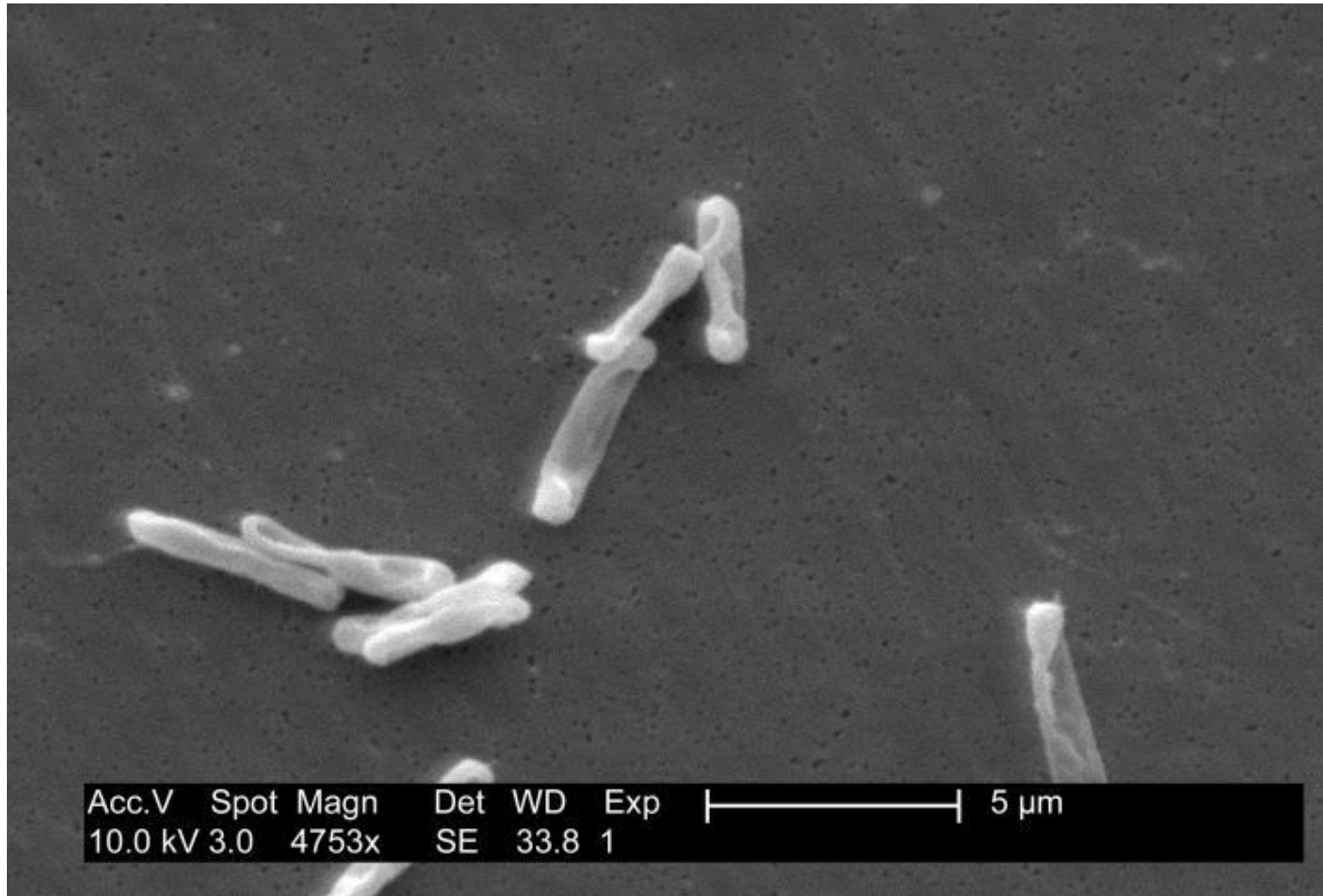


C. difficile: *c'est difficile!*

Chris Mackie, MD, MHSc, FRCPC

Spore-forming



Threshold Definition

- CDI outbreak definitions incorporate the concept of notification thresholds that optimally trigger action and dialogue between public health and hospitals to determine if an outbreak is occurring.
- The following CDI notification thresholds replace the existing outbreak definitions that were issued on September 1, 2008.
- Outbreak definitions have been redefined to incorporate notification thresholds.
- *Notification thresholds are more sensitive than outbreak definitions and are defined as:*
 1. For wards/units with ≥ 20 beds, 3 cases of nosocomial CDI identified on one ward/unit within a seven day period or 5 cases within a 4 week period; OR
 2. For wards/units with < 20 beds, 2 cases of nosocomial CDI identified on one ward/unit within a seven day period or 4 cases within a 4 week period; OR
 3. Hospitals that have a baseline CDI rate for two months that is at or above the 80th percentile for comparator hospitals; OR
 4. Hospitals that have a facility rate that is greater than or equal to 2 standard deviations above their baseline. Note: This does not apply to small hospitals with a single case of nosocomial CDI which artificially elevates the facility rate
