
HAI Report 2009-2012

HAI Surveillance Summary

Healthcare-associated infections (HAIs) are infections acquired while receiving health care irrespective of the site: hospital, long-term care facility, ambulatory care, or home. Each year about 8,000 Canadians die from hospital-acquired infections; 220,000 others get infected.¹ Treatment for HAIs is costly. Cost estimates for 2010 were \$129 million.² In Canada, two of the most common causes of HAIs are methicillin-resistant *Staphylococcus aureus* (MRSA) and *Clostridium difficile* bacteria.

Provincial Infection Control Newfoundland and Labrador (PIC-NL) identified surveillance for HAIs as a priority initiative and established a surveillance protocol for MRSA infections and colonizations and for *Clostridium difficile* infections (CDIs).³ Regional health authorities (RHAs) report statistics to the provincial Department of Health and Community Services.

This report provides an overview of the annual incidence of MRSA infections and colonizations and CDIs in acute care and long-term care facilities in Newfoundland and Labrador from January 01, 2009, to December 31, 2012. Additionally, all MRSA infections and CDIs identified in out-patient settings and the community are provided. The definitions are provided in Appendix A and B.

Methicillin-resistant *Staphylococcus aureus* Infections

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a strain of *Staphylococcus aureus* resistant to all the beta-lactam classes of antibiotics. These antibiotics include commonly-used products such as penicillin, amoxicillin and oxacillin. While MRSA usually causes skin infections in the community setting, more severe infections of the blood and surgical wounds can occur in healthcare settings. The Public Health Agency of Canada reported a 17 fold increase in MRSA rates in Canadian hospitals between 1995 and 2010.⁴ During the same time period, the proportion of community-associated MRSA strains increased from 2 per cent to 25 per cent.⁴ MRSA has been associated with significant morbidity and mortality, prolonged hospital length of stay and excess costs.⁵ Direct health care costs attributable to MRSA averaged \$82 million in Canada in 2004.⁴

The Provincial MRSA Surveillance Protocol includes standard case definitions for MRSA infections and colonizations.³ MRSA infection occurs when micro-organisms are able to multiply within the body and cause a response from the host's immune defences.⁶ Symptomatic or clinical infection is one resulting in clinical signs and symptoms (disease). MRSA colonization is the presence of micro-organisms in or on a host with growth and multiplication but without tissue invasion or cellular injury.⁶

The following graphs provide an overview of MRSA infections and MRSA colonizations from January 2009 to December 2012. They include data received from the four RHAs in the province. Infections data will be shown as follows: Figure 1 shows the incidence rate for MRSA infections in acute care facilities; Figure 2 shows the rate of MRSA infections in the long-term care facilities; and, Figure 3 shows combined data for MRSA infections healthcare-associated (not hospitalized) and community cases. This combination of cases is a result of the change to the definitions for these cases during the surveillance period (Appendix A). The rate of MRSA colonizations for acute care facilities and for long-term care facilities is shown in Figure 4 and Figure 5 respectively. The rate of colonization is reflective of the screening policies in the RHAs. Since different screening policies are being followed, comparisons between RHAs is not recommended.

The population under surveillance is any patient with newly-identified MRSA infection or colonization in the province. The numerator is the number of infections or colonizations. The denominator for acute care facilities is the number of patient care days (PCDs) for acute care facilities in each RHA and for long term care it is the number of resident care days (RCDs) for all long term care facilities in each RHA. The denominator for healthcare-associated (not hospitalized) cases and community cases is based on the population of the RHA. Provincial rates are calculated using total number of infections or colonizations. The provincial denominator is the total number of PCDs or RCDs for acute care and long-term care facilities in the province. The provincial denominator for healthcare-associated (not hospitalized) cases and community cases is the population of the province.

Figure 1: Incidence rates of MRSA infections in acute care facilities, NL, 2009 –2012.

