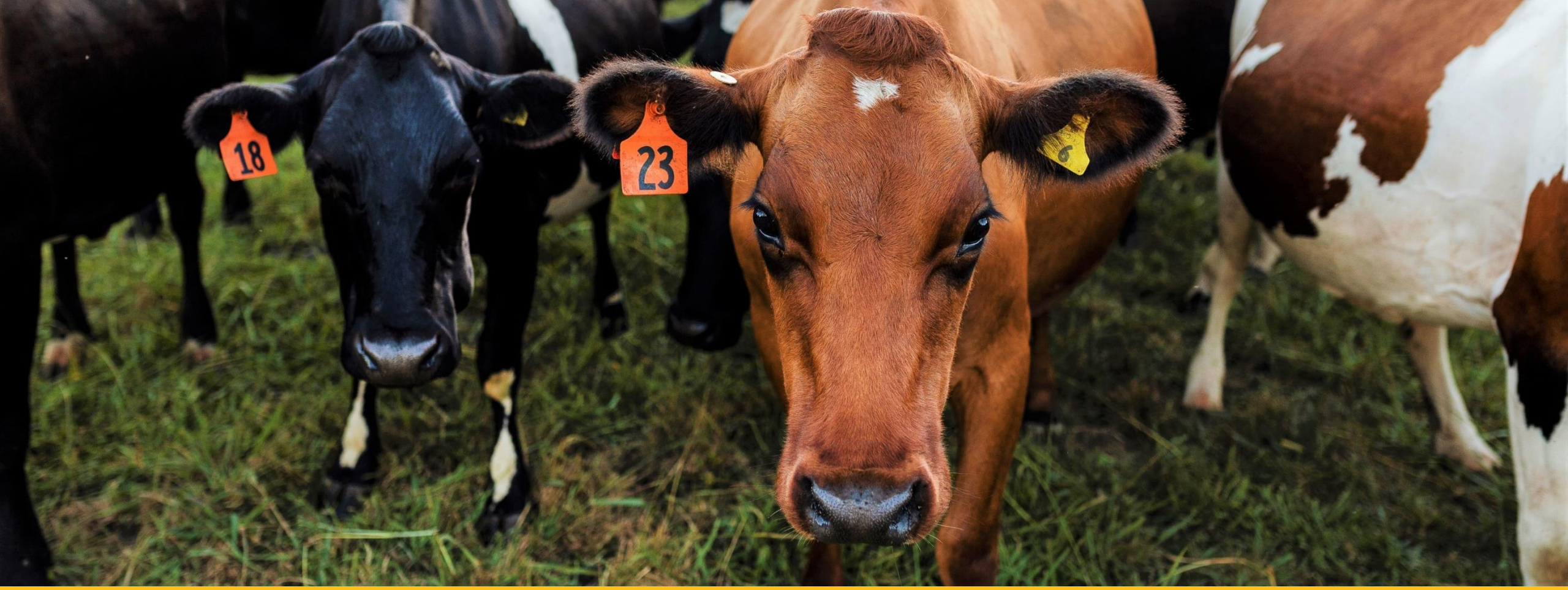


Are we there yet? Determining the evidence required to demonstrate *Mycoplasma bovis* eradication from Aotearoa

Amy Burroughs, Principal Adviser Strategic Epidemiology

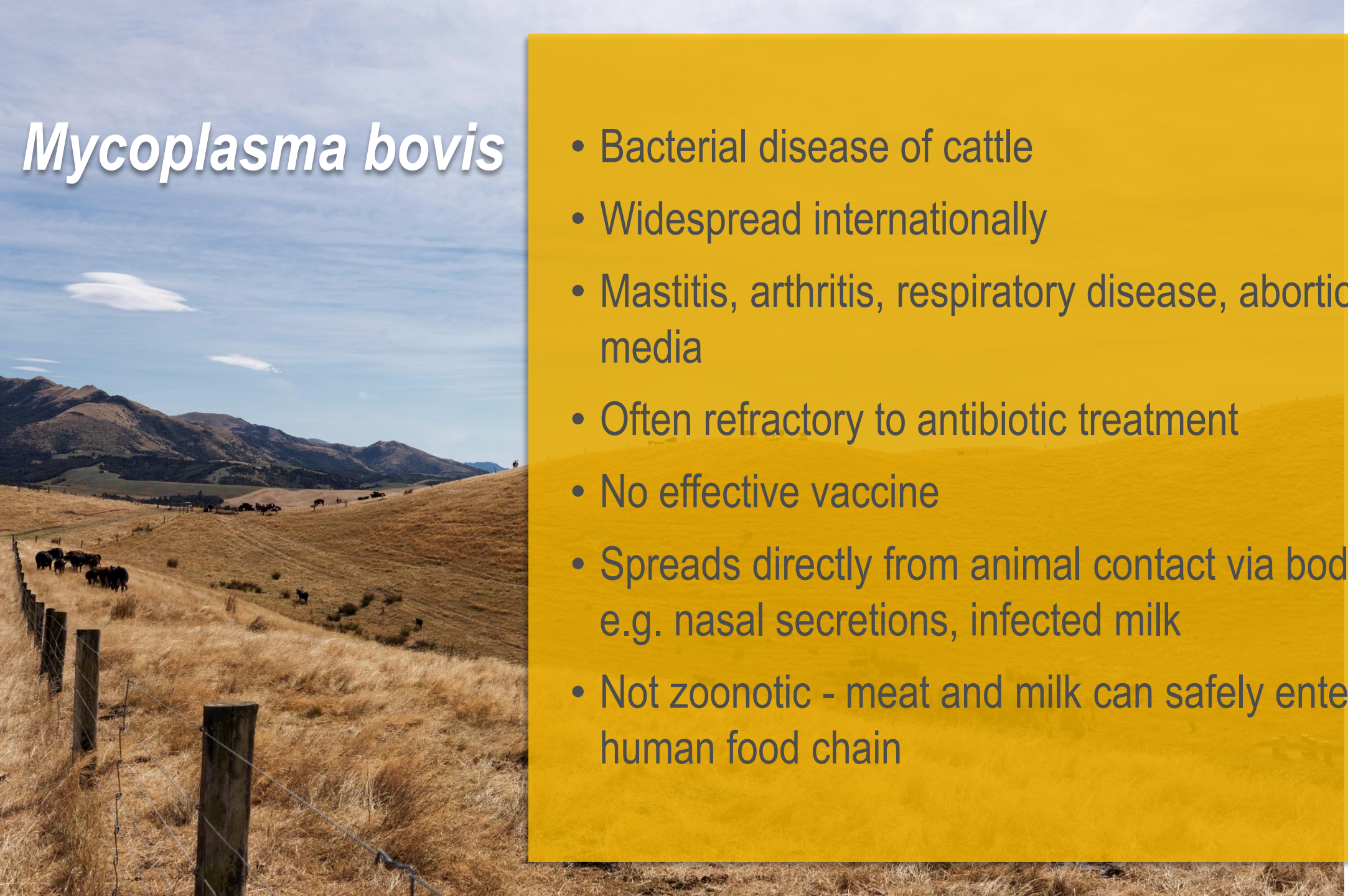
Biosecurity New Zealand
Ministry for Primary Industries
Manatū Ahu Matua

