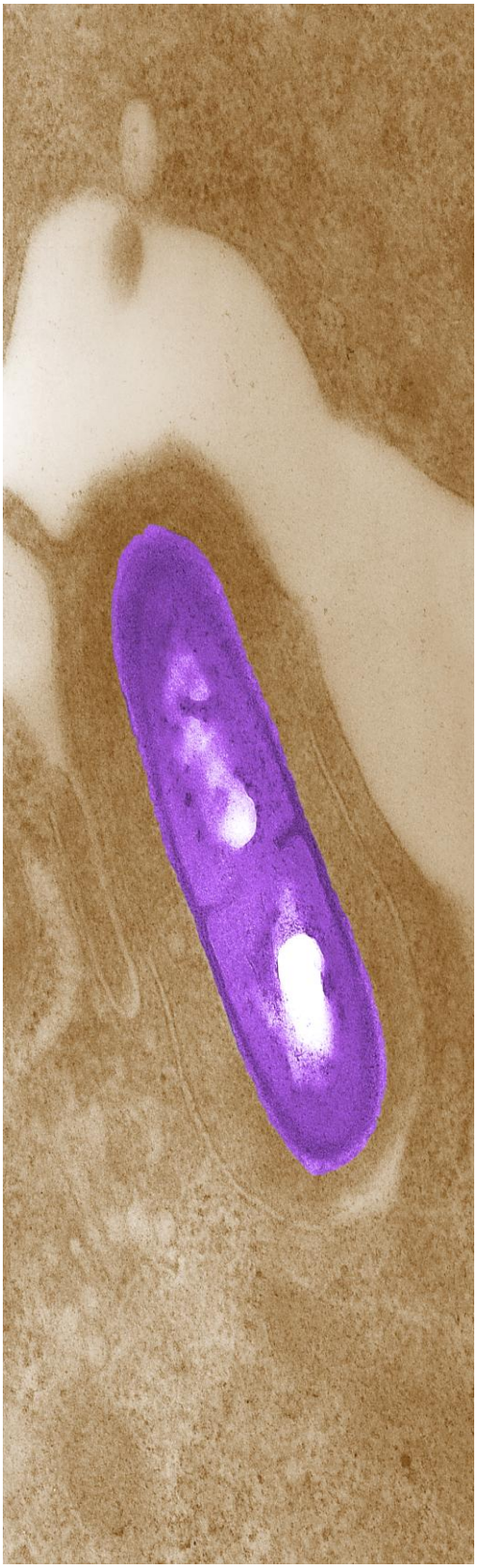
National Enteric Disease Surveillance: The *Listeria* Initiative



Surveillance System Overview: The *Listeria* Initiative

Listeria monocytogenes is estimated to cause nearly 1,600 illnesses each year in the United States; more than 1,400 related hospitalizations and 250 related deaths occur (1). *Listeria* infections (listeriosis) are nationally notifiable. Nearly all cases of listeriosis in persons who are not infants result from eating food contaminated with *L. monocytogenes*; newborn infants can develop listeriosis if their mother ate contaminated food during pregnancy.

The *Listeria* Initiative is an enhanced surveillance system that collects reports of laboratory-confirmed cases of human listeriosis in the United States. Demographic, clinical, laboratory, and epidemiologic data are collected using a standardized, extended questionnaire. The *Listeria* Initiative was piloted in the Foodborne Diseases Active Surveillance Network (FoodNet) in 2004 and implemented nationwide in 2005. Both the number of states participating in and the number of reports sent to the *Listeria* Initiative have increased since 2004.

A main objective of the *Listeria* Initiative is to aid in the investigation of listeriosis clusters and outbreaks by decreasing the time from outbreak detection to public health intervention. Patient interviews are conducted as cases are reported, rather than after clusters are identified, to minimize the effect of recall bias on food consumption history. In addition, clinical, food, and environmental isolates of *L. monocytogenes* are subtyped using pulsed-field gel electrophoresis (PFGE, a type of DNA fingerprinting). PFGE results are submitted to PulseNet, the National Molecular Subtyping Network for Foodborne Disease Surveillance, to identify clusters of possibly related cases. When clusters are identified, *Listeria* Initiative data are used to rapidly conduct epidemiological analyses. The food consumption histories of patients with cluster-associated illnesses are compared with those of patients with sporadic illnesses to identify foods possibly associated with the cluster. Without the *Listeria* Initiative database, appropriate comparison data ("controls") for listeriosis investigations would be difficult to obtain through traditional methods; the source population at risk of invasive listeriosis—older adults, immunocompromised persons, and pregnant women—is a small segment of the general population.

Local, state, and territorial public health professionals are encouraged to complete the *Listeria* Initiative questionnaire for all cases of laboratory-confirmed listeriosis. English and Spanish versions of the questionnaire are available at http://www.cdc.gov/nationalsurveillance/listeria_surveillance.html.. All *Listeria* isolates should continue to be forwarded promptly to state or national laboratories for PFGE subtyping.

Overview of *Listeria* Taxonomy

The genus *Listeria* contains seven species (*L. monocytogenes, L. ivanovii, L. seeligeri, L.innocua, L. welshimeri, L. martii,* and *L. grayi*), two of which are pathogenic. *L. monocytogenes* is pathogenic to humans and animals; *L. ivanovii* (previously *L. monocytogenes* serotype 5) primarily infects animals and very rarely causes disease in humans.

Serotyping differentiates isolates of *Listeria* below the species level. *Listeria* serotypes are designated based on the immunoreactivity of two cell surface structures, the O and H antigens. Twelve serotypes of *L. monocytogenes* (1/2a, 1/2b, 1/2c, 3a, 3b, 3c, 4a, 4b, 4c, 4d, 4e, and 7) are recognized, three of which (1/2a, 1/2b, and 4b) cause most (95%) human illness; serotype 4b is most commonly associated with outbreaks.

References

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Suggested Readings

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