



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



Editorial

Inaugural editorial: Towards evidence-based biosafety and biosecurity



We are pleased to introduce the Journal of Biosafety and Biosecurity, the first dedicated periodical addressing these subjects, published by KeAi Press.

China has experienced significant biosecurity and biosafety challenges and is the only nation that has been subjected to a bio-weapon assault.¹ Although the significant economic growth experienced by China has facilitated remarkable improvements in hygiene as well as food and water quality, the 2003 outbreak of Severe Acute Respiratory Syndrome (SARS) led to an infectious disease epidemic. In March of that year, as SARS spread beyond Chinese borders, the World Health Organization (WHO) issued a global alert.² The SARS epidemic served as a timely practical reminder to both China and the world that emerging infectious diseases could significantly threaten national and global safety and security.

However, this was not the end of the story for the SARS virus. In 2004, a case of laboratory-acquired SARS infection was reported, and a number of containment failures occurred in high-security laboratories in Singapore, Taiwan, and mainland China.^{3–7} The 2004 SARS outbreak in North China resulted from a series of flaws in the biosafety protocol at a national institute in Beijing,⁵ resulting in infection of four laboratory workers. This has been the most serious biosafety event to date.^{5,6}

In recent years, reports of outbreaks of African swine fever along the Chinese-Russian border fueled growing concerns that this livestock infection could spread to China. In 2018, these fears were realized, and within a very short time African swine fever had spread to many Chinese provinces.⁸ Given the large scale of China's pork sector, the economic impact of such a disease has the potential to be economically devastating.⁹

Recently, international political authorities and scientific organizations have both recognized the significance of and need for improved biosafety and biosecurity. The United Nations Secretary-General's Mechanism for Investigation of Alleged Use of Chemical and Biological Weapons has been proposed as the foundation on which to build a protocol to gauge the potential for biothreats and bioweapons, and a network of designated laboratories focused on supporting such investigations is under development.¹⁰ National legislation regarding biosecurity has been discussed and implemented in several countries.^{11–14} In 2016, the Chinese government incorporated biosecurity as a specific national security domain. Similarly, in 2018, the United States (U.S.) issued the new National Biodefense Strategy, and the United Kingdom (U.K.) issued the Biological Security Strategy.

Despite political recognition of the importance of biosecurity and biosafety, their implementation lacks a thorough empirical

evidence base. We propose that the scope of biosecurity and biosafety should include all relevant areas with the potential to cause death, social disruption and panic, economic breakdown, and/or national crisis (e.g. emerging infectious diseases, bioweapons, bioterror, laboratory biosafety, antibiotic-resistant bacterial super-strains, harmful invasive plant or animal species, misuse of synthetic biological technology, misuse of human genetic information, etc.).

The 2018 U.S. National Biodefense Strategy definition of biological threats includes catastrophic disease outbreaks, regardless of whether they are naturally occurring, accidental, or deliberate in origin (<https://www.whitehouse.gov/wp-content/uploads/2018/09/National-Biodefense-Strategy.pdf>). The 2018 U.K. Biological Security Strategy definition of biosecurity includes significant outbreaks of disease and events precipitated by an accidental release from biological facilities, deliberate biological attack, and animal or plant disease outbreaks with the potential to significantly impact the economy, environment, and society (<https://www.gov.uk/government/publications>).

In order to prevent and adequately prepare for potentially significant future biosecurity or biosafety threats, a dedicated scientific subject area is required. Optimal research strategies and technologies should be developed and employed to secure our nation and our world against such threats. These are the aims underlying the launch of this journal. The scientific community is invited to work with us in bringing together research and technology that will inform an improved understanding and implementation of biosafety and biosecurity.

Conflict of interest

The authors declared that they have no conflicts of interest to this work.

References

1. Watts J. Victims of Japan's notorious Unit 731 sue. *Lancet*. 2002;360(9333):628.
2. Cyranoski D. WHO issues rallying cry to keep fight against SARS on track. *Nature*. 2003;423(6943):905–906.
3. Desenclos J.C. Early influenza in Europe and SARS escaping from high security laboratories! *Euro Surveill*. 2003;8(12):227.
4. Senior K. Recent Singapore SARS case a laboratory accident. *Lancet Infect Dis*. 2003;3(11):679.
5. Enserink M., Du L.S.A.R.S. China dumps CDC head, probes lab. *Science*. 2004;305(5681):163.
6. Normile D. Infectious diseases. Mounting lab accidents raise SARS fears. *Science*. 2004;304(5671):659–661.
7. Normile D. Infectious diseases. Second lab accident fuels fears about SARS. *Science*. 2004;303(5654):26.

8. Zhou X., Li N., Luo Y., et al. Emergence of African swine fever in China, 2018. *Transbound Emerg Dis.* 2018;65(6):1482–1484.
9. Normile D.. Arrival of deadly pig disease could spell disaster for China. *Science.* 2018;361(6404):741.
10. Fooks A.R., Holmstrom L.. United Nations secretary-general's mechanism. *Rev Sci Tech.* 2017;36(2):629–637.
11. Durant S., Faunce T.. Analysis of Australia's new biosecurity legislation. *J Law Med.* 2018;25(3):647–654.
12. EU is a key source of biosecurity risk to the UK. *Vet Rec* 2018;183(17):518.
13. Pastorino B., de Lamballerie X., Charrel R.. Biosafety and biosecurity in European containment level 3 laboratories: focus on French recent progress and essential requirements. *Front Public Health.* 2017;5:121.
14. Vaught J.. Biobanking and biosecurity initiatives in Africa. *Biopreserv Biobank.* 2016;14(5):355–356.

Jianguo Xu
State Key Laboratory of Infectious Disease Prevention and Control,
National Institute for Communicable Disease Control and Prevention,
Chinese Center for Disease Control and Prevention, Beijing 102206,
China

Zhiming Yuan
Wuhan Institute of Virology, Chinese Academy of Sciences, Wuhan,
Hubei Province 020201, China
Received 14 January 2019
Accepted 16 January 2019