

Date of issue: 03 January 2018

Report issued by: Centre for Enteric Diseases (CED) and Division of Public Health Surveillance and Response, Outbreak Response Unit (ORU), National Institute for Communicable Diseases (NICD)/ National Health Laboratory Service (NHLS).

Note:

- Case data and outbreak response activity summary is the best available at time of publication, and are updated on an ongoing basis.
- Due to recent challenges with NHLS laboratory information system data (since epidemiological week 47) and a possible lag in reporting as a result of the public holidays, case numbers for weeks 47 – 52 of 2017 are likely to change on a daily basis and trends must be interpreted with caution until it has been confirmed that all cases have been captured.

Descriptive epidemiology

As of 03 January 2018, a total of 717 laboratory-confirmed listeriosis cases have been reported to NICD since 01 January 2017 (Figure 1). Most cases have been reported from Gauteng Province (61%, 436/717) followed by Western Cape (13%, 92/717) and KwaZulu-Natal (7%, 50/717) provinces. Cases have been diagnosed in both public (66%, 470/717) and private (34%, 247/717) healthcare sectors. Diagnosis was based most commonly on the isolation of *Listeria monocytogenes* in blood culture (70%, 502/717), followed by CSF (24%, 175/717). Where age was reported (n=683), ages range from birth to 93 years (median 26 years) and 39% (268/683) are neonates aged ≤28 days (Figure 2). Of neonatal cases, 96% (258/268) had early-onset disease (birth to ≤6 days). Females account for 55% (382/692) of cases where gender is reported.

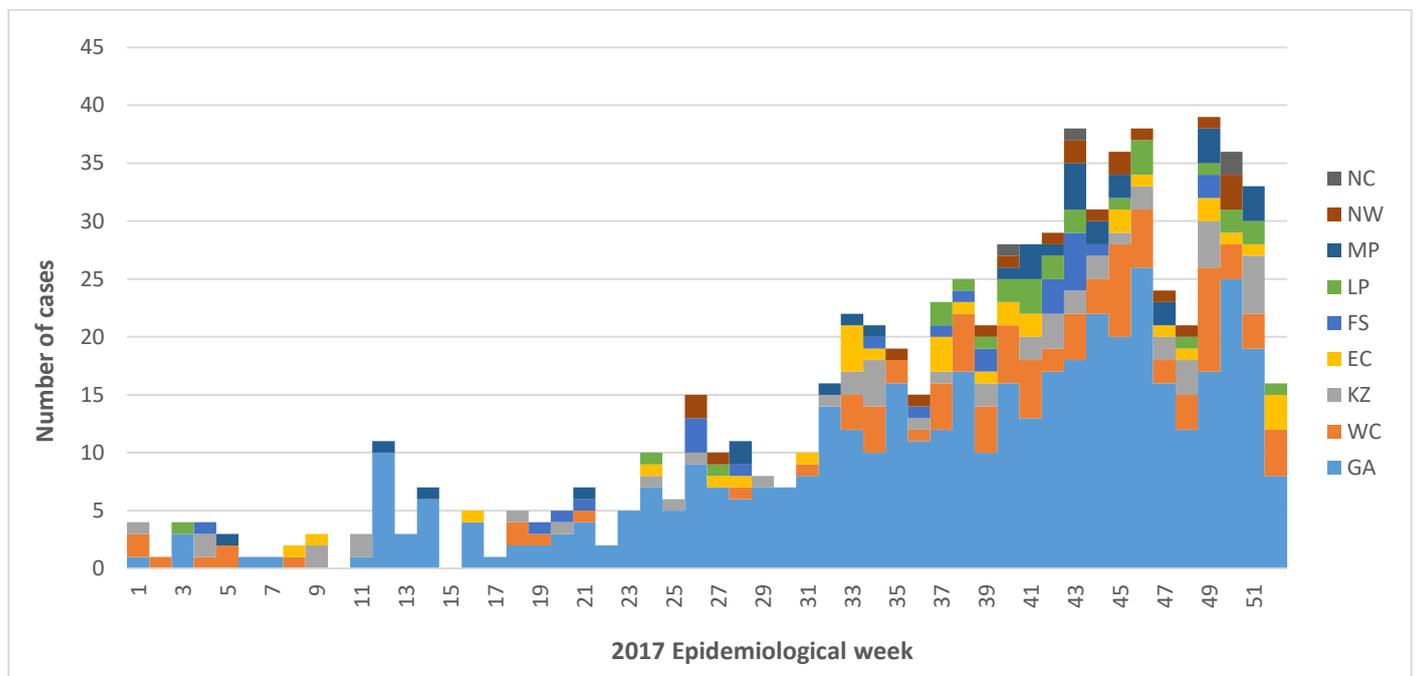


Figure 1: Epidemic curve of laboratory-confirmed listeriosis cases by epidemiological week and date of sample collection and province, South Africa, 01 January 2017 to 03 January 2018 (n=717)

