The BioWatch Program: What Information is Needed to Inform Decision Making

Strategies for Cost-effective and Flexible Biodetection Systems that Ensure Timely and Accurate Information for Public Health Officials: A Workshop

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Overview of BioWatch as it relates to public health

- First of its kind, bio-aerosol monitoring network intended to detect an aerial release of a high consequence infectious agent within a populous area.

- Viewed as a surveillance tool amongst others, such as syndromic surveillance, for detecting the presence of an infectious agent of public health significance.

- Information from BioWatch contributes to and is interpreted within the context of the larger surveillance picture.
Overview of BioWatch as it relates to public health (cont)

- While managed by DHS’s OHA, BioWatch itself is maintained and operated at the local level as a unique entity within each jurisdiction and represents decision-makers from municipalities, county, state and regional authorities, in addition to, both public and private entities.

- No two BioWatch jurisdictional operations, within thirty plus locations are exactly alike.

- In general, laboratory testing and much of the program’s operational response lies within public health as the lead entity while requiring close collaboration at the local and national level with key stakeholders, emergency response and law enforcement officials.
What is a BioWatch Actionable Result (BAR)?

- Production of a reliable, reportable laboratory result (laboratory BAR)
- Determination that a BAR result is actionable within the context of other key pieces of information
Benefits:

- Reducing the collection-to-result turn around times to 4-6 hours to decrease response time and benefit indoor/transportation venues.

- Potential for improving upon the depth of information provided by the BAR; for example, by improving upon pathogen identification (specificity) and strain discrimination.

- Potential to provide a quantitative BAR result which is useful information for response considerations with multiple collector “hits”.
Limitations/Issues:

- Managing a new timeline for response actions as a result of the increase in testing frequency.

- Provision of a robust quality assurance program that parallels the new standards in place for the current technology.

- Data management including assuring secure and reliable electronic resulting from each instrument and within the network.
Autonomous Detection Technology

Considerations:

- Provide flexibility in the agent panel to allow addition or removal of threat agents.

- Allow adjustment of the collection duration and/or the window between tests (especially after a BAR).

- Co-locate environmental monitors for temperature and humidity.

- Ensure ability to collect and appropriately store a portion of the test sample to verify by other test methods.

- Allow provision for some jurisdictions to perform basic maintenance to facilitate familiarity with the new technology and its inherent limitations.
What information is needed to determine a BAR from the new autonomous detector technology?

Prior to a BAR, the PHL director/designee will require pre-knowledge of parameters critical for test interpretation including:

- Sensitivity
- Specificity
- Reproducibility (machine-to-machine, day-to-day)
- Robustness (environment-to-environment, season-to-season)
- Inherent limitations (environmental interferents)

Following an instrument BAR, the PHL director/designee will need access to review and/or analyze:

- Instrument performance indicators (technology dependent)
- Positive and negative controls
- Threshold settings
- Historical data from the collector(s)
What analysis/actions may differ following a BAR generated by autonomous detection technology?

- BAR data may improve upon interpretation of a detection event but will still require interpretation within the context of other information.

- Following rapid notification to convene, interpret, and decide upon a course of action, decisions may be made to:

  - alter the routine instrument test schedule to collect/test more frequently to positively impact response efforts by providing more information.
Conclusions

- Any new technology should be benchmarked against the current technology. Data from the current system has served to establish an important baseline for sensitivity, specificity, reproducibility, and an understanding of inherent limitations of the current technology in interpreting and acting upon results.

- A specific DHS protocol is in place describing the mechanism for introducing a new platform and/or method to the BioWatch Program. It should be assumed that the new technology must perform equal or better to the current technology (Gen-2 RTD-PCR) before it is adopted.

- Public health is supportive and poised for adoption and implementation of new technologies to protect the nation’s health.