

Opinion

Countermeasures to reduce the risk of infections at the 2024 Olympic and Paralympic Games—A balancing act

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The Olympic and Paralympic Games are a global celebration of athletic dedication and achievement, bringing together athletes and spectators from around the world. However, such large gatherings present public health challenges for the Organizing Committees and local governments. As highlighted by the coronavirus disease 2019 (COVID-19) pandemic, these events are associated with an increased risk of transmission of infections, which can significantly impact the health and well-being of athletes and attendees. Prioritizing the health and safety of athletes, officials and spectators is fundamental to ensure the successful hosting of the Games. Therefore, it is essential to design and implement comprehensive countermeasures to mitigate the risk of an infectious disease outbreak among participants but also to the residents of the host city.

The International Olympic Committee (IOC) and the International Paralympic Committee have monitored illnesses during every Games since London 2012.^{1–6} Prior to the COVID-19 pandemic the reported illness rates had been fairly consistent with the percentage of athletes who developed infective illnesses during the Olympic Summer Games averaging between 3.0% and 3.3%.^{1,3}

As shown in Fig. 1, there was a dramatic reduction in the infection rate to 0.8% during the Tokyo 2020 Olympic Games.⁵ A similar trend was evident for the Paralympic Summer Games when comparing the pre-COVID all illness incidence (per 1000 athlete-days) to those held during the pandemic⁶ (Fig. 2). This dramatic (approximately 70%) reduction in infection and all illness risk, was undoubtedly due to the stringent COVID-19 countermeasures that were implemented. These resulted in not only mitigating the risk of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections,

but all other infections during these Games.⁷ This demonstrated the importance of effective risk mitigation strategies to reduce infection transmission. In this opinion piece we discuss the “balancing act” between implementing some of these successful countermeasures against the reality of the “costs” of these measures while still achieving the aim of risk mitigation for infections at the Paris 2024 Olympic and Paralympic Games.

1. What was done in Tokyo to successfully reduce the risk?

Several of the COVID-19 countermeasures implemented at the Tokyo 2020 Olympic Games should be considered and could potentially be applied at future events such as the Paris 2024 Olympic Games. These measures included the following.

1.1. Communication

Most of the countermeasures implemented were well-communicated to participants and attendees by the IOC and the International Paralympic Committee through specifically designed “Playbooks” detailing the mitigation protocols.⁸

1.2. Vaccination

Proof of COVID-19 vaccination was strongly recommended for the Tokyo Games, and a mandatory 21-day quarantine period was enforced for those not fully vaccinated. This ensured high rates of vaccination among participants. Reportedly, 85% of athletes, 100% of IOC officials, and 70%–80% of media staff were vaccinated for the Tokyo Olympic Games.⁹

1.3. Limiting exposure

The staggering of the arrival and departure dates for participants to and from the Games was applied to reduce the number of participants present at any given time. Additionally,

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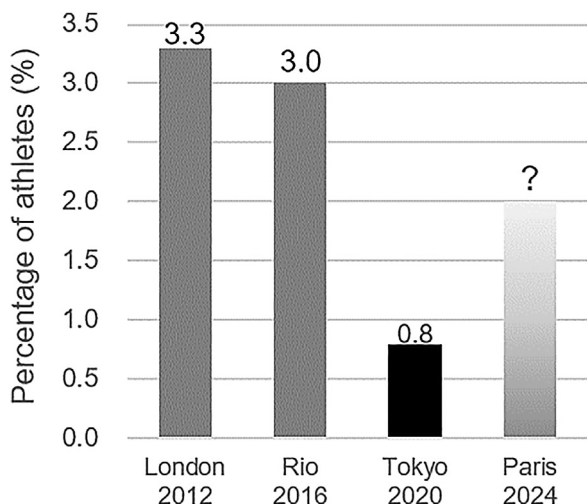


Fig. 1. Infection rates (per 100 athletes) at the Olympic Summer Games from 2012 to 2024.

