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FIFA World Cup 2022 in Qatar: Mitigating the risk of imported infections amid the COVID-19 pandemic, monkeypox outbreak and other emerging diseases

Qatar is hosting one of the most significant sports events in the world. From November 20 to December 18, 2022, this country will be the first in the Middle East to be selected to host the FIFA World Cup of soccer. More than 1.5 million people from all continents are expected to visit the country during that period, resulting in the most significant influx of people in the nation (<https://www.fifa.com/fifaplus/en/tournaments/mens/worldcup/qatar2022>). It may pose a substantial threat to public health due to imported infections, especially considering that the local population of Qatar is less than 3 million, and it is also a relatively densely populated nation [1].

Moreover, mass gatherings like sports or religious meetings are known to cause the spread of infections both among visitors and the local population [2–10]. Past regional events, especially the FIFA World Cup, have been the focus of multiple studies assessing such risk [11,12]. Furthermore, this year is extraordinary, as the COVID-19 pandemic is still not over. Even more, due to the COVID-19 pandemic, the 2020 Summer Olympics in Tokyo, Japan, to take place from July 24 to August 9, 2020, were postponed from July 23 to August 8, 2021 [13,14].

Added to it is the emerging risk of other severe infections known to be transmitted from humans to humans, like monkeypox and the Marburg virus [3]. That is apart from the threat of various other known respiratory and intestinal infections, even including the reemergence of cholera and polio [15,16].

Over the last months many infectious diseases and resulting epidemics have become a significant health threat, especially concurrently (syndemics). It is especially true for viral infections that are relatively more challenging to manage than bacterial infectious agents. If timely precautions are not taken, these infections may spiral out of control, causing epidemics in the host nation and other nations once the visitors return to their native states. Therefore, the host nation must protect its local population and ensure that mass gathering like FIFA World Cup does not pose global health threats.

Currently, COVID-19 (pandemic), monkeypox (public health emergency of international concern) and Marburg virus (reemerging) are of significant concern. Also, special attention must be paid to other respiratory and gastrointestinal infections. FIFA World Cup 2022 is the first major sporting event in the COVID-19 era where such a large number of visitors are expected, unlike the Tokyo Olympics 2020 (2021), which was carried out without visiting spectators [1,4].

In the middle east, perhaps the most extensive mass gatherings are due to Hajj, and studies show that it significantly increases respiratory infections [17–19]. Some studies suggest that in many instances, as many as 90% of pilgrims may be affected by respiratory viruses like rhinovirus and coronaviruses, not only SARS-CoV-2/COVID-19. In

addition, mass gatherings also result in a significant upsurge in respiratory infections caused by *Streptococcus pneumoniae*, *Staphylococcus aureus*, and *Haemophilus influenzae*. Additionally, mass gatherings may cause diarrheal infections in as many as one-fourth of the visitors [4]. However, the risk of an outbreak of different infections would be even more significant in this particular event as the visitors are expected to be of even more diverse backgrounds.

Additionally, data suggests that despite the high vaccination rates, COVID-19 is making an upsurge in certain nations. Thus it may pose a significant threat in the upcoming event as well as the concern of the sublineages of the Omicron variant of concern [5,20]. Moreover, early studies suggest that mass gatherings, especially sports events, played a significant role in the spread of COVID-19 in some countries, especially in the early months of the pandemic (2020). Thus, several mass gatherings in Borriana, a municipality in the province of Castellon, Spain, led to increased COVID-19 transmission [6]. Or a study suggests that in early 2020, football matches led to a more than 500% increase in COVID-19 infection rates in the province of Bergamo, Italy [7].

However, the most recent worry these days is the monkeypox infection. It is already declared a public health emergency of international concern by the World Health Organization (WHO). Although monkeypox has been known for more than five decades, it is for the first time that it has caused outbreaks outside its endemic zones in Africa [8]. Monkeypox cases have been reported in more than 90 locations and have not been reported before 2022 (more than 51,000 confirmed cases up to September 1) [8]. Monkeypox has previous significant fatality rates of about 5% and may cause many health complications, including fatal outcomes in 2022 [8,21]. Moreover, unlike COVID-19, the world is not yet ready to control the infection. Vaccines against it are not yet available in Qatar or many other nations, and education and prevention programmes for monkeypox are urgently needed.

Qatar also risks importing other exotic infections never reported in the nation earlier. For example, in recent years, Marburg virus disease incidences have been reported from places outside Africa [9]. The disease is dangerous because it can cause hemorrhagic fever and is associated with high case fatality rates [10].

Fortunately, COVID-19 has taught the world a lot about reducing the risk of infectious diseases. Many measures that worked for COVID-19 would help all other infections, but not necessarily. It means that if Qatar wants to prevent severe consequences for its people, it must take some significant steps.

Regarding COVID-19, vaccination and testing are effective ways to reduce the risk of its spread. Therefore, it would be right only to allow fully vaccinated adults to visit Qatar. Even as imposed in many

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countries, booster doses will be essential to require them. Those who had the last dose of their vaccine more than six months back must be asked to get a booster dose for COVID-19. Else, they must show proof of a negative RT-PCR test for SARS-CoV-2 taken 72 hours before the journey. Qatar should also ensure that all high-risk individuals get a booster dose before the start of the event.

However, things would be more challenging when it comes to monkeypox. Most football fans would arrive from the US and West European countries. These are the nations with significant outbreaks of the disease. However, Qatar's healthcare workers are still not sufficiently trained and prepared to identify the condition in its early stages. Thus, there is a need for mass training of the medical, paramedical staff, and all others involved in event management [8]. That would help identify or trace the infection early and thus isolate patients.

Similarly, identifying the signs of other less common infections like the Marburg virus, Ebola, Yellow fever, and Zika virus may be quite challenging (e.g. for travellers from endemoepidemic countries for yellow fever, proof of vaccination should be required). Therefore, Qatar needs to significantly increase its efforts in training all the stakeholders to minimize the risk of spreading these infections. Moreover, it is understood that Qatar, unlike Saudi Arabia or some western nations, has less experience organizing events of this scale. Thus, its health system may be ill-prepared for specific issues.

To conclude, FIFA World Cup is one of the most significant events in sports history. However, hosting such an event in these challenging times requires the nation's public health system to be well prepared to prevent outbreaks of infectious diseases. This event particularly increases the risk of an upsurge in the cases of COVID-19 and monkeypox. It may even introduce rare infections like the Marburg virus to the nation. However, the threat of these infections is apart from the risk of spreading respiratory diseases like rhinovirus or gastrointestinal conditions. Since Qatar has limited experience in hosting such large events, paying significant attention to the stakeholders' training for early identification of these infections and thus preventing their spread is mandatory.

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