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NIH finds forgotten smallpox store

Sixty-year-old ampoule contains smallpox DNA, and it is unclear whether the virus is viable.

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Smallpox, officially preserved in two repositories worldwide, may have been sitting alive and well in an unsecured US government refrigerator. On 8 July, the US Centers for Disease Control and Prevention (CDC) announced that vials containing the deadly virus had been discovered in a cardboard box in the refrigerator, located on the National Institutes of Health (NIH) campus in Bethesda, Maryland.

That refrigerator belongs to the US Food and Drug Administration (FDA), which has conducted some of its research at the Bethesda site since 1972. On 1 July, FDA researchers discovered the vials — labelled “variola”, the name of the virus that causes smallpox — while conducting an inventory of the lab in preparation for a move to the FDA's White Oak site in Silver Spring, Maryland. NIH safety officials determined that the virus had not leaked and there was no danger to the employees who had found it, and then moved the samples to a secure lab on the Bethesda campus, the agency said.

The NIH and the FDA then reported the find to the CDC and the World Health Organization (WHO), and on 7 July, CDC employees flew the vials to Atlanta, Georgia, where researchers confirmed that powder contained in the vials contained variola virus DNA. They are now attempting to grow the virus in cell culture under the highest level of containment to determine whether it is still viable, and expect results in two weeks. The NIH believes that the box that held the smallpox vials dates back to the 1950s, but the virus is extremely stable in its powdered form and could still be infectious.

Since its eradication was declared in 1980, smallpox officially exists in only two places: at the CDC in Atlanta and at its Russian counterpart, the State Research Center of Virology and Biotechnology VECTOR, in Novosibirsk. But most experts believe that numerous stocks exist around the world, whether in clandestine labs or preserved in human tissue, such as the scabs used for immunizations against smallpox into the twentieth century. A similarly forgotten stock of smallpox was found in a lab in Eastern Europe in the 1990s, for instance, and more recently at the former Swiss Serum and Vaccine Institute in Bern, says Peter Jahrling, a virologist at the National Institute of Allergy and Infectious Diseases in Frederick, Maryland. “Virologists are pack rats,” he says of their hoarding tendencies.

And those are only the stocks that officials know about: Jahrling says that he found out about the latest discovery when White House officials were discussing how to notify the WHO. He says that in the past, the response to such discoveries would probably have been simply to heat the virus to very high temperatures to kill it.

“This points out the concern that folks have articulated all over the world, that there is the possibility of undisclosed stocks,” says virologist Inger Damon, who heads the CDC's poxvirus research. But the case is unusual, Damon says, because the vials were stored in a cold unit instead of in a liquid nitrogen freezer, as the official stocks are.

The NIH says that it plans to conduct a comprehensive search of all its laboratory spaces as soon as possible. But such a move may not be sufficient to find other forgotten stocks, if they exist, says Jahrling, because disorganized scientists could have squirrelled samples away in unexpected places decades ago. “You could lock down and count every ampoule and still not find it,” he says.

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