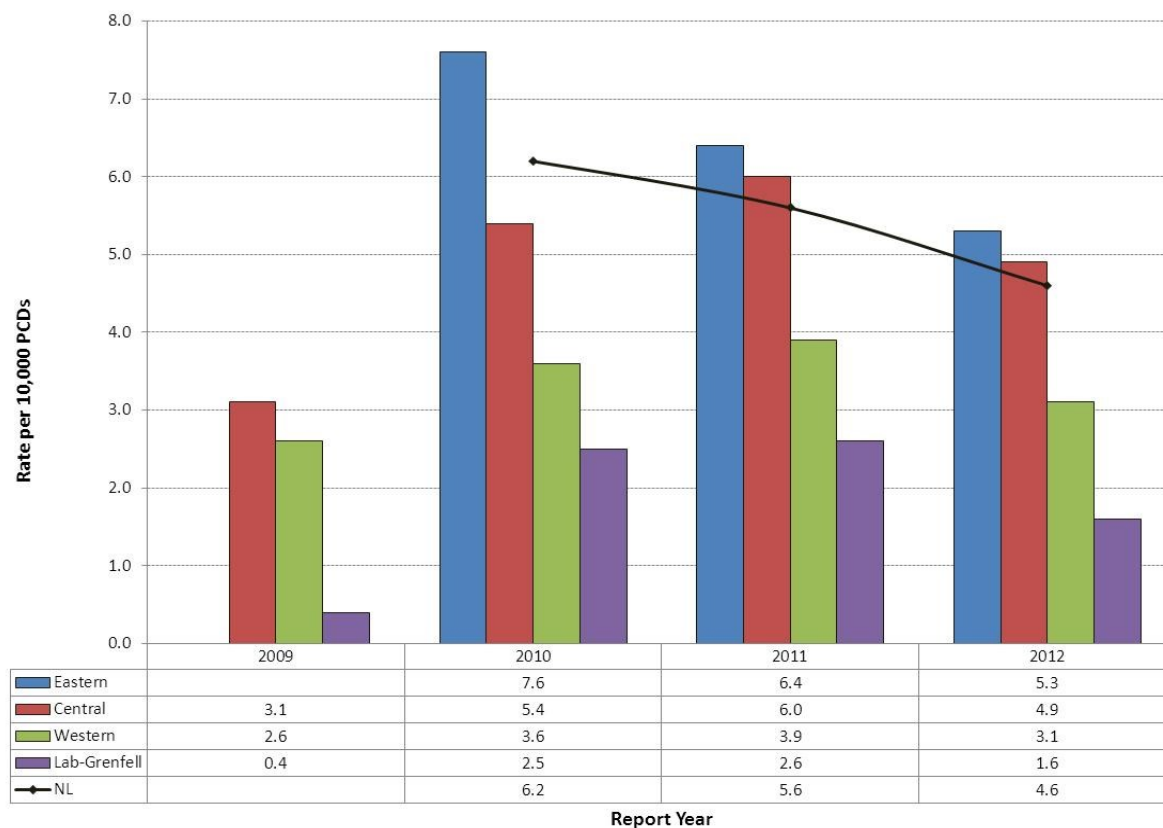


Figure 2: Incidence rates of MRSA infections in long-term care facilities NL, 2009 –2012.