DairyNZ

beef+lamb new zealand

Agenda

- Background
- Overview of Programme
- Surveillance
- Progress
- Phases to eradication
- Tools
- Summary



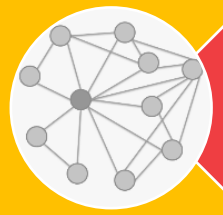
Mycoplasma bovis

- Bacterial disease of cattle
- Widespread internationally
- Mastitis, arthritis, respiratory disease, abortion, otitis media
- Often refractory to antibiotic treatment
- No effective vaccine
- Spreads directly from animal contact via bodily fluids e.g. nasal secretions, infected milk
- Not zoonotic - meat and milk can safely enter the human food chain

Mycoplasma bovis in New Zealand

- First detected South Canterbury July 2017
- Estimated $1.2 billion cost to industry over first 10 years if no action taken
- Joint decision with industry to attempt phased eradication in May 2018
- 3 goals for the *M. bovis* Eradication Programme:
  - eradicate
  - reduce the impact of the Programme on farmers, families and communities
  - apply the lessons learnt to further strengthen the biosecurity system.

Mycoplasma bovis surveillance



Network Surveillance

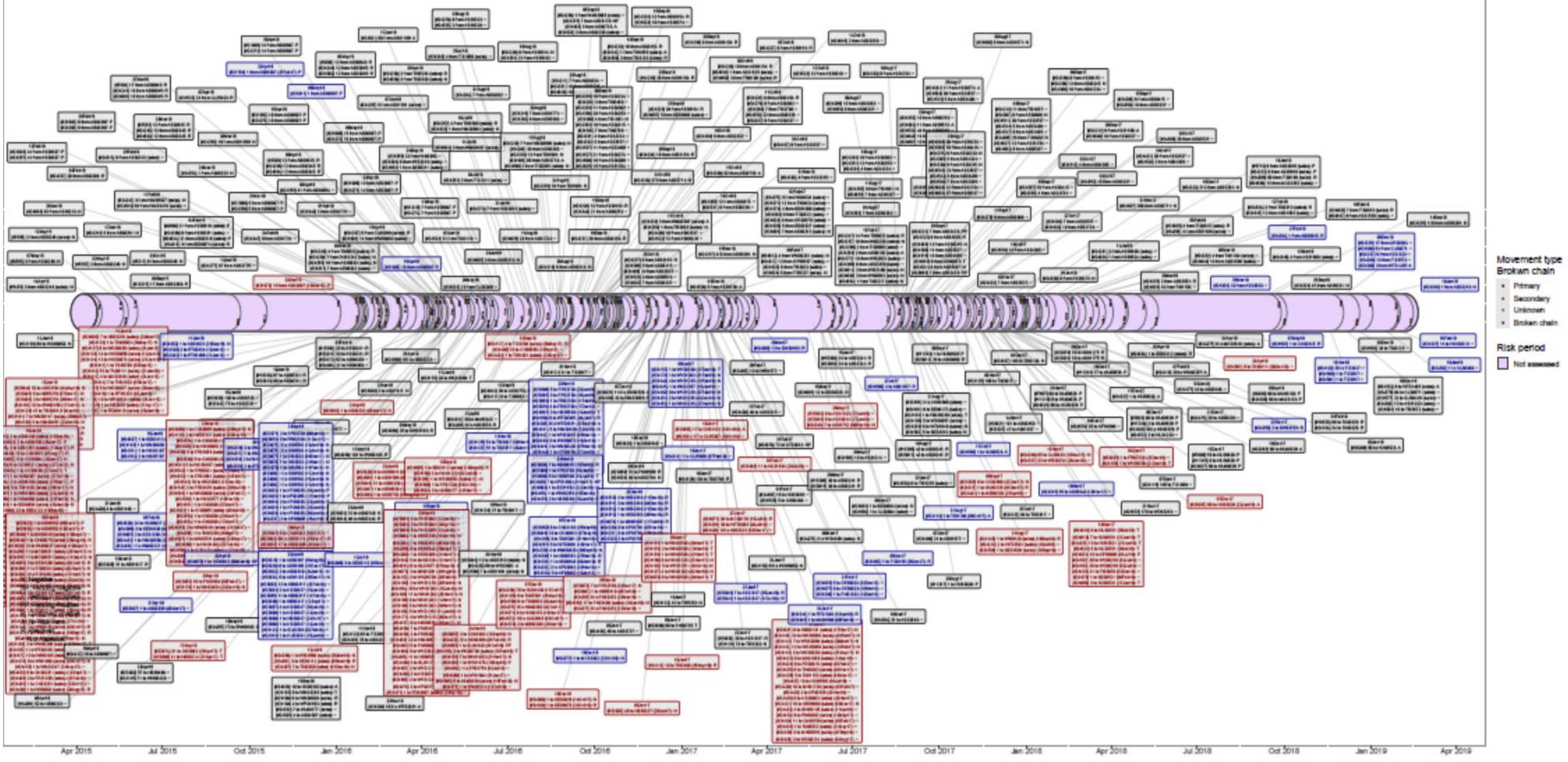
Background Surveillance - bulk tank milk screening

