PICNet
PROVINCIAL INFECTION CONTROL NETWORK OF BRITISH COLUMBIA
A program of the Provincial Health Services Authority

Methicillin-Resistant *Staphylococcus aureus* (MRSA) Surveillance Report

For the Fiscal Year 2013/2014

(April 1, 2013 to March 31, 2014)

Prepared by:

Provincial Infection Control Network of British Columbia (PICNet)

September 2014

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Acronyms

BC	British Columbia
CA	Community-associated
CI	Confidence interval
CNISP	Canadian Nosocomial Infection Surveillance Program
FHA	Fraser Health Authority
FQ	Fiscal quarter
FY	Fiscal year
HA	Health authority
HAI	Healthcare-associated infection
HCA	Healthcare-associated
ICP	Infection control practitioner
IHA	Interior Health Authority
MRSA	Methicillin-resistant *Staphylococcus aureus*
NHA	Northern Health Authority
PHC	Providence Health Care
PHSA	Provincial Health Services Authority
PICNet	Provincial Infection Control Network of British Columbia
SSC	PICNet's Surveillance Steering Committee
VCHA	Vancouver Coastal Health Authority
VIHA	Island Health Authority

Summary

A total of 2,655 cases of MRSA were newly identified in BC acute care facilities during FY 2013/2014. As per PICNet's MRSA surveillance protocol, 1,426 (53.5%) of those cases were classified as healthcare-associated (HCA) with the reporting facility, 553 (20.8%) cases were HCA with another facility, and 686 (25.8%) cases were community-associated or of unknown association. Among the MRSA cases associated with the reporting facility, two-thirds of them were associated with current admission to the reporting facility.

The provincial annual rate of MRSA associated with the reporting facility was 4.6 per 10,000 inpatient days [95% confidence interval (CI): 4.4-4.9] in FY 2013/2014. There was no statistically significant difference in the rate between FY 2013/2014 and any of FY 2010/2011, FY 2011/2012, and FY 2012/2013. The rate of MRSA by quarter was relatively stable in FY 2013/2014.

The rate of MRSA associated with the reporting facility in each health authority (HA) did not change significantly in FY 2013/2014 compared to the past three fiscal years.

The MRSA rate varied by hospital type, however, the difference was not statistically significant (i.e., <50 beds vs. 51-250 beds vs. >250 beds; or community hospital vs. regional hospital vs. tertiary/referral hospital; or teaching vs. non-teaching). Compared to the past three years, in general there were no significant changes in the rate in FY 2013/2014 for each category of hospital type.

Thirteen hospitals reported no cases of MRSA associated with the reporting facility in FY 2013/2014. The rate did not change significantly in almost all 80 hospitals in FY 2013/2014 compared to FY 2012/0213.

This annual report is based on the facility-aggregated data submitted to PICNet by each HA every fiscal quarter. The provincial MRSA surveillance program includes all 80 acute care facilities across the province. The data are collected and managed by individual HAs. Please note that variation exists among HAs in how they applied the case definition and how they classified cases. MRSA screening policies also vary by HA and hospitals, which can greatly affect the identification of MRSA cases. In addition, the rates of MRSA in this report are not risk-adjusted. **Direct comparisons of rates between HAs and between healthcare facilities should therefore not be made.**

Introduction

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a major cause of healthcare-associated infections (HAI) and has been of increasing concern in healthcare settings, as well as in community settings [1,2]. Monitoring changes in the incidence of MRSA through surveillance is essential to planning, implementing, and evaluating infection control measures to prevent HAIs [3]. A provincial surveillance protocol for MRSA in British Columbia (BC) was developed in 2011 by the Provincial Infection Control Network of BC (PICNet)'s Surveillance Steering Committee (SSC) to create standardized case definitions and reporting in the acute care facilities across the province. The protocol is reviewed annually to ensure consistency with national and international standards and to reflect scientific advances in MRSA epidemiology. Facility-aggregated incidence data are sent to PICNet on a quarterly basis by each health authority (HA). This report summarizes the cases of MRSA newly identified in the fiscal year (FY) 2013/2014 (April 1, 2013 – March 31, 2014), with a focus on the MRSA cases associated with the reporting facility.

