



Sports events: crowd dynamics and relevance in the context of the COVID-19 pandemic | Fact-sheets collection from the Portuguese COVID-19 pandemic Task Force on Behavioral Sciences

Osvaldo Santos^{1,2}, Margarida Gaspar de Matos^{3,4}, on behalf of the Portuguese Task Force on Behavioral Sciences⁵ for supporting health policies in the context of the COVID-19 pandemic

¹ Laboratório de Comportamentos de Saúde Ambiental (EnviHeB Lab), Instituto de Saúde Ambiental da Faculdade de Medicina da Universidade de Lisboa, Portugal

² Unbreakable Idea Research, Painho, Portugal

³ Supportive Environments for Individuals' Lifespan Development Research Group (RG2), Instituto de Saúde Ambiental da Faculdade de Medicina da Universidade de Lisboa, Portugal

⁴ Aventura Social, Lisboa, Portugal

⁵ Mandated by the Portuguese Health Minister from March 19th to December 31st 2021

Corresponding author: Osvaldo Santos | osantos@medicina.ulisboa.pt

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Abstract

Cultural and sporting events hold significant social value, promoting cognitive, emotional, and interpersonal skills. The COVID-19 pandemic has disrupted these events, necessitating a careful examination of safety conditions for their resumption. This policy brief summarizes evidence on safety predictors in organizing large-scale sporting events, focusing on crowd dynamics and relevance in the context of the pandemic. Emphasis is given to the importance of understanding crowd behavior, noting that violent behavior is an exception rather than the rule. Various factors need to be considered for promoting public health safety in the pandemic context, including the nature of the sport, spatial organization, and socio-demographic characteristics of the audience. Key recommendations include maintaining physical distance, organizing outdoor events, and perceiving crowds as compositions of smaller groups with shared social identities. Clear communication, consistent messaging, and involvement of informed individuals to guide crowd behavior are also crucial. Mega-events can be used to promote COVID-19 health behaviors and for enhancing collaborative actions among various stakeholders, including government bodies, sports organizations, and the media, to ensure the safe sporting events

Keywords: COVID-19, crowd dynamics, sporting events, public health, behavioral science.

Introduction

Cultural events (such as different forms of art, debates, sports events, etc.) represent moments of high social value that, in addition to the entertaining and economic dimensions that are naturally associated with them, also promote the development of cognitive, emotional and interpersonal skills.

The current focus on public health and pandemic control has prevented their realization. The return to holding these events requires in-depth reflection on the safety conditions in which they may take place, necessarily circumstantiated by epidemiological risk scenarios and the inherent difficulty of maintaining physical distance in large groups of people. On the other hand, the potential of these events as an opportunity for the promotion of mental health and health

behaviours related to COVID-19 should also be considered, since moments of pleasure are associated with facilitated learning processes (Tyng et al., 2017).

This document summarizes the evidence on safety predictors in the organization of large-scale sports events (i.e., with high concentration and movement of people).

Relevant pieces of knowledge for public health action

- During large-scale group events (crowds; notably sports events), the occurrence of less normative behaviour, such as violent or confrontational behaviour, represents an exception and not the rule (Barrows, 1981; Jetten et al., 2021). Even in cases when disturbances occur, the displayed behaviours carry a relevant social meaning (i.e., they are not a consequence of the loss of “collective consciousness”; Davis, 1973; Jetten et al., 2021). Within the group, individual behaviours strive towards mutual assistance and cooperation, either towards individuals perceived as belonging to the same group or towards individuals pertaining to other groups, as long as intergroup behaviours are perceived as mutually fair and appropriate.
- Sporting events with high concentration of people (derbies, final phases of competition between clubs or selections), have impact (and depend) on multiple determinants and societal actors, including (Challenger et al., 2009): nature of sport (with football assuming a distinctive role in Europe, namely for its mediating role and the complexity of economic interests involved), spatial typology and organization, security forces involved, stewards, transport networks, emergency medical services, tour operators, athletes, socio-demographic, cultural and linguistic characteristics of the audience, commercial operators in the immediate vicinity of the event, among others, with which it is important to facilitate an interactive and integrated discussion in the planning of the safety and public health promotion processes before, during and after the event.
- The definition of a crowd depends on the number of people and their spatial distribution within a given period of time (density), as well as the motivations that foster their grouping (Challenger et al., 2009; Department of culture, media and sport, 2009). During sports events, an adequate people density is estimated as no more than 47 people per 10 m², when the audience remains in place (for example, seated); in cases when the audience can move, the density should not be higher than 40 people per 10 m². Furthermore, group behaviour depends on several determinants of public health and safety including, among other determinants (Berlonghi, 1995; Challenger et al., 2009; Reicher, 2001): socio-demographic diversity of the crowd, emotional intensity of the event, location and physical/spatial conditions of the event (circulation and gathering spaces), type of crowd mobilization (speed, crucial moments - ticket purchase, entry/exit for the game), time of day and duration of the event, weather conditions, type of sport (again, highlighting football as a special phenomenon compared to other sports due to the involved magnitude of interest and emotionality). Safety at these events, in terms of public health, depends on the contextual and epidemiological scenarios, such as the COVID-19 pandemic, in which case the focus should be placed on maintaining physical distance between members of the crowd – a desirable minimum of two meters between individuals not having close relationships; and, with preference, towards organizing outdoor events.
- Crowds attending sports events should be perceived as a composition of several “small crowds”, each of which can be considered to have its own ‘personality’ (Berlonghi, 1995) or its own shared-social-identity (Reicher, 2001).
- A scarce amount of studies focus on the behaviour of large groups (crowds) (Challenger et al., 2009). Several predictive models explain the individual behaviour in a crowd: the classical models (with little supporting evidence, however still very influential in current crowd management planning, particularly in sports) proposed the concept of de-personalization of the individual when in crowds,