Background Surveillance - beef and drystock screening

Background passive surveillance – report cases

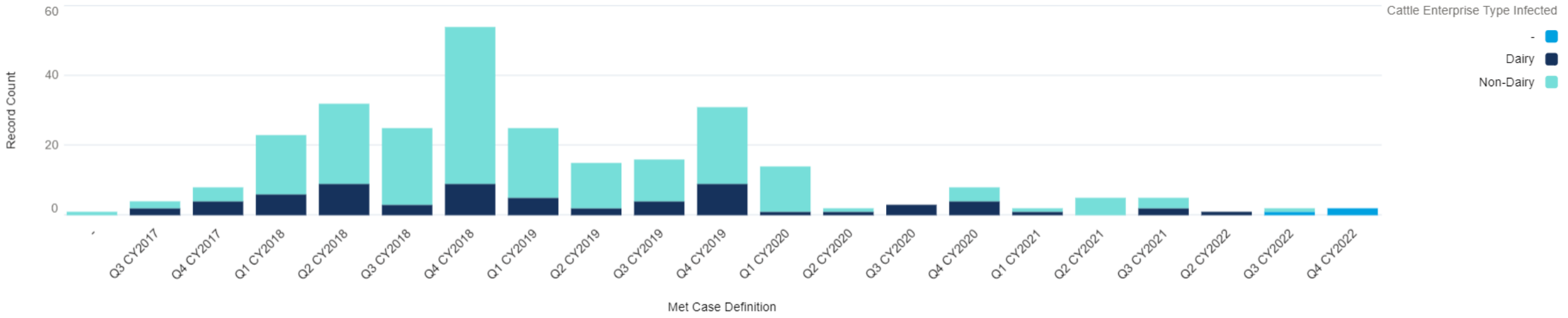
Surveillance challenges

1. Clinical disease rarely observed
2. Diagnostic test performance
3. Tracing cattle and milk movements
4. Cannot achieve a census

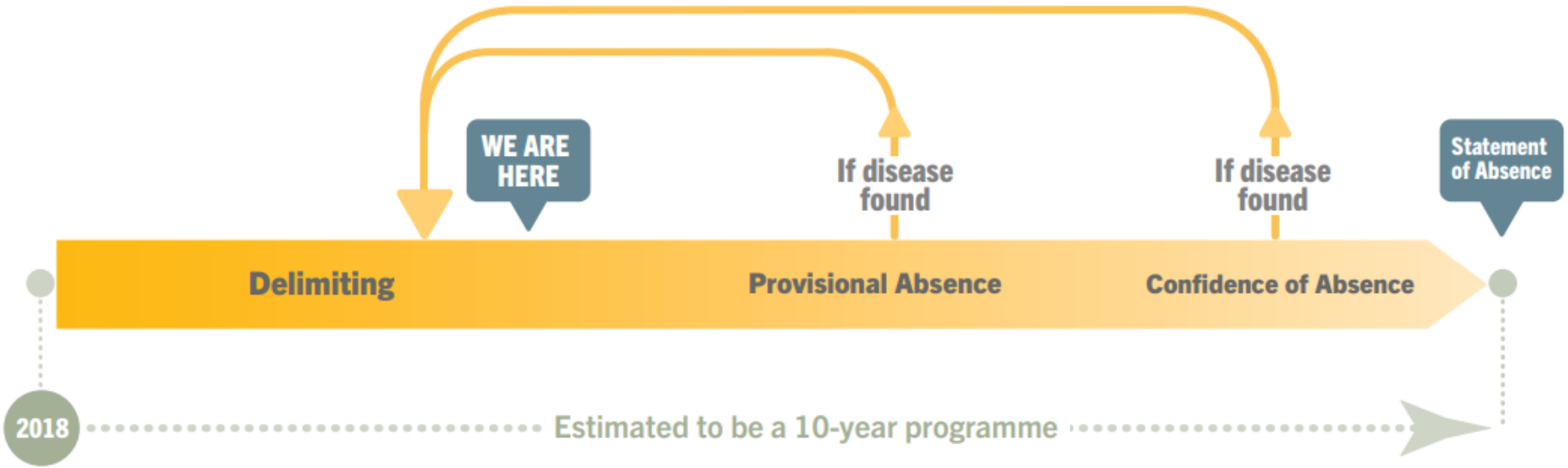

Movement type
Brokwin chain
Primary
Secondary
Unknown
Broken chain
Risk period
Not assessed
Apr 2015
Jul 2015
Oct 2015
Jan 2016
Apr 2016
Jul 2016
Oct 2016
Jan 2017
Apr 2017
Jul 2017
Oct 2017
Jan 2018
Apr 2018
Jul 2018
Oct 2018
Jan 2019
Apr 2019