Surveillance results

Population under surveillance

The provincial MRSA surveillance program includes all 80 acute care facilities in the province. All inpatients admitted to those facilities for acute care were under surveillance for MRSA. Table 1 summarizes the characteristics of the facilities during FY 2013/2014, along with the estimated general population in each HA on July 1, 2013.

Table 1. Summary of facilities participating in the provincial MRSA surveillance program by health authority, fiscal year 2013/2014

Health authority	IHA	FHA	VCHA[i]	VIHA	NHA	PHSA	Total
Total number of facilities	**22**	**14**	**11**	**13**	**18**	**2**	**80**
By hospital size[ii]							
1-50 beds	16	3	6	7	17	0	49
51-250 beds	5	7	2	3	1	2	20
>250 beds	1	4	3	3	0	0	11
By hospital category							
Community hospital	16	7	6	9	9	0	47
Regional Hospital	4	4	3	2	8	0	21
Tertiary/Referral Hospital	2	3	2	2	1	2	12
By teaching status							
Non-teaching hospital	21	8	6	11	16	0	62
Teaching hospital	1	6	5	2	2	2	18
Total acute care beds[iv]	**1,281**	**2,817**	**1,760**	**1,550**	**552**	**249**	**8,208**
Total acute care admissions	**84,085**	**137,820**	**92,616**	**74,978**	**28,284**	**23,199**	**440,982**
Total inpatient days	**498,970**	**1,070,889**	**666,382**	**571,018**	**188,174**	**89,975**	**3,085,408**
Estimated general population in 2013[v]	**717,466**	**1,689,875**	**1,138,657**	**752,144**	**283,836**	**N/A**	**4,581,978**

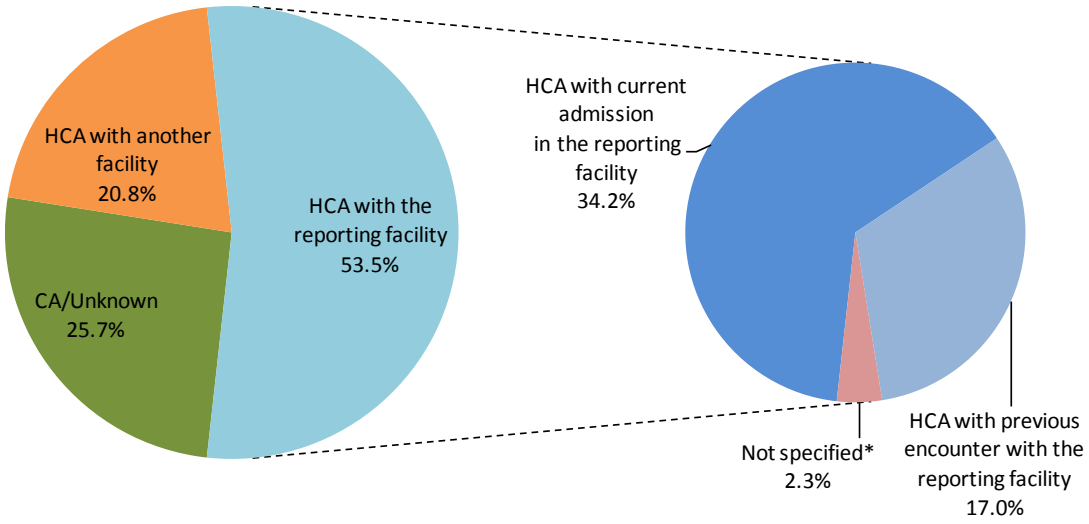
i. Includes acute care facilities of Providence Health Care (PHC)
ii. Based on the count of acute care beds in Q4 of FY 2013/2014. The number of beds may vary by quarter due to temporary closure of acute care beds by facilities.
iii. Based on the average of quarterly counts of acute care beds in each health authority.
iv. BC Stats. Population Estimates. http://www.bcstats.gov.bc.ca/

Overview of MRSA cases

A total of 2,655 cases of MRSA were newly identified in BC acute care facilities during FY 2013/2014. As per PICNet's provincial MRSA surveillance protocol, 1,426 (53.5%) of those MRSA cases were classified as healthcare-associated (HCA) with the reporting facility, 553 (20.8%) cases were HCA with another facility, and 686 (25.8%) cases were community-associated or of unknown association (Figure 1).