with a displayed tendency towards less ethical conduct and inappropriate behaviour (antisocial, behaviour that carries risk for oneself or for others) (Le Bon, n.d.); the contemporary models (of shared social identification, with greater evidence), do not consider crowd behaviour as abnormal or pathological, but as determined at the individual level through the perception of group norms and identification with the (sub)groups that constitute the crowd (Reicher, 2001). Therefore, an individual who is part of the audience at a football match (for example) can identify herself as a club fan (expressing the processes of belonging, and loyalty to the club), while at the same time maintain the identity to the accompanying subgroup to the event (e.g., family members), or professional group identity for the workplace (Reicher, 2001). According to this model (Reicher, 2001; Turner, 1983), when the individual integrates the crowd, the individual identity is not lost (opposed to what is stated by more classical models); only the shared social identity is adopted (in addition to the individual identity), with individual decisions being determined by norms and values of the group(s) to which the individual belongs (in-group effect), as opposed to the norms and values of the group(s) to which the individual does not belong (out-group effect; e.g., fans of another club or police forces).

- The actions of the Portuguese security forces at the 2004 European Championship have been used as a reference worldwide, acting in alignment with the principles of shared social identification (Hogget, 2009): throughout the duration of the sports event, the Portuguese police force sustained the fans perception of the legitimacy for their actions, which resulted in a process of self-surveillance on the part of the fans. Instead of confronting fans, security personnel limited themselves to regularly patrolling the areas where fans gathered and engaged in friendly interactions (minimizing the in-group/out-group normative differences).
- The presence of informed individuals (or with a mission to lead group behaviour) within crowds

influences the way the crowd behaves (where it moves, how it moves, with what intentions, etc.) more effectively, than when positioned on the periphery of crowds (Dyer et al., 2009; Leca et al., 2003). Certain experimental studies suggest that in order to promote the adoption of a social norm (and hence group behaviour), the ideal proportion of informed individuals inserted in the crowd needs to constitute 25% (Centola et al., 2018).

The Portuguese context: highlights from individual in-depth interviews with experts on sports events organization

In addition to the narrative literature review that underpins this policy brief, four individual in-depth interviews were conducted to tailor the evidence to the Portuguese context. The interviewees were recognised specialists in exercise science, sports practice, and sports-event organisation. These unstructured interviews focused on the theme *“Organising sports events in the context of the COVID-19 pandemic.”* Thematic analysis of the interview transcripts yielded the following key insights:

- Mega-events (sports, musical, etc.) carry a relevant social and economic significance; by limiting the realization of these types of events in Portugal, the trend of travelling to other countries is promoted (i.e., travel with increased risks of contagion).
- This type of event can be used as a strategy to promote COVID-19 health behaviours, either through the dissemination of event-related health messages (athletes/artists promoting these messages) or through branding messages (e.g., *“I always play to win: in sports and in health”*).
- There is an overwhelming dissatisfaction among sports fans related to the restrictions in audience numbers during sports events (compared to other types of cultural events); According to the opinions of the interviewees, this disparity signals that sport is not considered as a cultural activity, even though it obviously is.
- Sporting events bring together people with very different characteristics, predominantly younger people (mainly up to 30/35 years old) who, due to their age, have a lower capacity to regulate the

emotions that are naturally activated by sports competitions; this combination (younger population and emotional activation) increases the chances of COVID-19 risk behaviours, that are further amplified by the possible consumption of psychoactive substances.

