



CFIA



UBC

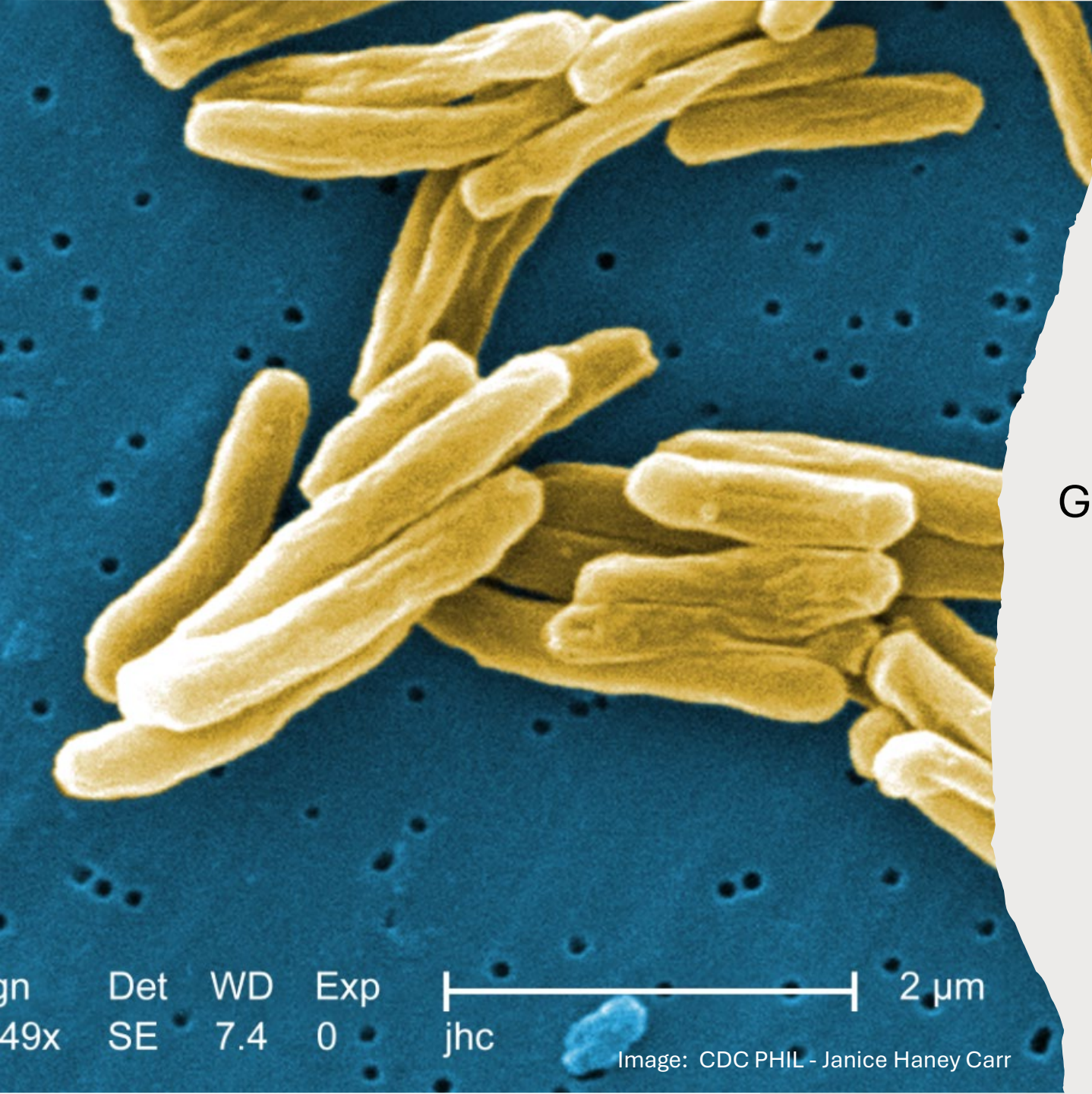


BC Centre for Disease Control

Trends in Animal and Human Tuberculosis

Nancy de With, CFIA

Nicholas Riopel, BCCDC, UBC



Mycobacteria

General categories:

- *M. tuberculosis* complex (MTBC)
- *M. leprae*
- Nontuberculous mycobacteria (NTM)
 - ubiquitous in the environment

MTBC consists of:

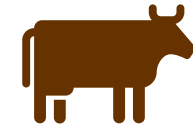
- Primarily human-adapted variants:

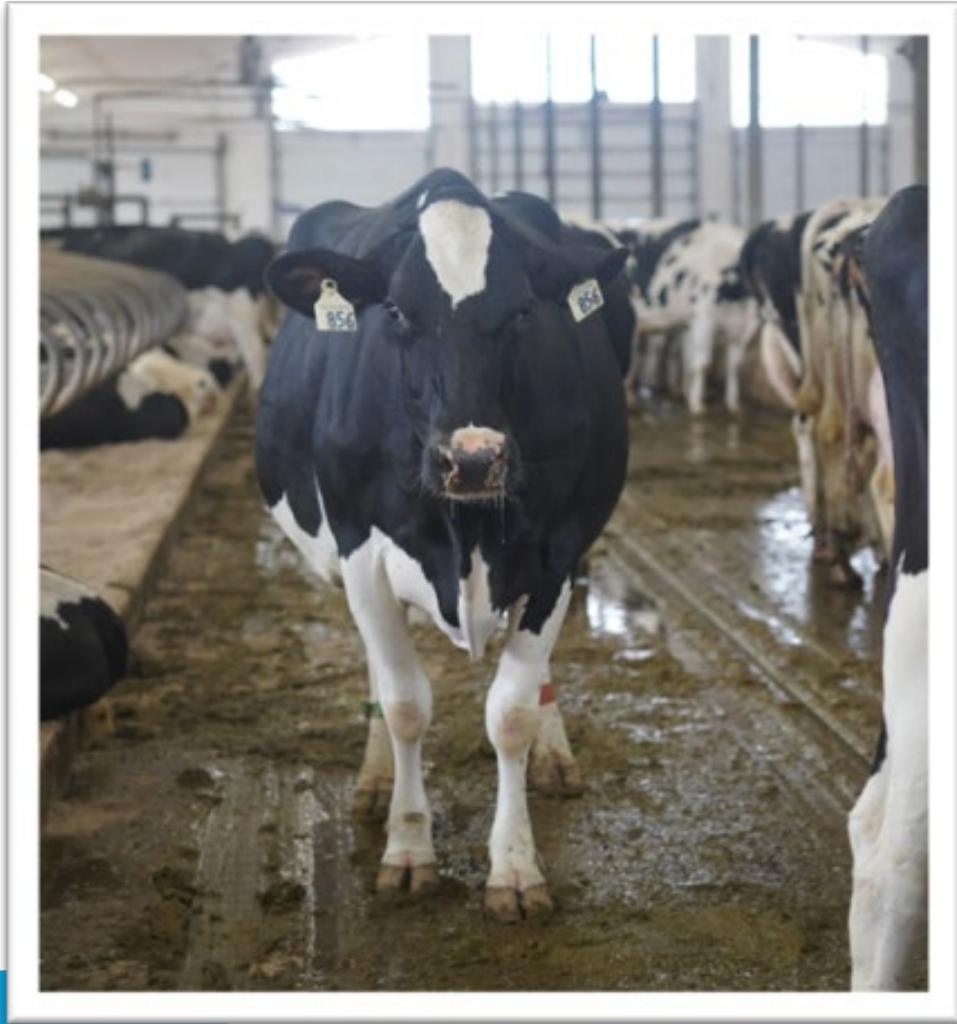
- *M. tuberculosis sensu stricto*
- *M. africanum*
- *M. canettii*



- Primarily animal-adapted variants (animal reservoir):

- *M. bovis* (cattle and various wildlife species)
- *M. caprae* (goats and sheep)
- *M. orygis* (oryx, South Asian cattle, other species)
- *M. pinnipedii* (seals and sea lions)
- *M. microti* (rodents)
- *M. suricattae* (meerkats)
- *M. mungi* (banded mongoose)





MTBC

- Found worldwide
- Cause granulomas
- Disease may lie dormant for years
 - clinical disease in livestock is rare
 - signs include weakness, loss of appetite, weight-loss, fluctuating fever
- Testing can be challenging
 - can be difficult to detect infection



Surveillance in Canada

Regulatory clinical surveillance

- Domestic animals
- Wildlife

Abattoir

- Visual inspection at slaughter
- Granuloma Submission Program (GSP)

Routine live-animal testing

- Live animal export
- Germplasm production centres
- Cervid Movement Permit (CMP)