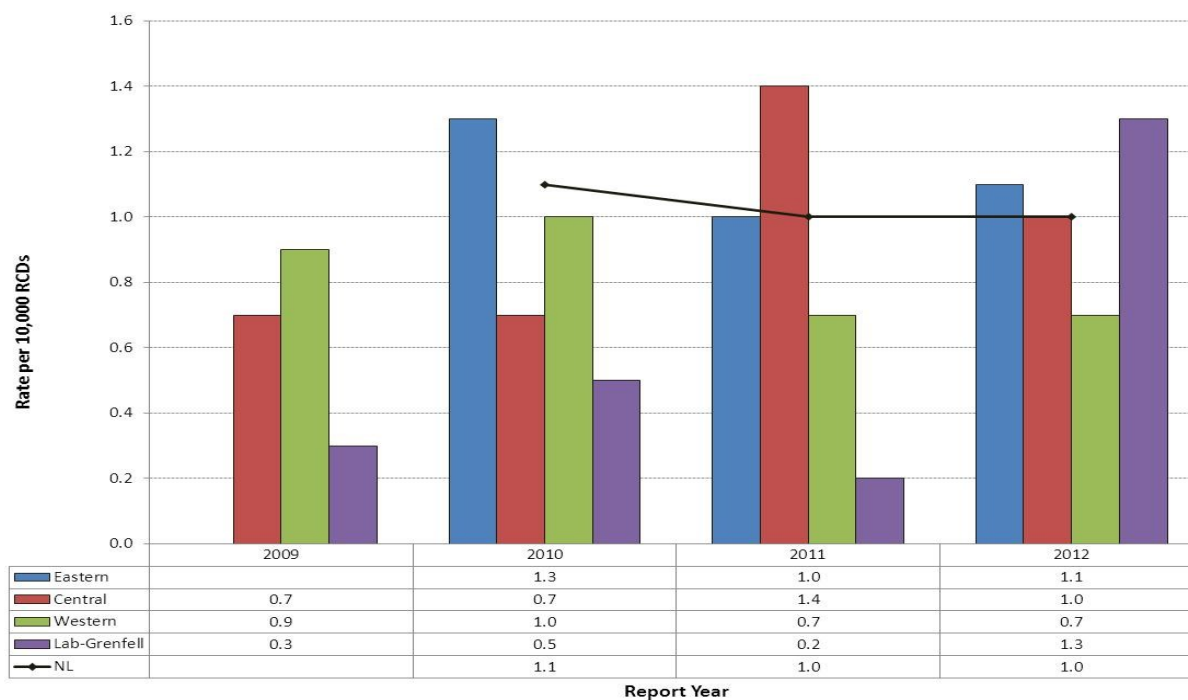
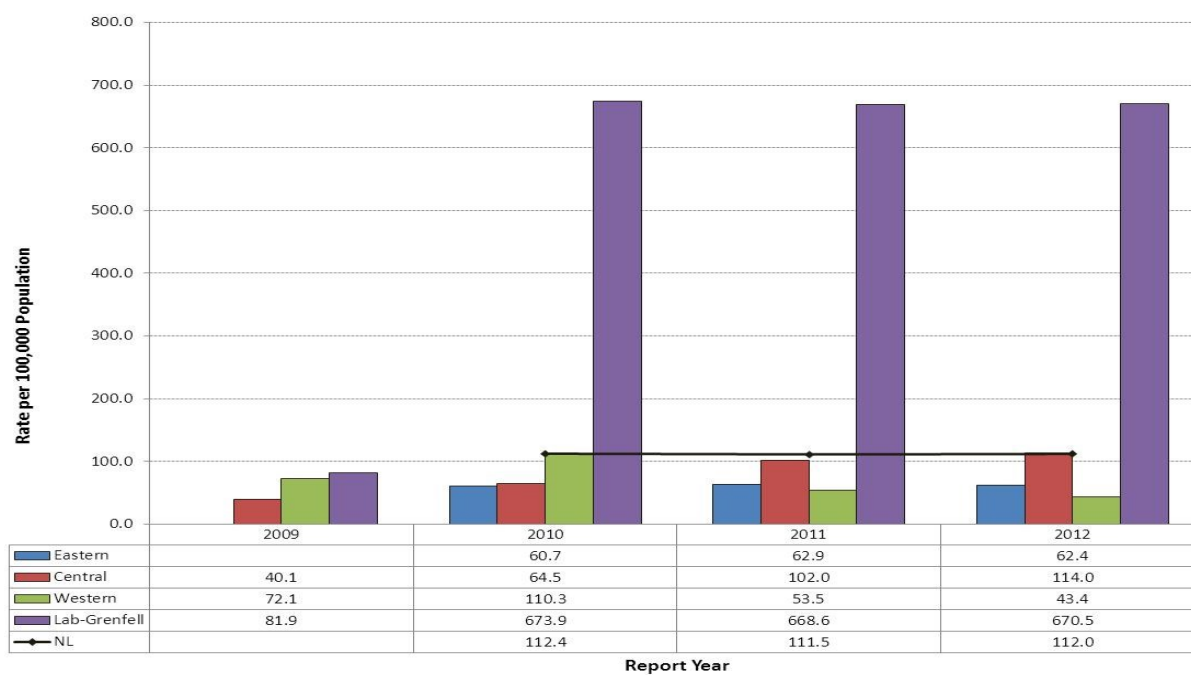


Figure 3: Incidence rate of community and healthcare-associated (not hospitalized cases) MRSA infections NL, 2009 –2012.



MRSA Colonizations

Figure 4: Incidence rates of MRSA colonizations in acute care facilities, NL, 2009 –2012.

