

QUARTERLY HOSPITAL ASSOCIATED INFECTIONS SURVEILLANCE REPORT

Clostridium difficile Infection (CDI) and Methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia in New Brunswick Hospitals

Reporting Period *Start:* January 1 2016
 End: March 31 2016

Summary

Counts and percentages of *Clostridium difficile* infection (CDI) by case classification for Quarter 4 of the 2015/2016 fiscal year are presented in **Table 1**.

Finalized Hospital associated CDI rates and counts by fiscal quarter are presented in **Table 2**.

One case of hospital associated methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia (bloodstream infections) was reported in Quarter 4 of fiscal year 2015/2016. To date, 8 cases of MRSA bacteremia were reported in fiscal year 2015/2016. The rate of hospital associated MRSA bacteremia for 2015/2016 fiscal year so far is as follows:

- Vitalité Health Network = 0.06 per 10,000 patient days
- Horizon Health Network = 0.11 per 10,000 patient days
- New Brunswick = 0.09 per 10,000 patient days

The calculation of the rates of Hospital associated *Clostridium difficile* infection and MRSA bacteremia has now been changed from 1,000 patient days to 10,000 patient days.

The provincial healthcare associated infections (HAI) surveillance system was established to monitor the incidence and trends of healthcare associated infections among patients who have been hospitalized. Currently, the system looks at two infections: CDI and MRSA bacteremia.

Clostridium difficile (*C. difficile* or *C. diff*) is a bacterium that can live in the bowel, as part of normal bowel flora, without causing harm, or it can cause an infection (diarrhea, fever, abdominal pain). When antibiotics destroy a person's good bowel bacteria, *C. difficile* bacteria can grow causing infection. This report includes hospital associated CDI identified during the hospital stay or within 4 weeks of leaving the hospital.

Staphylococcus aureus (*S. aureus*) is a type of bacteria that lives on the skin, amongst other places, of healthy people. When *S. aureus* develops resistance to certain antibiotics, it is called methicillin-resistant *Staphylococcus aureus*, or MRSA. MRSA can enter the body through artificial openings (e.g. wounds, IV lines) and cause infections like bloodstream infections, bladder infections, and soft tissue infections. These infections occur in the community and in hospitals. This report only includes MRSA bacteremia associated with hospitalization.

Data Limitations

This report is based on CDI and MRSA bacteremia cases reported to the Department of Health by hospitals in New Brunswick. There are no guarantees that all cases among the population under surveillance are identified.

Please exercise caution when interpreting the data in the reports. Care should be taken when comparing cases and rates between Health Authorities and healthcare facilities. Multiple factors can affect the rate and these include

- the health condition and medical history of the population served,
- the complexity of the patient care,
- the age of patient served,
- the laboratory methods used for detection,
- the use of antibiotics,
- the physical layout of the facility, and
- the size of the facility.

In addition to the factors listed above, the surveillance practice used by other provinces may be different from New Brunswick and extra care should be taken when reviewing New Brunswick's rates with Canadian rates and/or rates from other provinces. In New Brunswick, a standard surveillance practice has been implemented.

Facilities with smaller patient numbers may have unstable rates and slight changes in the number of cases can dramatically affect the rate, as such, these rates can fluctuate from one month to the next. It is best to monitor trends for a particular hospital over time.

Data Source

Data is provided by New Brunswick hospitals from both Regional Health Authorities using a standardized form and case definitions.

Data Analysis

The incidence, a rate, represents the number of new infections for a hospital in a certain quarter of the fiscal year. These are presented by patient days, which are the number of days spent in a hospital for all patients regardless of medical condition. For example, 10 patients in a hospital for 1 day would represent 10 patient days.

Counts are the number of patients with the hospital-associated infection in question during a certain quarter of the fiscal year (e.g., April 1-June 30).

A. *Clostridium difficile* infection (CDI)

This rate is determined by the number of patients with hospital associated CDI in a given quarter divided by the number of patient days, and multiplied by 10,000.