Disease investigation

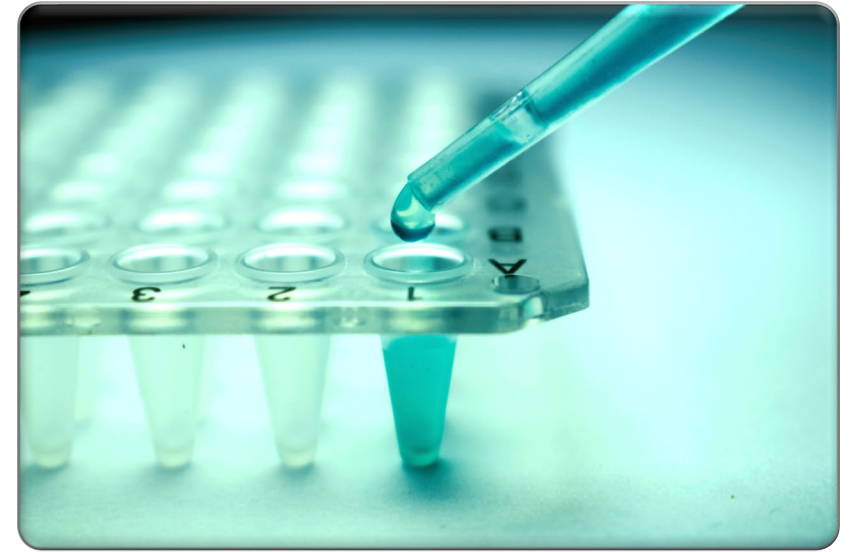
- Test reactor follow-up
- Outbreak surveillance

Risk-based surveillance

- High risk geographic area (disease in wildlife)

Surveillance results – all species (2024)

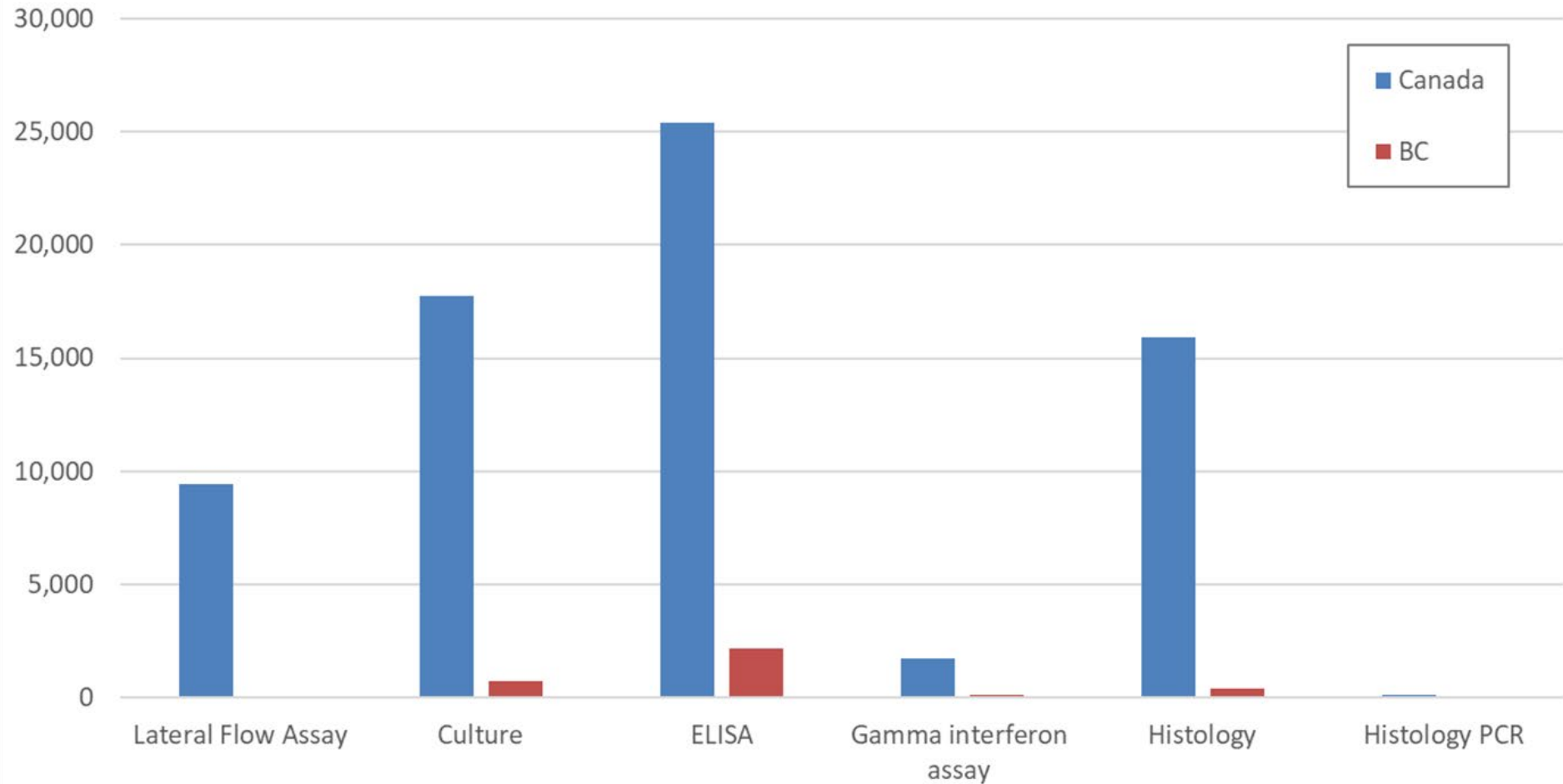
Species	Surveillance Total (not incl. slaughter inspection)	# of animals slaughtered	Abattoir GSP	Routine live animal testing	Disease investigations (confirmed case)	Other
Cattle	9,347	3,363,844	226	4,857	4,264 ^a	13
Bison	115	11,126	3	112	0	0
Cervids (elk & deer)	4,915	2,509	0	4,915	0	0
Sheep	0	595,207	0	--	0	0
Other domestic / zoo ^b	16	--	--	7	0	9
Wildlife ^c	181	--	--	--	166 ^c	15
Total	14,574	3,972,686	229	9,891	4,430	37



