GAO@100 Highlights

Highlights of GAO-21-292, a report to congressional requesters

May 2021

BIODEFENSE

DHS Exploring New Methods to Replace BioWatch and Could Benefit from Additional Guidance

Why GAO Did This Study

Early detection of a biological attack can help reduce illness and loss of life, but DHS has faced challenges in acquiring biodetection capabilities to replace BioWatch, the current system used to detect aerosolized biological attacks. According to DHS, it is exploring the use of a new anomaly detection capability that, if developed successfully, could reduce the time to detection.

GAO was asked to examine the BD21 acquisition and assess technical maturity. This report (1) describes BD21 and the extent to which the program has followed DHS's acquisition policy, and (2) examines potential technical challenges to successful BD21 development, and actions to mitigate acquisition risks. GAO analyzed program acquisition documents against DHS acquisition policy and analyzed DHS's TRA guide against GAO's TRA best practices guide. GAO also interviewed DHS and DOD officials familiar with the BD21 acquisition effort for additional context.

What GAO Recommends

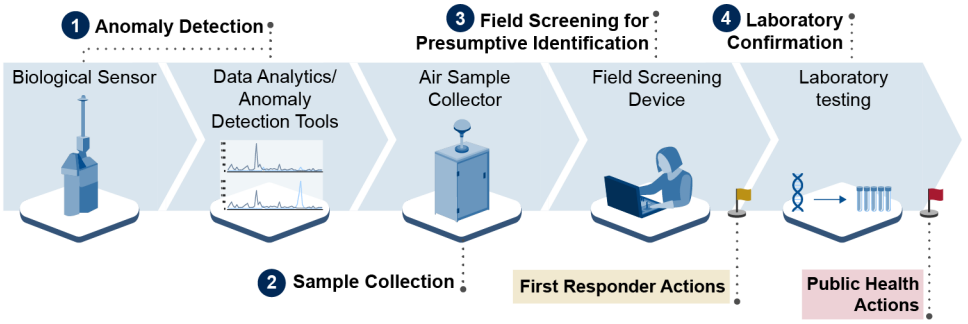
GAO makes three recommendations including that DHS incorporate best practices as outlined in GAO's TRA best practice guide into its TRA guidance, and ensures the BD21 program conducts TRAs that follow these best practices prior to the program's acquisition decision events. DHS concurred with all three GAO recommendations.

View GAO-21-292. For more information, contact Karen L. Howard at (202) 512-6888 or howardk@gao.gov or Chris P. Currie at (404) 679-1875 or curriec@gao.gov.

What GAO Found

The Department of Homeland Security (DHS) is following the agency's acquisition policy and guidance to acquire Biological Detection for the 21st Century (BD21). This system-of-systems concept—an assembly of technologies to gain higher functionality—is intended to combine various technologies, such as biological sensors, data analytics, anomaly detection tools, collectors, and field screening devices to enable timelier and more efficient detection of an aerosolized attack involving a biological agent than the current biodetection system. The BD21 program is early in the acquisition lifecycle and DHS has not yet selected the technologies to be used. Potential technologies are still being analyzed to demonstrate that certain components of the overall concept are feasible, such as an anomaly detection algorithm.

However, BD21 faces technical challenges due to inherent limitations in the technologies and uncertainties with combining technologies for use in biodetection. For example, biological aerosol sensors that monitor the air are to provide data on biological material in the environment, but common environmental material such as pollen, soil, and diesel exhaust can emit a signal in the same range as a biological threat agent, thereby increasing false alarm rates. Program officials report that the risk of false alarms produced by biological sensor technologies could be reduced by using an anomaly detection algorithm in addition to the sensor. However, it is too early to determine whether integration of an anomaly detection algorithm will successfully mitigate the false alarm rate. Specifically because the algorithms have never been developed and used for the purpose of biodetection in an urban, civilian environment.



Source: GAO analysis of Department of Homeland Security information. | GAO-21-292

BD21 program is following the agency's acquisition policy and guidance to mitigate technological risks in acquisition programs, and plans to conduct technology readiness assessments (TRA) along the way. In 2020, DHS issued a TRA guide, but it lacked detailed information about how the department will ensure objectivity and independence, among other important best practices GAO has identified. If DHS follows GAO's best practices guide, decision makers and program managers will be in a better position to make informed decisions at key acquisition decision events.