health in the US, to make the nation healthier and more productive and competitive, interschool track and field events should allow all to compete and should be integrated with multisport local and state games involving millions of additional participants. The organization of many events should be improved, including better communication through different mediums that attract mass participation and a specific structure to its meets. Most importantly, sponsorships dollars from big events are to be used for 'lesser competitions' where more competitors could participate. Progressive exemplary practices include New York City's free swimming tournaments among districts for which all desiring youth can join at no charge for coaching and facility use [66], or the Road Runners Club of America's Kids Run the Nation Program, which are running programs offered to schools, before and after school programs, community centers, homeless shelters, nonprofits and other organizations that serve youths and are interested in establishing a youth running program [55].

At the macro-level, partnerships with supporting agencies, particularly public funding, could be improved. Research

results are available to convince elected officials and government departments to devote sufficient resources to such mass and healthy sport as track and field. For example, by providing tax and other financial incentives for the development of the sport through the ADM and school physical education, this could save healthcare costs [23, 34]. USATF could join such initiatives as the Sports and Fitness Industry Association lobbying to increase the PE budget nationally [62], which is only 764 dollars a year per average US school, and to pass legislations that will allow Americans to use Pre-Tax Medical Accounts for physical activity expenses, particularly for track and field. Public-private track and field partnerships such as the Partnership for a Healthier America (PHA) [88] and outreach programs, such as RJT, should be offered at more locations. Again, the instructors of these programs should be paid professionals who are serious about coaching. Track and field should be promoted more in educational systems to advance it as a primary sport. The funds are usually available but go towards more popular sports, leaving underqualified coaches running track and field programs in schools.

Funding and structures of mass and elite track and field could be better balanced and integrated. Programs should be better designed to reach city youth and other impoverished areas to better diversify participants. Overall, there should be more focus on providing opportunities to athletes from lower income families. Findings from this study suggest working with IMG-type academies in order to allow more financial flexibility and possibly propose programs accepting financial aid recipients, so that participants from different demographics are able to learn the sport. Again, the PHA [88] can serve as exemplary practice of providing free track and field services to diverse participants connecting mass and elite sport for both performance and well-being of everyone. In the US, a more efficient and fairer sport system which fully benefits national health can be developed through greater, more transparent and more accountable allocation of moneys, including continuous public and private support, grants, and tax deductions.

Tables and Figures

Table 1: Talent Search and Development

Distribution of Responses				
Desired Practices	Average Score	Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. Young track and field athletes are trained based on clear guidelines for multiple development stages recommended by USA Track and Field (USATF) (many national governing bodies (NGBs) have guidelines for nurturing athletes from the introduction to sport through the achievement of peak performance on to retirement from sport, USOC encourages and helps all its NGBs to implement such guidelines as American Development Model).	2.8	34	45	21
2. In addition to being introduced to track and field by themselves and parents, potential track and field athletes are attracted from outside the sport's participation base (e.g., by a search at schools).	3.1	16	57	27
3. Sufficient resources (coaching, facilities, equipment, cash, etc.) are available collectively from various supporting organizations for all young talented track and field athletes to progress through all developmental stages.	2.4	62	33	5
4. A multi-stage system of athlete qualification based on results/ranking within age groups is used to reward track and field athletes progress from beginner to top international level.	3.1	25	40	35
5. Performance of track and field athletes in each competitive age group is monitored and developed using a national database.	2.9	33	37	30
6. A high number of full-time track and field coaches are available making the athlete-coach ratio low	2.0	77	18	5
7. Track and field coach expertise is equally high across all participant ages and levels	2.0	77	23	0
8. Track and field coaches are paid according to multi-level certification based on coaches'	1.9	80	17	3

education and achievements of entrusted athletes.				
9. Track and field athletes with potential to represent the country (e.g. nation's top 100 athletes per age group) are offered the conditions to train full time with high performance standards	2.4	57	32	11
10. Track and field training is well integrated with school/college/university education for harmonious/well-balanced development of athletes	2.9	29	45	25
Across all items in element (N=102)	2.6	49	35	16