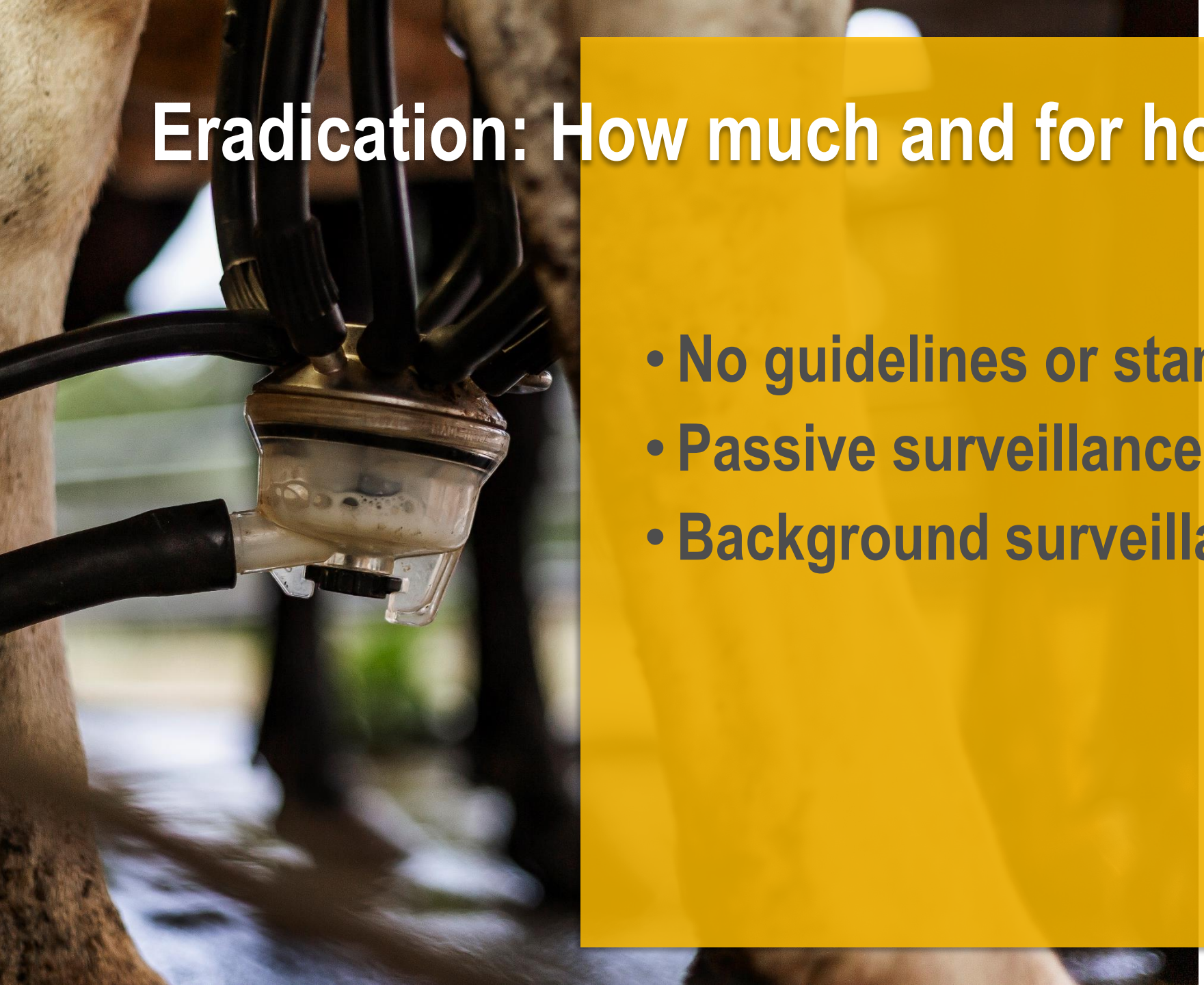

Delimiting surveillance looks at the places disease is likely to be
Background surveillance looks at places where disease isn’t likely to be present

Progress: Epidemic curve



Three phases to eradicate *Mycoplasma bovis*

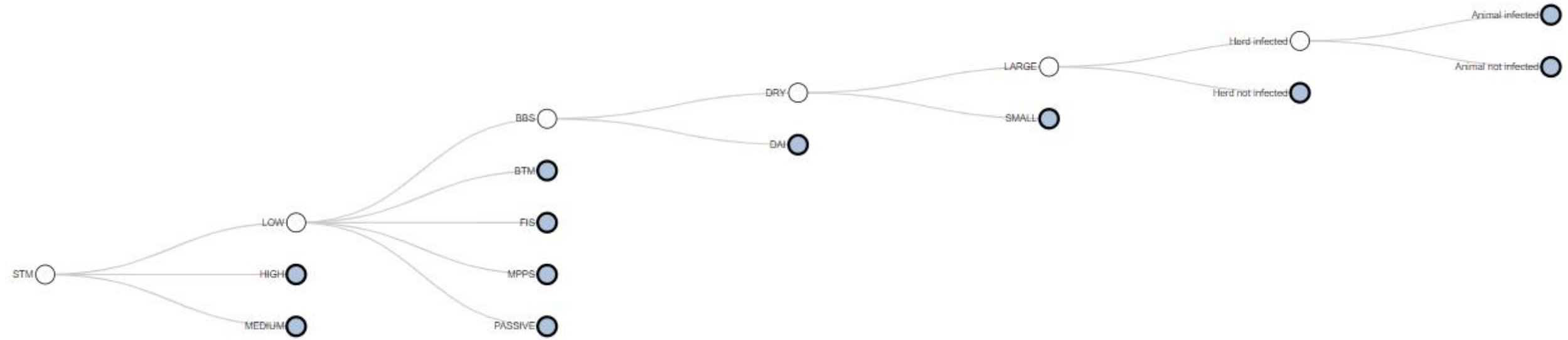




Eradication: How much and for how long?