- It should be noted that exceeding a threshold does not necessarily imply that an outbreak will be declared.

CDI Outbreak thresholds

Following consultation between the institution and the Medical Officer of Health (MOH), decisions on the declaration of an outbreak will be made based on the following two criteria:

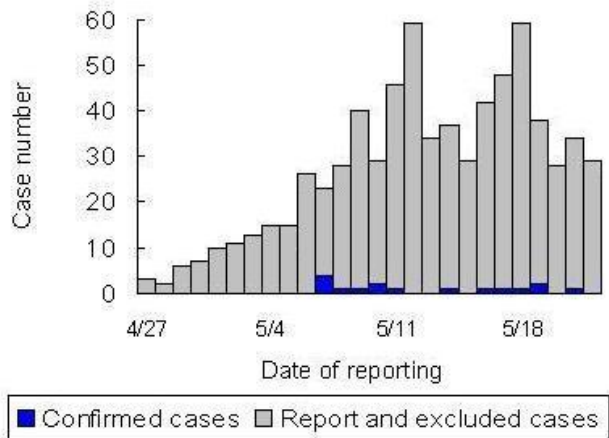
- Significant* (as determined by the facility and health unit) increase in CDI numbers or rate compared to own baseline and/or that of comparator institutions
- Epidemiologic evidence of ongoing nosocomial transmission within the ward/unit or facility

*Significance may be determined by reviewing:

- Number of new nosocomial cases associated with the reporting ward/unit or facility;
- Historic level of CDI activity of the ward/unit or facility;
- Current trend in ward/unit CDI activity or facility rate;
- Location of current cases and possible epidemiologic links between cases;
- Current control measures (and evidence that they are being implemented);

Declaration of an outbreak can be made by either the institution or the MOH.

