

The Havelock North campylobacter outbreak 2016- implications for risk management of drinking water

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Havelock North: Part of Hastings in Hawke's Bay district, North Island



Friday 12th August - how health events unfold

- Overnight presentations of D&V to HBDHB Emergency Department
 - Notification of 1 confirmed case of campylobacteriosis received from rest home in Havelock North (HN)
 - Report that a pharmacy in HN had number of requests for D&V medication
 - Pharmacy contacted – confirms 10-15 people presented for D&V medication
 - Notifications come in of 5 suspected campylobacteriosis cases – all in HN
 - Water supplier (HDC) notifies positive E.coli result from HN and Hastings reticulation
 - @ 2pm – intelligence gathering - all ED presentations from HN, other rest homes in HN reporting D&V, 20% absenteeism at HN schools, D&V at boarding schools
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Context

- Havelock North has a population of about 14,000 people
 - Drinking water is supplied by Hastings District Council
 - The DW is sourced from aquifer under the Heretaunga plains
 - **Aquifer considered to be confined and water secure from contamination**
 - 2 bores in Havelock North (Brookvale Road) access the aquifer and water pumped into HN reticulation system (third bore has not in use due to contamination event in October 2015)
 - **No water treatment at any point (other than fluoridation)**
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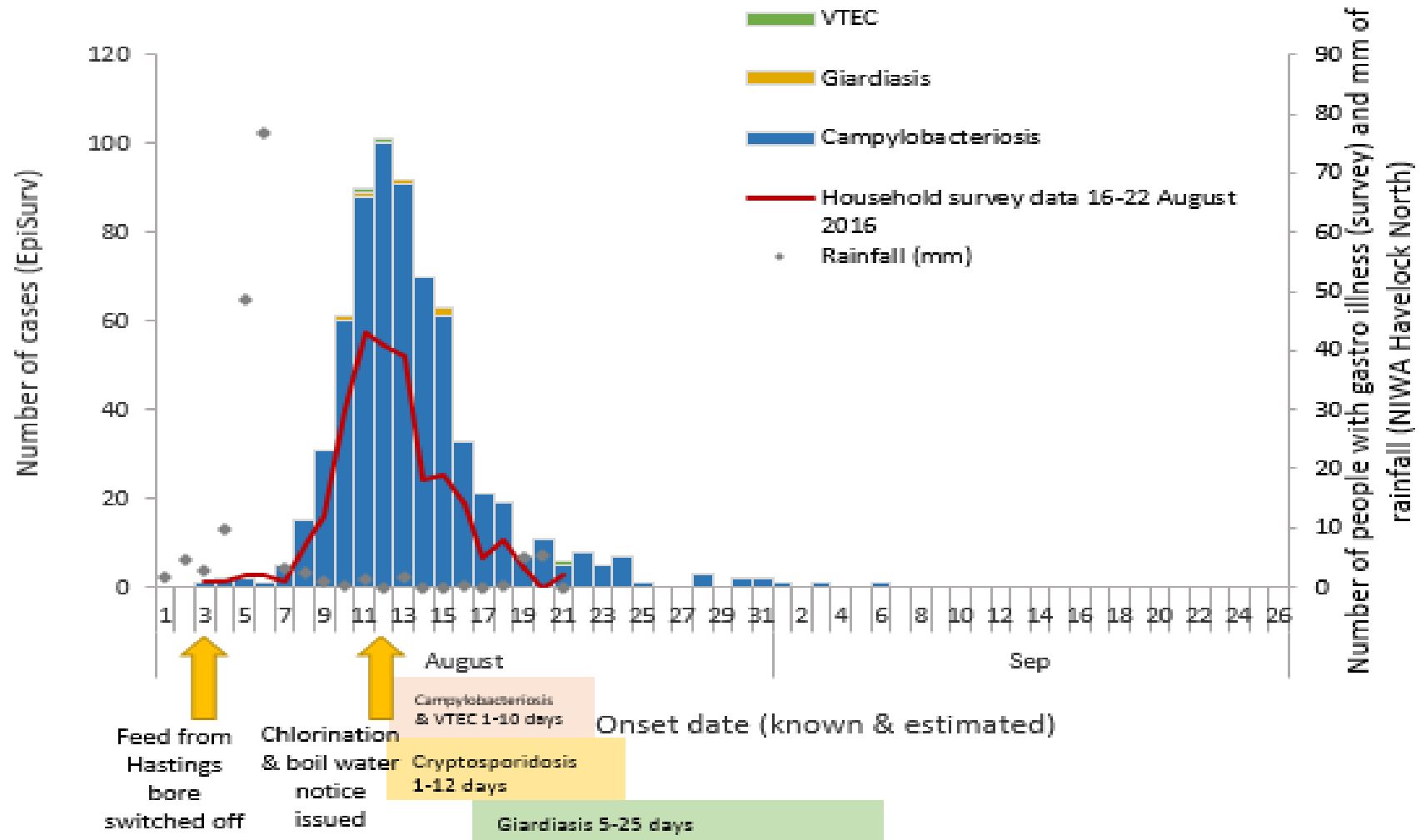