Laboratory testing

Number of tests for tuberculosis performed at CFIA laboratories

from Dec 1999 - Sept 2025
(total n=72,184)



Culture samples from BC by animal species

Animal Species	Number of Cultures
Cervid	362
Deer - Mule	17
Deer - WTD	5
Deer - fallow	3
Deer - not specified	1
Cattle	279
Pigs	22
Sheep	19
Bison	14
Cat	1
Llama	1
Hippopotamus	1
	725



Culture results from BC (Dec 1999-Oct 2025)

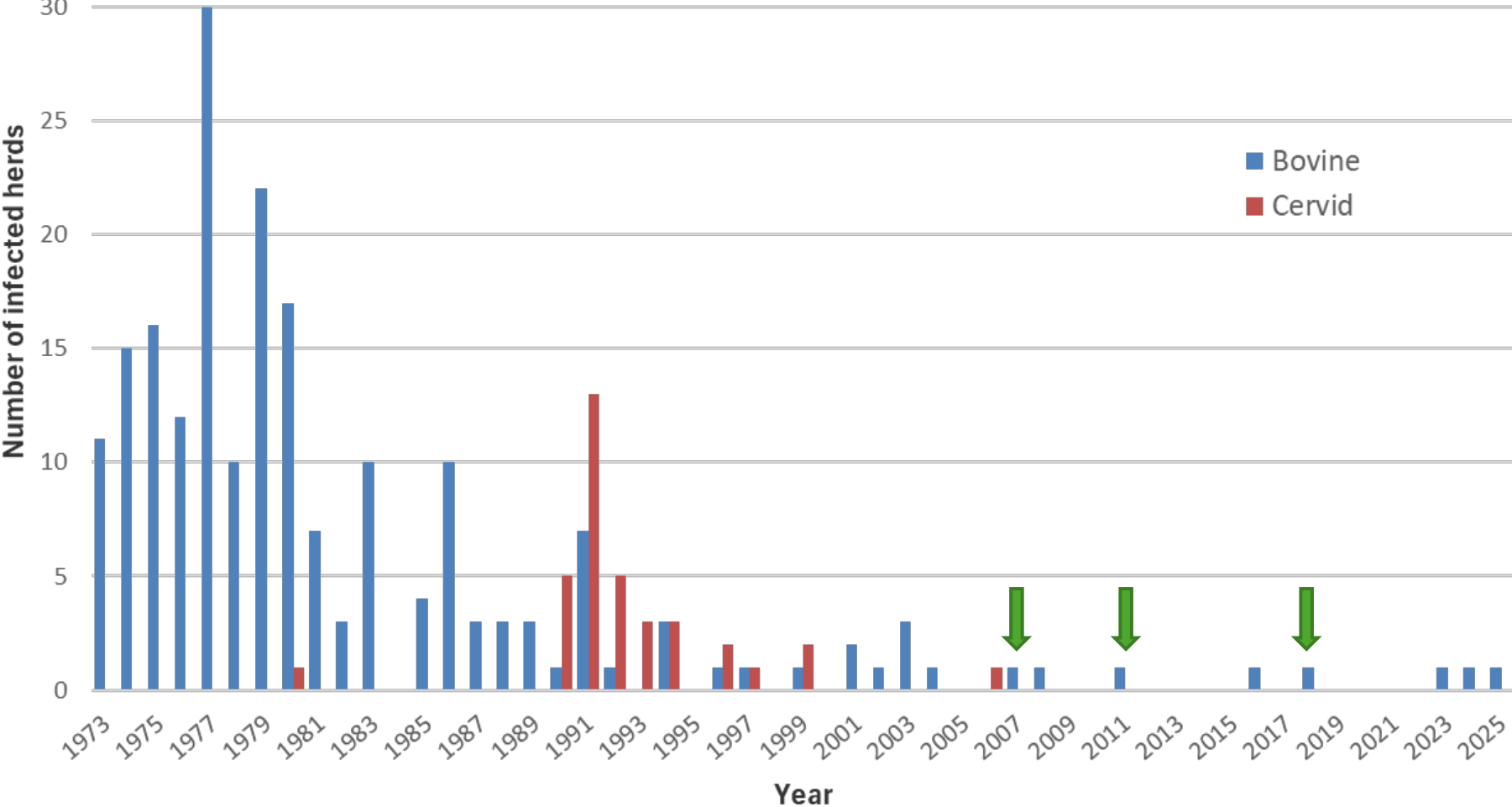
Result	Total	Details	Subtotal
Culture not done	95 (13%)		
Negative	539 (74%)		
NTM	83 (11%)	<i>M. spp (not MTBC)</i>	40
		<i>M. avium complex</i>	32
		<i>Non-chromogenic Mycobacteria</i>	5
		<i>M. terrae complex</i>	4
		<i>M. triviale</i>	1
		<i>M. kansasii</i>	1
MTBC	10 (1%)	<i>M. bovis</i>	10

