

AVIAN INFLUENZA

WHO Group: H5N1 Papers Should Be Published in Full

An elite group of 22 influenza scientists, public health officials, and journal editors from 11 countries recommended last week that the details of how a highly pathogenic bird flu virus was rendered capable of being transmitted easily among mammals be published in full. The recommendation, agreed to at a meeting at the World Health Organization (WHO) in Geneva, flies in the face of advice from an influential U.S. committee that key details of the experiments be confined only to those who have a need to know.

H5N1 is highly lethal to humans but does not spread easily from person to person. Two teams working with ferrets, which many researchers consider the best animal model for humans, manipulated H5N1 to introduce genetic changes that made it easily spread through the air between these weasel-like animals. In December, the National Science Advisory Board for Biosecurity (NSABB), a U.S. government committee, recommended that *Science* and *Nature*, which have reviewed papers about the work, not publish key details. NSABB feared that in the wrong hands, the information could provide a recipe for triggering a devastating human pandemic. An impassioned international debate ensued, pitting scientific freedom against public safety. The journals, heeding NSABB's advice, had planned to publish manuscripts stripped of critical details in mid-March, provided an as-yet-undetermined mechanism is established to make the entire manuscripts available to flu investigators and public health officials who need to know all the data.

In Geneva, the researchers who led the work—Ron Fouchier of the Erasmus University Medical Center in Rotterdam, the Netherlands, and Yoshiro Kawaoka of the University of Wisconsin, Madison—passed out copies of the papers they submitted to the journals. To demonstrate what the papers would look like if the journals followed NSABB's advice, the researchers also distributed redacted versions at the closed-door meeting. The drafts of each paper were numbered, participants had to sign for them upon receipt and return, and in the end, the authors shredded all the papers in front of everyone in the room. "That certainly was a surreal touch," says Barbara Jasnay, a

deputy editor at *Science*, who represented the journal at the meeting, held 16–17 February.

The group recommended that the journals publish the papers without deleting details. Keiji Fukuda, WHO's assistant director-general for Health Security and Environment, said the complexity of distributing the full manuscripts to a select few, combined with the public health and scientific value of widely sharing the data, led to a "quite strong"—but not unanimous—

ernment's top representative at the meeting, Anthony Fauci, also dissented from the consensus. "I stand by the NSABB recommendations," says Fauci, who heads the U.S. National Institute of Allergy and Infectious Diseases (NIAID).

In many ways, the WHO meeting gave a stamp of validation to NIAID, which funded both of the studies, and the researchers themselves, whom some have criticized for conducting the work in the first place. Summing up the consensus of the WHO group, Fauci said, "being able to pursue openly this type of research by the public health and scientific community outweighs the issues of a terrorist getting enough information to do something nefarious."

Fouchier, Kawaoka, and their co-workers say their studies reveal critical factors that



Peer review. WHO's Keiji Fukuda led an expert group that said papers on transmissible bird flu viruses should not be redacted.

agreement among the Geneva group to go against NSABB's recommendations. "Who would hold on to the sensitive information?" Fukuda asked at a WHO press conference. "Under what conditions would that information be released? What are the other complicating factors? It was recognized that coming up with such a mechanism would be very difficult to do overnight, if not impossible."

Paul Keim, the acting chair of NSABB, who attended the Geneva meeting, disagrees with the consensus opinion. Keim, a geneticist and anthrax specialist at the University of Northern Arizona in Flagstaff, praises the international makeup of the WHO group but stresses that it mainly consisted of influenza researchers. "I believe that the redacted versions were so obvious to them that they held them in little value," Keim said. "This type of policy decision can't be made by the flu research community alone." The U.S. gov-

lead to transmission of H5N1 in mammals. They contend that their data can also potentially help surveillance efforts detect dangerous mutations in birds or other species before these variants make the jump into humans (*Science*, 17 February, p. 785).

Albert Osterhaus, a meeting participant who works with Fouchier, says the WHO group received information about recently detected H5N1 variants in nature that underscores the value of their ferret work. "Quite a number of data, which are not yet in the public domain, have been shown that actually indicated that the H5N1 viruses are developing very fast," says Osterhaus, who did not want to discuss specifics. These new details, which he noted were not available to NSABB, mean their experiments could aid surveillance today. "That's a very important thing to realize," he says.

Although it endorsed full publication,

the WHO group urged the journals to delay publishing the manuscripts and asked the research community to continue a voluntary 60-day moratorium set to expire on 20 March to allow time to increase “public awareness” about the importance of the work. “This was a most important step for making sure anxieties will not be unnecessarily increased,” Fukuda said. The WHO group also hopes that extending the moratorium will allow for a fuller dis-

cussion about the safety conditions needed by labs that work with these viruses.