B. Methicillin-resistant *Staphylococcus aureus* (MRSA) Bacteremia

This rate is determined by the number of hospitalized patients diagnosed with hospital associated MRSA bacteremia (bloodstream infection) in a given quarter divided by the number of patient days, and multiplied by 10,000.

Having a better understanding of these infections through measuring, monitoring, and reporting allows hospitals in New Brunswick to strengthen existing infection prevention and control interventions and to continue to work towards protecting the health of New Brunswickers.

Acknowledgements

The Department of Health would like to acknowledge the contributions of the Infection Prevention and Control Professionals from Vitalité Health Network and Horizon Health Network in preparing this report.

TABLE 1: Counts and percentages of CDI by case classification in New Brunswick acute care hospitals, Quarter 4 of fiscal year 2015/2016

RHA	Region ¹	Acute Care Hospital	# of beds Category	2015/2016 Q4						Total
				Count of CDI attributed to (%)						
				Reporting hospital- CNISP ²	Reporting hospital- non CNISP ³	Reporting hospital- Total ⁴	Another acute care facility	Long term care facility or non-acute care facility	Unknown source	
Health Region 1										
		Hôpital Stella-Maris- de-Kent	<100	1 (20%)	0 (NA)	1 (20%)	0 (NA)	0 (NA)	4 (80%)	5 (100%)
		Dr. Georges-L.-Dumont University Hospital Centre	250+	7 (29%)	0 (NA)	7 (29%)	0 (NA)	0 (NA)	17 (71%)	24 (100%)
		Health Region Total	-	8 (28%)	0 (NA)	8 (28%)	0 (NA)	0 (NA)	21 (72%)	29 (100%)
Health Region 4										
		Hotel-Dieu Saint-Joseph de Saint-Quentin	<100	0 (NA)	0 (NA)	0 (NA)	0 (NA)	0 (NA)	1 (100%)	1 (100%)
		Hôpital général de Grand-Sault	<100	0 (NA)	0 (NA)	0 (NA)	0 (NA)	1 (20%)	4 (80%)	5 (100%)
		Hôpital régional d'Edmundston	100-249	2 (25%)	0 (NA)	2 (25%)	0 (NA)	0 (NA)	6 (75%)	8 (100%)
		Health Region Total	-	2 (14%)	0 (NA)	2 (14%)	0 (NA)	1 (7%)	11 (79%)	14 (100%)
Health Region 5										
Vitalité		Hôpital Régional de Campbellton	100-249	3 (38%)	2 (25%)	5 (63%)	0 (NA)	0 (NA)	3 (38%)	8 (100%)
		Health Region Total	-	3 (38%)	2 (25%)	5 (63%)	0 (NA)	0 (NA)	3 (38%)	8 (100%)