- No guidelines or standards
- Passive surveillance lacks sensitivity
- Background surveillance is key

Scenario Tree Model



92.35% (91.91% to 92.81%)

Current confidence of freedom

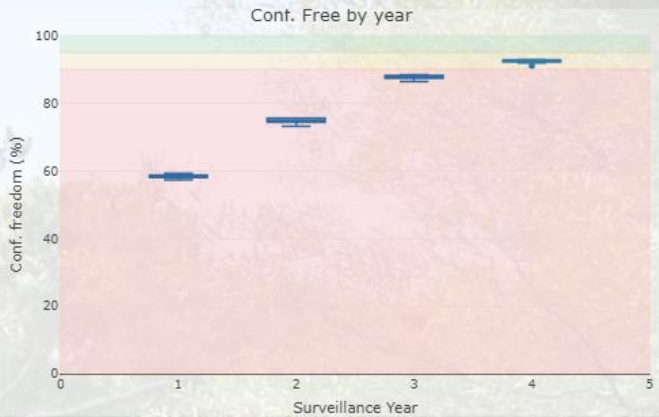
88% (87.18% to 88.22%)

Prior probability of freedom

SSC	SSC Se Est. (%, YTD)	SSC Se 95% CI (lower)	SSC Se 95% CI (upper)
BBS	3.32	3.3	3.34
BTM	35.03	31.84	35.34
FIS	1.9	1.89	1.92
MPPS	18.94	18.77	19.12
PASSIVE	0	0	0

Surveillance Region	Se Est. (%, YTD)	Se 95% CI (lower)	Se 95% CI (upper)
LOW	9.68	8.73	9.79
MEDIUM	7.26	6.72	7.35
HIGH	40.39	38.17	40.68

