



Listeria Risks & Diagnostic Regulatory Policies in Australia

Novel Diagnostics for Infectious Diseases

Incentives for Clinicians &
Community Health Workers

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College of London, UK.



Roadmap

Listeria monocytogenes Risks:
Transmission Insights

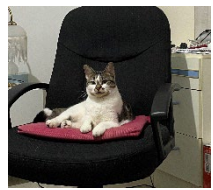
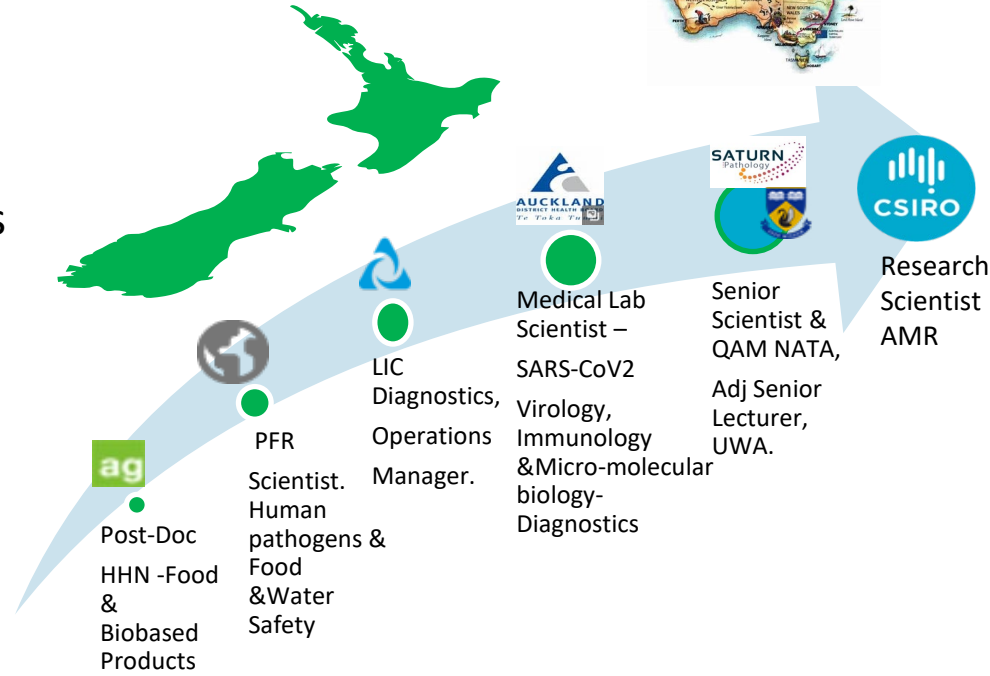
Diagnostic Regulatory Policies in
Australia with Special Reference to
Point of Care Tests

Disclaimer: This presentation contains general information about diagnostic regulatory landscape in Australia and previous research work carried out on *Listeria* outside CSIRO.



About Me

TANUVAS – India
Research – Transmission of TB
– Rep.BioT – Stem cells

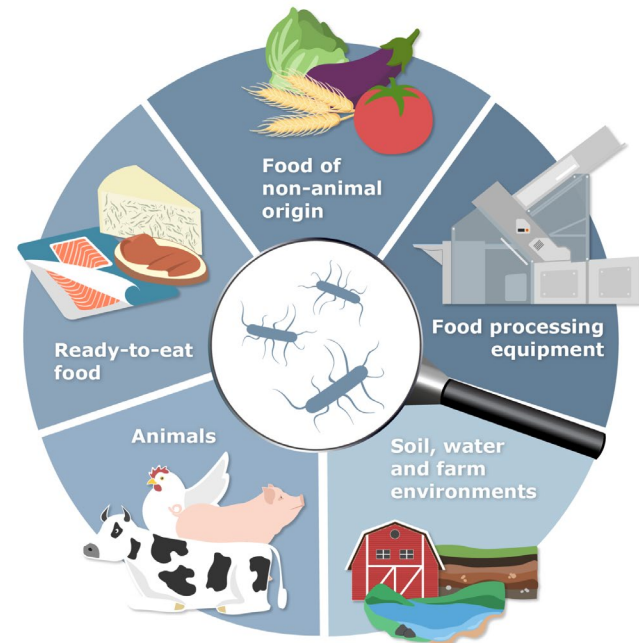


Molecular epi. Infectious Disease Research Centre, Massey University, NZ



Listeria monocytogenes Risks – Transmission Insights

- A saprophyte foodborne pathogen
- Gram positive bacteria
 - Zero tolerance in USA
 - Nil detection in 25g (NZ & Aus)
- Infective dose
 - 10^6 to 100 million CFU (healthy)
 - <10 million CFU (high risk population)