Health Region 6										
		Hôpital de l'Enfant-Jesus	<100	0 (NA)	0 (NA)	0 (NA)	0 (NA)	0 (NA)	2 (100%)	2 (100%)
		Hôpital et centre de santé communautaire de Lamèque	<100	0 (NA)	0 (NA)	0 (NA)	1 (50%)	0 (NA)	1 (50%)	2 (100%)
		Hôpital de Tracadie -Sheila	<100	0 (NA)	0 (NA)	0 (NA)	0 (NA)	0 (NA)	2 (100%)	2 (100%)
		Hôpital régional Chaleur	100-249	3 (33%)	0 (NA)	3 (33%)	0 (NA)	0 (NA)	6 (67%)	9 (100%)
		Health Region Total	-	3 (20%)	0 (NA)	3 (20%)	1 (7%)	0 (NA)	11 (73%)	15 (100%)
		RHA Total	-	16 (24%)	2 (3%)	18 (27%)	1 (2%)	1 (2%)	46 (70%)	66 (100%)
Health Region 1										
		Sackville Memorial Hospital	<100	0 (NA)	0 (NA)	0 (NA)	0 (NA)	0 (NA)	0 (NA)	0 (NA)
		The Moncton Hospital	250+	8 (29%)	0 (NA)	8 (29%)	0 (NA)	4 (14%)	16 (57%)	28 (100%)
		Health Region Total	-	8 (29%)	0 (NA)	8 (29%)	0 (NA)	4 (14%)	16 (57%)	28 (100%)
Health Region 2										
		Grand Manan Hospital	<100	1 (100%)	0 (NA)	1 (100%)	0 (NA)	0 (NA)	0 (NA)	1 (100%)
		Sussex Health Centre	<100	0 (NA)	0 (NA)	0 (NA)	0 (NA)	0 (NA)	0 (NA)	0 (NA)
		Charlotte County Hospital	<100	1 (50%)	0 (NA)	1 (50%)	0 (NA)	0 (NA)	1 (50%)	2 (100%)
		Saint John Regional Hospital	250+	10 (29%)	3 (9%)	13 (38%)	0 (NA)	2 (6%)	19 (56%)	34 (100%)
		Health Region Total	-	12 (32%)	3 (8%)	15 (41%)	0 (NA)	2 (5%)	20 (54%)	37 (100%)
Health Region 3										
		Hotel-Dieu of St. Joseph	<100	1 (100%)	0 (NA)	1 (100%)	0 (NA)	0 (NA)	0 (NA)	1 (100%)
		Upper River Valley Hospital	<100	0 (NA)	0 (NA)	0 (NA)	0 (NA)	0 (NA)	4 (100%)	4 (100%)
		Oromocto Public Hospital	<100	0 (NA)	0 (NA)	0 (NA)	0 (NA)	0 (NA)	3 (100%)	3 (100%)
		Dr. Everett Chalmers Regional Hospital	250+	3 (11%)	5 (19%)	8 (30%)	0 (NA)	0 (NA)	19 (70%)	27 (100%)
		Health Region Total	-	4 (11%)	5 (14%)	9 (26%)	0 (NA)	0 (NA)	26 (74%)	35 (100%)
Health Region 7										
		Miramichi Regional Hospital	100-249	3 (33%)	2 (22%)	5 (56%)	0 (NA)	1 (11%)	3 (33%)	9 (100%)
		Health Region Total	-	3 (33%)	2 (22%)	5 (56%)	0 (0%)	1 (11%)	3 (33%)	9 (100%)
		RHA Total	-	27 (25%)	10 (9%)	37 (34%)	0 (NA)	7 (6%)	65 (60%)	109 (100%)
		New Brunswick Total	-	43 (25%)	12 (7%)	55 (31%)	1 (1%)	8 (5%)	111 (63%)	175 (100%)

