In August 2021, the 2020 Summer Olympics were finally unveiled, among expectations, excitement, or even doubts (Figure 1). It is the second time that Tokyo has been given the chance to host the Olympics; the first time, the Olympic Games were postponed due to an abrupt natural disaster, which brought tremendous challenges to the host city. As the International Olympic Committee (IOC) states, “Olympic legacy is the result of a vision. It encompasses all the tangible and intangible long-term benefits initiated or accelerated by the hosting of the Olympic Games/sport events for people, cities/territories and the Olympic Movement.” The notion of “legacy” would have made these games “Regeneration Games” rather than “One Planet Games.”

For each theme, the plan provided explicit guiding plans. For “safety and security,” pandemic safety and security measures were introduced to make sure all the people involved were safe and healthy. In addition, sustainable recovery initiatives concerning innovative approaches adopted in the process of coping with newly arrived problems were proposed, in which high technology played a vital role. “Urban development” referred to promoting tangible and intangible development that made life safer and more secure for the people of Tokyo. In addition to improving the sustainability of game-related sites, such as sporting venues and the Olympic village, and the accessibility of public transportation, cybersecurity, anti-terrorism, and infection control measures aimed at building a safer and attractive community were also given high priority. “Sports and health” focused on utilizing the power of sports and athletes to improve sports awareness and participation, promote health, create motivation in life, and revitalize local communities among people with and without physical defects. “Participation and cooperation” involved efforts to deliver excitement and joy through a variety of programs for residents, such as the torch relay and countdown events, and a culture

**Figure 1. Opening ceremony of the 2020 Summer Olympics in Tokyo**
of voluntarism was encouraged. Also, Tokyo had been making efforts to blend Japanese traditional culture with modern elements, so as to showcase its distinct natural attractions, cuisine, and other cultural elements. It was hoped that Tokyo, or even Japan as a whole, could be an intriguing destination to people around the globe. The “education and diversity” initiative helped residents, especially children and youngsters, to build a positive mindset to embrace diversity and help the vulnerable. “Environment and sustainability” measures were taken to better use hydrogen and other renewable resources during the Games to push the realization of a “Zero Emissions Tokyo.” For the “prosperity and technology” part, efforts were made to boost the economy and the technology industry, benefiting the whole society or even the world. At the same time, the “smooth biz initiative” was launched to allow everyone to select their preferred working style, to energize the city’s residents through all stages of life. Last, the “disaster recovery” initiative gave Tokyo a chance to convey dreams and hope to people affected by disasters, and gratitude to the world for supporting the recovery from the Great East Japan Earthquake. This legacy plan shows Tokyo’s determination to take the opportunity to host the Olympics to comprehensively solve local social problems, upgrade infrastructure and the social system, and then fashion a better international image and connect with the global community. It is hoped that both its tangible and its intangible heritage will bring beneficial changes to Japanese society and even the global community, now and for a long time in the future.

Highlights of the 2020 Games legacy
Despite its lack of zealous sports fans and crowds of tourists, Tokyo still impressed the world with an amazing performance with elaborate preparation. Some highlights of its legacy plans are extraordinarily distinctive and worthy of retrospection. Among them, its valuable legacies in pandemic prevention for large-scale sports events and world-leading technology boosting the Olympics are particularly prominent. First, Tokyo provided valuable experience in hosting large-scale events under the pandemic. Although a number of international events had taken place prior to this, with the help of “bubble” management system, this was the first time such a large movement of athletes had taken place. According to statistics, a total of 11,309 athletes from 206 delegations had registered for the 2020 Olympic Games. People with different identities (including athletes, referees, technical officials, and accompanying officials) and locations (including airports, railway stations, venues, and the athletes’ village) were provided with customized plans. The Tokyo Organizing Committee developed several internet-based digital platforms to cover multiple aspects, such as submitting entry information, approving post-entry activity plans, and confirming nucleic acid test results. Also, the empty-field competition program implemented in most venues has given rise to multi-dimensional, multi-channel, and multi-platform event broadcasting, whereby traditional ways of watching the games are transformed and upgraded. Second, as Tokyo is usually seen as a technology highland, the Olympics could not be missed as a window to present new cutting-edge products. From epidemic prevention and control to virtual game viewing, from high-tech barrier-free facilities to hydrogen energy vehicles, high tech could be seen almost everywhere. Notably, it was the first time that the Olympic torch and the flame platform were fueled by hydrogen; the hot water system in the Olympic Village was powered by hydrogen fuel, and the participants, including the athletes, were housed in the world’s first community to adopt hydrogen energy, and commuting travel between the competition venues and the Olympic Village was powered by hydrogen-fuel-cell buses. In addition, robotics, 5G technology, and automated driving technology were comprehensively enhanced to solve social problems such as traffic congestion, long commuting times, and the declining workforce due to aging, and these technological achievements and affiliated policy innovations will bring significant changes to Japanese society in the future.

Implications for the Beijing 2022 Winter Games
The successful hosting of the Tokyo Olympics under the pandemic has provided valuable experience for the upcoming Beijing 2022 Winter Olympics and Winter Paralympics, and its well-established and innovative legacy plan has also provided useful lessons for Beijing. First, Tokyo provided Beijing with valuable experience in pandemic prevention and control. With the help of timely data acquisition and analysis technique, Tokyo adjusted its strategy in real time in terms of whether to play with empty stadiums, the number of accompanying personnel, and the epidemic prevention process. Second, Tokyo stunned the world with its hydrogen-energy-fueled Olympic Village and transportation facilities, intelligent viewing technology, and advanced robots, and also provided valuable experience for other countries in holding large-scale events efficiently, sustainably, and intelligently under the new situation. Official information shows that Beijing has also made great high-tech progress in venue construction, maintenance and operation, transportation energy renewal, and multi-channel coverage.

The Tokyo Olympics was a unique sports event held in a special historical moment. It demonstrated to the world the unique role of sports in uniting humankind and inspiring courage. Its comprehensive pandemic prevention and control and high-tech power have made all things possible, and have also become unique legacies left by Tokyo to the world. As the IOC said, “the Olympic Games could stand as a beacon of hope to the world during these troubled times.”

REFERENCES
1. Gold, J.R., and Gold, M.M. (2021). Olympic legacies and the sustainability agenda. Nat. Sustain. 4, 290–291.
2. Tokyo Metropolitan Government (2016). Towards 2020—building the legacy. https://www.2020games.metro.tokyo.lg.jp/eng/index.html.
3. Tokyo Metropolitan Government (2021). Towards 2020—building the legacy. https://www.2020games.metro.tokyo.lg.jp/18bb65c7f15441af918b560d601926c21.pdf.
4. Liao, H., Zhang, L., Marley, G., and Tang, W. (2020). Differentiating covid-19 response strategies. Innovation 1, 100003.
5. Beijing Organising Committee (2021). Legacy report of the olympic and paralympic winter games Beijing 2022 (pre-Games). https://www.beijing2022.cn/sv1/wog.html?cmsid=MHI202106230082200.

DECLARATION OF INTERESTS
The authors declare no competing interests.