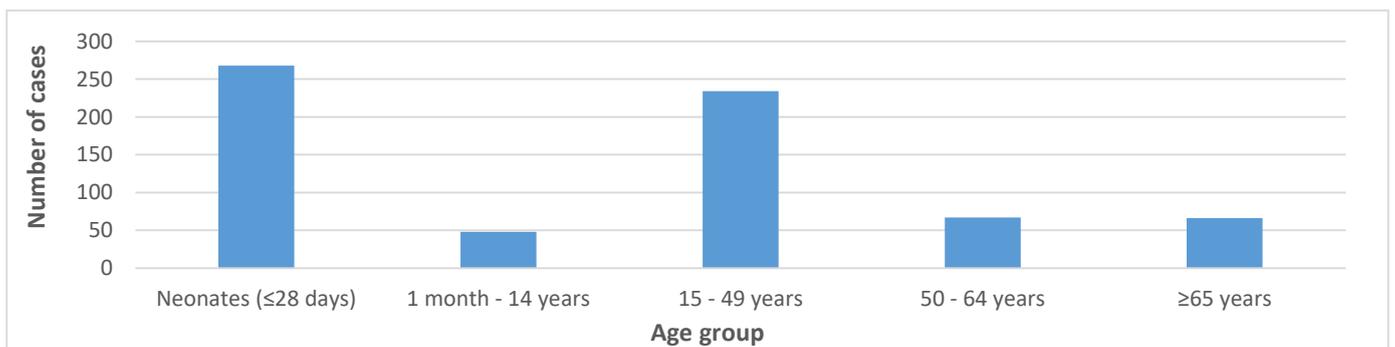


Figure 2: Age distribution of laboratory-confirmed listeriosis cases, South Africa, 01 January 2017 to 03 January 2018 (n=683)

As of 02 January 2018, case investigation forms (CIFs) of variable completeness have been received for 264/712 (37%) cases. Apart from neonates (≤ 28 days) and the elderly (> 65 years), additional risk factors for listeriosis reported include pregnancy (15/61 females aged 15-49 years where pregnancy status known) and HIV infection status (44/120 cases with known HIV infection status are HIV-positive). Final outcome data is available for only 19% (134/712) of cases, of which 45% (61/134) died.

Recent developments

Environmental Health Practitioners from the City of Tshwane recently investigated a Tshwane patient hospitalised with listeriosis. A chicken sample collected from the fridge at the patient's home tested positive for *L. monocytogenes*. This chicken was traced back to the store, and from there traced back to the abattoir it was sourced from. The Environmental Health Practitioners visited the abattoir and collected food and environmental samples, several of which tested positive for *L. monocytogenes*. As a precaution, the abattoir was closed pending further investigations. The abattoir-related *L. monocytogenes* are undergoing WGS to assess whether they are related to the ST6 outbreak strain or not; these results will be available during the week.

At present, the source of the outbreak is not known, so it is uncertain which food/s may be implicated. Cases of listeriosis will continue to be investigated, with trace back and further investigation of any positive food/environmental samples.

Update on whole genome sequencing analysis

Whole genome sequencing of currently available clinical and food-related (food and food production facility environmental sample) isolates received since 01 January 2017 is ongoing. As at 03 January 2018, of the 337 isolates sequenced to date, 73% (247/337) are clinical isolates, 22% (74/337) are food isolates and 5% (16/337) are food production environment isolates.

The clinical isolates are represented by nine sequence types (ST1, ST101, ST2, ST219, ST5, ST54, ST6, ST8 and ST876); however, 91% (225/247) are sequence type 6 (ST6) and are very closely related, representing a single strain of *L. monocytogenes* - i.e. the outbreak strain. This ST6 strain has been identified in isolates from all nine provinces, and this finding supports the current working hypothesis of a single source of food contamination causing the outbreak, i.e. a single widely consumed food product, or multiple food products produced at a single facility.