- Within the current pandemic context, compared to other sports, football has characteristics that increase the public health risk:
 - a) it activates the passion for the results (of the competition), in addition to the passion for the sport itself (the latter being the main emotional/affective aspect of other sports, such as, for example, most Olympic sports);
 - b) the financial dimension associated with football spectacles promotes a flow of information and activation of emotions that is difficult to control, which may facilitate the emergence of conflicts and emotions;
 - c) Taking the above listed points into consideration (mainly the commercial/financial component of football), the football industry and *the media* hold a social responsibility that can/should be activated for public health promotion purposes through the media event. The protagonists of this sport (athletes, coaches) can act as models for action as well as transmitters of health messages.
 - d) Football matches are mass events, which requires a careful definition of measures to mitigate the risk of contagion among the different participants (athletes, event organizers, audience), some of which have already been generally established for cultural events: percentage of maximum stadium capacity, staged schedule of entry and exit times at the stadium, restrictions on the sale of alcoholic beverages within a defined perimeter, control fences; in addition to strategies for promotion of safe behaviour (consistent messages associated with nudge strategies promoting the use of masks, maintenance of physical distance, ventilation in closed spaces, and hand hygiene).
- It was stated as crucial to define and convey a consistent message of confidence for the sport *rentrée* (mainly from August 2021), with risk management that is clear and consistent; a message

that allows for augmenting the perception of control, with well-defined medium-term epidemiological scenarios (i.e., following sports year), integrating into the sports events current strategies and rules for sustaining public health.

- The mitigation of COVID-19 risk behaviours at major sporting events involves rigorous actions between different actors, including: Ministry of Internal Affairs, State Secretariat for Youth and Sports, Olympic Committee, federations, journalists, official security commentators (in stadiums), cheerleaders etc.

Calls for action

- The availability and possibility to physically (in-person) attending of cultural events, particularly in sports, is essential for the psychosocial well-being. Furthermore, it represents an opportunity for the promotion of public health. Hence, considering the current epidemiological scenario of the pandemic, it is important to reopen this social activity.
- Conveying a coherent message is essential for the different types of cultural and collective activity in accordance with specific medium and long-term scenarios (considering the risk matrix and protective factors, particularly vaccination coverage and level of herd immunity). More specifically, it is important to outline and align the conditions for organizing sporting events with the current epidemiological scenario, while providing a clear and transparent justification of the rationale for these conditions.
- The gathering of numerous people at cultural events is perceived as a serious security problem. In a pandemic context, such as COVID-19, large-scale gatherings naturally raise even greater concerns. One of the main determinants of this threat is the stereotype that behaviour is changed in a group, when people's normative behaviour changes to a less rational behaviour. This is a stereotype that must be addressed by those whose main role is to assist these population groups to experience the relevant moment and return home safely. Failure to change this perception

risks the creation of a greater tension (hence inappropriate reactions from authority) among security agents, with a tendency towards repressive attitudes (instead of facilitating the appropriate decision-making behaviour).

- Although group behaviour does not alter the essence of normative individual behaviour, it can amplify pre-established normative emotions and attitudes. In order for groups to function in accordance to specific rules (regardless of group size), it is important to maintain the same principles of behavioural adoption: ensuring alignment between the rationality of what is requested (the perception of injustice is amplified in a group context), the perception of usefulness of the requested behaviours, and the feasibility of what is requested, promoting perception of self-efficacy for behaviour(s) activation, according to the behavioural determinants of the COM-B model: capacity (to perform the behaviour), providing opportunity (with very clearly outlined actions on how to perform the behaviour), and motivation to activate the behaviour.
- Depending on the epidemiological scenarios, the usual safety standards for sport events must be maintained and accompanied by appropriate public health measures.
- It is important to acquire knowledge about the (sub)groups that are expected to constitute the audience for the relevant sporting event, therefore adapting the pre-/during-/post-event communication to this/these population(s). It is essential to maintaining consistency in the terminology used (such as detailed information on the desired behaviours – and how to implement them in a group context).
- The use of signage and stimuli that facilitate/activate behaviours (nudge technology) is very effective in ensuring that groups function in a normative manner, while maintaining the perception of autonomy in their decisions (i.e., without perceiving imposition by authorities).
- For groups to be effectively mobilised for appropriate/healthy behaviour, it is important to:
 - a) Explain the importance, both for the individual and the group, of adopting specific behaviours

in the context of the relevant event; it is easier to promote adherence to a few strategic behaviours than to several behaviours that do not have a designated clear hierarchy of importance;