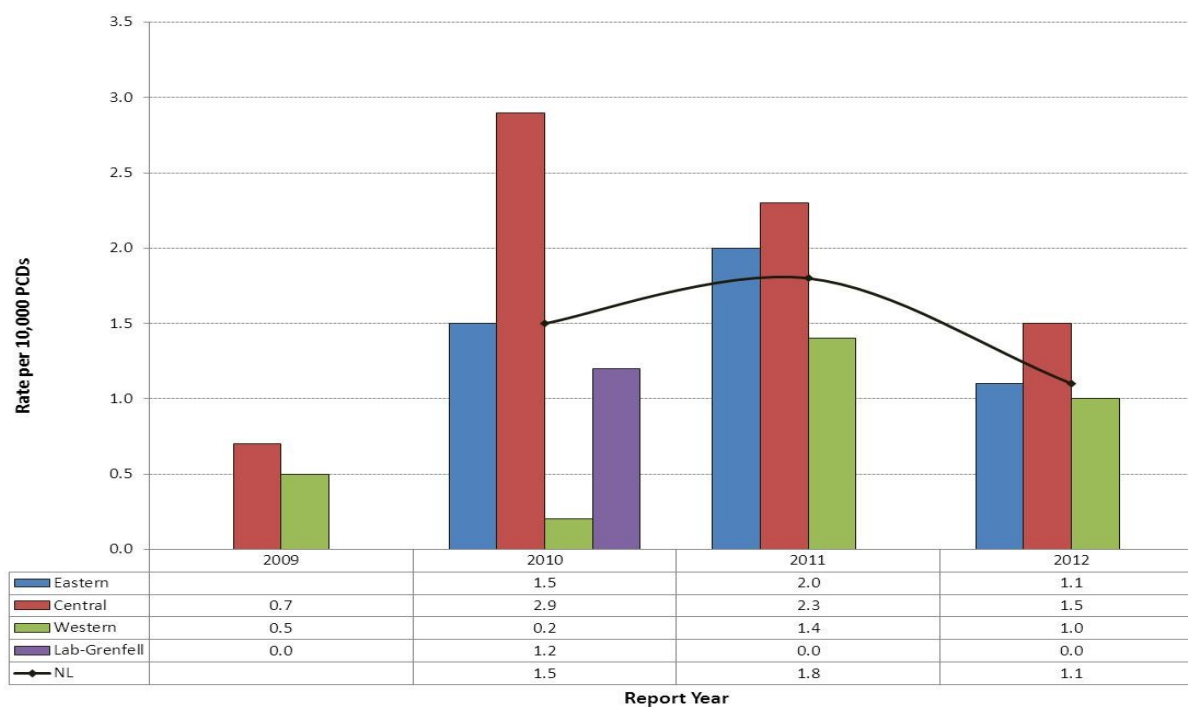
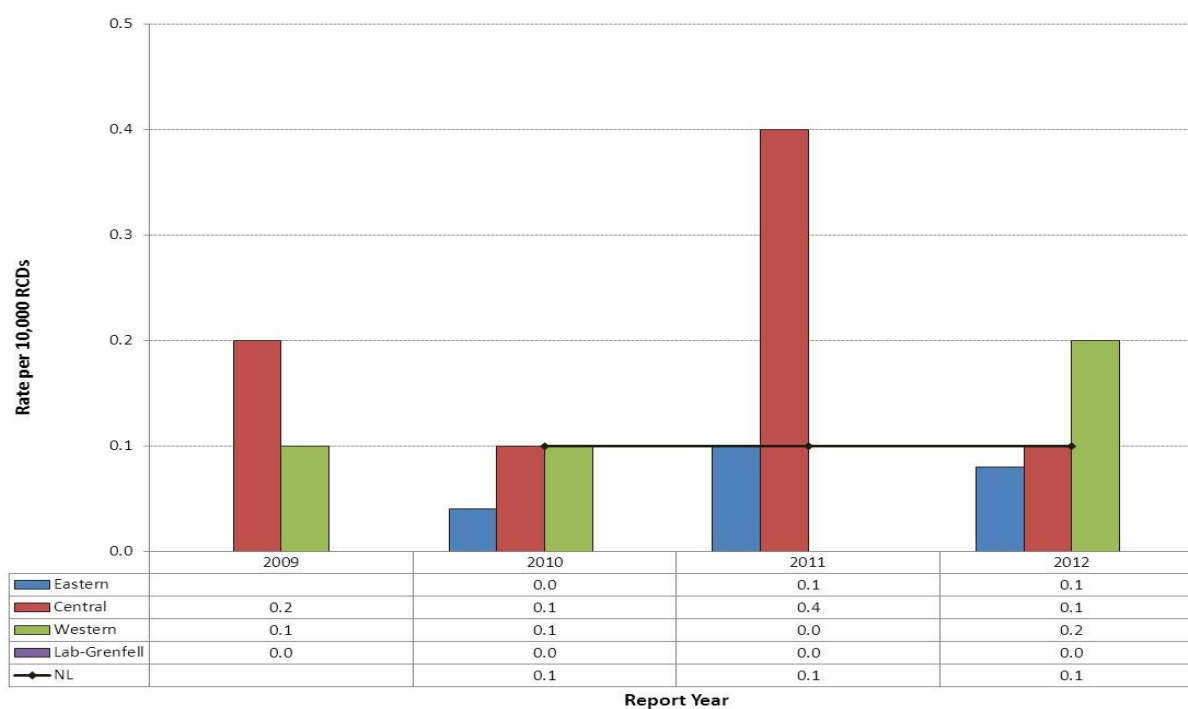


