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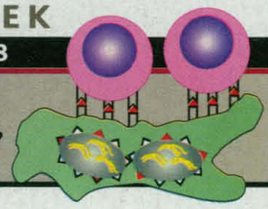

PUBLIC HEALTH

Bioterror Defense Initiative Injects Shot of Cash

Johns Hopkins University staffers were nervous in January that they wouldn't be able to fill the seats at what they were billing as the "first ever" national health conference on how to defend civilians against bioterrorist attack. They need not have worried. When the symposium* came to order last week, the seats were full. "We could have sold another 300 places," said an ebullient organizer. Reporters from dozens of news outfits lined a hotel ballroom in Crystal City, Virginia. And an audience of more than 900 turned up to hear the kickoff speech by Secretary of Health and Human Services (HHS) Donna Shalala, who said the meeting "will help replace complacency with a new sense of urgency."

Bioterrorism is suddenly on the map, bringing a major funding boost for research and defensive measures. This year alone, Shalala noted, the president's $1.4 billion antibioterrorism agenda will channel $158 million to HHS, and she is seeking an increase of $72 million next year. "I learned that the Administration is serious about setting up national defenses against bioterrorism," said Raymond Zalinskas, a former member of the team that inspected Iraq's bioweapons effort and who now works for the Monterey Institute of International Studies in Washington, D.C. It's "tremendous," he says, that the government is doing something.

This sense of urgency pervaded the meeting, which also kicked off a new Hopkins center on antiterrorism, headed by former Hopkins public health dean and antismallpox crusader Donald "D. A." Henderson. Attendees reviewed frightening scenarios—models in which U.S. cities were hit with anthrax or smallpox bombs—looking for weak points in the public health system. Speakers contended that hospitals and emergency services are woefully unprepared for a real emergency, such as a smallpox outbreak. And public health officials debated whether 20-year-old vaccine stocks would be adequate.

Dress rehearsal. What turned out to be an anthrax hoax in Indianapolis provided a test of emergency procedures.

The new initiative is meant to address these gaps with a national communication network, retraining for medical and emergency crews, and R&D on new drugs and vaccines. A federal coordinating committee headed by National Security Council staffer Richard Clark is already in place at the White House, and programs are unfolding in several agencies. But even Zalinskas notes that discussions about the threat contain "some hype." And a few skeptics—such as Israeli political scientist Ehud Sprinzak of Hebrew University—suggest the "craze" over biological threats is bad policy, noteworthy for making "a few defense contractors very rich." It remains to be seen how long the policy will endure.

BIOTERRORISM DEFENSE SPENDING SELECTED AGENCIES

$ millions

	1998	1999	2000 (proposed)
CDC	–	120	138
NIAID	13.5	19.7	20.7
DARPA	58.5	84.8	145.9
DOE	19	19	32

Until recently, "bioterrorism wasn't on the agenda" for most public health researchers, says Peter Jahrling, chief scientist of the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) at Fort Detrick, Maryland. "They had important things to take care of, like *Salmonella* in the potato salad," he says. So biodefense was largely assigned to military agencies. But attitudes have changed, partly as a result of high-profile revelations, such as the disclosure last year by defector Ken Alibek that the Soviets developed systems for loading smallpox into ballistic missiles. Such surprises have led to a "real culture shift" among public health officials and scientists, says Jahrling.

Henderson is one of the prominent biomedical figures who's heading the campaign (see Review, p. 1279). Molecular biologist Joshua Lederberg, the president emeritus of Rockefeller University, is another. Winner of a Nobel Prize in 1958, Lederberg chaired an advisory committee that helped guide the Defense Advanced Research Projects Agency (DARPA) as it made its first investments in biological research 3 years ago. DARPA's spending on biodefense has grown rapidly since then and is projected to nearly double over the next year (see table).

The HHS effort got a boost from an ad hoc "round table" of seven presidential advisors, chaired by Lederberg, which included genome researcher J. Craig Venter, head of Celera Genomics Inc. of Rockville, Maryland, and Thomas Monath, a vaccine expert and executive at OraVax Inc. of Cambridge, Massachusetts. At a meeting with Clinton on 10 April 1998, the group sketched out bioterror scenarios and answered Clinton's questions. Six weeks later, the president announced he was developing an antibioterrorism initiative, which would include a vaccine and medicine stockpile. Congress, already concerned about terrorist threats, passed an "emergency" appropriation last fall, sending more than $150 million in HHS's direction. The bill also earmarked $1 million for the civilian bioterror defense research center at Hopkins.

Since December, the Administration has been working out the details of how it will spend all this new money. Most of HHS's funds will be passed through the Centers for Disease Control and Prevention (CDC) to local public health and disaster agencies. The goal, assistant HHS secretary for plan-

* National Symposium on Medical and Public Health Response to Bioterrorism, 16 to 17 February, in Crystal City, Virginia, sponsored by Johns Hopkins University, HHS, the Infectious Diseases Society of America, and the American Society for Microbiology.

CREDIT: (TOP) MICHAEL CONROY/AP PHOTO

ning Margaret Hamburg said last week, is to build connections between emergency crews who first respond to a crisis and agencies like CDC that have expertise in exotic diseases. Most doctors today have never seen a smallpox or anthrax case, so the network will serve in part to educate physicians about recognizing and treating these diseases. It will also provide a secure communications link in a crisis.