Figure 1. Proportion of newly identified MRSA cases among acute care inpatients by case classification and health authority, fiscal year 2013/2014

(n = 2,655)



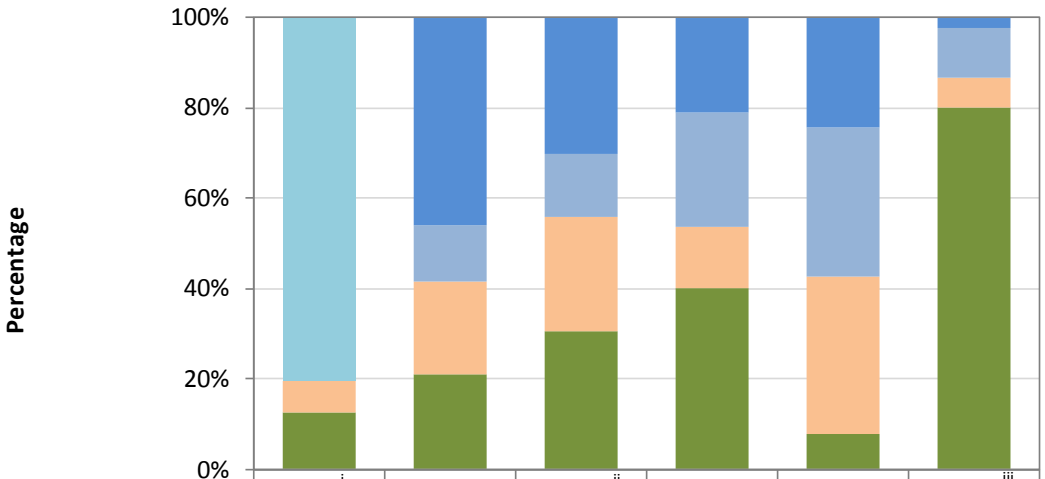
HCA: healthcare-associated; CA: community-associated

* Not specified whether they were associated with current admission in the reporting facility or associated with previous encounter with the reporting facility.

Among the MRSA cases associated with the reporting facility, 911 (34.2% of total MRSA cases) were associated with current admission to the reporting facility, and 454 (17.0% of total MRSA cases) were associated with a previous encounter with the reporting facility in the last twelve months. Therefore, two-thirds of MRSA cases associated with the reporting facility were associated with current admission to the reporting facility. The remaining 61 cases were not further classified into whether they were associated with current admission or a previous encounter with the reporting facility in the last twelve months.

Please note that variation existed among HAs in how they applied the case definition and how they classified cases (see "Data limitations" in the section "About the MRSA surveillance program") (Figure 2).

Figure 2. Proportion of newly identified MRSA cases among acute care inpatients by case classification and health authority, fiscal year 2013/2014



	IHA[i]	FHA	VCHA[ii]	VIHA	NHA	PHSA[iii]
HCA with the reporting facility	80.3%	NA	NA	NA	NA	NA
HCA with current admission in the reporting facility	NA	46.0%	30.1%	21.1%	24.5%	2.2%
HCA with previous encounter with the reporting facility	NA	12.5%	14.2%	25.3%	32.9%	11.1%
HCA with another facility	7.2%	20.4%	25.3%	13.6%	34.8%	6.7%
CA/Unknown	12.5%	21.1%	30.4%	40.0%	7.7%	80.0%
Total number of cases[iv]	279	939	982	265	155	45

HCA: healthcare-associated; CA: community-associated

i. IHA assigned MRSA cases that were associated with another facility within IHA to the appropriate facilities, the cases that were associated with the facilities outside of IHA as "healthcare-associated with another facility", and the remaining cases as "Community-associated" in Q1 and Q2 of FY 2013/2014. It did not separate the cases of MRSA associated with reporting facility between current admission and previous encounter in Q2 of FY 2013/2014.

ii. Includes PHC, which defines another facility as a facility that is within PHC. PHC classified the cases that were not associated with PHC facilities as "Not-PHC-associated", which were merged into the "Unknown".

iii. PHSA classified the MRSA cases other than those associated with the reporting facility as "Community-associated" or "Unknown".