Summary

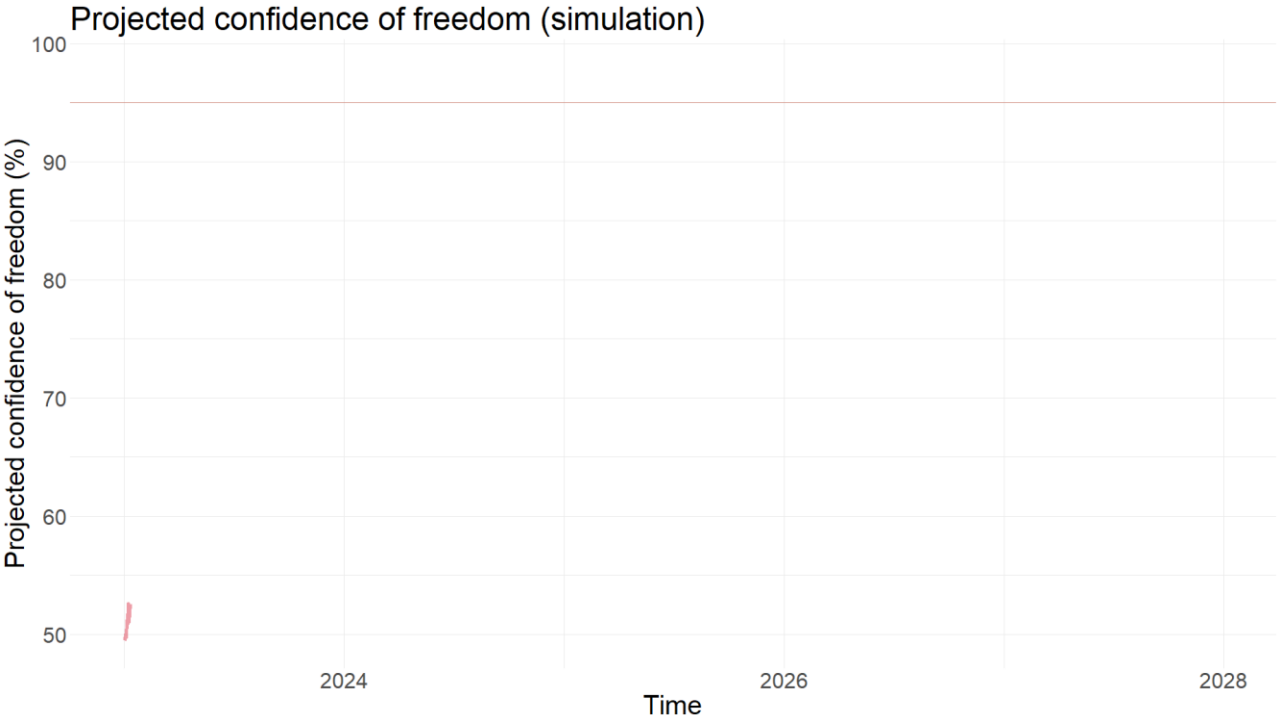


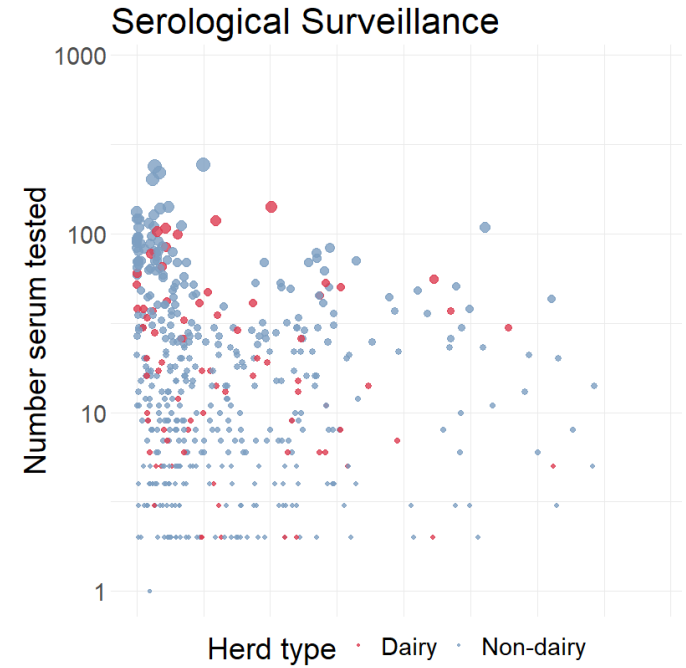
Surveillance Region | SSC | Surveillance category

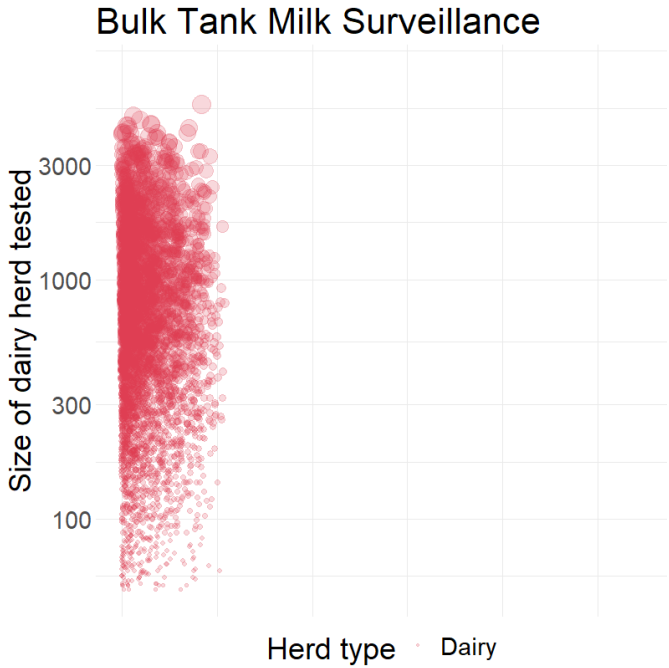
Surveillance region	Surveillance year	Herds tested	Surveillance proportion
HIGH	1	1934	0.19
LOW	1	7342	0.73
MEDIUM	1	765	0.08
HIGH	2	5281	0.27
LOW	2	12516	0.63
MEDIUM	2	1946	0.1

