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Pathogen Mishaps Rise as Regulators Stay Clear

By DENISE GRADY JULY 19, 2014

The recently documented mistakes at federal laboratories involving anthrax, flu and smallpox have incited public outrage at the government's handling of dangerous pathogens. But the episodes were just a tiny fraction of the hundreds that have occurred in recent years across a sprawling web of academic, commercial and government labs that operate without clear national standards or oversight, federal reports show.

Spurred by the anthrax attacks in the United States in 2001, an increase in "high-level containment" labs set up to work with risky microbes has raised the number to about 1,500 from a little more than 400 in 2004, according to the Government Accountability Office.

Yet there has never been a national plan for how many of them are needed, or how they should be built and operated. The more of these labs there are, the G.A.O. warned Congress last week, the greater the chances of dangerous blunders or sabotage, especially in a field where oversight is "fragmented and largely self-policing."

As the labs have multiplied, so have mishaps. According to a 2012 article by researchers from the Centers for Disease Control and Prevention, the number of reported accidents involving microbes that can cause severe illnesses grew rapidly — from just 16 in 2004 to 128 in 2008 and 269 in 2010, the last year reported. Many of the accidents involved leaks, spills or other releases of infectious material inside the laboratories, potentially infecting workers and often requiring extensive decontamination.

Another report, by the Department of Homeland Security in 2008, provided a rare glimpse into the types of accidents that have occurred at high-level labs around the country, often at universities.

Lab workers at different sites accidentally jabbed themselves with needles contaminated by anthrax or West Nile virus. An air-cleaning system meant to filter dangerous microbes out of a lab failed, but no one knew because the alarms had been turned off. A batch of West Nile virus, improperly packed in dry ice, burst open at a Federal Express shipping center. Mice infected with bubonic plague or Q fever went missing. And workers exposed to Q fever, brucellosis or tuberculosis did not realize it until they either became ill or blood tests detected the exposure.

The good news is that relatively few lab workers have become ill from accidental exposures: only 11 from 2004 to 2010, according to the C.D.C. report. None died, and none infected other people.

Richard H. Ebright, a molecular biologist and laboratory director from Rutgers University, said he had “no confidence” in the safety of the many labs that have sprung up since 2001. He suggested there was a culture of complacency at some of them, as well as hubris among some researchers who believe they do not need oversight or management.

The most recent revelations have underscored potentially serious lapses at the government’s premier institutions. In June, dozens of C.D.C. employees may have been exposed to live anthrax. In another case disclosed this month, a C.D.C. lab accidentally contaminated a relatively benign flu sample with a dangerous H5N1 bird flu strain that has killed 386 people since 2003 — and then shipped it to a lab at the Department of Agriculture. In yet another episode this month, vials of smallpox and other infectious agents were discovered in a government laboratory on the campus of the National Institutes of Health after being stored and apparently forgotten about 50 years ago.

Six or seven government agencies were involved in the growth spurt of labs across the country focusing on dangerous pathogens, with no overall strategic plan, according to Nancy Kingsbury, the managing director of applied research and methods at the G.A.O., who testified

last week before a House Energy and Commerce subcommittee.

For years, the accountability office has warned that there was no one federal agency overseeing all the laboratories. In fact, it has said, the real number of high-level labs is not even known because the only ones required to register with the government are those handling “select agents” — microbes that can cause serious illness in people, animals or crops. Other high-level labs handle pathogens that may be dangerous but are not listed as select agents, the office said, adding that not much is known about them.

Both Dr. Kingsbury and Dr. Ebright, who also testified before Congress last week, said there should be one independent national agency to oversee work with select agents. Dr. Ebright said that many of the labs should be shut down, and that no more than 25 to 50 were needed nationwide.

Dr. Thomas Frieden, director of the C.D.C., has also said the number of high-level labs, dangerous pathogens and people with access to them should be reduced to “the absolute minimum necessary.” Testifying on Wednesday, he said the more such labs there were, the greater the risk of accidents.

The recent mistakes at federal labs have opened the door to a much broader criticism of the risks posed by the expanding research into risky pathogens, especially the efforts to create dangerous strains of flu not currently circulating, or to manipulate already deadly flu viruses to make them more contagious.

Researchers who conduct that work, sometimes labeled “gain of function” research, say its purpose is, in part, to help scientists recognize changes in natural viruses that may help predict which ones are becoming more deadly or more contagious. But it provoked a public outcry in 2011 because of fears that a lab accident might release the altered viruses and start a lethal pandemic.

The studies were halted for about a year while governments and research organizations tried to develop safety rules, but the work has since resumed in several laboratories.

Scientists who oppose the research issued a statement last week

urging that the experiments be curtailed until their risks and benefits can be reconsidered.

They expressed particular concern about the possibility of accidents involving newly created strains of highly transmissible, dangerous viruses, saying they could cause outbreaks that would be difficult or impossible to control. Once transmission of a new flu strain becomes established, the statement said, it can infect a quarter of the world's population within two years.

One of the signers, Marc Lipsitch, a professor of epidemiology and director of the Center for Communicable Disease Dynamics at the Harvard School of Public Health, said, "These experiments knowingly put large numbers of human lives at risk."

Then on Wednesday, the European Center for Disease Prevention and Control, funded by the European Union, also expressed concerns about the flu research, stating, "Recent incidents remind us that laboratory accidents and laboratory escapes can happen with dangerous pathogens, even if the highest security standards are applied."

Focusing specifically on recent work at the University of Wisconsin by Yoshihiro Kawaoka — who used genetic engineering to create a bird-flu virus similar to the one that killed millions of people in 1918 — the group said accidents would pose a risk to lab workers and the public.

Dr. Kawaoka said in an email message that the accidents at the C.D.C. were "very troubling." Even so, he said, the flu studies have to continue because "these pathogens exist in nature, and they could be used as bioweapons."

He said that at his lab, "we continue to take every precaution to ensure risks are as low as possible." And he added that to be approved for the research, his lab had to submit to unannounced inspections, and had one in the first half of July.

Ron Fouchier, a virologist who does similar work on flu viruses at the Erasmus Medical Center in the Netherlands, said the recent lab errors had no bearing on his work.

"Just because there were incidents in one institute does not mean

others have the same problem,” Dr. Fouchier said by email. He said the fact that no one had contracted anthrax from the accident at the C.D.C. proved that adequate safety measures were taken.

“One cannot bring down the number of incidents in labs to zero, but one can reduce the risks to negligible,” he wrote.

Dr. Fouchier dismissed as irrelevant the finding of forgotten vials of smallpox at the National Institutes of Health.

“Box found,” he wrote. “Contained. Destroyed. Done.”

Donald G. McNeil Jr. contributed reporting.

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