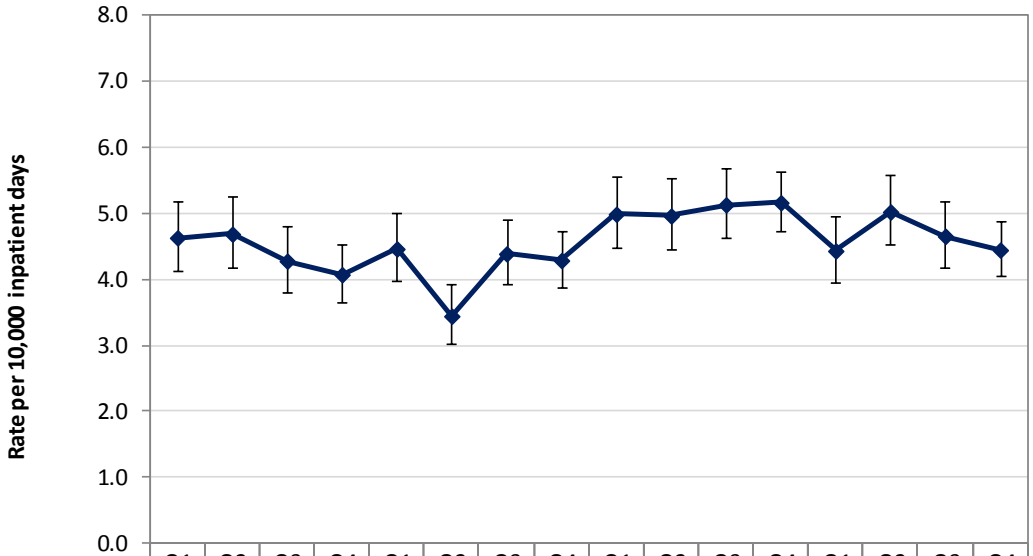
iv. Direct comparison of the numbers of MRSA cases between health authorities is not recommended.

Provincial rate of MRSA associated with the reporting facility

The provincial annual rate of MRSA associated with the reporting facility was 4.6 per 10,000 inpatient days [95% confidence interval (CI): 4.4-4.9] in FY 2013/2014. There was no statistically significantly difference in the rate between FY 2013/2014 and any of the three previous fiscal years.

The rate of MRSA by quarter was relatively stable in FY 2013/2014 and was not significantly different from the quarterly rates in the past three years, except Q2 of FY 2011/2012, when the lowest quarterly rate was reported (Figure 2).

Figure 3. Provincial rate of MRSA associated with the reporting facility per 10,000 inpatient days by fiscal quarter, FY 2010/2011 to FY 2013/2014



	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	2010/2011[i]				2011/2012[i]				2012/2013[i]				2013/2014			
Rate of new cases of MRSA associated with reporting facility	4.6	4.7	4.3	4.1	4.5	3.4	4.4	4.3	5.0	5.0	5.1	5.2	4.4	5.0	4.7	4.4
Number of new cases of MRSA associated with reporting facility	299	294	272	342	288	220	298	392	336	333	362	504	305	349	334	438

Fiscal year and quarter[ii]

Bars in the line chart represent 95% confidence interval of the rates.

i. Excluded from this report were NHA for FY 2010/2011, some facilities in IHA for certain periods in FY 2010/2011 and FY 2011/2012, and one facility in VIHA from Q1 of FY 2010/2011 to Q2 of FY 2012/2013.

ii. Data were aggregated by fiscal quarter for each HA except PHSA, which aggregated the data by calendar quarter (for start and end date of each quarter, see Fiscal Year in the Glossary).