HHS is planning to spend $51 million on a stockpile of drugs and vaccines, says James LeDuc of CDC's National Center for Infectious Disease. The CDC's two top concerns are anthrax, a tough bacillus, and the variola virus that causes smallpox. Anthrax is treatable with antibiotics if detected quickly, but it's hard to spot an infection early, and it kills quickly. Anthrax usually is not communicated from person to person. Smallpox, on the other hand, is highly contagious, and would cut a devastating swath through unvaccinated urban populations.

CDC has about 15 million doses of smallpox vaccine in its 20-year-old reserve, but because the rubber seals are deteriorating, about a quarter are suspect. This vaccine should be replaced, preferably with a new type, LeDuc says, produced with modern techniques. (The existing vaccine is neither sterile nor pure.) But establishing the safety and efficacy of a new vaccine could be difficult, because there are no smallpox patients to test it on. CDC is talking to the National Institutes of Health (NIH) and USAMRIID about developing animal models for testing a new formula.

Researchers are also debating the wisdom of a plan to destroy the last stocks of smallpox virus, at CDC and at the Research Institute for Viral Preparations in Moscow. Henderson and some other researchers argue that the destruction, scheduled for June, would reduce the risk of a smallpox attack by keeping the virus out of terrorist hands. But some argue that stocks should be preserved to help develop new drugs and vaccines (*Science*, 19 November 1993, p. 1223 and 1225.)

For anthrax, there are no civilian vaccine stocks at all: Supplies have been purchased by the Defense Department for the troops, and the sole factory that makes the vaccine is shut for renovation. CDC officials agree that it will be necessary to develop a new anthrax vaccine soon. USAMRIID has candidates in development, but bringing them through a series of clinical trials will be costly. A new version may be ready by 2005. In the meantime, CDC will store up antibiotics.

Another chunk of money, about $25 million, will go to NIH for basic science supporting vaccine and drug research. The bulk of it will be channeled through NIH's National Institute of Allergy and Infectious Diseases (NIAID) to extramural grantees for genetic studies of pathogens (anthrax, smallpox, plague, and tularemia). Starting next year, according to NIAID's Catherine Loughlin, "We'd like to take advantage of the genomic information to identify targets" for drug and vaccine development.

One promising therapeutic development, according to NIAID staffer Bernard Moss, comes from an agency that isn't earmarked for a funding boost—USAMRIID. There, microbiologist John Huggins has been screening licensed antiviral drugs to find some that might help combat smallpox. Using a mouse model of smallpox he developed, Huggins found a good candidate: cidofovir, a drug used mostly by AIDS patients for cytomegalovirus eye infections. But it must be given intravenously, and it has strong side effects—problems that make it impractical for emergency use. Henderson, for one, sees no immediate application. But Huggins is collaborating with NIAID and CDC in a search for analog drugs, says Loughlin, although Huggins is "doing all the work."

While USAMRIID is pleased to have collaborators in its traditional line of research, long-time workers in the field wonder how long the enthusiasm will last. Mindful of the ephemeral quality of such policy initiatives, reporters asked Shalala last week at what point the government's antibioterror program would reach its objectives. Shalala shot back: "This is not a quick response. … I will never say we have done enough." **–ELIOT MARSHALL**

RADIOACTIVE WASTE

Yucca Mountain Panel Says DOE Lacks Data

With just 2 years to go before deciding whether Yucca Mountain in southern Nevada should be a permanent home for spent fuel from the country's nuclear power plants, the U.S. Department of Energy (DOE) has run into another snag. In a report* submitted 2 weeks ago, a panel of experts says major questions about the controversial site are still unanswered and casts doubt on DOE's ability to make a final decision in 2001.

Congress chose Yucca Mountain as the sole site to be studied as a high-level radioactive waste repository in 1987, and DOE has spent $6 billion toward reaching that goal. While waste piles up in 72 temporary facilities, political and legal battles have pushed back its original start-up date of 1998 to the current target of 2010. In December, the department announced that the latest study, an assessment of the remote mountain's ability to entomb the waste safely for thousands of years, had identified "no show stoppers." Although safety questions remain, DOE officials said then, they were confident that the repository "would protect public health and the environment for thousands of years."

CREDIT: YUCCA MOUNTAIN PROJECT/DOE

A long haul. Panel wants more testing at Yucca Mountain and in the lab.

But on 11 February, a blue-ribbon panel of six experts hired to peer review the agency's study raised doubts about that conclusion in what the panel calls a "highly critical" report. "There's a lot to be done" before DOE can make such a prediction, says panel chair Chris Whipple, a risk assessment engineer at ICF Kaiser Engineers Inc., in Oakland, California. "Can they do it on their current schedule? That seems unlikely."

DOE is taking the panel's report in stride. "I think they overstated [the uncertainties] a bit, [but] it's what we paid for," says Abe Van Luik, senior technical adviser for performance assessment in the Yucca Mountain Project. "We're taking them seriously." DOE is still aiming for a decision in 2001, he says.

The report faults the department's current model for predicting the repository's behavior, which takes into account everything affecting the movement of radioactive elements out of

* "Final Report, Total System Performance Assessment Peer Review Panel." For a copy, see www.ymp.gov