The image shows the main sources of *Listeria*



Listeriosis & Populations at Risk

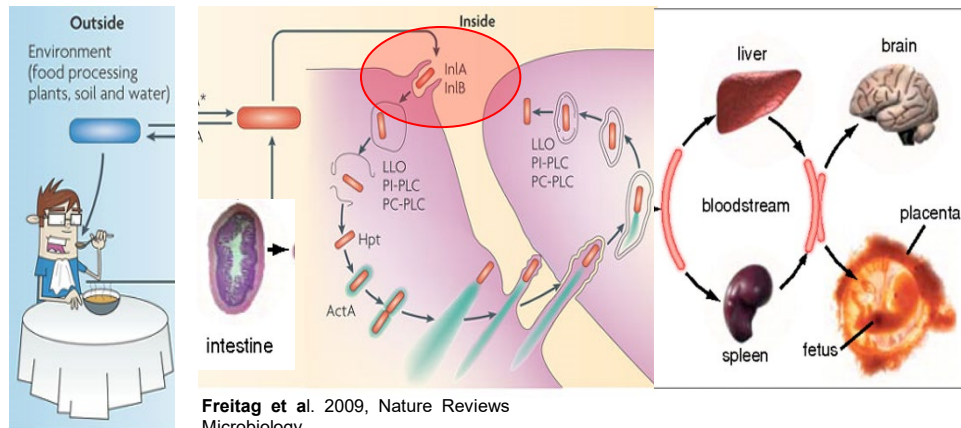
World Health Organisation

- Rare disease
- Significant death rates 20-45%
- Non-invasive - Gastrointestinal
- Invasive – Systemic infection

Notifiable disease – Australia & NZ

Populations at risk:

- Extremes of age (neonates & > 65 yrs)
- Pregnant women
- Immunocompromised people (malignancy, HIV, organ transplant, corticosteroid use, immunosuppressants, chronic liver disease, alcoholism, auto-immune disease etc.)



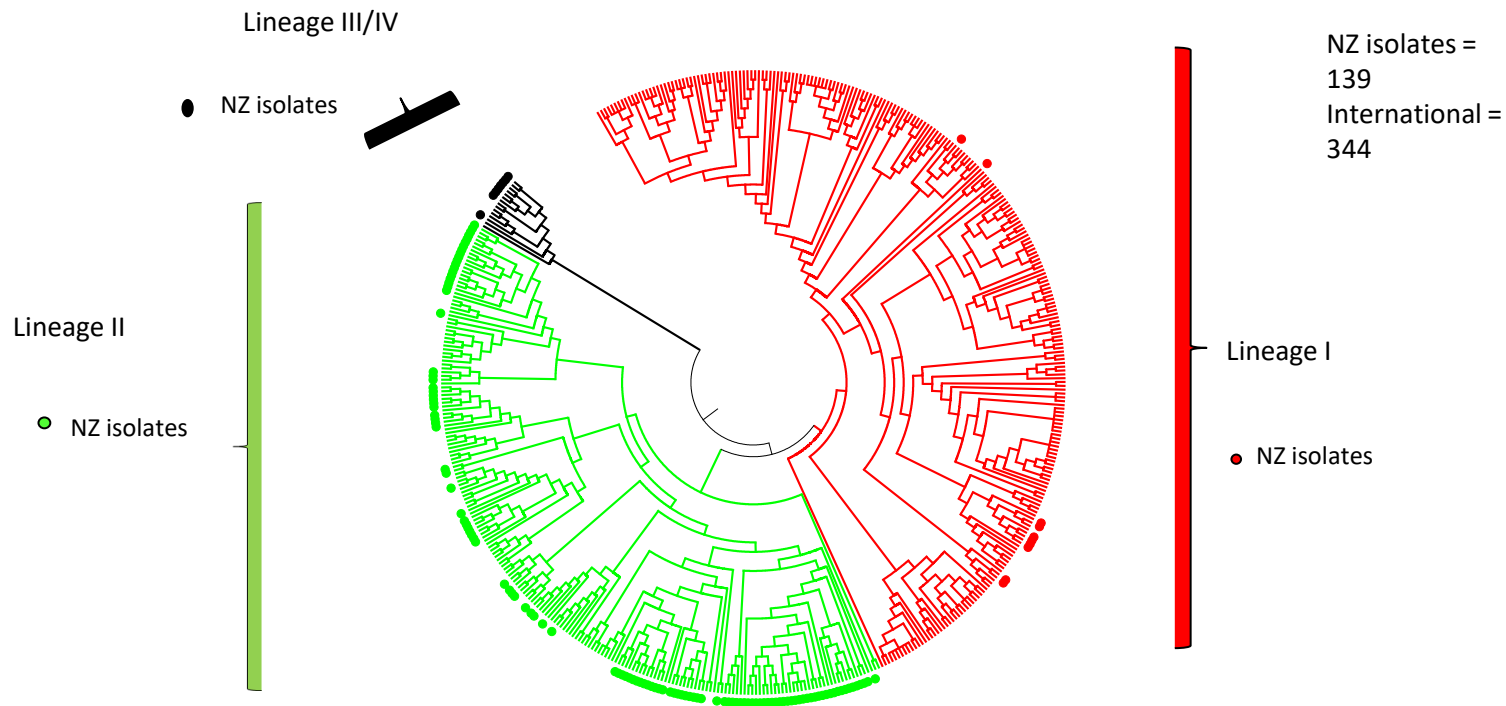
Freitag et al. 2009, Nature Reviews Microbiology.