Rate of MRSA associated with the reporting facility by health authority

The rate of MRSA associated with the reporting facility in each HA did not change significantly in FY 2013/2014 compared to the past three fiscal years (Table 2). Comparison between HAs is not recommended due to differences in MRSA identification strategies and at-risk population served.

Table 2. Rate of MRSA associated with the reporting facility per 10,000 inpatient days, by health authority

Health Authority	2010/2011	2011/2012	2012/2013	2013/2014
IHA[i]	4.0 (3.5-4.6)	3.4 (2.9-4.0)	4.7 (4.2-5.4)	4.5 (3.9-5.1)
FHA	4.7 (4.3-5.1)	4.7 (4.3-5.1)	5.8 (5.3-6.2)	5.1 (4.7-5.6)
VCHA	6.1 (5.5-6.7)	5.3 (4.8-5.9)	6.7 (6.1-7.4)	6.5 (5.9-7.2)
VIHA[ii]	2.6 (2.2-3.1)	2.9 (2.5-3.4)	2.6 (2.2-3.1)	2.2 (1.8-2.6)
NHA[iii]	N/A	3.6 (2.8-4.6)	5.2 (4.2-6.3)	4.7 (3.8-5.8)
PHSA	1.8 (1.1-2.9)	2.1 (1.4-3.3)	2.0 (1.2-3.1)	0.7 (0.3-1.5)
Total	4.4 (4.1-4.6)	4.2 (3.9-4.4)	5.1 (4.8-5.3)	4.6 (4.4-4.9)

i. Excludes facilities that the data were not unavailable for certain periods in FY 2010/2011 and FY 2011/2012.
ii. Excludes St Joseph's Hospital's data from Q1 of FY 2010/2011 to Q2 of FY 2012/2013.
iii. Data were not available for FY 2010/2011.
Note: Direct comparison between HAs is not recommended due to differences in MRSA identification strategy and at-risk population.

Rate of MRSA associated with the reporting facility by facility type

The rate of MRSA associated with the reporting facility differed by hospital size (50 or fewer beds, 51-250 beds, and >250 beds). Hospitals with 50 or fewer beds still had the highest rate of MRSA associated with the reporting facility in FY 2013/2014. However, the MRSA incidence varied remarkably between hospitals in this group, with the rate ranging from 0 per 10,000 patient days in 13 hospitals to over 16.0 per 10,000 inpatient days in two hospitals. The lowest rate in FY 2013/2014 was in hospitals with 51-250 beds. The difference between each category of hospital size was not statistically significant in FY 2013/2014 (Table 3).

Compared to the previous three fiscal years, the rate in FY 2013/2014 was not statistically significantly different for each category of hospital size, except for hospitals with 50 or fewer beds. The difference in the rates for hospitals with 50 or fewer beds was statistically significant between FY 2013/2014 and FY 2010/2011.

Table 3. Annual rate of MRSA associated with the reporting facility per 10,000 inpatient days by hospital size

Hospital size	2010/2011	2011/2012	2012/2013	2013/2014
1-50 beds	3.1 (2.5-3.8)	3.8 (3.1-4.6)	5.9 (5.0-6.8)	5.4 (4.6-6.3)
51-250 beds	3.8 (3.4-4.2)	3.7 (3.4-4.1)	4.4 (4.1-4.9)	4.4 (4.0-4.8)
>250 beds	5.1 (4.7-5.4)	4.5 (4.2-4.8)	5.4 (5.0-5.7)	4.6 (4.3-5.0)
Total	4.4 (4.2-4.6)	4.2 (3.9-4.4)	5.1 (4.8-5.3)	4.6 (4.4-4.9)

The rate of MRSA associated with the reporting facility did not differ significantly between any of the hospital categories (Community hospital, Regional Hospital, Tertiary/Referral Hospital) in FY 2013/2014.

Within each hospital category, the rate in FY 2013/2014 did not change significantly from any of the previous three years, with the exception of community hospitals, for which the difference in rates was statistically significant between FY 2013/2014 and FY 2010/2011.