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

Table 2: Advanced Athlete Support

Distribution of Responses				
Desired Practices	Average Score	Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. Athletes, including track and field athletes, are supported at places of work similar to those at companies such as Hilton or the US Army where they are given paid time to train and compete.	2.4	53	41	5
2. High performance track and field athletes are ranked into hierarchical levels/pools with appropriate financial and technical support.	2.9	33	45	22
3. Athletes are assisted with formal education and career outside sport by clubs, state and national track and field governing bodies, USOC and/or sponsors.	2.4	52	44	4
4. Athlete support is well shared/balanced between coaches and advisors (e.g., coach may provide psychological, nutritional and performance science support, while independent advisors may best assist with medicine, career, education and personal finances).	2.7	34	56	10
5. Scientific research (e.g., biomechanics of athlete movement and psychophysiological analysis) is applied quickly and effectively to immediately benefit athlete performance.	2.9	30	52	18
6. A track and field career is prolonged by medical personnel knowledgeable in track and field (helping with such things as injury prevention, adjustment of training levels, nutrition, pharmacology, rest, and stimulation therapy, doping use prevention).	3.3	18	44	39
7. Doping is controlled by the USATF and is based on the most recent guidelines from the World Anti-Doping Agency.	4.0	6	34	60
8. Athletes leaving elite sport are provided with individualized lifestyle plans for physical and psychological health.	2.1	49	50	1
Across all items in element (N=102)	2.8	34	46	20

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

Table 3: Training Centers

Distribution of Responses				
Desired Practices	Average Score	Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. High performance athletes are provided with priority access to specific high-quality equipment and facilities	3.3	20	53	27
2. Training centers provide specialized facilities and equipment for each age and level of participation.	2.6	46	46	9
3. All national, regional and local training centers are available to athletes at affordable costs.	2.3	60	38	2
4. Travel from home to training facilities takes little time for USA Track and field athletes of all levels and types.	2.3	57	37	5
5. Training facilities are close to all facilities for athlete support (e.g., school/college, medical, room & board, leisure/entertainment).	2.6	37	52	11
6. An organized network of training centers is used to prepare USA Track and field athletes in different environments/sociogeoclimates (e.g., high altitude/temperature/humidity, city/pollution, rural/resort).	2.5	42	48	10
7. Track and field training centers are located close to other sport facilities so that athletes participate in and learn from other sports.	2.4	43	49	8
Across all items in element (N=102)	2.5	44	46	10

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

Table 4: Competition Systems

Distribution of Responses				
Desired Practices	Average Score	Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. Hosted international events and international opportunities are sufficient for all athletes with potential to represent the country.	2.7	44	35	21
2. Competitions are well structured at all levels (e.g., club/training center, regional, and national).	2.8	33	45	22
3. USATF and their support mechanisms sufficiently assist in local and developmental events.	2.6	45	43	13
4. USATF attempts to integrate professional and amateur tournaments into a progressive plan of competitions gradually preparing athletes for peak performance at "Elite events" (i.e. Olympic Games, USATF Championship Series, US Running Circuit, Team USA events, and more).	2.9	32	39	29
5. USATF tries to coordinate all domestic and international competitions for all ages and levels, between and within all possible organizations.	3.0	26	46	28
6. Event sponsorship incomes are used to develop competitions for all participation levels.	2.3	38	59	3
Across all items in element (N=102)	2.7	36	44	19

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

Table 5: Intellectual Services

Distribution of Responses				
Desired Practices	Average Score	Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. All specialists engaged in the development of track and field are well educated for their roles - from grass roots volunteer instructors to high performance managers, coaches, referees, physicians, nutritionists, psychologists, etc.	2.7	38	53	9
2. USATF fosters research on all important aspects of track and field development (from training methods and nutrition to event and facility management).	3.3	14	51	35
3. Principles of sportsman like conduct and Olympism are communicated well (e.g., through mass media, school education, and through the arts as part of track and field events).	3.1	21	52	27
4. Research results are well communicated to coaches (e.g., by research institutes, universities, USATF).	2.8	38	44	19
5. Communication by the USATF contributes to national values and identity by inspiring participants to strive for excellence, to show the best results and character in the world.	3.1	20	53	27
6. USATF provides vision and leadership in improving all aspects of the participants' wellbeing through track and field (e.g., physical, social, emotional, mental, spiritual, and environmental/ecological).	2.8	38	39	24
Across all items in element (N=102)	3.0	28	49	23

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

Table 6: Partnerships with Supporting Agencies

Distribution of Responses				
Desired Practices	Average Score	Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. Support for track and field development is adequate from various levels of government.	2.0	72	27	1
2. Sufficient help is obtained from USATF and other national governing bodies of track and field that provide coach education and certification.	2.9	29	47	24
3. Role of clubs/community programs in track and field development is sound/strong.	2.7	37	49	13
4. Track and field is well supported by educational sector (e.g., schools, colleges, universities).	3.0	29	43	28
5. Cooperation with agencies outside of sport industry (e.g., medical, scientific, military, philanthropic and sponsoring organizations, lotteries) is in place.	2.6	40	55	5
6. USATF influences media coverage and popularity of track and field to increase support from the society.	2.5	42	44	8
Across all items in element (N=102)	2.6	42	45	13

