

# 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, with more than 1,400 hospitalizations and 250 deaths (1). Although human *Listeria* infections are nationally notifiable, some cases may not be recognized through public health surveillance, in part because some *Listeria* isolates may not be forwarded or reported from clinical laboratories to state public health laboratories. Additionally, although invasive listeriosis is a serious disease for which patients would be expected to seek medical care, it is likely that some cases of infection, especially those that involve miscarriages and stillbirths, may not be diagnosed (1).

The *Listeria* Initiative is an enhanced surveillance system that collects reports of laboratory-confirmed cases of human listeriosis in the United States. Demographic (e.g., age, sex, race/ethnicity), clinical (e.g., symptoms, type of illness, patient outcomes), laboratory (e.g., date of collection and source of the specimen that yielded the *Listeria* isolate), and epidemiologic (e.g., food consumption history) 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 continue to increase.

A main objective of the *Listeria* Initiative is to aid in the investigation of listeriosis clusters and outbreaks. To minimize the effect of recall bias on food consumption history, patient interviews are conducted as individual cases are reported, rather than after clusters are identified. Clinical, food, and environmental *Listeria* isolates are submitted to PulseNet, the National Molecular Subtyping Network for Foodborne Disease Surveillance, for pulsed-field gel electrophoresis (PFGE) to identify clusters of PFGE-matching isolates. Case-specific data from the *Listeria* Initiative database (e.g., food consumption history) are linked with PFGE information in the PulseNet database, allowing for identification of epidemiologically related and nonrelated illnesses for rapid case-control analyses. Appropriate controls for listeriosis outbreak investigations can be difficult to obtain through typical control-finding methods such as random digit dialing, primarily because the source population at risk of invasive listeriosis—older adults, immunocompromised persons, and pregnant women—is a small segment of the general population. The use of ill controls provides timely, appropriate controls who can be matched to case-patients by age and pregnancy status to decrease the time from outbreak detection to public health intervention.



Because the *Listeria* Initiative collects food consumption history for the purpose of generating hypotheses about food vehicles in outbreak settings, each mother-infant pair in pregnancy-associated cases is counted as a single case, even when clinical isolates are obtained from both the mother and the infant. The rationale is that the infant's infection presumably occurs because of the mother's consumption of contaminated food. Cases are classified as pregnancy-associated if illness occurred in a pregnant woman or an infant  $\leq 28$  days old; all other cases are considered non-pregnancy-associated.

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/national-surveillance/listeria\\_surveillance.html](http://www.cdc.gov/national-surveillance/listeria_surveillance.html). All *Listeria* isolates should continue to be promptly submitted to state or national laboratories for subtyping.

### Overview of *Listeria* Taxonomy

The genus *Listeria* contains seven species (*monocytogenes*, *ivanovii*, *seeligeri*, *innocua*, *welshimeri*, *martii*, and *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 can differentiate isolates of *Listeria* beyond the species level. *Listeria* serotypes are designated based on the immunoreactivity of two cell surface structures, the O and H antigens. There are twelve recognized serotypes of *L. monocytogenes* (1/2a, 1/2b, 1/2c, 3a, 3b, 3c, 4a, 4b, 4c, 4d, 4e, and 7), 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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