Table 4. Annual rate of MRSA associated with the reporting facility per 10,000 inpatient days by hospital category

Hospital category	2010/2011	2011/2012	2012/2013	2013/2014
Community hospital	3.1 (2.6-3.6)	4.1 (3.6-4.8)	4.9 (4.3-5.5)	4.9 (4.3-5.5)
Regional hospital	4.5 (4.0-5.0)	3.9 (3.5-4.4)	4.6 (4.2-5.1)	4.7 (4.3-5.2)
Tertiary/Referral hospital	4.8 (4.5-5.2)	4.3 (4.0-4.6)	5.4 (5.1-5.8)	4.5 (4.2-4.8)
Total	4.4 (4.2-4.6)	4.2 (3.9-4.4)	5.1 (4.8-5.3)	4.6 (4.4-4.9)

Note: Please refer to the Glossary for the definition of each hospital category.

The rate of MRSA associated with the reporting facility was not significantly different between non-teaching hospitals and teaching hospitals in FY 2013/2014 (Table 5). Compared to the previous three fiscal years, there were no significant changes in the rate in FY 2013/2014 for both non-teaching hospitals and teaching hospitals.

Table 5. Annual rate of MRSA associated with the reporting facility per 10,000 inpatient days by teaching status of hospital

Teaching status	2010/2011	2011/2012	2012/2013	2013/2014
Non-teaching hospital	3.6 (3.2-4.0)	3.8 (3.5-4.3)	5.1 (4.6-5.5)	4.6 (4.2-5.0)
Teaching hospital	4.8 (4.5-5.1)	4.3 (4.0-4.6)	5.1 (4.8-5.4)	4.6 (4.4-5.0)
Total	4.4 (4.2-4.6)	4.2 (3.9-4.4)	5.1 (4.8-5.3)	4.6 (4.4-4.9)

Note: Please refer to the Glossary for the definition of teaching hospital.

Please note that the hospital types are mutually exclusive within each group (i.e., <50 beds vs. 51-250 beds vs. >250 beds; or community hospital vs. regional hospital vs. tertiary/referral hospital; or teaching vs. non-teaching), but not exclusive between the groups. For example, larger hospitals tend to be tertiary/referral hospitals and also tend to be teaching hospitals. They are more likely to care for patients with more severe and complicated health issues.

Rate of MRSA associated with the reporting facility, by acute care facility

Table 6 below presents the rate of MRSA associated with the reporting facility for each hospital, listed in alphabetical order. The 95% CI of the rate is provided to show the reliability of the rate. The wider the range of CI, the less certainty in the accuracy of the rate; because there is a greater margin for random error. Smaller facilities with a low number of patient days may have a high rate but few cases, and a wide 95% CI range. Rates for these facilities may vary substantially from reporting period to reporting period, because slight changes in the number of cases – even one case – can considerably affect the rate. For this reason, a letter 'E' is denoted in the table below for the rate when the difference between the upper limit and lower limit of 95% CI was greater than twice the rate, indicating that the rate may not be reliable.

Example	In a facility with 30 acute care beds, if there were two cases of MRSA associated with the facility and 8,000 inpatient days in FY 2010/2011, and three cases of MRSA associated with the facility and 6,000 inpatient days in FY 2011/2012, the rates would be 2.5 and 5.0, respectively. As demonstrated in this example, the rate doubled, although the number of cases increased by only one case and the number of patient days decreased by 25%.

Please note that direct comparison of the rate between individual facilities is not recommended. The rates in this table are not risk-adjusted. The rate represents MRSA only that were newly identified by the reporting facility among inpatients and the patient had an encounter with the reporting facility within the past twelve months. MRSA screening policies vary between HAs and facilities, which can greatly affect identification of MRSA cases. In addition, the large hospitals usually serve as tertiary hospitals providing specialty care, and may also provide teaching or training to medical and nursing students, and other healthcare professionals. These hospitals are more likely to admit patients with greater severity of illness or receive transferred patients from other healthcare facilities, which may in turn increase the risk of acquiring MRSA. Furthermore, the rate in the table

In FY 2013/2014, 13 hospitals reported no cases of MRSA associated with the reporting facility. The rate did not change significantly in almost all 80 hospitals in FY 2013/2014 compared to FY 2012/0213.