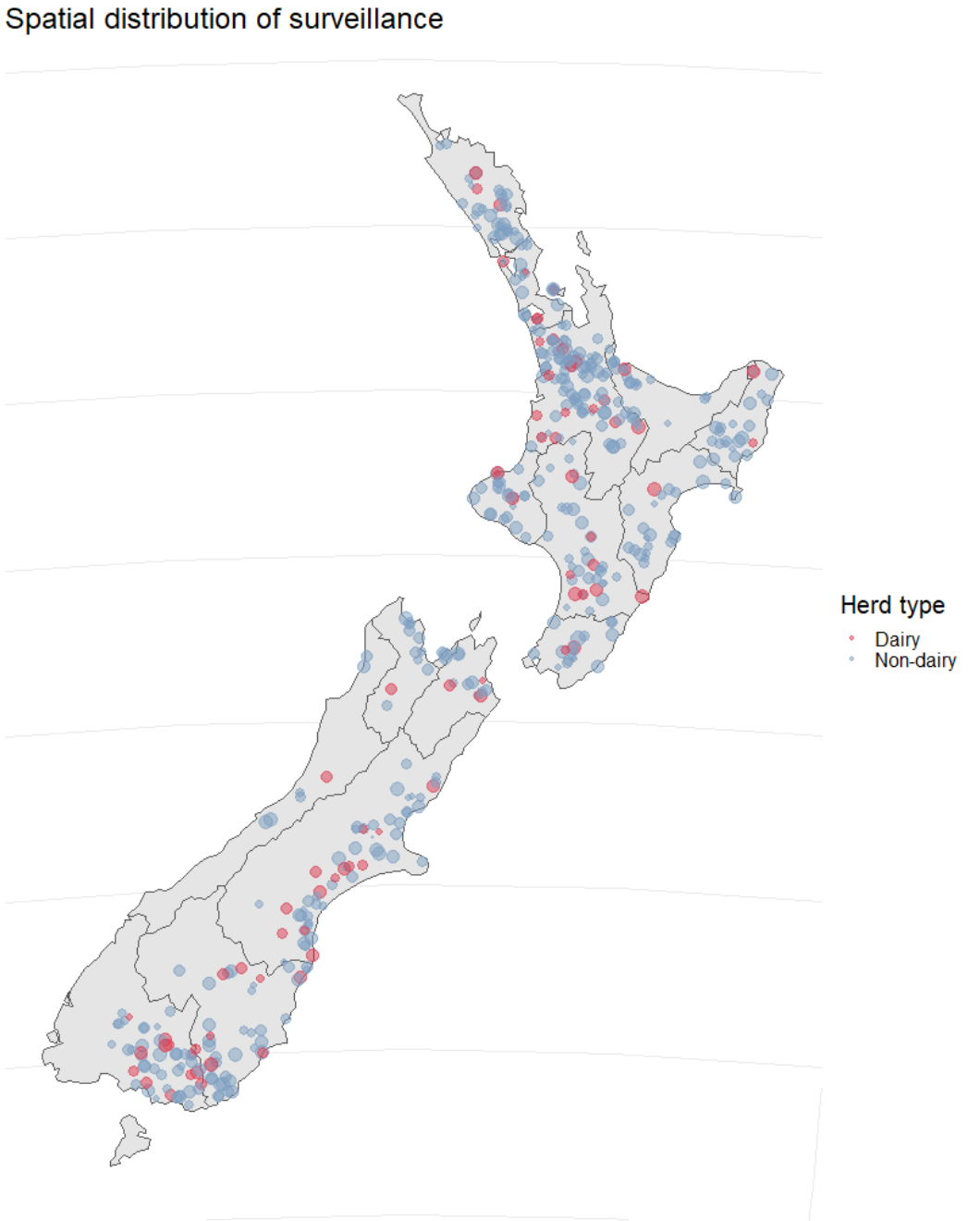
1–6 of 12 rows

Previous 1 2 Next

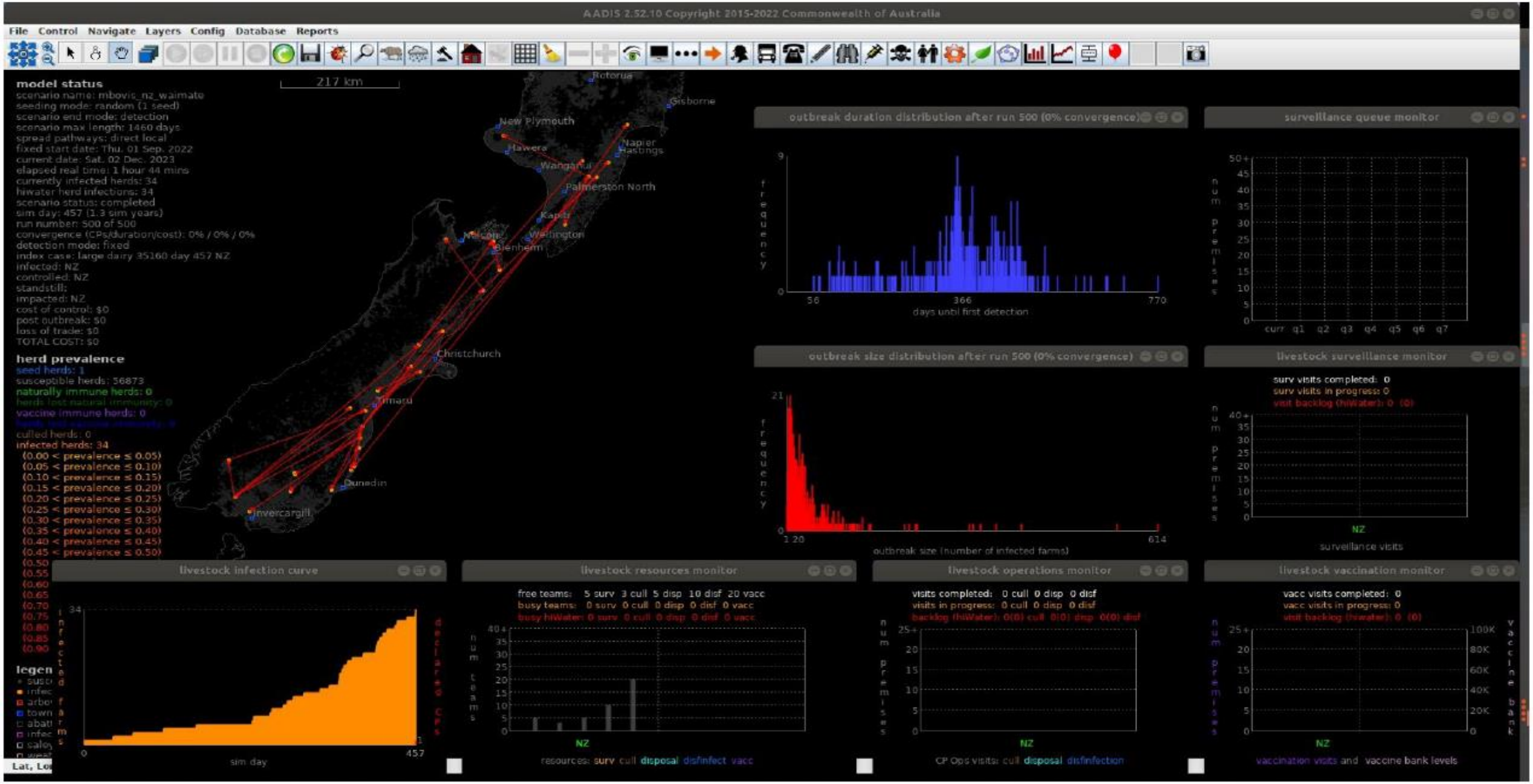

Projected confidence of freedom (simulation)
Projected confidence of freedom (%)
100
90
80
70
60
50
2024
2026
2028
Time


Serological Surveillance
Number serum tested
1000
100
10
1
Herd type
Dairy
Non-dairy


Bulk Tank Milk Surveillance
Size of dairy herd tested
3000
1000
300
100
Herd type
Dairy