Figure 5: Incidence rates of MRSA colonizations in long-term care facilities, NL, 2009 –2012.



***Clostridium difficile*-Infection (CDI)**

Clostridium difficile infection (CDI) is the most frequent cause of healthcare-associated infectious diarrhea in industrialized countries. Clinical symptoms range from asymptomatic colonization to severe diarrhea, pseudomembranous colitis, toxic megacolon and death.⁷ In Newfoundland and Labrador, CDI is reportable to the provincial Department of Health and Community Services. The following graphs provide an overview of CDIs from January 2009 to December 2012. They include data received from the four RHAs in the province. Infections data will be shown as follows: Figure 6 shows the incidence rate for CDIs in acute care facilities; Figure 7 shows the rate of CDIs for the long-term care facilities; Figure 8 shows data for *Clostridium difficile* healthcare-associated (not hospitalized) infections; and, Figure 9 shows CDI infections identified in the community.

The population under surveillance is any patient with laboratory-confirmed CDIs in the province. The numerator is the number of infections. The denominator for acute care facilities is the number of patient care days (PCDs) for all acute care facilities in each RHA and for long term care it is the number of resident care days (RCDs) for all long term care facilities in each RHA. The denominator for healthcare-associated (not hospitalized) cases and community cases is based on the population of the RHA. Provincial rates are calculated using total number of infections. The provincial denominator is the total number of PCDs or RCDs for acute care and long-term care facilities in the province. The provincial denominator for healthcare-associated (not hospitalized) cases and community cases is the population of the province.

Figure 6: Incidence rates of CDIs in acute care facilities, NL, 2009 –2012.

