

Why GAO Did This Study

The ability to attribute the source of an intentionally released biological threat agent and quickly apprehend and prosecute the perpetrator is essential to our nation's safety. However, questions remain about whether DHS's and the FBI's capabilities have improved since the 2001 anthrax attack. GAO was asked to report on DHS's and the FBI's bioforensics capabilities.

This report examines the (1) extent to which DHS and the FBI have identified gaps in their bioforensics capabilities since 2010, (2) bioforensics needs experts have identified, and (3) actions, if any, DHS and the FBI have taken to enhance their ability to attribute the source of a biological attack, and to identify any challenges to enhancing bioforensics capabilities. GAO's review focused on the agencies' efforts since 2010, when the FBI's investigation of the 2001 anthrax attack was closed. GAO analyzed relevant agency documents and interviewed agency officials and scientists on issues related to bioforensics. GAO also convened a meeting of experts with NAS's assistance to discuss potential bioforensics needs.

What GAO Recommends

GAO recommends that DHS—in consultation with the FBI—conduct a formal bioforensics capability gap analysis and update it periodically. DHS concurred with GAO's recommendation.

BIOFORENSICS

DHS Needs to Conduct a Formal Capability Gap Analysis to Better Identify and Address Gaps

What GAO Found

The Department of Homeland Security (DHS) and the Federal Bureau of Investigation (FBI) have identified some gaps in their bioforensics capabilities, but DHS has not performed a formal bioforensics capability gap analysis. It is therefore not clear whether DHS and the FBI have identified all of their capability gaps. A capability gap analysis can help identify deficiencies in capabilities and can help support the validation and prioritization of how to address the gaps. DHS and the FBI have identified capability gaps using an informal undocumented process. For example, DHS held informal meetings to seek FBI input on capability gaps associated with recent casework. Gaps identified through this informal process include the inability to (1) characterize unique, novel, and engineered agents and “unknowns” (emerging or synthetic organisms) and (2) understand and communicate uncertainty associated with analyzing complex biological samples, among other things. In the absence of a well-documented bioforensics capability gap analysis, the rationale for DHS's resource allocations, or its plans for future enhancements to existing capabilities are not clear and thus cannot ensure that resources are being targeted to the highest priority gaps.

In addition to DHS and the FBI, other organizations, such as the National Research Council (NRC) of the National Academy of Sciences (NAS), and the National Science and Technology Council (NSTC) of the Office of Science and Technology Policy (OSTP), have identified potential bioforensics capability needs. These needs can generally be grouped into three areas: science, technology and methods, and bioinformatics and data. GAO also convened a meeting of experts, with the help of NAS, and these experts updated a list of potential bioforensics capability needs that NAS and OSTP had previously identified within each of these areas. Some of the needs these experts confirmed as still relevant were similar to those DHS and FBI officials have identified, while others were different. For example, like DHS and the FBI, the experts agreed that an ability to characterize genetically engineered agents was needed, but they also suggested that evaluating existing protocols, such as those for DNA sequencing, to determine whether they were validated, was needed. GAO believes that this information may be helpful to DHS and the FBI as part of any future bioforensics capability gap analysis they undertake.

Since 2010, DHS has enhanced some of its bioforensics capabilities, with FBI input, by focusing on developing methods-based capabilities while maintaining agent-based capabilities. DHS has funded research and development projects addressing areas such as genome sequencing approaches, which underpin many methods-based bioforensics capabilities. DHS is also developing an in-house reference collection for use in investigations. In addition, DHS is developing the ability to characterize unique, novel agents as well as “unknowns,” such as synthetic organisms. DHS projects that some enhanced capabilities will be complete in about 2025. However, in pursuing enhancements, DHS faces several challenges, including establishing a statistical framework for interpreting bioforensics analyses and associated inferences and communicating them in a court setting, as well as obtaining suitable biological agents and DNA sequences to ensure quality references for use in investigations.