Table 6. Annual rate of MRSA associated with the reporting facility per 10,000 inpatient days by facility

Acute care facility	Facility type[i]	2010/2011	2011/2012	2012/2013	2013/2014
100 Mile District Hospital	S,C,N	13.9 (7.3-26.4)	7.8 (3.3-18.3)	17.2 (9.0-32.6)	13.6 (6.6-28.1)
Abbotsford Regional Hospital	L,T,Y	2.9 (2.0-4.1)	2.8 (2.0-4.0)	3.0 (2.2-4.2)	3.7 (2.7-4.9)
Arrow Lakes Hospital[ii]	S,C,N	0.0	0.0	0.0	16.9 (4.6-61.6)[E]
BC Children's Hospital	M,T,Y	2.9 (1.6-5.4)	2.4 (1.2-4.7)	4.2 (2.5-7.0)	1.3 (0.6-3.2)
BC Women's Hospital	M,T,Y	1.1 (0.5-2.4)	2.0 (1.1-3.5)	0.7 (0.3-1.8)[E]	0.2 (0.0-1.1)[E]
Bella Coola General Hospital	S,C,N	0.0	0.0	0.0	0.0
Boundary Hospital[ii]	S,C,N	15.6 (5.3-45.9)[E]	14.2 (4.8-41.7)[E]	11.8 (4.6-30.4)[E]	2.7 (0.5-15.1)[E]
Bulkley Valley District Hospital[iv]	S,R,N	N/A	7.8 (3.3-18.2)	0.0	1.8 (0.3-10.4)[E]
Burnaby Hospital	L,R,Y	6.6 (5.3-8.3)	5.4 (4.2-6.9)	6.2 (4.9-7.8)	5.3 (4.2-6.8)
Campbell River & District General Hospital	M,C,N	4.4 (2.5-7.7)	3.5 (1.8-6.7)	1.8 (0.7-4.1)	4.4 (2.6-7.5)
Cariboo Memorial Hospital and Health Centre	S,C,N	2.0 (0.6-7.4)[E]	1.0 (0.2-5.7)[E]	3.8 (1.5-9.7)[E]	9.2 (4.9-17.5)
Chetwynd General Hospital[iv]	S,C,N	N/A	0.0	0.0	5.8 (1.0-32.5)[E]
Chilliwack General Hospital	M,C,Y	2.4 (1.4-4.1)	3.6 (2.4-5.5)	3.6 (2.4-5.6)	5.9 (4.2-8.2)
Cormorant Island Community Health Centre	S,C,N	40.9 (13.9-119.6)[E]	12.6 (2.2-70.9)[E]	0.0	0.0
Cowichan District Hospital	M,C,N	3.3 (2.0-5.6)	3.3 (1.9-5.5)	1.7 (0.8-3.4)	2.7 (1.5-4.6)
Creston Valley Hospital[iii]	S,C,N	5.0 (1.7-14.7)[E]	3.6 (0.6-20.6)[E]	2.0 (0.3-11.2)[E]	3.6 (1.0-13.0)[E]
Dawson Creek Hospital[iv]	S,R,N	N/A	1.2 (0.3-4.4)[E]	1.2 (0.3-4.4)[E]	1.2 (0.3-4.4)[E]
Delta Hospital	M,C,N	1.3 (0.4-3.8)[E]	5.3 (3.0-9.2)	3.8 (2.0-7.2)	0.8 (0.2-3.0)[E]
Dr. Helmcken Memorial Hospital & Health Centre	S,C,N	0.0	5.6 (1.0-31.5)[E]	17.7 (6.0-51.8)[E]	6.7 (1.2-37.8)[E]
Eagle Ridge Hospital	M,C,N	2.5 (1.4-4.5)	2.6 (1.5-4.4)	5.1 (3.6-7.2)	6.6 (4.9-8.9)
East Kootenay Regional Hospital[iii]	M,R,N	12.7 (9.1-17.9)	6.3 (3.2-12.5)	7.5 (4.8-11.6)	3.7 (2.0-6.8)
Elk Valley Hospital[iii]	S,C,N	9.9 (4.2-23.2)	15.1 (5.9-38.7)[E]	7.5 (2.5-21.9)[E]	11.8 (5.4-25.8)
Fort Nelson General Hospital[iv]	S,C,N	N/A	14.0 (6.0-32.8)	3.6 (0.6-20.6)[E]	6.7 (1.8-24.4)[E]
Fort St. John General Hospital[iv]	S,R,N	N/A	4.1 (1.9-8.9)	2.5 (1.0-6.5)[E]	4.9 (2.5-9.7)
Fraser Canyon Hospital[iv]	S,C,N	2.8 (0.5-15.6)[E]	13.2 (5.6-30.8)	9.4 (3.2-27.5)[E]	0.0
G.R. Baker Memorial Hospital[iv]	S,R,Y	N/A	1.5 (0.4-5.5)[E]	3.9 (1.7-9.1)	4.3 (2.0-9.5)
Golden & District General Hospital[iii]	S,C,N	8.7 (2.4-31.8)[E]	0.0	5.4 (1.0-30.5)[E]	4.6 (0.8-26.0)[E]
Invermere & District Hospital[iii]	S,C,N	14.6 (5.7-37.5)[E]	7.3 (1.3-41.0)[E]	8.8 (2.4-32.2)[E]	3.8 (0.7-21.6)[E]
Kelowna General Hospital	L,T,Y	4.5 (3.5-5.7)	2.6 (1.9-3.7)	2.9 (2.1-3.9)	2.0 (1.4-2.8)[E]
Kitimat General Hospital[iv]	S,R,N	N/A	4.1 (1.4-12.1)[E]	15.0 (7.9-28.4)	16.5 (8.7-31.4)
Kootenay Boundary Regional Hospital[ii]	M,R,N	9.0 (4.9-16.6)	4.1 (1.7-9.5)	3.3 (1.7-6.2)	2.2 (1.0-4.8)
Kootenay Lake Hospital[ii]	S,C,N	1.7 (0.3-9.8)[E]	0.0	7.6 (4.1-14.1)	7.3 (3.9-13.9)
Lady Minto Gulf Islands Hospital	S,C,N	3.3 (0.9-11.9)[E]	6.1 (2.4-15.8)[E]	7.1 (2.8-18.2)[E]	3.5 (1.0-12.8)[E]