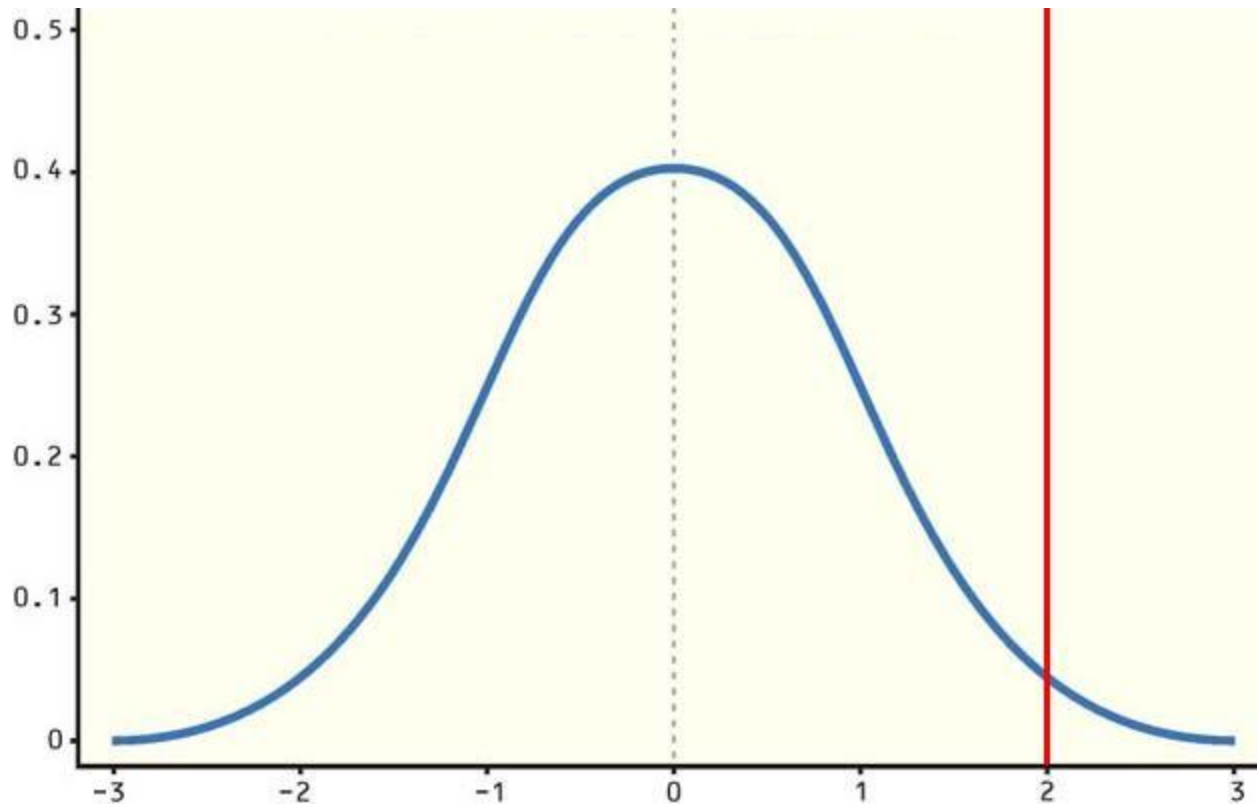
Incidence vs. Prevalence



VS.



Outbreak vs. Random Variation (the problem with “two standard deviations”)

