



## APHL Position/Policy Statement

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### Use of Non-Culture Assays to Detect Communicable Infectious Agents

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#### A. Statement of Position

The Association of Public Health Laboratories (APHL), in partnership with the Council of State and Territorial Epidemiologists (CSTE) and the Centers for Disease Control and Prevention (CDC), recognizes the need for, and the advantages of, rapid non-culture assay methods for individual patient care. However, from a public health perspective, it is essential that all positive results from such tests be confirmed by additional analyses performed on an isolate of the pathogenic organism. Confirmation should include conventional and molecular grouping and sub-typing of the pathogenic organism to enable public health practitioners to trace disease sources, develop intervention strategies, and eliminate threats to the health of the community.

#### B. Background/Data Supporting Position

The public health laboratory system is a network of local, state, and national laboratories, in close partnership with epidemiology programs, that play a key role in the prevention and control of communicable infectious diseases. It does so by providing population-based surveillance data to detect and investigate outbreaks of infectious disease, and to monitor significant trends in the development of antibiotic resistance and altered pathogenicity.

Several national surveillance programs built on this laboratory network are currently in place. The oldest is the National *Salmonella* Surveillance System<sup>1</sup>. For over 50 years, this program based on the serotyping of bacterial isolates has been the foundation of a national monitoring system to track laboratory confirmed cases and detect unusual clusters of *Salmonella* infection. Similar public health benefits have resulted from the National *Shigella* Surveillance System<sup>2</sup>.

In 1997, the CDC implemented the PulseNet<sup>3</sup> program, a national network using molecular methods to detect outbreaks of foodborne illness. This new molecular network, utilizing the technology of pulsed-field gel electrophoresis (PFGE) to create molecular DNA “fingerprint” patterns (subtypes) for individual bacterial isolates, has been extremely effective. Its effectiveness has depended on the active participation of many public health laboratories around the nation that use this technology to characterize isolates. Patterns obtained by these laboratories are shared and compared nationally. If a fingerprint pattern is found to be similar to that of other isolates, a common source outbreak is considered possible and a focused epidemiologic investigation is undertaken. This is a remarkable surveillance system, but it is clearly dependent on the continuous availability of microbial isolates for analysis. Without adequate numbers of such isolates, the effectiveness of this PulseNet system will be severely compromised.

Early identification of food borne outbreaks using PulseNet has made it possible to respond rapidly on a national level to prevent further cases of disease by facilitating “trace back” to sources, so that production, distribution, and sale of implicated food can be halted. Because this model has been so successful, PulseNet is now being applied to the surveillance of other infectious pathogens, including agents of meningitis, respiratory infection, and a wide variety of other food borne and invasive diseases. In the future, as technology advances, additional surveillance programs will be developed and implemented using this public health laboratory network.

An essential feature of this network is the need for continuous access to a broad spectrum of cultured microbial agents that can be specifically identified and thoroughly characterized in the public health laboratory. To detect communicable disease outbreaks early and focus epidemiologic investigations, isolates must be available for identification and sub-typing by serological, biological, or molecular methods to demonstrate critical point-source relationships within a community, a state, or the nation. Such isolates are also essential for conducting in depth analyses required to monitor trends in antibiotic resistance and the emergence of new or altered pathogens. While the availability of an isolated pathogen often is not required by laboratory testing that affects patient management, i.e., for individual health, the availability of such isolates is critical to infectious disease surveillance and public health.

**C. References**

<sup>1</sup> CDC. Salmonella surveillance: annual tabulation summary, 1999. Atlanta, Georgia: US Department of Health and Human Services, CDC, 2000.

<sup>2</sup> CDC. Shigella surveillance: annual tabulation summary, 1999. Atlanta, Georgia: US Department of Health and Human Services, CDC, 2000.

<sup>3</sup> CDC. PulseNet: The National Molecular Subtyping Network for Foodborne Disease Surveillance, 2000. Information may be found at: <http://www.cdc.gov/ncidod/dbmd/pulsenet/pulsenet.htm>

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