The food and environmental samples are represented by 18 sequence types, four of which (ST1, ST101, ST2 and ST5) are STs also represented in the clinical isolates. However, no ST6 food/environmental isolates have been identified to date.

Narrative summary of actions to date

1. Co-ordination of outbreak investigation and response

- A multisectoral outbreak response team with representatives from the National Department of Health, the Department of Agriculture, Forestry and Fishery (DAFF), the Department of Trade and Industry, the NICD and other relevant stakeholders has been tasked by the Minister of Health to coordinate the outbreak response activities.

2. Epidemiology and surveillance

- The line list database of listeriosis cases is updated daily with data from NHLS Central Data Warehouse (CDW) downloads, and direct reports from NHLS, private laboratories, clinicians and infection prevention practitioners.
- Case investigation forms (CIFs) are currently being completed by healthcare workers in both the public and private healthcare sectors. All clinicians are requested to submit completed CIFs (found on the NICD website at www.nicd.ac.za) to outbreak@nicd.ac.za.
- Provincial CDCs have been requested to assist with outstanding demographic and clinical outcome data.
- The case investigation form (CIF) is being revised to focus on the most commonly consumed food items according to currently available data from CIFs and open-ended interviews.
- Listeriosis is now a Category 1 Notifiable Medical Condition and as such requires immediate reporting by the most rapid means available upon diagnosis, followed by a written or electronic notification to the Department of Health within 24 hours of diagnosis by healthcare providers, private health laboratories or public health laboratories.

3. Clinical management and diagnosis

- Clinical listeriosis management guidelines are available on the website (www.nicd.ac.za).
- Where clinicians suspect listeriosis but specimens (including CSF and blood) are culture negative, a polymerase

chain reaction (PCR)-based test can be performed at the NICD. Please contact nicolap@nicd.ac.za, junot@nicd.ac.za or arvindas@nicd.ac.za for further details.

4. Laboratory diagnostics and investigations

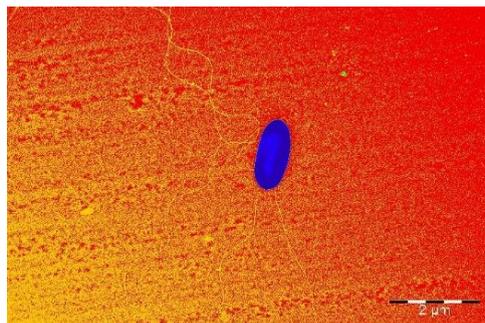
- Private and public sector laboratories are submitting clinical isolates to the NICD Centre for Enteric Diseases (CED). All isolates of *L. monocytogenes* received at the CED are subjected to confirmatory identification tests, and are stored. Please email arvindas@nicd.ac.za or junot@nicd.ac.za should you have queries or require assistance.
- Whole genome sequencing is being performed on all clinical isolates and food/environmental isolates received from the NHLS Infection Control Laboratory in Johannesburg.

5. Environmental health and food control

- Environmental health practitioners have been requested to visit homes of persons newly diagnosed with listeriosis and sample available food where possible. Environmental health practitioners should submit food specimens to the NHLS Infection Control Services Laboratory in Johannesburg. The specimen submission form is available on the NICD website (www.nicd.ac.za). Contact rob.stewart@nhls.ac.za for further information.
- Some private sector food testing laboratories have voluntarily submitted *L. monocytogenes* isolates (from food and environmental samples) to the NICD.
- The Director General of the National Department of Health has formally requested food industry stakeholders to submit details of *Listeria*-positive food items, environmental swabs and *Listeria* isolates to the NICD, along with samples. Whilst several stakeholders have been forthcoming with information, not all stakeholders have responded as yet.

6. Communications

- The NICD has made information available on the website regarding listeriosis, including Frequently Asked Questions (FAQs), clinical management guidance, and laboratory testing methodology. These can be accessed at <http://www.nicd.ac.za/index.php/listeriosis/>.
- The Food Control Division within the National Department of Health has distributed information about the outbreak to food industry stakeholders.
- The NICD continues to operate its 24-hour hotline for clinicians



Electron Micrograph of *L. monocytogenes*, courtesy of Monica Birkhead, Centre for Emerging, Zoonotic and Parasitic Diseases, NICD