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## **Introductory Chapter: *Listeria monocytogenes***

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Additional information is available at the end of the chapter

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### **1. Introduction**

The purpose of this book is to give informative well-researched chapters to the readers, health practitioners, policy makers, food industry, researchers and all stakeholders involved in food safety and food security. The chapters in this book are from specialists in their respective disciplines. The unprecedented outbreak of listeriosis in South Africa recently from January 2017 to March 2018 [1] has made this book to be more important. This has been reported as the greatest outbreak of listeriosis in recent times because of the number of cases reported as well as the number of fatalities.

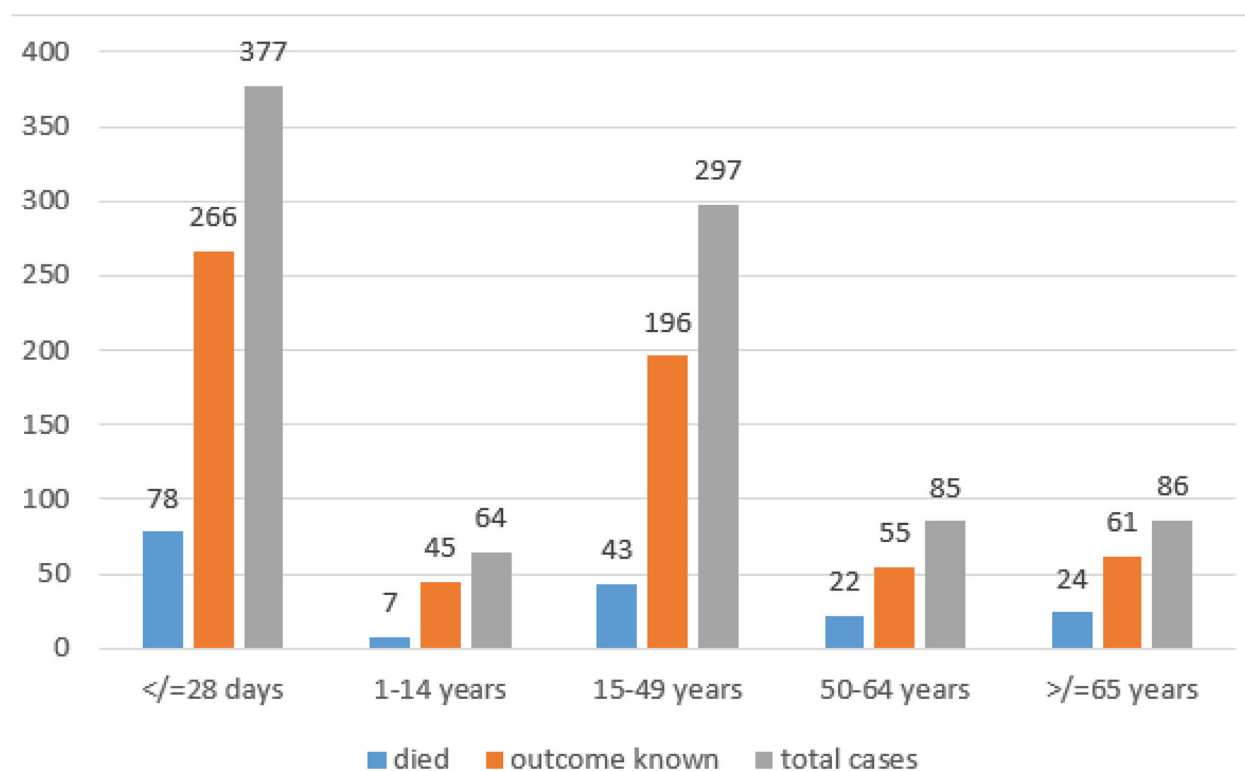
The book is about the foodborne pathogen, *Listeria monocytogenes*. The pathogen is of public health concern [2], which causes serious diseases such as endocarditis, encephalitis sepsis and meningitis, gastro-enteritis and death [3, 4]. Infected pregnant women suffer from flu-like febrile illness, and depending on the stage of pregnancy, it may lead to abortion. Listeriosis is a notifiable disease in most industrialised countries with few or no report from Africa. It became a notifiable disease recently in South Africa after the unprecedented outbreak. In countries where listeriosis is a reportable disease, the countries have come up with actions that keep surveillance of food and food-processing plants [5].

*L. monocytogenes* is a ubiquitous pathogen because it is found everywhere. It has been reported [6] that the municipal wastewater effluent was a source of listerial pathogen in the aquatic environment. Surveillance in developing countries is on assumption that the cases of listeriosis are not always reported [7] and that traditional methods used for food storage eliminate means of growth of microorganisms. The outbreak of listeriosis has been widely reported in Japan, North America and Europe [8].

## 2. Why it is important to know much about *L. monocytogenes*?

Many lives would be saved if more research on *L. monocytogenes* can be done as well as educating the public about hygiene, food handling, preparation and distribution and cooking. The declaration of the listeriosis outbreak was done in December 2017 in South Africa [1] although the listeriosis outbreak occurred long before December 2017. The reported cases in South Africa were as follows: 743 cases in 2017 and 202 cases in the first 2 months of 2018. In the reported cases, female accounted for 55% and neonates aged  $\leq 28$  days accounted for 41% [1]. Gauteng Province had the most reported cases of 59% followed by the Western Cape with 17% and KwaZulu-Natal with 7%. The National Health Laboratory Services (NHLS) sampled over 1500 food stuffs from retail outlets, food-processing plants and patients. The molecular sequences were done at the NICD. Over 70 items tested positive for *L. monocytogenes*. **Figure 1** taken from NICD shows the confirmation of listerial infection per age distribution. The ready-to-eat meat products, which include Russians, ham, other 'cold' meats, sausages, Viennas and Polonies, were found to be the source of listerial outbreak.

**Figure 1** shows that neonates were severely affected by the outbreak of listeriosis in South Africa. The results are similar to the reported [8] maternofetal listeriosis or neonatal listeriosis which presented life-threatening illness. Gastrointestinal listeriosis has been widely reported in the developed countries as shown in **Table 1**.



**Figure 1.** Age distribution and outcome of laboratory-confirmed cases of listeriosis identified from 1 January 2017 to 27 February 2018 (n = 909 where age was reported) [1].

Year	Location	Number of cases	Implicated source
1993	Northern Italy	18	Rice salad
1994	IL, USA	44	Chocolate milk
1997	Northern Italy	1566	Cold corn and tuna salad
1998	Finland	N/A	Cold-smoked fish
2000	New Zealand	32	Ready-to-eat meat
2001	CA, USA	16	Delicatessen turkey ready-to-eat meat
2001	Sweden	48	Raw milk cheese
2001	Japan	38	Cheese

N/A, number of cases not given.

**Table 1.** Gastrointestinal listeriosis outbreaks, 1993–2001 (adapted from [8]).

### 3. Chapters in this book

The chapters in this book cover a vast scope with regard to the *L. monocytogenes* pathogen.

The topics cover *L. monocytogenes* in medical research, quality assurance of raw food material, virulence traits of *L. monocytogenes* relevant to food safety, and so on. The topics investigate at *L. monocytogenes* in all angles such as pathogenicity, virulence, stress factors, susceptibility, prevention and control.

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