Culture results from Canada (Dec 1999-Oct 2025)

Result	Total	Details	Subtotal
Culture not done	4898 (29%)		
Negative	10,273 (62%)		
NTM	1,312 (8%)		
MTBC	210 (1%)	<i>M. bovis</i>	204
		<i>M. tuberculosis</i>	5
		<i>M. microti</i>	1

M. bovis cases in Canada (1973-2025)

35



MTBC in Animals - Summary



MTBC infection in animals remains a challenge



A surveillance system is in place for animals in Canada

Designed for *M. bovis*
Captures other MTBC




National eradication program for *M. bovis* has reduced incidence in livestock to sporadic cases (*prevalence in cattle of ~0.00024%*)



Trends in Humans

The WHO's “End TB Strategy”

- 95% reduction in number of human TB deaths (2015→2035)
 - 90% reduction in human TB incidence (2015→2035)
 - Zero TB-affected families facing catastrophic costs due to TB by 2035
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Canadian context?

- Baseline incidence in 2015 was already <5 TB cases / 100,000
- Canada's goal set to <1 TB case per 100,000 people by 2035

Figure 1. TB disease rates in BC and Canada*, 2015 to 2024

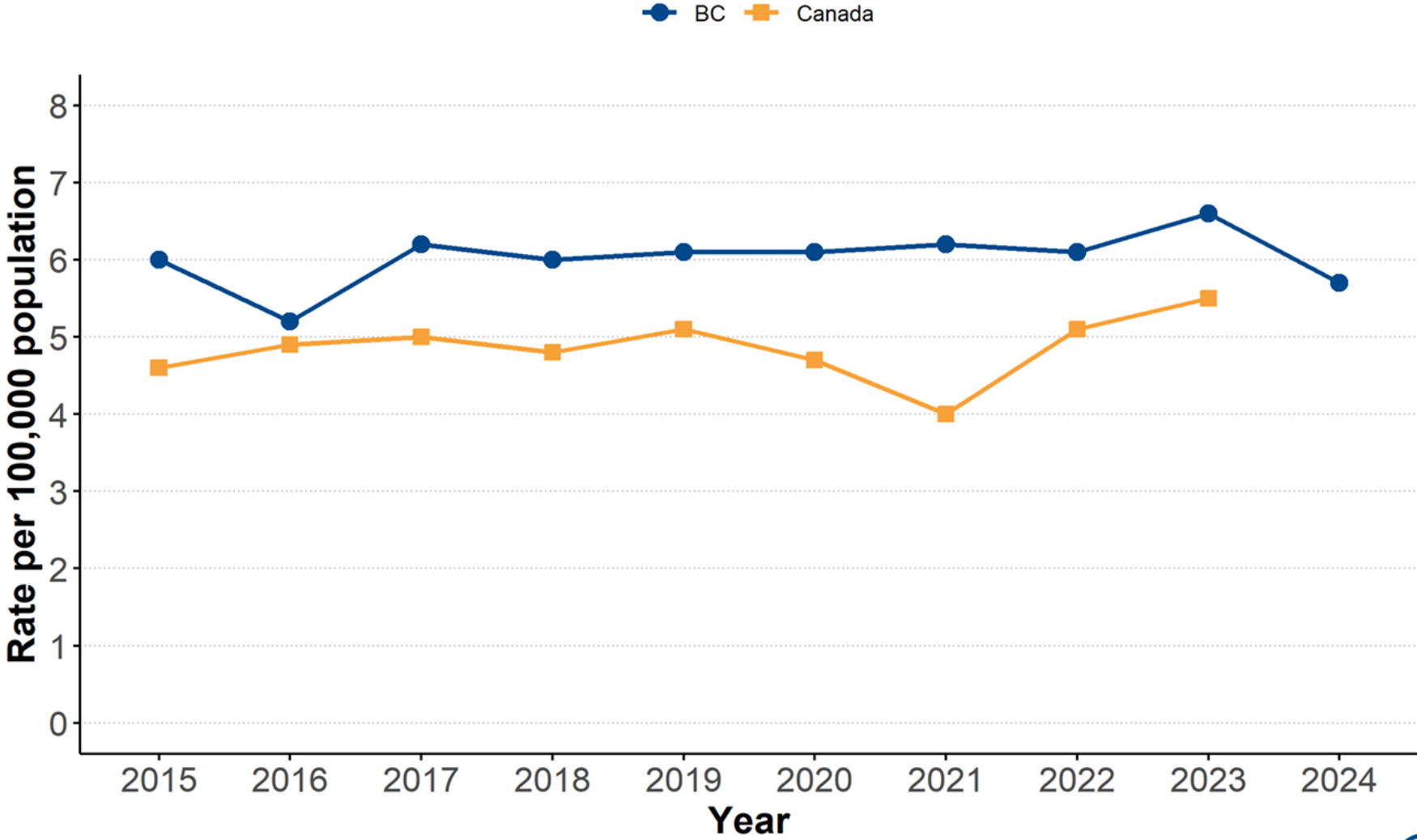
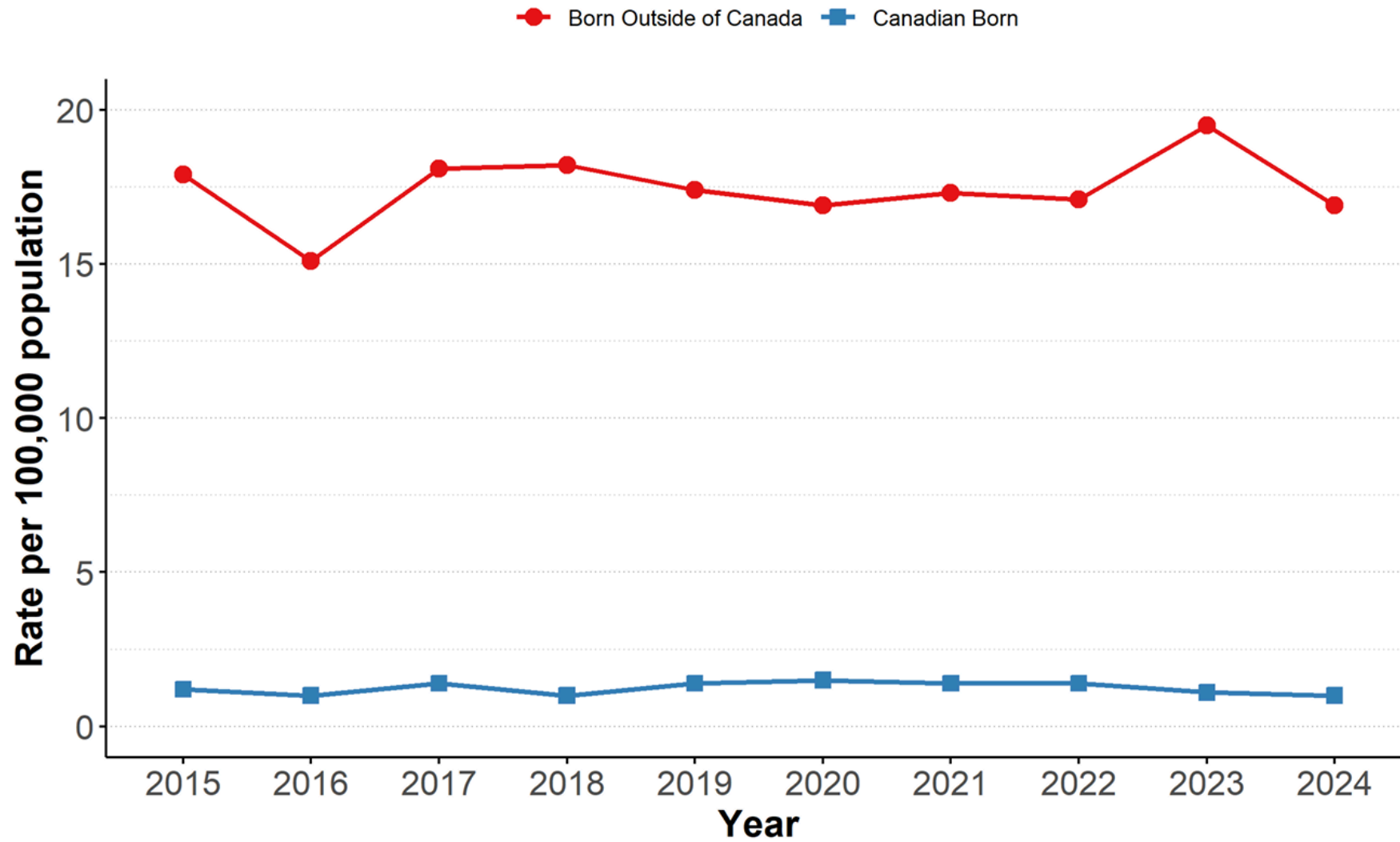