Resistance characteristics in *L. monocytogenes*

- Survival:
 - Wide temperature range (0-45C)
 - High salinity (10% up to 14%)
 - Wide pH range (4.4 - 9.6)
- Sanitisers:
 - Quaternary ammonium compounds (QACs) Benzylkonium chloride
- Antimicrobials:
 - Intrinsic resistance: Cephalosporins, fluoroquinolones, lincosamides

Whole Genome Sequence (WGS-SNP) Analysis

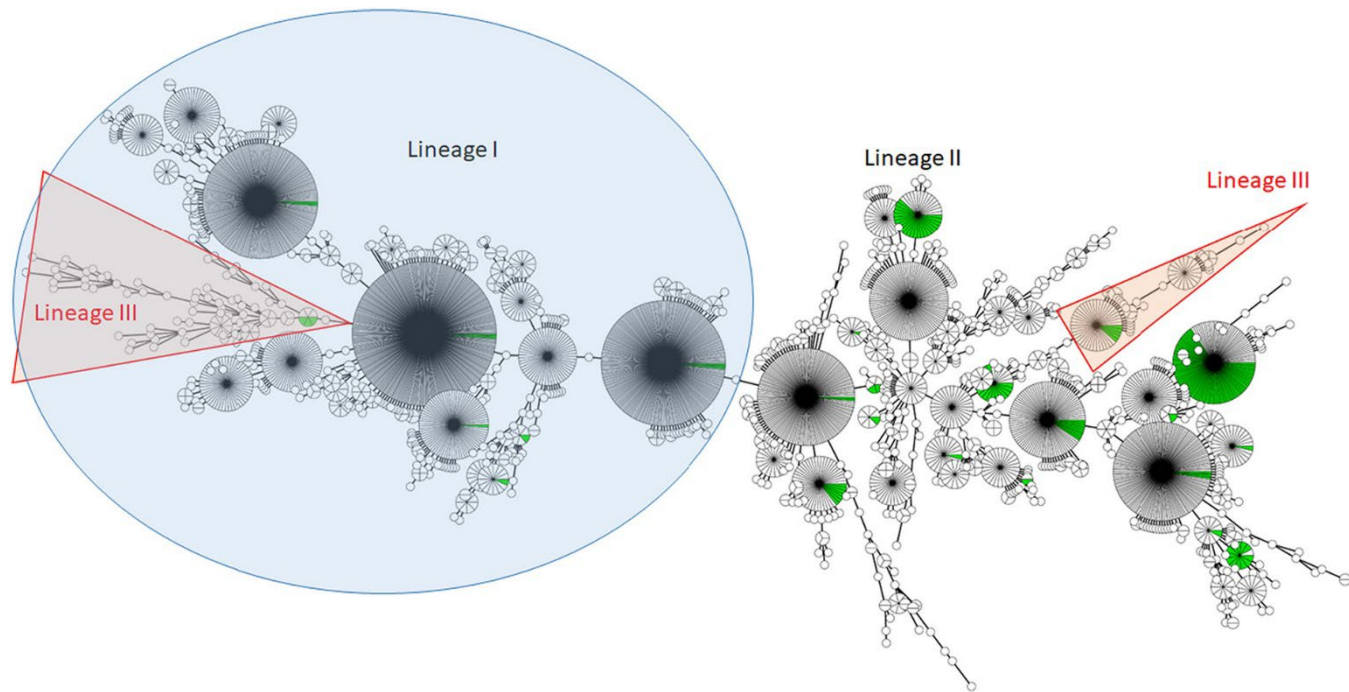


- Mohan, V., et al., *Genomic diversity of Listeria monocytogenes isolates from seafood, horticulture and factory environments in New Zealand*. Int J Food Microbiol, 2021. **347**: p. 109166.
- Mohan, V., et al., *Identifying Suitable Listeria innocua Strains as Surrogates for Listeria monocytogenes for Horticultural Products*. Front Microbiol, 2019. **10**: p. 2281.
- Mohan, V., et al., *The Anti-Listeria Activity of Pseudomonas fluorescens Isolated from the Horticultural Environment in New Zealand*. Pathogens, 2023. **12**(2).



