



Do not censor science in the name of biosecurity

Security officials should not be concerned about the publication of mutant-flu research, says bio-weapons expert **Tim Trevan**.

The recent controversy over research into mutated versions of the H5N1 flu virus has focused on biosecurity concerns. It is easy to get the impression that this debate has created a clear split between a scientific community that wants the research to proceed and the results to be published and a biosecurity community that doesn't.

As a member of this biosecurity community for more than 30 years — I was special adviser to the chairman of the United Nations weapons inspectors in Iraq and covered chemical and biological disarmament with the UK Foreign Office in both London and Geneva, Switzerland — I believe this to be a false dichotomy. The research should be published in full, as it will be this week.

In fact, I will go further and say that the whole concept of dual-use biological research that is 'of concern' is flawed. It is a dangerous distraction, an inappropriate hangover from nuclear-threat analysis. Almost all biological knowledge can be either misused or applied for good.

Those concerned about publishing full details of the mutant-flu work say that they fear the research will be misused to develop more-effective biological weapons. But who would want to use a live, highly transmissible, virulent organism as a weapon, and to what purpose? And would censorship stop them?

Although such a weapon would strike terror and harm economies, its impacts would be uncontrollable, indiscriminate and unpredictable. And compared with conventional weapons, it would be slow to take effect and relatively easy to combat, through prompt vaccination and treatment.

That severely restricts the number of potential users. An uncontrollable weapon is unsuited to targeted attacks and its use would heap opprobrium on the user. And if insurgents or terrorists unleashed a catastrophic and indiscriminate attack on civilians, it would devastate sympathy for their cause.

The only groups who might logically consider using such a weapon are those for whom humans are the problem, such as environmental extremists and animal-rights activists, or apocalyptic sects, such as the Japanese terrorist cult Aum Shinrikyo, which released sarin gas in the Tokyo underground in 1995. Then there are those who do not care about casualties, such as a state or a regime that believes it faces imminent existential threat, or suicide fighters.

Censorship of the H5N1 papers would not have kept the genie in the bottle. Suppressing such papers or limiting access to their findings might even encourage proliferation by drawing attention to the risks and by provoking those researchers denied access to the results to seek to replicate them.

Can we prevent proliferation by controlling research? Certainly, researchers, institutional review boards and funders must consider the implications of proposed research from the

NATURE.COM
For more on mutant
flu, see:
go.nature.com/mhmibi

outset and implement a full biosafety and biosecurity plan. Major efforts have been made in this area. But to deny funding to projects with clear scientific or public-health value, even if they have some biosecurity risks, will drive research to undesirable sources of funding and prevent valuable research from being done.

If the knowledge and the science cannot be contained, then what about access to the materials and equipment required to turn research results into weapons? The direction in which technology and scientific services are heading does not bode well for controlling proliferation in this way. Companies already make genes for mail order. Free gene-design software exists. DNA printers will probably be on lab bench tops within the decade. But it cannot be morally or politically defensible to prevent wide distribution of tools that are indispensable to public health and basic research.

Warfare and terrorism are not the only biological risks that confront humanity. There is an entire spectrum of risks, from natural and accidental to deliberate. We are mostly helpless to prevent the periodic creation of new deadly diseases. We know that we face regular flu pandemics and that some will be particularly deadly.

An analysis of the effect of carrying out and publishing such research must compare two factors. The first — the cost — is the risk that publication will lead to deliberate release, multiplied by the impact of the release, multiplied by the frequency of release. The second — the benefit — is the possible reduction in the 250,000–500,000 annual deaths worldwide due to seasonal flu and the more than 12 million lives lost annually to other infectious diseases, among other public-health benefits.

Precise calculation is not possible, but the evidence strongly suggests that the increase in risk is quite small. The known benefits of addressing public-health challenges from nature will almost always far outweigh the potential and unknowable increased risk of misuse.

The bigger argument in favour of continued research into viral transmissibility and pathogenicity (the focus of the mutant-flu work) is that it will ultimately deter the use of biological weapons.

The best strategy to stop biological attacks is to make biological weapons unattractive by making preparedness and responses so effective that the consequences are no worse than those of a train wreck. Increased understanding of transmissibility and pathogenicity will enable countries to identify threats earlier, develop better vaccines, produce them more quickly and develop broad-spectrum defences to diseases. This will protect against both nature and warfare. ■

Tim Trevan is executive director of the International Council for the Life Sciences in McLean, Virginia.
e-mail: trevan@iclscharter.org