Figure 2. TB disease rates by country of birth in BC, 2015 to 2024



How are we working to lower these rates in Canada's low-incidence setting?

Improve access to TB infection (“latent TB”) screening and treatment, especially for populations with higher incidence rates

Improve tolerance of treatment for TB infection (“Latent TB”) – studies underway for shorter and better tolerated treatments

Early detection of TB disease (“active TB”) and appropriate isolation/treatment – clinicians must have high suspicion

Active disease finding among underhoused populations and in communities with known high incidence

Zoonotic Tuberculosis and One Health?

Animal-lineage MTBC species known to cause human disease

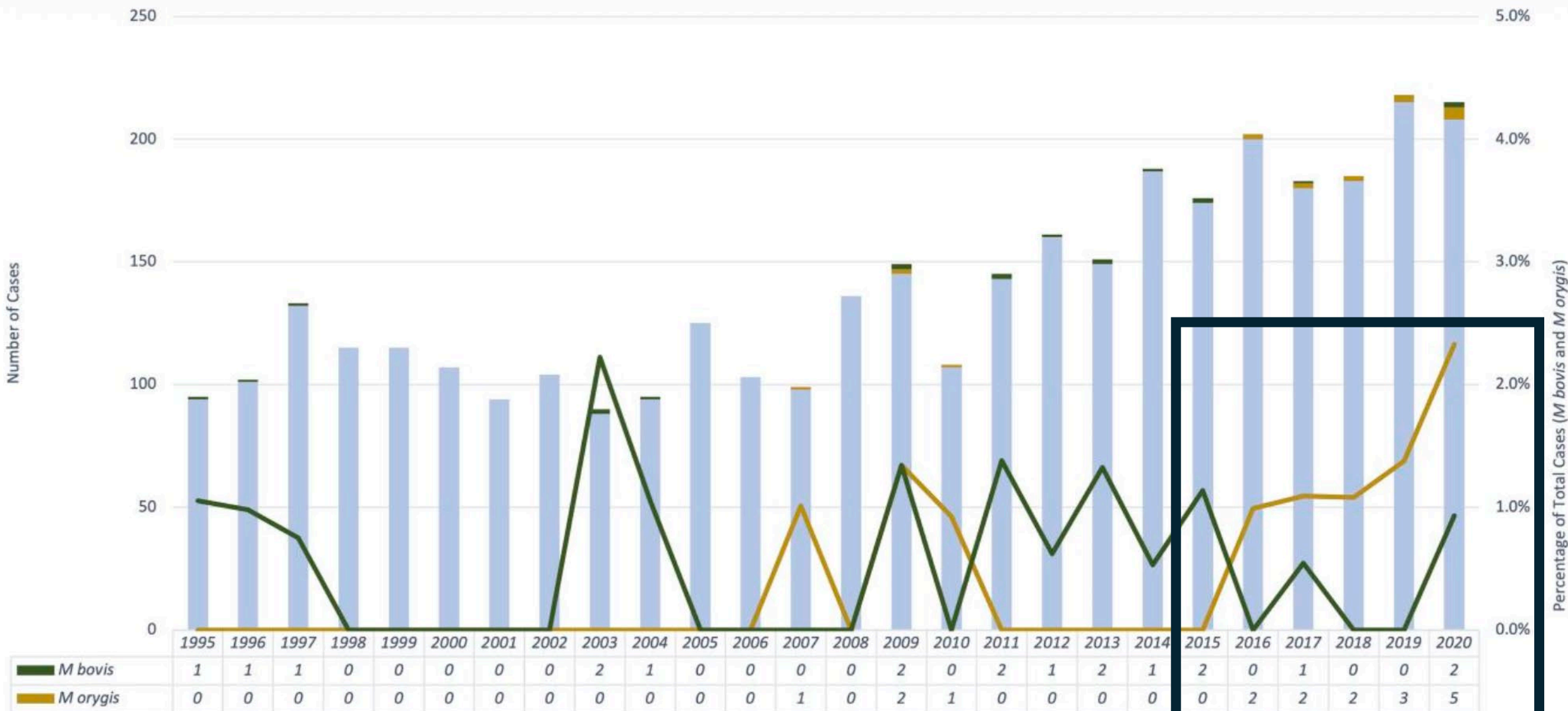
M. bovis (cattle and various wildlife species)