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

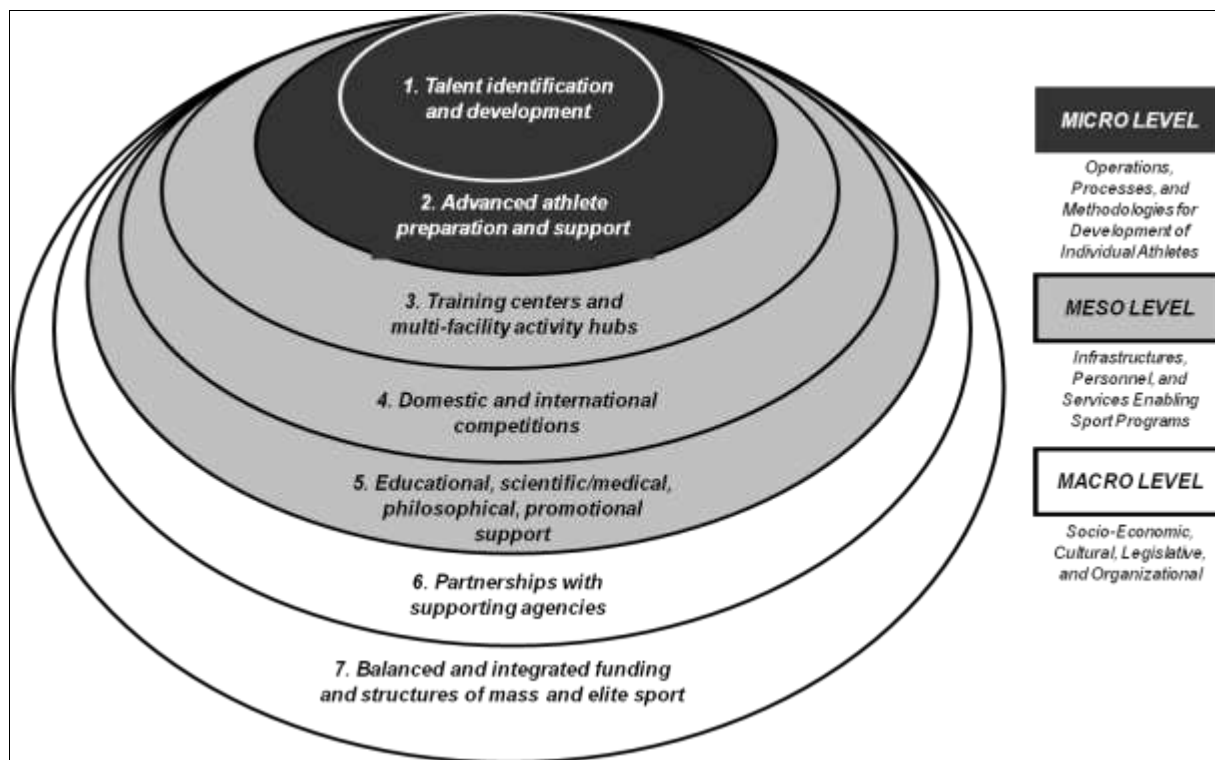


Fig 1: Ideal-type Model of Integrated High Performance and Mass Sport Development

Table 7: Balanced and Integrated Funding and Structures of Mass and Elite Sport

Distribution of Responses				
Desired Practices	Average Score	Negative Perceptions* (%)	Neutral Perceptions* (%)	Positive Perceptions* (%)
1. Corporate and philanthropic tax incentives provide sufficient support of mass and elite track and field.	2.0	49	51	0
2. Participation in various sports, as a foundation for track and field development, is encouraged through physical education requirements.	2.6	47	43	10
3. Sport participation, including track and field, is rewarded with reduced personal tax.	1.3	59	41	0
4. Track and field programs service both recreational and high-performance athletes.	3.3	19	42	39
5. Specialized sport schools similar to IMG academies are available and affordable to all talented track and field athletes.	1.9	67	33	0
6. A multi-stage system of elite track and field qualification is integrated with a system of fitness tests for mass participation.	2.1	64	28	8
7. Memberships and other "fees" affordable for all are available in various track and field clubs.	2.9	25	51	24
8. Track and field participants are diverse as general population.	3.9	12	19	69
9. USATF demonstrates systematic/strategic management in developing track and field athletes on every level.	2.5	45	42	13
10. USATF is effective in fostering both mass participation and high performance in track and field.	2.7	39	46	16
11. Track and field is developed in integration with Olympic and Paralympic sports to achieve sustainable competitive excellence.	3.2	19	54	27
Across all items in element (N=102)	2.6	40	41	19

*Note. Possible scores on questions range from 1 to 5. Negative Perceptions is an aggregation of '1 = never' and '2 = rarely' responses. Neutral Perceptions is an aggregation of '3 = sometimes' and 'Do not know' responses. Positive Perceptions is an aggregation of '4 = often' and '5 = always' responses.

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