- b) Provide practical information on recommended behaviours at critical event moments (ticket purchase, entering, leaving, emergency situations, etc.);
- c) Provide legitimacy, in the eyes of the participants, for the actions of security agents, by integrating proximity (security agents physically close to the groups), collaborative and empathetic behavior (reducing the perception of “us against the others”). It is important to follow the excellent example of the security action at Euro 2016, by defining what exactly constitutes a deviant behaviour and how to act in such circumstances;
- d) Involve athletes, coaches, cheerleaders and the media in concerted actions for communicating COVID-19 health-related behaviours, more specifically behaviours to be adopted by sports fan clubs;
- e) Following the good practice of the *playbooks* created for the Tokyo 2020 Olympic Games, it would be important to create a set of guidelines for each event typology, (aimed at different social actors involved in the events): <https://www.olympics.com/ioc/tokyo-2020-playbooks>.

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References

- Barrows, S. (1981). *Distorting mirrors : visions of the crowd in late nineteenth-century France*. Yale University Press. https://books.google.com/books/about/Distorting_Mirrors.html?id=owVhQgAACAAJ
- Berlonghi, A. E. (1995). Understanding and planning for different spectator crowds. *Safety Science*, 18(4), 239–247. [https://doi.org/10.1016/0925-7535\(94\)00033-Y](https://doi.org/10.1016/0925-7535(94)00033-Y)
- Centola, D., Becker, J., Brackbill, D., & Baronchelli, A. (2018). Experimental evidence for tipping points in social convention. *Science*, 360(6393), 1116–1119. <https://doi.org/10.1126/science.aas8827>
- Challenger, R., Clegg, C. W., Robinson, M. A., & Leigh, M. (2009). *Understanding crowd behaviours: Supporting evidence*.
- Davis, K. (1973). The Case for and Against Business Assumption of Social Responsibilities. *Academy of Management Journal*, 16(2), 312–322. <https://doi.org/10.2307/255331>
- Department of culture media and sport. (2009). *Guide to safety at sports grounds* (Fifth Edit).
- Dyer, J. R. ., Johansson, A., Helbing, D., Couzin, I. D., & Krause, J. (2009). Leadership, consensus decision making and collective behaviour in humans. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 364(1518), 781–789. <https://doi.org/10.1098/rstb.2008.0233>
- Hogget, J. (2009). *Crowd psychology and the policing of football crowds in England and Wales*. University of Liverpool.
- Jetten, J., Bentley, S. V., Crimston, C. R., Selvanathan, H. P., & Haslam, S. A. (2021). COVID-19 and social psychological research: A silver lining. *Asian Journal of Social Psychology*, 24(1), 34–36. <https://doi.org/10.1111/ajsp.12465>
- Le Bon, G. (n.d.). General characteristics of crowds--Psychological law of their mental unity. In *The crowd: A study of the popular mind*. (pp. 25–38). T Fisher Unwin. <https://doi.org/10.1037/10878-001>
- Leca, J.-B., Gunst, N., Thierry, B., & Petit, O. (2003). Distributed leadership in semifree-ranging white-faced capuchin monkeys. *Animal Behaviour*, 66(6), 1045–1052. <https://doi.org/10.1006/anbe.2003.2276>
- Reicher, S. (2001). The Psychology of Crowd Dynamics. In *Blackwell Handbook of Social Psychology: Group Processes* (pp. 182–208). Wiley. <https://doi.org/10.1002/9780470998458.ch8>
- Turner, R. H. (1983). Figure and Ground in the Analysis of Social Movements*. *Symbolic Interaction*, 6(2), 175–181. <https://doi.org/10.1525/si.1983.6.2.175>
- Tyng, C. M., Amin, H. U., Saad, M. N. M., & Malik, A. S. (2017). The Influences of Emotion on Learning and Memory. *Frontiers in Psychology*, 8. <https://doi.org/10.3389/fpsyg.2017.01454>