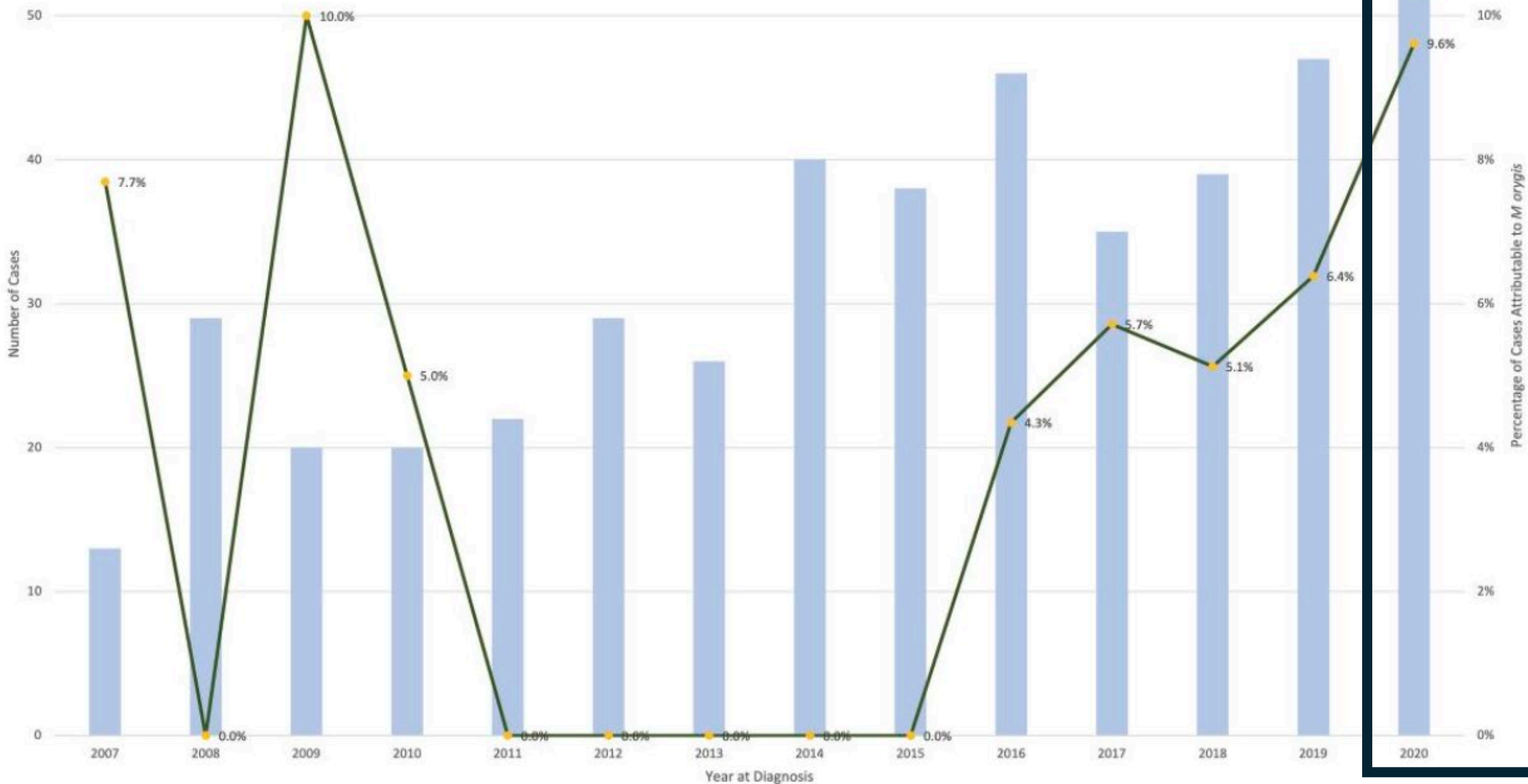
M. orygis (oryx, South Asian cattle, other species)

M. caprae (goats and sheep)

M. microti (rodents)
– 30 cases in humans reported worldwide

M. pinnipedii (seals and sea lions) – 1 case in a human reported





How can we lower incidence of zoonotic TB?

Continue education around risks of unpasteurized dairy consumption

Education for travelers going to areas where *M. bovis* remains endemic in cattle population

Ongoing animal surveillance per CFIA

Further research required for *M. orygis*, around modes of transmission and understanding burden of disease in Southern Asia



Questions?