

CLOSTRIDIUM DIFFICILE CONTAMINATION OF AUSTRALIAN RETAIL VEGETABLES AND HOUSEHOLDS

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Background

Community-associated *Clostridium difficile* infection (CA-CDI) has been rising in Australia for several years. Increasing evidence suggests that the use of animal manure and human biosolids and effluents as fertilizer contributes to high prevalence of *C. difficile* spores in many community sources including retail root vegetables, gardens and parks. In turn, household surfaces may become contaminated with *C. difficile* due to storage and handling of contaminated vegetables.

Aims

To determine the prevalence and molecular types of *C. difficile* present on retail vegetables and households in Queensland (QLD) and Western Australia (WA).

Methods

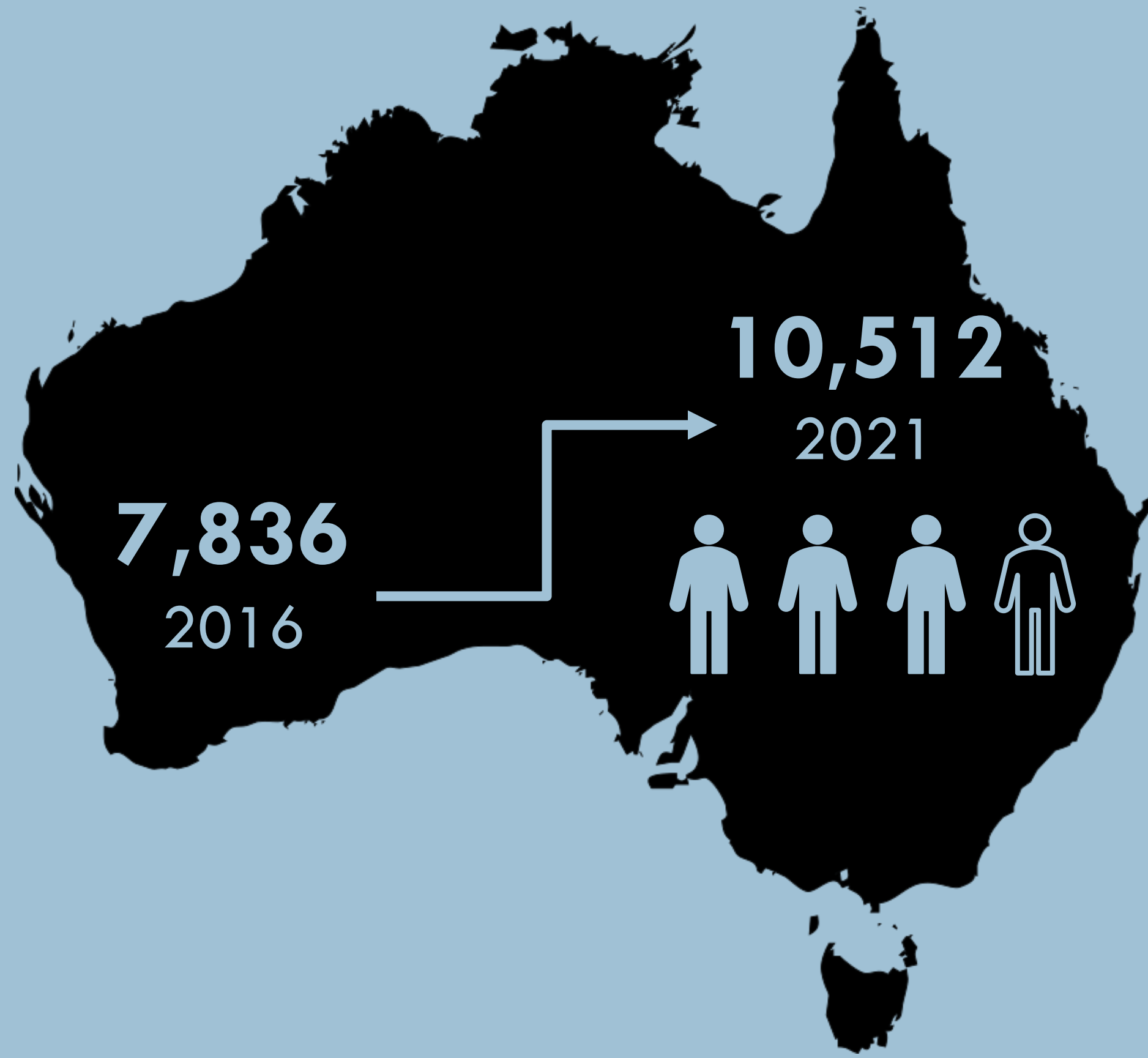
- During April and July 2023, unwashed potatoes and onions were purchased at major retail outlets, independent grocers and farmers' markets.
- Randomly selected householders in Brisbane and Perth who regularly purchased unwashed potatoes were enrolled to collect environmental samples in their home. Moistened sterile cellulose sponges (Medical Wire & Equipment, England) were used to collect one swab each from their countertop/chopping board, their fridge/pantry (vegetable storage area) and an unwashed potato.