the creation of a “bubble” system was implemented to separate and minimize transmission of SARS-CoV-2 from the local workforce and the public to the participants. This entailed dedicated transport, accommodation, and venues only accessible to the Games’ participants, who were not allowed out of this bubble. There were also restrictions on the number of people per venue, to limit transmission in potentially crowded situations and there was limited social interaction among participants. Other specific measures enforced by the Organizing Committee included the mandatory wearing of face masks and physical distancing measures including floor markings and the use of transparent barriers. Furthermore, shouting, cheering, and singing were discouraged, while clapping was recommended. Lastly, there were limitations on the number of spectators allowed at the Games (approximately 30% of the usual number of attendees).¹⁰

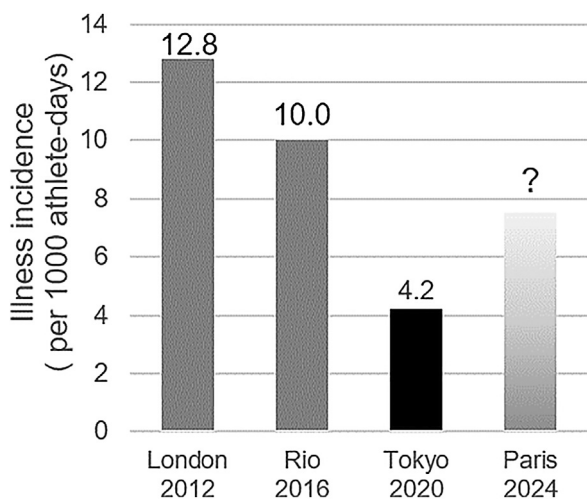


Fig. 2. Illness incidence (per 1000 athlete-days) at the Paralympic Summer Games from 2012 to 2024

1.4. Illness detection

Rigorous, large-scale daily COVID-19 antigen or reverse transcription-polymerase chain reaction screening testing was undertaken and enforced by the local authorities. This entailed approximately 30,000 tests per day in Tokyo.¹⁰ In addition to the testing during the Games, testing was also required before arrival and departure to the host nation. Strict contact tracing and isolation/quarantine criteria were adhered to, including the mandatory isolation of positive cases in specialized isolation hotels.

1.5. Responsibility

The success of the measures described above were largely due to the exceptional compliance that was overseen by the Organizing Committee and the local authorities.¹⁰

In summary, as a result of implementing the above countermeasures, not only was SARS-CoV-2 transmission minimized within the Olympic Village,¹⁰ but the risk of all other infections, including gastrointestinal viruses, were also significantly reduced throughout the Games.⁷

2. What was the “cost” of the Tokyo measures?

The obvious question is whether the countermeasures from the Tokyo Games can now be applied to mitigate the risk of infections at future Games, including Paris 2024. While these measures were incredibly successful and ensured the safety of all involved, it also came with a significant cost, including financial, human resources, planning and administration, and political commitment. The psychological impact of these stringent measures on the participants and visiting delegations also needs to be taken into consideration. While many of these strategies may be transferable and could be considered and perhaps modified for future events, their positive effects on risk mitigation must be balanced against potential negative costs. These stringent countermeasures cannot be directly replicated at all future events as they may not be feasible nor reasonable.

3. Finding the balance for Paris 2024

3.1. Communication

Countermeasures to reduce the risk of infections should be implemented *prior to* the start of the Games. Participants should also be educated about strategies to mitigate the different risk factors associated with infections in athletes.¹¹ Further educational content promoting effective hand and respiratory hygiene and the use of personnel protection measures (such as face masks, condoms, *etc.*) should be communicated through targeted pre-event campaigns.

3.2. Vaccination

All participants and attendees should be encouraged to consider appropriate and timely vaccinations against common respiratory pathogens (e.g., influenza, SARS-CoV-2) and ensure that all routine immunizations are up to date.¹²

3.3. Limiting exposure

Throughout the Games, all participants including athletes, medical and support staff, and team officials, should be encouraged to practice regular, thorough, hand washing and sanitizing. This can be facilitated by ensuring the supply of an abundance of hand sanitizers in easily accessible locations throughout the event venues and displaying educational messages detailing correct hand-washing technique, and other infection control measures such as cough etiquette, encouraging fist-pumping instead of handshaking, and using face masks if ill, *etc.* Enforced hand hygiene measures (e.g., sanitization) should also be implemented upon entrance to certain communal venues (e.g., dining halls). The risk of infection transmission should be further minimized by regular and stringent disinfection of all venues including training facilities, competition areas, dining halls, restrooms, and other commonly touched surfaces. Furthermore, potentially crowded venues and facilities (e.g., dining halls, *etc.*) should be designed with adequate ventilation and open-air spaces should be utilized to mitigate airborne transmission of pathogens. This should also be considered for transportation (e.g., in crowded buses).