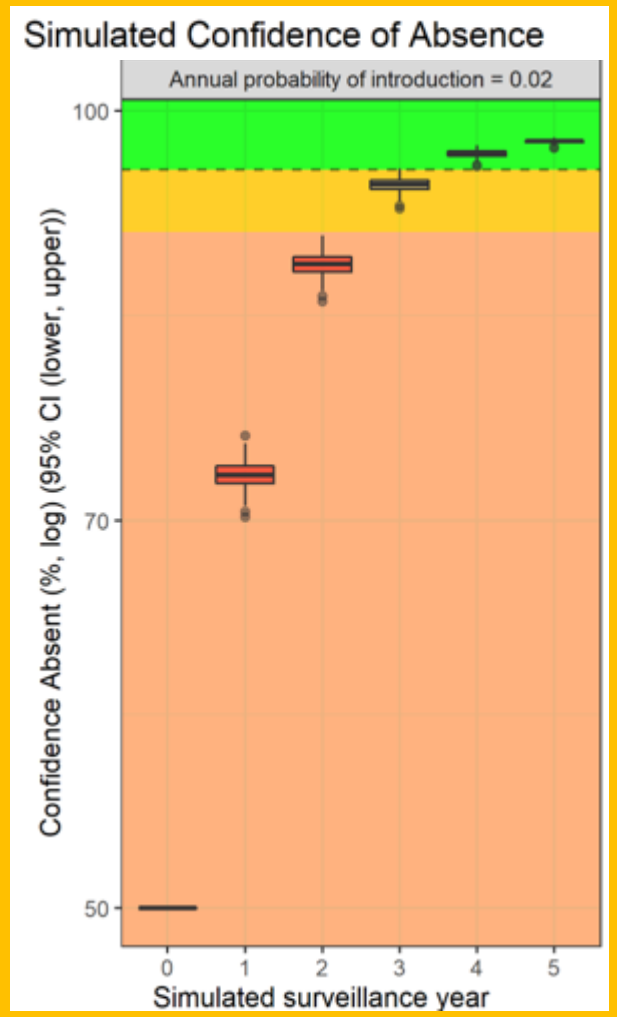

Spatial distribution of surveillance
Herd type
Dairy
Non-dairy

AADIS-Mbovis-NZ

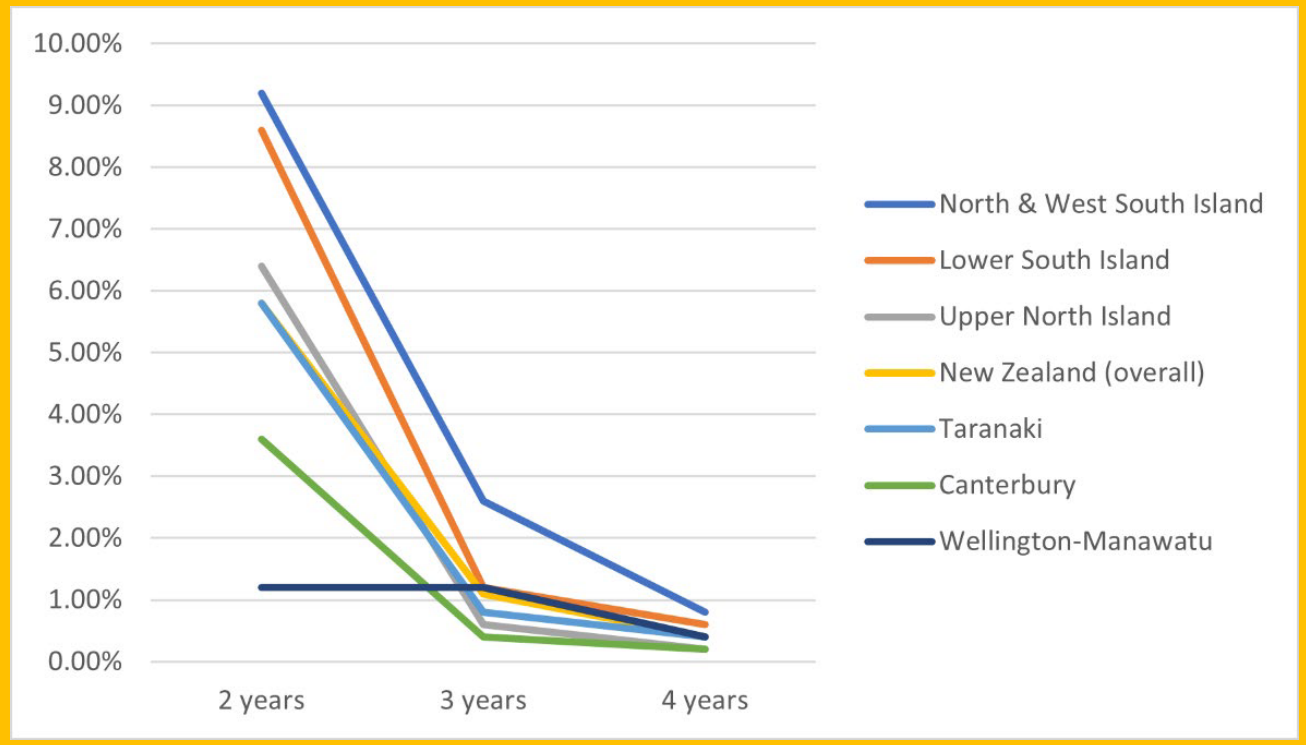


Model comparison

Scenario Tree Model



AADIS-Mbovis-NZ



Proportion of outbreaks that remained undetected after 2, 3 and 4 years of background surveillance, by seed surveillance region

Summary

- Working in an environment without guidelines
- Existing surveillance
- Eradication target
- Used two distinct models to inform surveillance plan for eradication
- Model agreement
- Provides confidence

Acknowledgements

- *Mycoplasma bovis* Eradication Programme (MPI, DairyNZ and Beef + LambNZ)
  - Alex Crosbie
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- AsureQuality and Veritag/SVS
- MilkTestNZ
- New Zealand cattle farmers, veterinarians and the wider industry

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Questions?

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