Notes

¹ Refer to Figure 1.

² is the number of patients with a *Clostridium difficile* infection associated with the hospital that meet the 2014 definition used by The Canadian Nosocomial Infection Surveillance Program (CNISP) (<http://www.phac-aspc.gc.ca/nois-sinp/survprog-eng.php>). Capturing this subset permits our hospitals to benchmark or trend against other hospitals in Eastern Canada who participate in the CNISP surveillance. Publicly reported surveillance data is located on the CNISP Surveillance Projects webpage (<http://www.phac-aspc.gc.ca/nois-sinp/projects/index-eng.php>).

³ is the remaining patients with a *Clostridium difficile* infection who do not meet the criteria to be included as a CNISP case, but are associated with an admission to that hospital. This number, although smaller, contributes to the overall picture of *Clostridium difficile* infections associated with hospitals.

⁴ is the rate of hospital-associated *Clostridium difficile* infections published on this website including both CNISP and non CNISP in the calculation.



TABLE 2: Hospital associated CDI incidence rate per 10,000 patient days for New Brunswick acute care hospitals

RHA	Region ¹	Acute Care Hospital	# of beds Category	Hospital associated CDI incidence rate per 10,000 patient days for New Brunswick acute care hospitals									
				Finalized Rates (number of cases)					Trend (last 6 Quarters)	Finalized Rate {95% confidence interval} (number of cases)			
				2014/2015 Q3	2014/2015 Q4	2015/2016 Q1	2015/2016 Q2	2015/2016 Q3		2015/2016 Q4	2014/2015 Q4	2015/2016 Q4	Signal ²
Health Region 1													
		Hôpital Stella-Maris- de-Kent	<100	0.00 (0)	4.80 (1)	5.58 (1)	11.34 (2)	0.00 (0)	5.18 (1)		0.00 {0.01 - 2.67}	5.18 {0.01 - 2.88}	●
		Dr. Georges-L.-Dumont University Hospital Centre	250+	1.15 (3)	2.92 (8)	3.04 (8)	2.86 (7)	1.56 (4)	2.56 (7)		1.15 {0.13 - 0.57}	2.56 {0.10 - 0.53}	●
		Health Region Total	-	1.07 (3)	3.05 (9)	3.20 (9)	3.43 (9)	1.46 (4)	2.74 (8)		1.07 {0.14 - 0.58}	2.74 {0.12 - 0.54}	●
Health Region 4													
		Hotel-Dieu Saint-Joseph de Saint-Quentin	<100	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)		0.00 {0.00 - 0.00}	0.00 {0.00 - 0.00}	NA
		Hôpital général de Grand-Sault	<100	0.00 (0)	0.00 (0)	0.00 (0)	5.98 (1)	5.69 (1)	0.00 (0)		0.00 {0.00 - 0.00}	0.00 {0.00 - 0.00}	NA
		Hôpital régional d'Edmundston	100-249	0.68 (1)	0.00 (0)	0.00 (0)	0.72 (1)	1.44 (2)	1.53 (2)		0.68 {0.00 - 0.00}	1.53 {0.02 - 0.55}	NA
		Health Region Total	-	0.58 (1)	0.00 (0)	0.00 (0)	1.23 (2)	1.85 (3)	1.31 (2)		0.58 {0.00 - 0.00}	1.31 {0.02 - 0.47}	NA
Health Region 5													
Vitalité		Hôpital Régional de Campbellton	100-249	0.00 (0)	3.74 (5)	3.97 (5)	4.80 (6)	2.47 (3)	3.66 (5)		0.00 {0.12 - 0.87}	3.66 {0.12 - 0.85}	●
		Health Region Total	-	0.00 (0)	3.74 (5)	3.97 (5)	4.80 (6)	2.47 (3)	3.66 (5)		0.00 {0.12 - 0.87}	3.66 {0.12 - 0.85}	●
Health Region 6													
		Hôpital de l'Enfant-Jesus	<100	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)		0.00 {0.00 - 0.00}	0.00 {0.00 - 0.00}	NA
		Hôpital et centre de santé communautaire de Lamèque	<100	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	9.15 (1)	0.00 (0)		0.00 {0.00 - 0.00}	0.00 {0.00 - 0.00}	NA