3.4. Illness detection

Daily screening with abbreviated symptom questionnaires and body temperature assessments should be performed by the team physicians or the head of the medical staff of the National Olympic Committees. Utilizing technology, such as digital real-time monitoring systems (e.g., electronic data-entering devices or illness-tracking apps), can enhance the ability to detect and respond to early signs of illness. Monitoring for early signs of infection can allow for prompt and targeted treatment of infectious cases and control of potential transmission. A consideration is for the village polyclinic to have a dedicated infection control clinic available for targeted testing of selected cases to detect potential communicable diseases. With the use of a multiplex polymerase chain reaction device, common respiratory or gastrointestinal pathogens that could potentially spread throughout the village can be detected. Once these cases are identified, a seamless process should be available allowing for transfer to separate accommodation if necessary. Enhanced surveillance to identify potential infectious cases is essential in preventing the spread of these infections. The Organizing Committees should ensure that sufficient isolation rooms will be available to limit transmission from identified infectious cases.

3.5. Responsibility

Despite the best preventative measures, there is always a possibility of a potential outbreak of an infectious disease at the Games. The Organizing Committee must have well-defined protocols in place to manage such situations. In the event of a suspected outbreak, prompt testing and laboratory analyses should be conducted to confirm the presence of the infectious disease. Close collaboration with local healthcare authorities is

essential to ensure a coordinated response and effective management of these situations. Receiving epidemiological data from these authorities on local disease trends may also help to mitigate these risks. The Organizing Committee should also oversee countermeasures to reduce the risk of infection transmission to the participants from the workforce behind the running of the Games. This includes the technical officials, volunteers, essential staff entering the athlete villages and venues, and other people accredited by the local organizing committee to assist with service delivery during the Games. Consequently, pre-event education and training on infection control measures should be provided to these members. In addition, daily screening of these members for early symptoms of infections should be implemented by designated personnel.

4. Conclusion

Infection control at the Olympic and Paralympic Games is a complex task that requires the collaboration of various stakeholders and the development and implementation of detailed risk mitigation strategies tailored to the demands of the event and the current public health challenges. It requires a strategy to balance the importance of creating a safe environment while ensuring an enjoyable and festive experience for all. Importantly, the countermeasures need to be effectively communicated to all participants and attendees, *prior to* and during the Games. While many of the infection control measures are common knowledge, compliance with these measures is pivotal to the success of the mitigation strategies. Where in the past, the compliance has been controlled and enforced by the Organizing Committees, this responsibility should now be handed to the athletes themselves, medical and support staff, team officials, technical officials, volunteers, and the spectators. Perhaps the most significant advancement to be endorsed is that the effectiveness of future infection prevention depends on the commitment and compliance of all participants' and attendees' application of these countermeasures.

So, what is the likely infection risk for Paris 2024? That we may not be able to predict. However, it is essential to evaluate and learn from past experiences and then refine and implement strategies to reduce the risk of infections at events such as these. With ongoing advancements in technology and a commitment to global health, we can ensure the ongoing improvement in infection control strategies, thereby enhancing the safety of future Olympic and Paralympic Games.

Authors' contributions

MJ conceptualized and drafted the initial manuscript; MS contributed to the conceptualization and critically reviewed and edited the manuscript. Both authors have read and approved the final version of the manuscript, and agree with the order of presentations of the authors.

Competing interests

MS is a consultant to the International Paralympic Committee (IPC) medical committee at the Paris 2024

Paralympic Games. The authors declare that they have no other competing interests.

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