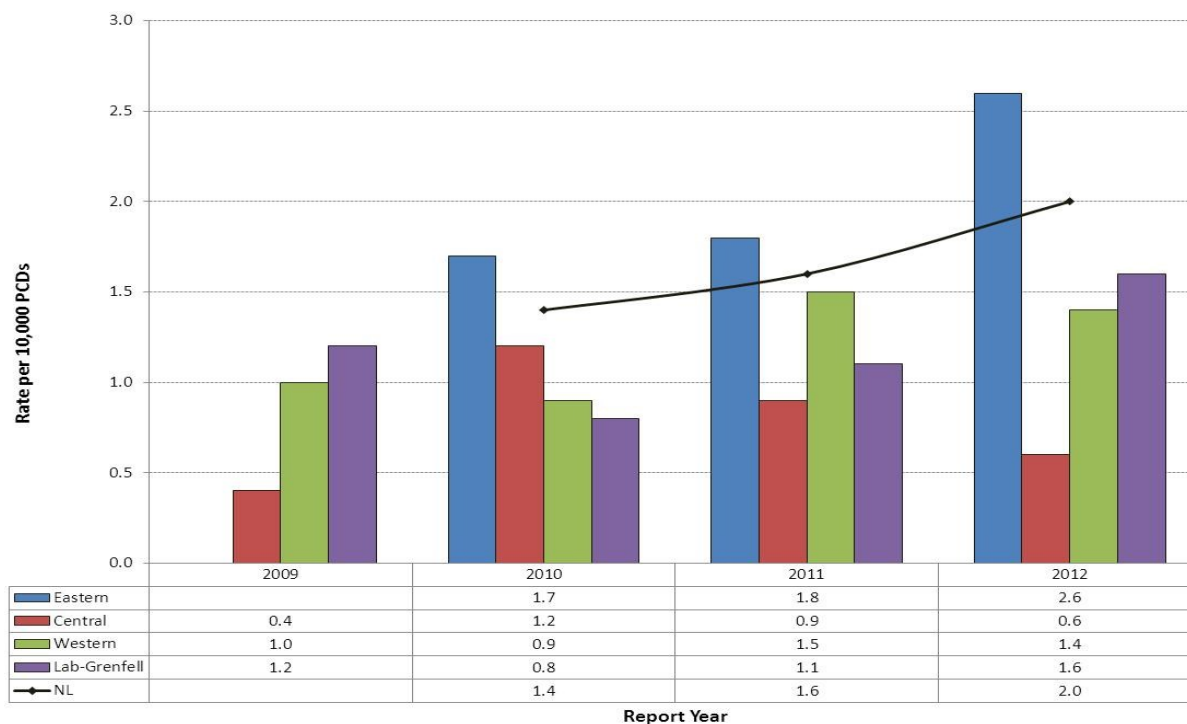


Figure 7: Incidence rates of CDIs in long-term care Facilities, NL, 2009 –2012.

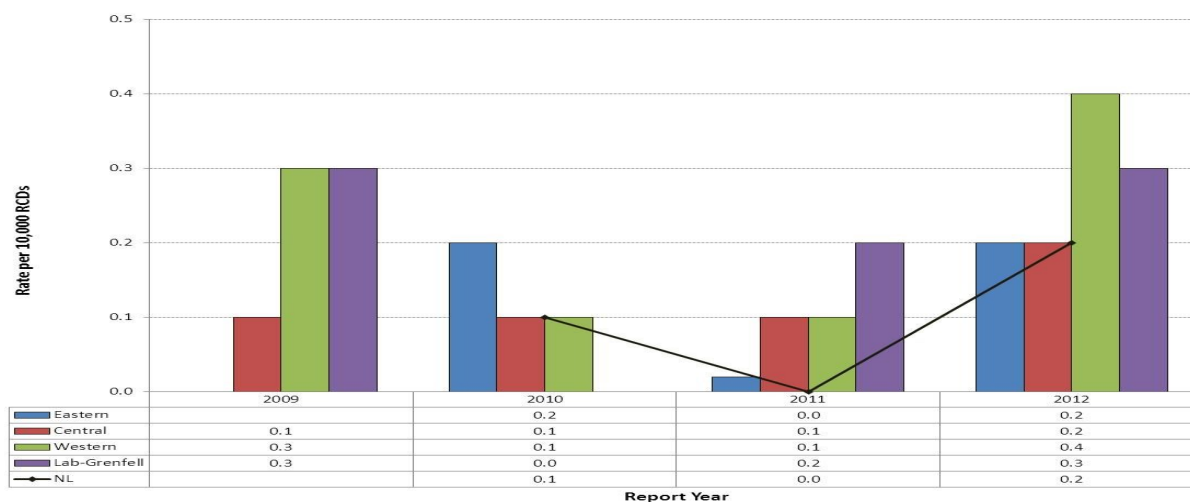


Figure 8: Incidence rate of healthcare-associated (not hospitalized cases) CDIs, NL, 2009 –2012.