How events unfolded....

- It's the water !
- Chlorination commenced
- Boil water notice issued that evening
- Health providers alerted and media advisory issued
- Over the course of the next few days the level of illness continued to escalate
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Cases linked to the Havelock North waterborne outbreak reported by onset date with event data



The impact

Health

- 5,500 people affected (approx. 40% of population)
- 1000 case notifications
- 45 hospitalised
- 4 deaths
- Ongoing sequelae for some – reactive arthritis

Economic and business impacts - \$21 million

Schools

Drinking water management local and nationally

Government Inquiry - 2 stages

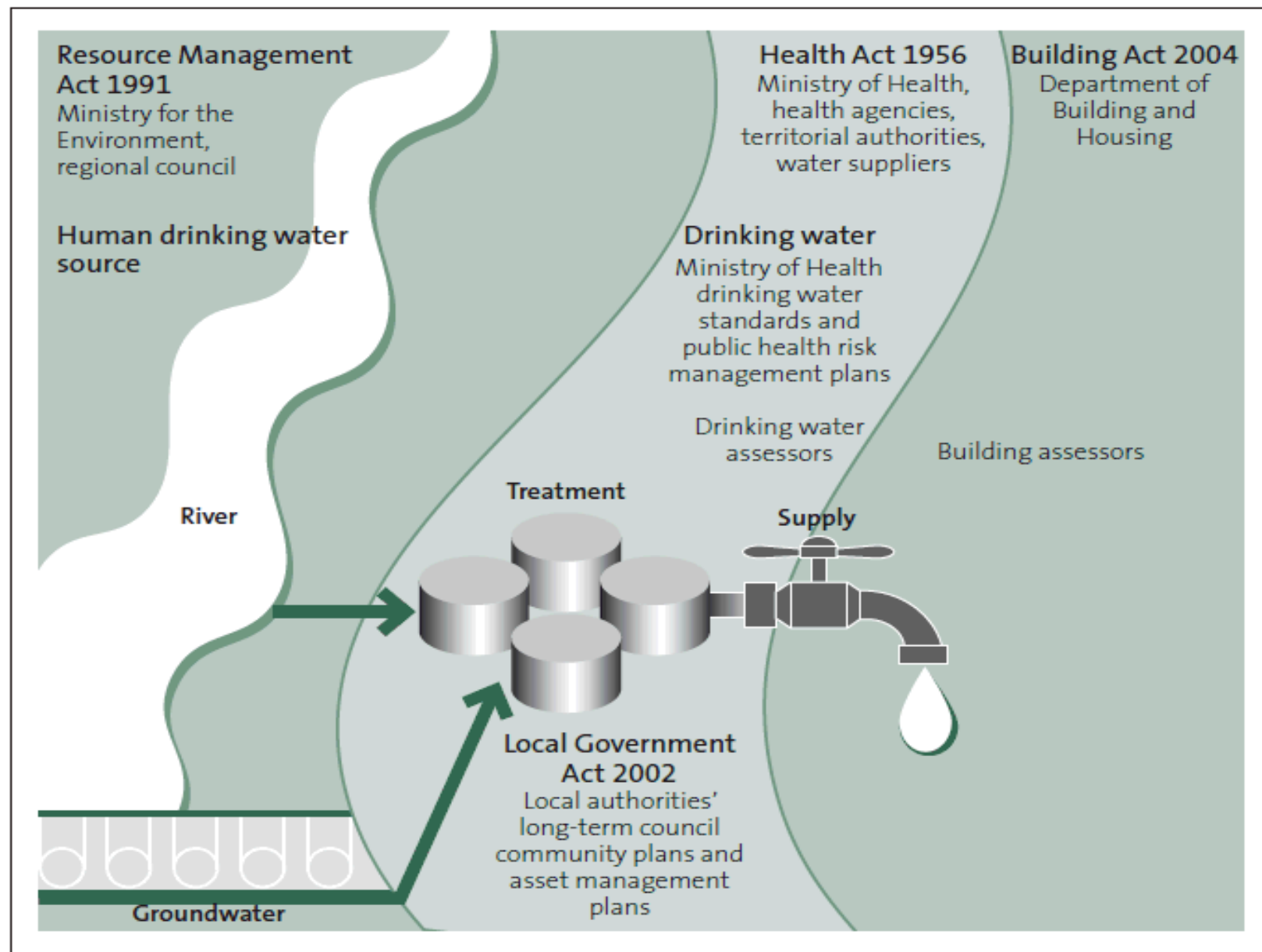
Stage 1: - to address matters directly related to the contamination event, focusing on findings of fact and fault