		Hôpital de Tracadie -Sheila	<100	2.05 (1)	3.83 (2)	4.57 (2)	0.00 (0)	1.78 (1)	0.00 (0)		2.05 {0.05 - 1.38}	0.00 {0.00 - 0.00}	NA
		Hôpital régional Chaleur	100-249	0.63 (1)	2.52 (4)	0.00 (0)	4.99 (7)	0.70 (1)	2.08 (3)		0.63 {0.07 - 0.65}	2.08 {0.04 - 0.61}	●
		Health Region Total	-	0.87 (2)	2.60 (6)	0.93 (2)	3.30 (7)	1.35 (3)	1.37 (3)		0.87 {0.10 - 0.57}	1.37 {0.03 - 0.40}	●
		RHA Total	-	0.74 (6)	2.40 (20)	2.03 (16)	3.15 (24)	1.67 (13)	2.25 (18)		0.74 {0.15 - 0.37}	2.25 {0.13 - 0.36}	●
Health Region 1													
		Sackville Memorial Hospital	<100	0.00 (0)	11.67 (2)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)		0.00 {0.14 - 4.21}	0.00 {0.00 - 0.00}	NA
		The Moncton Hospital	250+	3.10 (11)	3.99 (14)	4.80 (16)	1.78 (6)	1.98 (7)	2.33 (8)		3.10 {0.22 - 0.67}	2.33 {0.10 - 0.46}	●
		Health Region Total	-	2.95 (11)	4.35 (16)	4.61 (16)	1.70 (6)	1.88 (7)	2.22 (8)		2.95 {0.25 - 0.71}	2.22 {0.10 - 0.44}	●
Health Region 2													
		Grand Manan Hospital	<100	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	0.00 (0)	23.47 (1)		0.00 {0.00 - 0.00}	23.47 {0.06 - 13.01}	NA
		Sussex Health Centre	<100	0.00 (0)	0.00 (0)	8.77 (2)	4.43 (1)	0.00 (0)	0.00 (0)		0.00 {0.00 - 0.00}	0.00 {0.00 - 0.00}	NA
		Charlotte County Hospital	<100	3.01 (1)	5.11 (2)	0.00 (0)	10.82 (3)	3.15 (1)	2.84 (1)		3.01 {0.06 - 1.84}	2.84 {0.01 - 1.58}	●
		Saint John Regional Hospital	250+	4.21 (17)	2.39 (10)	2.50 (10)	4.51 (18)	2.95 (12)	3.07 (13)		4.21 {0.11 - 0.44}	3.07 {0.16 - 0.53}	●
Horizon		Health Region Total	-	3.91 (18)	2.47 (12)	2.60 (12)	4.85 (22)	2.80 (13)	3.09 (15)		3.91 {0.13 - 0.43}	3.09 {0.17 - 0.51}	●
Health Region 3													
		Hotel-Dieu of St. Joseph	<100	0.00 (0)	0.00 (0)	0.00 (0)	5.41 (1)	0.00 (0)	4.83 (1)		0.00 {0.00 - 0.00}	4.83 {0.01 - 2.69}	NA
		Upper River Valley Hospital	<100	3.49 (2)	1.66 (1)	1.80 (1)	0.00 (0)	6.71 (4)	0.00 (0)		3.49 {0.00 - 0.93}	0.00 {0.00 - 0.00}	NA
		Oromocto Public Hospital	<100	0.00 (0)	2.45 (1)	4.96 (2)	0.00 (0)	4.95 (2)	0.00 (0)		0.00 {0.01 - 1.36}	0.00 {0.00 - 0.00}	NA
		Dr. Everett Chalmers Regional Hospital	250+	1.04 (3)	1.04 (3)	1.38 (4)	3.65 (10)	3.27 (9)	2.90 (8)		1.04 {0.02 - 0.30}	2.90 {0.13 - 0.57}	●
		Health Region Total	-	1.23 (5)	1.22 (5)	1.74 (7)	2.82 (11)	3.82 (15)	2.27 (9)		1.23 {0.04 - 0.28}	2.27 {0.10 - 0.43}	●
Health Region 7													
		Miramichi Regional Hospital	100-249	4.63 (7)	4.41 (6)	5.93 (9)	6.47 (9)	2.09 (3)	3.55 (5)		4.63 {0.16 - 0.96}	3.55 {0.12 - 0.83}	●
		Health Region Total	-	4.63 (7)	4.41 (6)	5.93 (9)	6.47 (9)	2.09 (3)	3.55 (5)		4.63 {0.16 - 0.96}	3.55 {0.12 - 0.83}	●
		RHA Total	-	2.95 (41)	2.79 (39)	3.22 (44)	3.59 (48)	2.77 (38)	2.68 (37)		2.95 {0.20 - 0.38}	2.68 {0.19 - 0.37}	●
		New Brunswick Total	-	2.14 (47)	2.64 (59)	2.79 (60)	3.43 (72)	2.37 (51)	2.52 (55)		2.14 {0.20 - 0.34}	2.52 {0.19 - 0.33}	●

Notes

¹ Refer to Figure 1.

² When the 95% confidence intervals DO NOT overlap from one quarter to the next for a given reporting facility, it is deemed statistically significant and denoted by a red dot (●). Statistically non-significant rates are represented by the presence of a green dot (●) in the Signal column.



FIGURE 1. Map of New Brunswick by Regional Health Authorities and Health Regions.