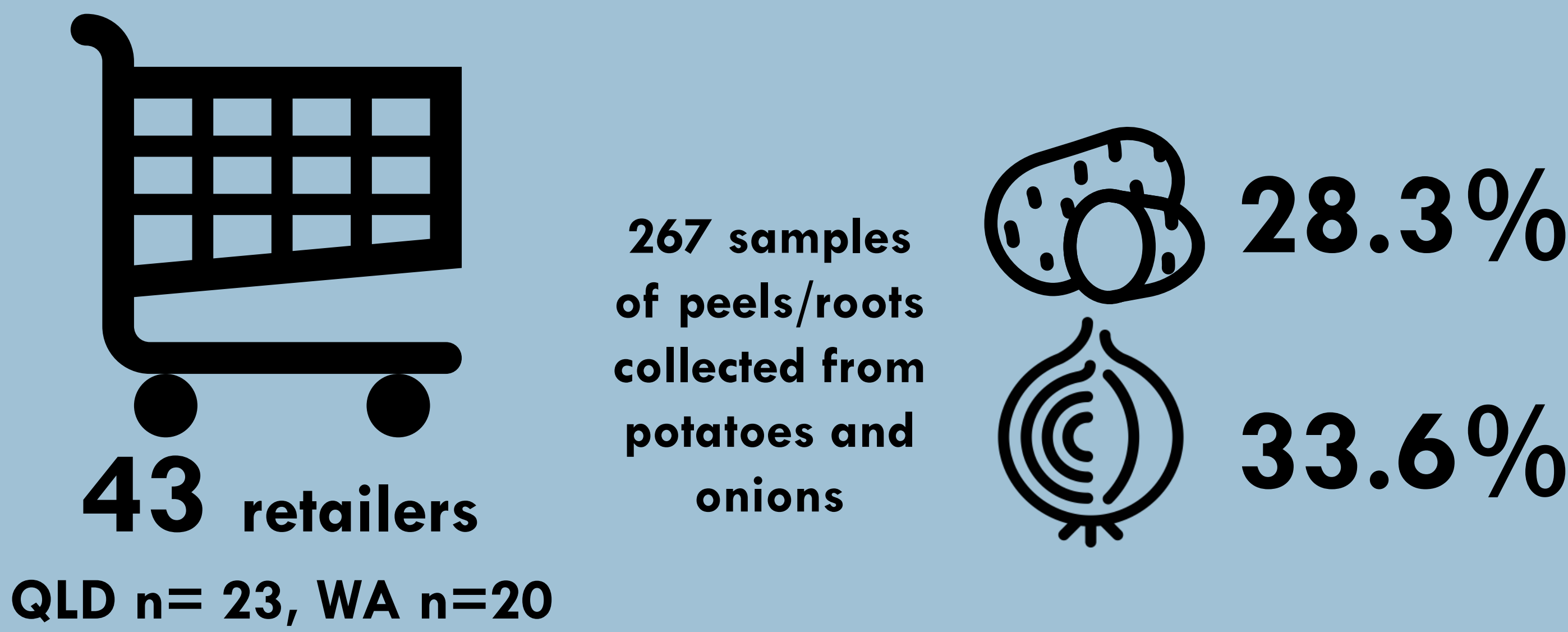
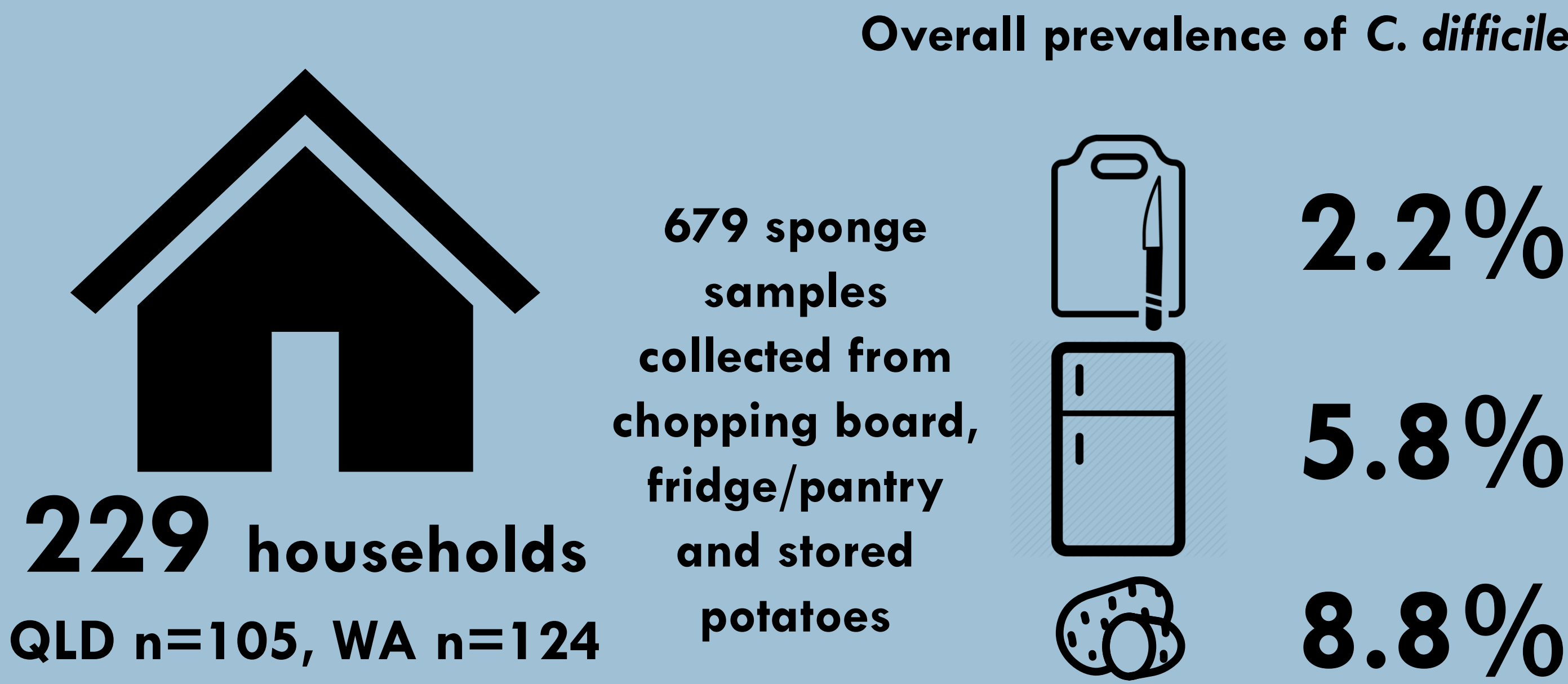
- Potato peels, onion roots and household samples were subjected to enrichment culture for *C. difficile*. Isolates underwent PCR ribotyping and PCR for toxin genes.

