Dangerous experiments need to be stopped

I was not intending to write more about COVID-19 and the need for much more regulation of extraordinarily dangerous research, but recent events have made me change my mind. My readers will know that I believe that it is overwhelmingly likely that COVID-19 was a virus engineered in the Wuhan Institute of Virology (WIV), that escaped by accident. Very briefly, a proposal was made in 2018 to engineer a virus that would look remarkably like COVID-19, and study its properties at WIV. It is just too much of a coincidence that the COVID outbreak should then begin *in Wuhan*. However we are losing this argument in the court of public opinion – see for example a recent article in Foreign Policy magazine *Conspiracy Theories About COVID-19 Help Nobody* **FP:link**. There are contrary informed voices though. For instance: **Sachs:link** describes the views of Jeffrey Sachs, on the inadequate investigation of COVID origins, and where the truth may lie.

It seems that some people who disbelieve that COVID-19 was caused by a lab leak, argue that there is no reason to think that gain-of-function research that creates very dangerous pathogens needs strict regulation. There is no logic to this. Whatever the origins of COVID, there is no doubt at all that Peter Daszak of EcoHealth and WIV wished to carry out an enormously dangerous experiment with little benefit to science or medicine. Such work needs to be prevented.

Now, last week, a preprint was published, Here is a link. **BU:link** by a research group at Boston University. From the abstract:

> We generated chimeric recombinant SARS-CoV-2 encoding the S gene of Omicron in the backbone of an ancestral SARS-CoV-2 isolate and compared this virus with the naturally circulating Omicron variant. The Omicron S-bearing virus robustly escapes vaccine-induced humoral immunity, mainly due to mutations in the receptor49 binding motif (RBM), yet unlike naturally occurring Omicron, efficiently replicates in cell lines and primary-like distal lung cells. In K18-hACE2 mice, while Omicron causes mild, non-fatal infection, the Omicron S-carrying virus inflicts severe disease with a mortality rate of 80%.

In layman's terms they took two strains of COVID-19, one being highly transmissible, the other causing relatively high mortality after infection. They combined the two strains and made a virus which by testing they showed to be both highly transmissible and highly lethal in mice.

The scientific benefits of this work are very minor; yes a virus was created with the expected very dangerous properties and some increased understanding was obtained about genomic factors affecting transmissibility and lethality. The risks are obvious, a lab escape could have killed millions.

The work was carried out at Biosafety level 3 (not the highest level) and the procedures were 'approved by the institutional biosafety committee (IBC)', which appears to be an internal committee of Boston University. A Boston University spokesperson has argued that the work in question was not 'gain-of-function' as lethality in mice (after infection) was less than in one of the constituent strains (80% vs 100%). Firstly we have (fortunately) no idea of how the engineered virus would affect humans, and secondly is it seriously argued that taking a highly lethal but not very infectious pathogen and making it much more infectious but slightly less lethal is not dangerous?

Work like this is not technically very hard. I guess that more than a thousand labs could have done it. Some virologists have argued that work like this is being carried out in many labs, so why the fuss. This is supposed to make me feel better? We need much more control and monitoring of such work, and a realistic evaluation of the benefits. This Boston University group decided to do an experiment potentially endangering every person on the planet, apparently on their own initiative. We need laws to stop this, strict regulation and enforcement, and violations punishable under the criminal code, including long prison sentences for the principal investigators.

Failing this, it is certain that some research group will accidentally release another pandemic on the world, potentially one much worse than COVID-19.

I was about to post this when I came across the following by Jocelyn Kaiser of Science magazine:

> In a U.S. government lab in Bethesda, Maryland, virologists plan to equip the strain of the monkeypox virus that spread globally this year, causing mostly rash and flulike symptoms, with genes from a second monkeypox strain that causes more serious illness. Then they'll see whether any of the changes make the virus more lethal to mice. The researchers hope that unraveling how specific genes make monkeypox more deadly will lead to better drugs and vaccines.

Indeed, what could possibly go wrong?