Cause:

- Heavy rain inundated paddocks adjacent to the bores
- Sheep faeces on the paddocks contained campylobacter
- The resulting contaminated run-off seeped through to the aquifer, most likely via a pond close by.

Multiple failings identified

How legislation applies to the parts of a typical system for supplying people with drinking water



Source: Adapted from Ministry for the Environment (2009), *Draft Users' Guide: National Environmental Standard for Sources of Human Drinking Water*, Wellington.

Multiple Failures

Regional Council	To assess the risks of contamination - resource consent processes, management of uncapped / disused bores in proximity, liaison with District council
District Council	To implement high standard of care required of a public drinking water supplier –previous outbreak in 1998, history of multiple transgressions, key omissions in assessment of risks, breached drinking water standards, slow to obtain report on bore head security and to carry out recommended improvements, lack of collaboration and liaison with RC
Drinking water assessors	Too hands off in applying DWS , should have been stricter in ensuring compliance, failure to press DC on lack of risk assessment, failure to require deeper investigation into transgressions

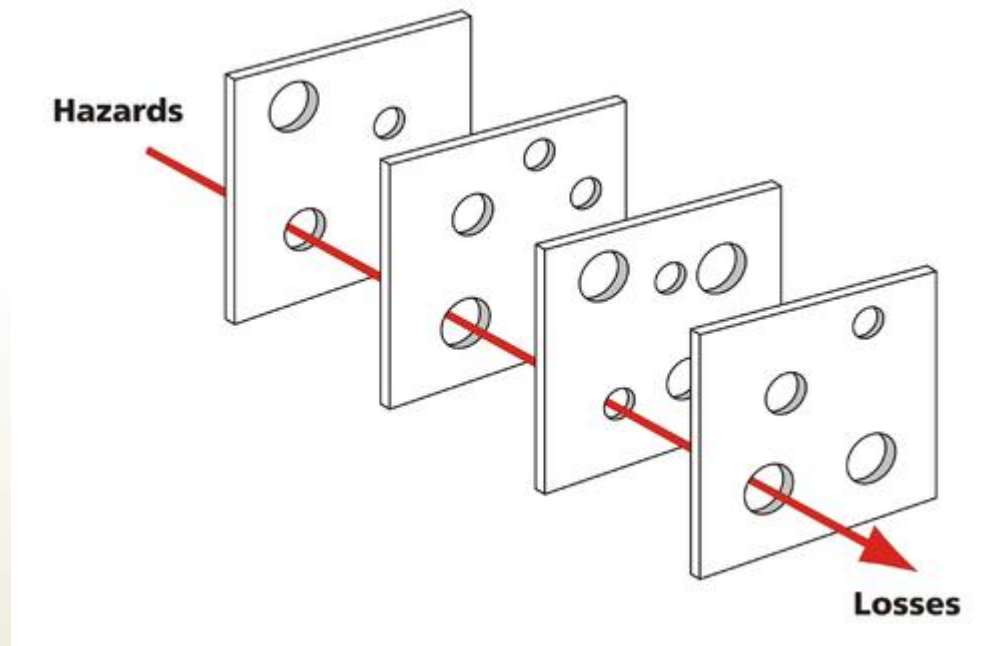
Multibarrier approach to risk management in relation to drinking water