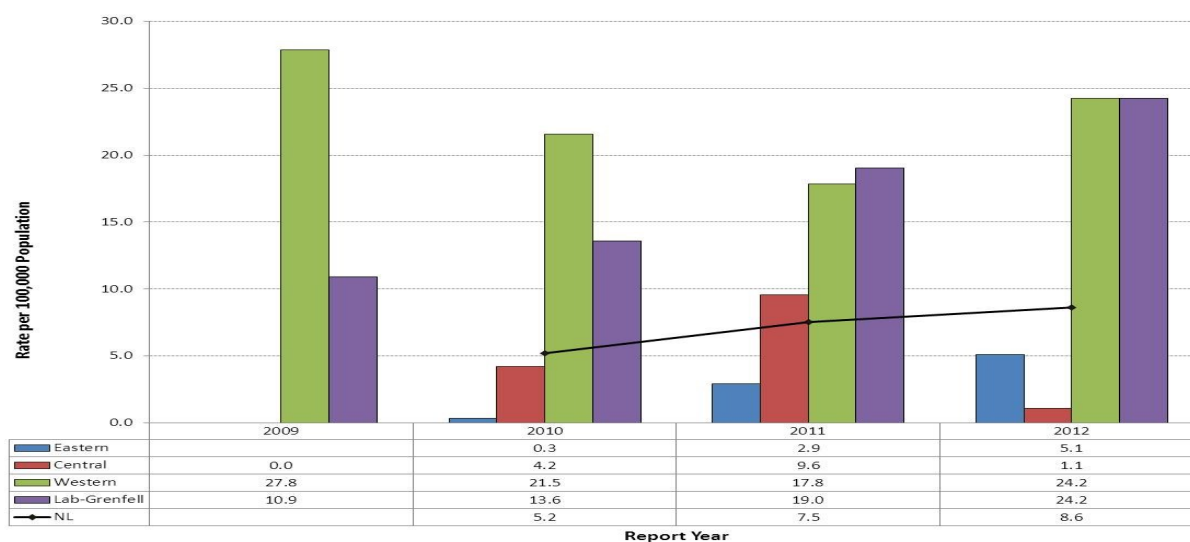
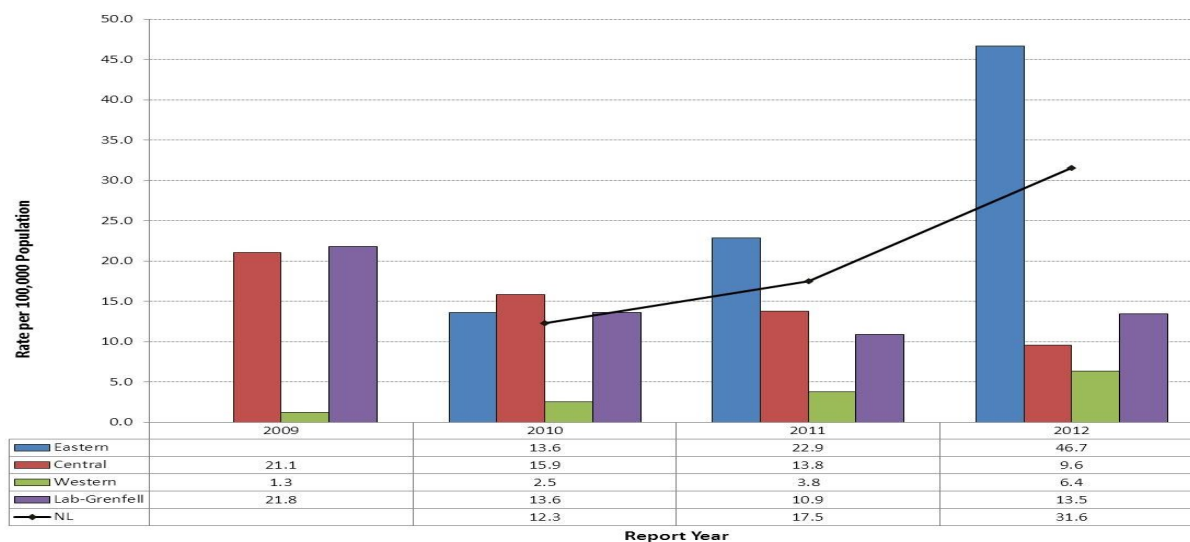


Figure 9: Incidence rate of community cases of CDIs, NL, 2009 –2012.



Appendix A: MRSA Definitions

MRSA case: Laboratory-reported isolation of *Staphylococcus aureus* from any body site and resistance of the isolate to oxacillin.

MRSA infection: The organism is present in or on the body and is causing symptomatic illness.

MRSA colonization: The organism is present on the body but no cellular injury is occurring and there are no signs or symptoms of infection present. The infection or colonization must be related to identification of *Staphylococcus aureus* from any body site and is a newly identified MRSA case.

Infected cases

Healthcare-associated – (hospitalized) case: The infection was not present on admission with onset of symptoms ≥ 48 hours after admission to the acute care facility OR the infection was present at the time of admission but is related to a previous admission to the same facility within the last 12 months.

