Balancing act over deadly flu research

Debora MacKenzie

BATTLES continue over whether or not to publish research in which H5N1 bird flu transmitted readily among mammals.

Last week, a group of flu virologists, public health experts from countries where H5N1 circulates, bioethicists and the World Health Organization advised that the work should be published – even though the top US biosecurity panel has advised against it.

The US National Science Advisory Board for Biosecurity (NSABB) feared publication would hand hostile forces a fearsome bioweapon. The WHO, which hosted the meeting in Geneva, Switzerland, decided it was impossible to stop publication yet make details of the work available to protect public health. *New Scientist* has found that publication might add little to what is already openly available in the scientific literature.

H5N1 has killed over half the people known to have caught it since it spread worldwide in birds in 2004. Inability to pass readily between people has so far kept it from going pandemic. The current dispute concerns two pieces of research that created H5 viruses that spread through the air among ferrets – the best test-animal – like normal flu.

Ron Fouchier and colleagues at the Erasmus Medical Centre in Rotterdam, the Netherlands, created transmissible H5N1 by putting two mutations into the HA surface protein of an H5N1 virus, and one into its polymerase enzyme, before exposing ferrets to it. It spontaneously acquired two more significant mutations, and remained lethal. In the other research under scrutiny, Yoshi Kawaoka at the University of Wisconsin-Madison also created transmissible H5 flu.

However, a paper that shows how to makes H5 readily transmissible had already been published in September last year by Reuben Donis and colleagues at the US Centers for Disease Control and Prevention in Atlanta, Georgia. His team equipped a different H5N1 with the same two mutations as Fouchier. He also added a third mutation, and switched other genes to make it transmissible among ferrets.

While Fouchier concluded from his work that transmissible H5N1 might readily emerge naturally, Donis said it could be difficult. "Research must continue for such differences to be resolved, and for the world to understand the threat posed by H5N1," says Ab Osterhaus, head of the Rotterdam lab. Yet the dispute over publication of Fouchier's and Kawaoka's papers has led to an indefinite moratorium on such research.

The journals *Nature* and *Science* both agreed to publish redacted versions of the papers, without details of the methods or mutations – but only if means were found to get those details to the people who need them. These include researchers working with H5N1, who must guard against inadvertently creating such viruses, and public health agencies.

Last week Keiji Fukuda of the WHO said there was "unanimous" agreement that this could not readily be done. He said it was impossible to decide who should grant access to the information.

US officials at the meeting stated that they still supported the NSABB's stance, although Fukuda says everyone there agreed there was no way to meet the journals' conditions. The group advised postponing publication while it raised "understanding in non-scientific groups" about the risks. Tony Fauci, head of the US National Institutes of Allergy and Infectious Disease, says there is "no way we can require the journals not to publish". ■

TJADEN/LAIF/CAMERAPRESS

Biosecurity in the spotlight

MEANWHILE, BACK IN THE PIG PEN

While the world's flu scientists and biowarriors face off over publishing research on H5N1 bird flu, other flu continues to evolve among pigs. And it may just have taught us something disconcerting about bird flu.

The "triple reassortants" of bird, pig and human flu viruses circulating in pigs were the source of the 2009 human pandemic. Some carry surface proteins from human H3N2 flu from the early 1990s, and few people born since then have antibodies to them. In the past two years 17 people are known to have caught these viruses from pigs, but it never spread far.

Terrence Tumpey at the US Centers for Disease Control and Prevention in Atlanta, Georgia, can't explain why. He has shown that the pig viruses from those human cases bind to human receptors, spread readily among ferrets, and replicate better than current human H3N2 viruses in human airway cells in culture (*Proceedings of the National Academy of Sciences*, DOI: 10.1073/pnas.1119945109). This suggests that adapting to humans is only part of the pandemic process. Some virologists argue that because transmissible H5N1, such as the viruses created in the lab (main story), has not been seen in nature, it cannot occur. But perhaps it hasn't yet had the opportunity: an adapted virus may need other things to take off, such as enough susceptible humans, says Tumpey.