1. Source protection to keep source water as clean as possible (Bore not secure)
 2. Treatment to remove or inactivate contaminants (No treatment)
 3. Secure distribution system against intrusion of contaminants (Not issue here but no residual treatment)
 4. Monitoring programmes to detect contamination and give assurance system is working (monitoring infrequent)
 5. Well thought out response to adverse conditions (heavy rain fall)
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Multibarrier Swiss cheese



Alignment of weaknesses in barriers




Key findings and recommendations Stage 2 (6th Dec 2017)

Overarching principle : - a very high standard of care and diligence should be applied to the supply of drinking water

“ ... the risks to public health from unsafe drinking water justify the application of the highest standards of care. “

“ Complacency (is) common within the drinking water supply system in New Zealand. ... the risks to drinking water can be sporadic and poorly understood and thus provide fertile ground in which complacency can grow among drinking water suppliers, local body politicians whose councils in many cases own the water infrastructure, as well as health professionals, including DWAs and officials within the Ministry of Health responsible for drinking water. “

Principles of drinking water safety

1. A high standard of care must be embraced
 2. Protection of source water is of paramount importance
 3. Maintain multiple barriers against contamination
 4. Change precedes contamination
 5. Suppliers must own the safety of drinking water
 6. Apply a preventive risk management approach
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51 recommendations

- 19 Urgent and early recommendations - as a matter of urgency.
 - 31 Further Recommendations to prevent recurrences
 - There is a widespread systematic failure of drinking water suppliers in New Zealand to meet the high standards required to ensure the safe supply of drinking water to the public
 - There is currently no adequate or effective enforcement of the statutory obligations on drinking water suppliers and the Ministry of Health has not demonstrated an ability to call the industry to account
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Substantial changes required

Abolish the secure bore classification system

Mandatory appropriate and effective treatment of drinking water for all supplies (networked and self-suppliers). This should include a residual disinfectant in the reticulation

A new dedicated drinking water regulator should be established early and promptly

Fewer water suppliers who should operate across larger regions in order to reduce costs and improve outcomes

Licensing regime for drinking water suppliers.

Secure classification

DWSNZ - Once classified as secure bore , water from that bore does not need to be treated and less monitoring is required.

3 criteria - water-ageing or residence time tests ; bore head sealed at surface;
absence of past e.coli positive results

Inquiry findings:

Gives false sense of security

Overstates knowledge about aquifers

Conveys message that there is no appreciable level of risk

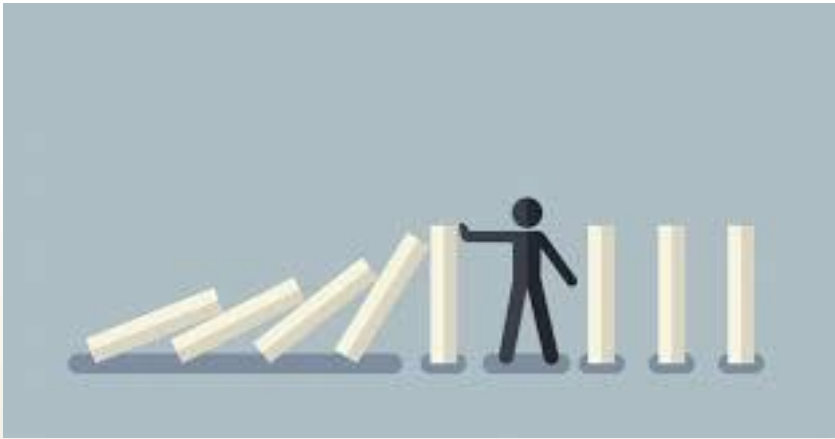
Inherently unsafe

Should be abolished

Managing risk - Disinfection status (draft annual report 16/17)

	Number	%
Chlorination	3,133000	82.1%
Ozone	47000	1.2%
UV	606000	15.9%
Any disinfection	3,215000	84.3%
Secure bore status *	590000	15.5%
Disinfected or secure	3,700000	97%
Neither disinfected nor secure	115,000	3%
Secure bore no disinfection	457,000	12%

Risk management - probability and consequences



Some risks are known, some are able to be known and some are neither known nor knowable

Achievement against DWS (draft annual report 2016-17)

For network supplies serving more than 100 people

Bacteriological achievement	96.2%
Protozoal achievement	83.1%
Chemical achievement	97.2%