Like NSABB, the WHO group influences but does not control the fate of these papers. *Science* Editor-in-Chief Bruce Alberts, who was not at the WHO meeting, said he is “not completely clear about what the decision means because it’s qualified,” but said *Science* has scuttled plans to publish the redacted papers next month. *Nature*

Editor-in-Chief Philip Campbell, who attended the Geneva gathering, issued a statement that *Nature* supports the group’s decisions about the benefits of full publication. “Discussions at the WHO meeting made it clear how ineffective redaction and restricted distribution would be for the *Nature* paper,” Campbell’s statement said. Neither journal offered a timeline for publication. **—JON COHEN**

U.S. SCIENCE BUDGET

Scientists Decry Cuts That Would Doom ExoMars Missions

Next week, planetary scientists building instruments for a 2016 Mars mission called Trace Gas Orbiter will update a committee advising NASA on its Mars exploration program. But they’ll also be grilling NASA officials attending the meeting on the Obama Administration’s decision last week to kill the mission, one of two joint efforts with the European Space Agency (ESA) dubbed ExoMars (*Science*, 17 February, p. 783).

The president’s 2013 budget request eliminates funding for the 2016 mission, which received \$27 million this year, as part of a 20% cut to NASA’s planetary science division. The division’s proposed \$1.2 billion budget also terminates NASA’s participation in an ESA-led 2018 mission to Mars, for which the two space agencies were planning to build a rover. NASA had planned to spend up to \$1.2 billion on ExoMars.

Planetary scientists say that NASA’s decision to withdraw from ExoMars is a devastating blow that will end U.S. leadership in Mars exploration after five successful missions to the Red Planet. “The Mars community cannot understand why they have been targeted when they have been so successful,” says G. Scott Hubbard, who served as the first Mars program director at NASA and is now a professor at Stanford University in Palo Alto, California.

NASA Administrator Charles Bolden says the agency pulled the plug on ExoMars because “it was another multibillion-dollar flagship mission. Flagships are expensive. We just could not afford to do another one.” But he says NASA isn’t walking away from Mars. In August, a rover called Curiosity is scheduled to land and begin exploring the

Red Planet, and next year NASA hopes to launch the Mars Atmosphere and Volatile Evolution Mission.

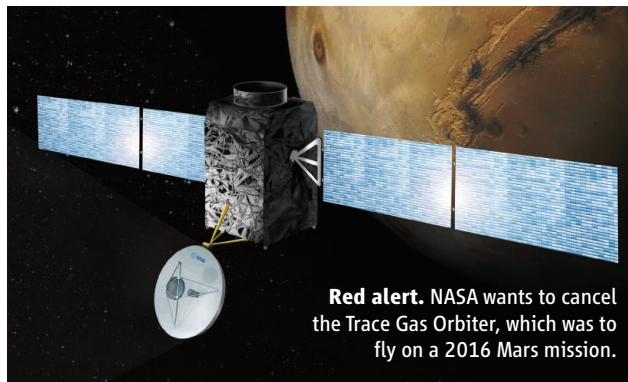
In lieu of ExoMars, officials are discussing a small 2018 mission that would still advance NASA’s goal of sending humans to Mars by the mid-2030s. John Grunsfeld, the new head of the \$5 billion Science Mission Directorate, wants scientists to provide ideas that NASA can use to plan a “basic mission” that “both

me can’t fault OMB. It’s up to NASA to demonstrate that we can estimate costs correctly and then stick to those estimates,” Bell says. At the same time, he says, “it is the nature of complex, big projects that they end up costing more than anticipated.”

The proposed cuts in the Planetary Science Division affect more than just ExoMars, notes Mark Sykes, head of the Planetary Science Institute in Tucson, Arizona. Designated funding to continue operating and analyzing data from Mars Reconnaissance Orbiter (MRO) would be eliminated. MRO’s “HiRISE instrument only recently found evidence for seasonal water flow just below the surface of Mars,” Sykes says. Funding for a program to prepare for a return to the moon would drop from \$140 million to \$61 million in 2013, and the outer planets program, which supports the ongoing Cassini mission to Saturn, would decline from \$122 million to \$84 million.

The flagship instrument on the Trace Gas Orbiter, much of which was being built at NASA’s Jet Propulsion Laboratory (JPL) in Pasadena, California, would have measured the distribution of trace gases that could signal the presence of life on the planet. JPL’s John Schofield is principal investigator on another instrument that aims to measure the global distribution of atmospheric temperature, dust, ices, and water vapor on a daily basis. Together, the instruments would have helped NASA prepare for future landings and human missions. Schofield says he and others “have been instructed to close out the 2016 mission in the next several months.”

The elimination of ExoMars in the president’s budget does not mean game over, says John Mustard, a planetary astronomer at Brown University and a member of the Mars advisory panel. “The Mars exploration community is a resilient one,” he says. “We’ll be thinking very hard on how to get these cuts reversed.” **—YUDHIJIT BHATTACHARJEE**



Red alert. NASA wants to cancel the Trace Gas Orbiter, which was to fly on a 2016 Mars mission.

answers scientific questions and supports future human exploration of Mars.”

That approach puzzles planetary scientists. “You cut the budget by a significant amount, and you’re going to send humans to Mars, which would be several times more expensive than a robotic mission,” Hubbard says. “It doesn’t make any sense.” Jim Bell, an astronomer at Arizona State University in Tempe and head of the Planetary Society, says the Administration’s decision to cancel ExoMars is all the more painful because the community “brought Mars back into the ball park” by scaling back the cost of the 2016 and the 2018 missions.

Bell and others believe the White House Office of Management and Budget (OMB) feared backing yet another project that would end up with massive cost overruns like so many NASA missions before it. “Some part of