Healthcare-associated – (long-term care) case: The infection was not present on admission, with onset of symptoms ≥ 48 hours after admission to the long-term care facility. If the infection is identified in a resident who has transferred from acute care within the last 48 hours, the infection would be attributed to that acute care facility.

Healthcare-associated - Other (previous definition 2009-2011): Healthcare-associated – refers to infections that occur as a result of contact with the health care system for care provided in any of the following locations: emergency room, ambulatory clinics, personal care homes, doctor's offices, nursing clinics, or care provided in the home within the past 12 months. This definition proved to be problematic for the collection of the data on cases not identified in the hospital or long-term care facility. An updated definition was provided in 2012 see below.

Healthcare-associated - Other (current definition): A case that does not meet the definition for healthcare-associated (hospitalized), healthcare-associated (long-term care) or community-associated infection.

Community-associated case: A case must meet all of the following criteria:

- If admitted, MRSA identified <48 hours after hospital admission.
- No previous history of MRSA.
- No history of hospitalization, surgery or dialysis within one year of MRSA culture.
- Not in residence at a long-term care facility within one year of MRSA culture.
- No indwelling catheter or medical devices (e.g., Foley catheter, IV line, tracheotomy, feeding tube) within one year of MRSA culture

Colonized cases

Healthcare-associated – (hospitalized) case: A case in whom colonization was not present on admission who is identified as part of a screening endeavour ≥ 48 hours after admission to the acute care facility.

Healthcare-associated – long-term care case: A case in whom the colonization was not present on admission who is identified as part of a screening endeavour ≥ 48 hours after the admission to the long-term care facility.

Health care-associated - Other: A case that is identified as part of a screening endeavour (e.g., admission screen) to a health care facility or long-term care facility and the case does not meet the definition for healthcare-associated (hospitalized) or healthcare-associated (long-term care) colonization.

For additional definitions, please see the Provincial Surveillance Protocol for Healthcare-associated Infections: http://www.gov.nl.ca/health/publichealth/cdc/healthcare_associated_surveillance.pdf.

Appendix B: CDI Definitions

CDI case: Clinical illness* and laboratory confirmation of infection:

- a positive *C. difficile* toxin assay (enzyme immunoassay, nucleic acid amplification test or toxigenic cell culture assay) or
- Diagnosis of pseudomembranes on sigmoidoscopy or colonoscopy, or histological/pathological diagnosis of *C. difficile* infection

*Clinical illness consists of diarrhea or fever, abdominal pain and/or ileus. Diarrhea is defined as one of the following:⁸

- Six, watery stools in past 36 hours;
- Three, unformed stools in 24 hours for at least 1 day; or,
- Eight unformed stools over 48 hours.

Healthcare-associated nosocomial (hospital) acquired: A case in which symptoms occur at least 72 hours or more after the current admission OR symptoms occur in a patient who has been hospitalized at your hospital and discharged within the previous four weeks.

Long-Term Care acquired: A case in which symptoms occur at least 72 hours after the admission and the resident has not had a hospital admission within the last four weeks.

Recurrent CDI: Recurrence of diarrhea within four weeks of a previous *C. difficile* infection episode. A recurrent infection is to be considered a continuation of the previous episode and not a new infection.

Reinfection: A case in which symptoms started more than four weeks from a previous *C. difficile* infection episode.

Episode: The time from the start to the end of symptoms.

Healthcare-associated - Other:

A case that does not meet the definition for healthcare-associated (hospitalized), healthcare-associated (long-term care) or community-associated infection.

Community-associated CDI: A case with symptom onset in the community or three calendar days or less after admission to a healthcare facility, provided that symptom onset was more than four weeks after the last discharge from a healthcare facility.

Unknown: A patient does not fit any of the above criteria.

Disclaimer

The data presented here are incidence rates and case-counts from January 2009–December 2012 (revised June 18, 2013). Data is reported from the Provincial Healthcare-Associated Infections (HAI) database.

Note: Fluctuations in data occur with each report and can be attributed to continuous updating.

For questions, please contact Marion Yetman, Provincial Infection Control Nurse Specialist at (709) 729-3427, MarionYetman@gov.nl.ca.

Appendix C: References

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