

---

## EDITORIAL

### Illegal biolabs in the community – is Reedley a one-off?

MacIntyre, CR<sup>1</sup>

<sup>1</sup>Kirby Institute, University of New South Wales, Australia

---

Much attention has been given to the origin of SARS-COV-2 and whether it may have arisen from the Wuhan Institute of Virology or from nature (1, 2). Errors and accidents may occur in official laboratories and may result human infections or epidemics (3). The other source of lab-created pandemics is deliberate release (4). If an accident or mishap involves a highly transmissible pathogen, a pandemic may arise (5).

Whilst documented laboratories are known and regulated, undocumented ones may also exist. The best known clandestine lab that of the Rajneesh cult in Oregon, who were responsible for the largest known bioterrorist attack in the United States (4). The Rajneesh lab was discovered almost a year after the attack and long after public health authorities declared the epidemic of salmonella to be accidental, due to poor hygiene. The finding of a warehouse containing mice, microorganisms, reagents and laboratory equipment in Reedley, California in late 2022 highlights the potential for illegal labs to fly under the radar. It was discovered accidentally by a local code enforcement officer in December 2022, but the warehouse was not searched until March 2023, at which time a large number of genetically modified mice, and a range of BSL-3 level viruses such as SARS CoV-2 and HIV were reportedly found at the warehouse. The contents belonged to Prestige Biotech, which was operating without a licence in Reedley. It is a medical technology company which acquired Chinese predecessor company, Universal Meditech Inc. after it was declared bankrupt. Universal Meditech had their SARS CoV2 rapid antigen test recalled in late 2022 by the FDA. The warehouse contents were those belonging to Universal Meditech Inc, stored by Prestige Biotech until it could be moved to a new laboratory location.

Concerns raised by the Reedley warehouse are of community safety, animal ethics and waste disposal. It was reported that some of the genetically engineered mice were dead and ill. Infection of lab staff by the viruses housed there, or unsafe waste disposal could have caused a community outbreak. Waste streams from labs can be disseminated through waterways, may accumulate in soil, or be aerosolised, and this in turn can affect humans, animals or plants. Even leading labs such as USAMRIID have suffered accidental waste leakage into the environment, so surely the risk is higher in undocumented labs (6).

Open-access methods and rapidly declining costs of gain-of-function research and synthetic biology (7), greatly enable illegal labs. Illegal labs with nefarious intent may exist in the community in the same way that drug labs do so. The Reedley case illustrates how easily clandestine biolabs can escape detection. Regardless of the intent and purpose of the Reedley lab, which appears to have been benign, the incident highlights weakness in US intelligence and biodefense. It is doubtful that a US company would be able to easily set up a warehouse full of biological materials in China without a permit and remain undetected.

A Trojan Horse attack is a real risk, where a state or non-state actor could set up an illegal lab and launch a biological attack, especially if governments have no systematic method to track or regulate such labs. The explosion of Do-It-Yourself biology and community biohacking in the last decade should have been a trigger for better biodefense preparedness (8). Although such DIY labs are only allowed to operate at BSL-1 level, there is no policing of this, and some biohacking occurs inside homes, not laboratories. Public awareness of dual-use research of concern (DURC) and biohacking is low, yet most people, when presented with information about DURC are concerned about the risks of such research (9). The public has not been informed or engaged as a stakeholder in the debate about risky gain-of-function research, which has focused mostly on the rights of scientists and the potential benefits of such research. A recent report on the landscape of gain-of-function research even combined both gain and loss-of-function research in the same analysis, thus obfuscating the risk of the former (10).

We have seen quantum advances in technology including gain of function and synthetic biology, and face an ever-expanding array of potential engineered pandemic pathogens (11). This requires new methods for regulation and oversight of biolabs in all realms, including private and DIY labs. Law enforcement agencies can apply lessons learned from detecting illegal drug labs toward identifying illegal biolabs. Legal frameworks for managing risk should also be reviewed. A pathogen of pandemic potential can spread around the world in a matter of weeks, yet legal processes reflecting the urgency of such a threat are not readily available. In the case of the US anthrax attacks of 2001, it took seven years before the FBI was ready to charge a suspect (4). In the Reedley case it

took about three months to obtain a warrant to search the warehouse. What if an investigation involves a highly contagious pathogen that could cause a pandemic in a matter of weeks? There also appear to be policy gaps in regulation of private biolabs and DIY bio, with few if any systematic processes in place to mitigate risk. There are many available AI methods to harness textual, video and other open-source and non-open data streams to identify potential illegal biolabs. Such methods require inter-disciplinary skills such as

data linkage and AI to process vastly different data streams for pattern recognition and signal detection. Such approaches are necessarily cross-disciplinary, involving health, law enforcement, intelligence, defence, emergency response and community members. Without new approaches to biosafety, we cannot adequately mitigate the very real and increasing risk of illegal and undocumented biolabs in our communities.

## References

1. Harrison NL, Sachs JD. A call for an independent inquiry into the origin of the SARS-CoV-2 virus. *Proc Natl Acad Sci U S A*. 2022;119(21):e2202769119.
2. Andersen KG, Rambaut A, Lipkin WI, Holmes EC, Garry RF. The proximal origin of SARS-CoV-2. *Nature Medicine*. 2020;26(4):450-2.
3. Wilkening DA. Sverdlovsk revisited: modeling human inhalation anthrax. *Proc Natl Acad Sci U S A*. 2006;103(20):7589-94.
4. MacIntyre CR. Biopreparedness in the Age of Genetically Engineered Pathogens and Open Access Science: An Urgent Need for a Paradigm Shift. *Mil Med*. 2015;180(9):943-9.
5. Rozo M, Gronvall GK. The Reemergent 1977 H1N1 Strain and the Gain-of-Function Debate. *mBio*. 2015;6(4).
6. Young A. Pandora's Gamble: Lab Leaks, Pandemics, and a World at Risk. New York, NY: Center Street, Hachette Book Group; 2023. ISBN 1546002936 1.
7. Noyce RS, Evans DH. Synthetic horsepox viruses and the continuing debate about dual use research. *PLoS Pathog*. 2018;14(10):e1007025.
8. Engells TE, MacIntyre R. Do it yourself biology-- committed hobbyists or dangers to the public safety? *J Healthc Prot Manage*. 2016;32(2):39-54.
9. MacIntyre CR, Adam DC, Turner R, Chughtai AA, Engells T. Public awareness, acceptability and risk perception about infectious diseases dual-use research of concern: a cross-sectional survey. *BMJ Open*. 2020;10(1):e029134.
10. Schuerger CB, S. Quinn, K. Kinoshita, R. Daniels, O. Puglisi, A. Understanding the Global Gain-of-Function Research Landscape. Center for Security and Emerging Technology 2023. <https://doi.org/10.51593/20220035>
11. MacIntyre CR. Reevaluating the Risk of Smallpox Reemergence. *Mil Med*. 2020

**How to cite this article:** MacIntyre, CR. **Illegal biolabs in the community – is Reedley a one-off?** *Global Biosecurity*. 2023; 5(1).

**Published:** October 2023

**Copyright:** Copyright © 2023 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by/4.0/>.

*Global Biosecurity* is a peer-reviewed open access journal published by University of New South Wales.