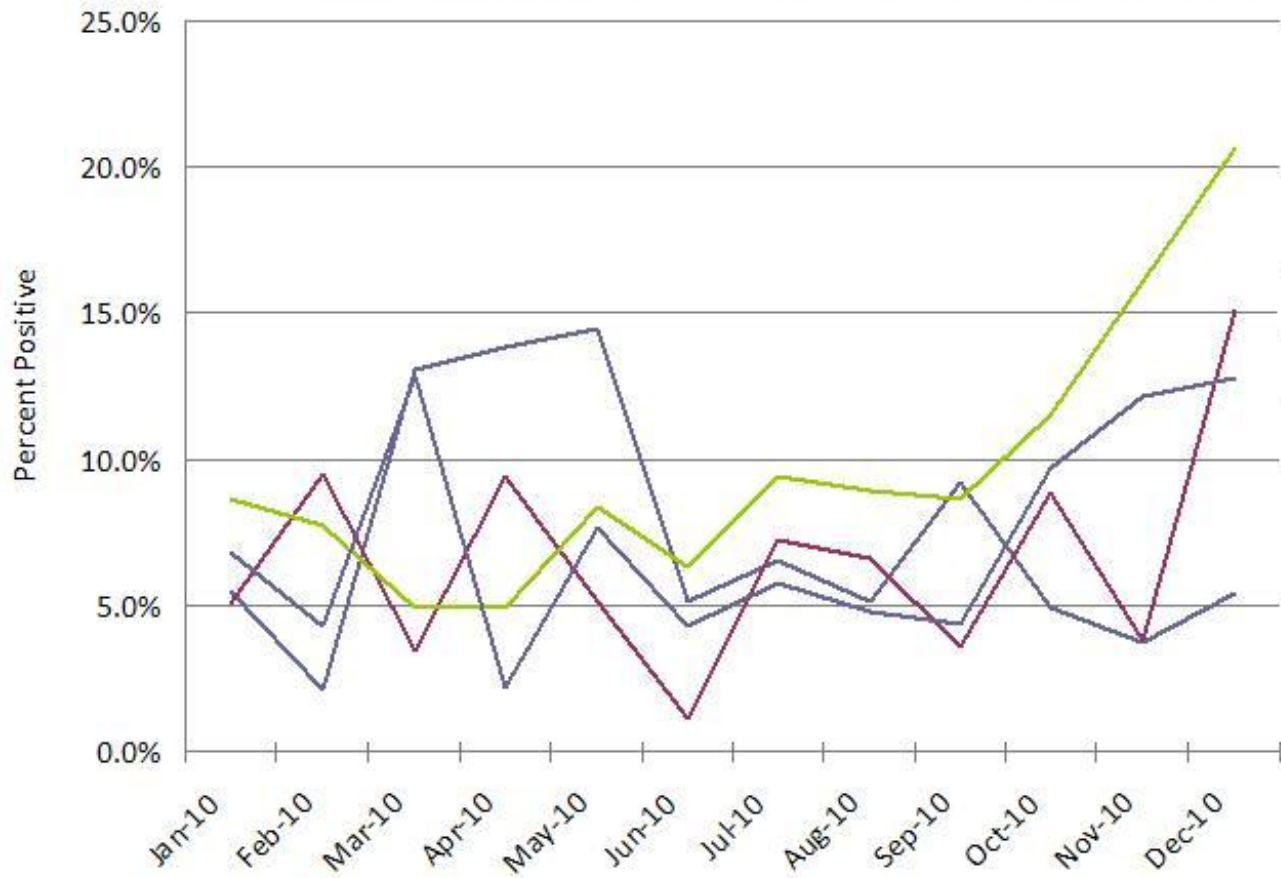


Toxin vs. PCR Testing

	Toxin A/B TECHLAB	C. Diff QuickChek (GDH Antigen)	CTA	PCR Toxin B proGastro Cd	PCR Toxin A & B Astra	PCR In-House (tcdC/bin ary toxin)
Sensitivity (%)	48.78	97.56	63.40	95.12	92.6	95.1
Specificity (%)	99.3	94.0	99.7	99.7	100	99.7
PPV (%)	86.9	61.5	96.3	97.5	100	97.5
NPV (%)	95.5	99.7	99.7	99.5	99.3	99.5

McCaffrey M, Lee C, *et al.* 2010

Clostridium difficile Toxin Positivity Rate by Month - 2010



Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Tests per patient-day
91	95	84	94	76	78	92	97	76	61	80	74	0.10881818
119	116	88	85	117	87	97	121	84	124	105	86	0.178625
267	182	204	202	155	190	191	191	208	200	355	223	0.22692308
117	116	109	140	157	116	104	126	114	103	99	94	0.26966667

Some sound principles

- Significant increase → investigate
- Line list
- Links between cases
- Typing (challenging due to lab restrictions)
- Percent positivity

We still have (lots of) cases. Is this thing ever going to be over??

Yes.

- Implementing recommendations of the ICRT as well as a number of other innovative infection control practices
- Audits of cleaning and infection control practices indicating that recommendations and best practices are being followed
- Percent positivity of C.diff tests is on par with comparator facilities
- Testing rate per bed day for C.diff still higher than other facilities
- The cases of C.diff are of several different strains and not likely related to each other

Should we change the thresholds
and definitions?