Minimum Spanning Tree of *L. monocytogenes* Lineages

Green – NZ isolates



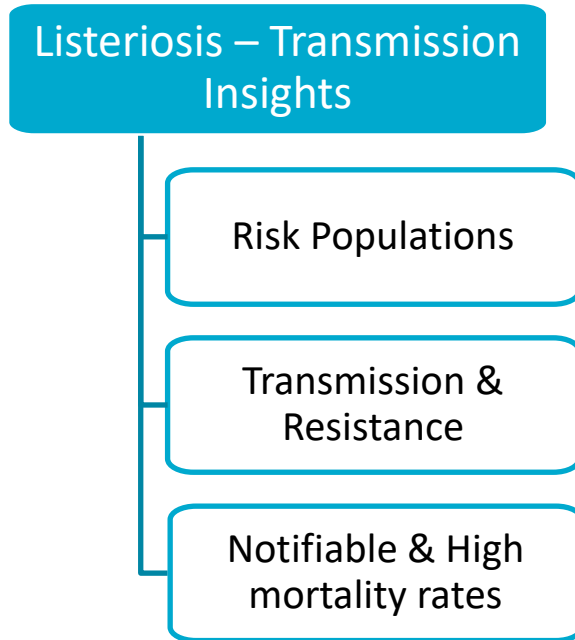
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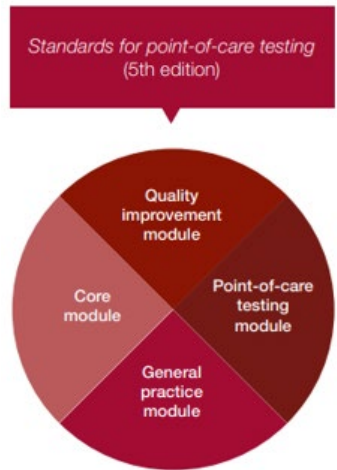
Consensus





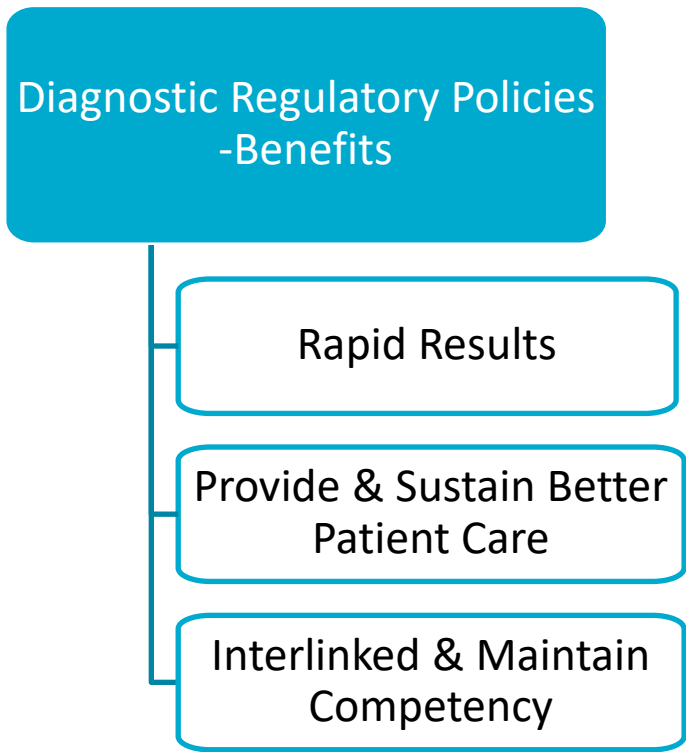
Diagnostic Regulatory Policies in Australia (special reference to PoCT)

- **The Medical Services Advisory Committee (MSAC)** Independent non-statutory committee established by the Australian Government Minister for Health: Medical Technologies & Procedures.
- **Australian Registration of Therapeutic Goods**
All invitro medical devices (IVDs) must be included in the Australian Registration of Therapeutic Goods (ARTG).
- **Royal Australian College of General Practitioners (RACGP) standards for PoCT** (Administered by The National General Practice Accreditation Scheme)
- **National Association of Testing Authorities (NATA)**
Standard SA TS ISO 22583:2021: Specific for supervisors and operators of point-of-care testing (POCT) services where POCT is performed without medical laboratory training, supervision or support.
- **The National Pathology Accreditation Advisory Council (NPAAC)**
AS ISO 22870 Point of care testing – Requirements for quality and competence





Consensus





Thank you

CSIRO
Minimising AMR Mission
Human Health Program
Dr. Kim Fung
Dr. Karen Patterson
Dr. Susan Hawes
Prof. Branwen Morgan
Dr. Nicholas Archer
Dr. Maxime Francois

New Zealand

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