

THIS WEEK



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Flu papers warrant full publication

Although more debate is needed, the benefits of publishing sensitive data outweigh the risks that have so far been made public.

“No one should presume to know all the ways in which influenza virus could be misused, and the motivations for doing so, but the consequences could be catastrophic. There are many scenarios to consider, ranging from mad lone scientists, desperate despots and members of millennial doomsday cults to nation states wanting mutually assured destruction options, bioterrorists or a single person’s random acts of craziness. These are low-probability events, but they could introduce a new evolutionary H5N1 seed into the environment that seems not to exist in nature. This might not cause a pandemic instantly, but it could start the virus on a new path for pandemic evolution.”

That is the rationale provided by Paul Keim, acting chair of the US National Science Advisory Board for Biosecurity (NSABB), in response to questions posed by *Nature* (P. S. Keim *Nature* **482**, 156–157; 2012) about the NSABB’s recommendation that recent work on the transmissibility in mammals of artificial strains of avian H5N1 influenza virus should not be published in full. The work was conducted in ferrets — generally considered the best animal models for human transmission — and shows that avian H5N1 viruses have a greater potential to evolve into transmissible forms in mammals, including humans, than had been thought. The work is reported in two papers accepted but not yet published in *Nature* and *Science*.

Last week, a group of flu and public-health experts gathered at the World Health Organization (WHO) headquarters in Geneva, Switzerland, to discuss the matter (see go.nature.com/uyr1uu). And it was clear at the meeting that the above opening quote expresses the only rationale that attendees had received.

To its credit and that of the US government, the NSABB is the only body in the world set up to review these issues in a systematic fashion. It includes ex-officio representatives of all relevant government departments (including intelligence and security agencies), as well as independent researchers. The NSABB’s guidance was an important first step in public consideration of the impacts and potential regulation of such research. The second step was last week’s meeting at the WHO — again, like the NSABB, a body empowered only to make recommendations.

Some context is important in considering the issues surrounding publication. In 2003, *Nature* and many other journals met to establish editorial procedures for considering papers that have public-health and scientific benefits but that might also have biosecurity risks (see *Nature* **421**, 771; 2003). The statement that emerged from that meeting envisaged the possibility that a journal would reject a paper if it was clear that the risks of publication outweighed the benefits. *Nature* accordingly used independent advisers in considering the submission of the latest paper, and most of the advisers recommended publication in full. This is also the first paper submitted to any *Nature* journal for which recommendations have been made against publication on biosecurity grounds.

Rather than simply reject the papers, given also the NSABB’s opinion,

both *Nature* and *Science* decided to investigate another option: to publish a redacted version omitting key methods and data. But a condition of such an approach was that a method should exist for distributing a full version to those in need of the results for public-health reasons and those capable of pursuing the science. Both journals accordingly prepared full and redacted versions.

Those at the WHO meeting, under conditions of strict security, examined both versions of the two papers. It had already been said in blogs and news coverage that, because the methods used are not novel, and because one of the papers had been presented at an open meeting, redaction would be pointless. As one WHO participant said: “It was only when I’d seen both versions that I realized how ineffective redaction would be.” What was also concluded was that a system for distributing the full paper only to selected individuals would be impossible to set up on any relevant timescale.

But what also became clear, partly from unpublished data, was that not only does the mammalian transmissibility threat seem greater than previously thought, but also that current avian viruses have some of the mutations identified in the new work. In other words, there is already a substantial immediate risk to humans. The meeting also concluded that the new data are of value for surveillance, and that the results should be built on to explore the mechanisms underlying transmissibility and the high fatality rate observed in humans infected by H5N1.

Given the inadequacy of redaction, and the immediate risks to global public health, the biosecurity objections expressed above seem too general and hypothetical to justify obstructing publication and further research. Moreover, with regard to the NSABB’s recommendations and the recommendations of the WHO meeting (see go.nature.com/ky2skc), neither of the discussions that preceded them were sufficiently inclusive of the security, societal and research interests at stake.

Therefore, further discussion is essential. That must include a review of the safety regimes (lab equipment, buildings and practices) in which future work should be conducted. The two laboratories in which the latest research originated are categorized as ‘BSL-3 enhanced’ (see *Nature* **480**, 421–422; 2011), a classification that, although rigorous in these cases, is not well defined in general. The Public Health Agency of Canada has deemed the highest level of BSL-4 to be required (see page 447). Safety-standards committees in the United States and Europe are currently assessing required safety levels, and may report within a few weeks.

As was agreed by the journals and the lead authors at the meeting, publication of the papers must wait at least for the outcome of those discussions. There may yet be regulatory or legal obstacles to publication, or biosecurity or biosafety risks sufficient to outweigh the health risks. Otherwise, it is *Nature*’s view that the papers should ultimately be published in full. ■

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