Household samples							
	Chopping board		Fridge/pantry		Potato		
	QLD	WA	QLD	WA	QLD	WA	Total
	(n=103)	(n=123)	(n=103)	(n=123)	(n=103)	(n=123)	
Prevalence	3.9%	0.8%	4.9%	6.5%	8.7%	8.9%	5.6%
Ribotype							
QX 690						5	5
RT 056*			1	2	1		4
RT 014/020*				1			1
QX 014*					2		2
QX 551					1	1	2
RT 010	1		1				2
RT 286						1	1
RT 002*				2			2
Others	3	1	3	3	5	4	19
Total	4	1	5	8	9	11	38
Retail vegetables							
	Onion		Potato				
	QLD (n=69)	WA (n=76)	QLD (n=61)	WA (n=61)			Total
Prevalence	36.1%	31.1%	30.4%	14.5%			21.8%
Ribotype							
RT 101*	5	1	3	1			10
QX 690				3			3
RT 056*				3			3
RT 014/020*	2	1	1				4
QX 014*		1	1	1			3
QX 551			1	1			2
RT 010		1					1
RT 070*	2		1				3
RT 286				2			2
RT 002*	1						1
QX 692			3				3
Others	11	7	12	8			38
Total	21	11	22	19			73

* Toxigenic strain



- Cases of CDI in Australia continue to increase
- 3/4 cases develop symptom onset in the community (1)
- Many community sources of *C. difficile* have been identified in Australia, including gardens and retail vegetables (2, 3, 4)



Conclusions

- A wide variety of toxigenic strains of *C. difficile* was identified on retail vegetables and within households, highlighting potential for CA-CDI cases to be acquired within households.
- Populations at high risk of CDI e.g. inflammatory bowel disease and cancer patients should be educated about safe handling and cleaning of potential sources of *C. difficile* in their homes.

1. ACSQHC 2023. *Clostridioides difficile* infection Data snapshot report: 2020 and 2021.
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4. S. C. Lim, D. A. Collins, K. Imwattana, D. R. Knight, S. Perumalsamy, N. M. R. Hain-Saunders, et al. 2022. J Appl Microbiol 2022 :133(3):1156-1168.