Acute care facility	Facility type[i]	2010/2011	2011/2012	2012/2013	2013/2014
Lakes District Hospital	S,C,N	N/A[d]	0.0	2.6 (0.5-14.8)[E]	0.0
Langley Memorial Hospital	M,R,Y	3.4 (2.3-4.9)	3.5 (2.4-5.1)	2.0 (1.2-3.2)	3.7 (2.6-5.4)
Lillooet Hospital and Health Centre	S,C,N	0.0	0.0	5.2 (0.9-29.2)[E]	6.5 (1.2-36.9)[E]
Lion's Gate Hospital	L,R,Y	5.9 (4.5-7.7)	4.6 (3.4-6.2)	6.6 (5.2-8.4)	7.7 (6.2-9.7)
Mackenzie and District Hospital[iv]	S,C,N	N/A	23.1 (6.4-84.0)[E]	18.1 (5.0-65.8)[E]	9.7 (1.7-54.7)[E]
Matsqui Sumas Abbotsford	S,C,N	0.0	1.1 (0.2-6.0)[E]	5.6 (2.4-13.1)	1.1 (0.2-6.1)[E]
McBride and District Hospital[iv]	S,C,N	N/A	0.0	23.7 (6.5-86.1)[E]	0.0
Mills Memorial Hospital[iv]	S,R,N	N/A	3.1 (1.3-7.3)	5.4 (2.8-10.2)	5.1 (2.6-10.0)
Mission Memorial Hospital	S,C,N	5.3 (2.4-11.6)	4.2 (1.8-9.7)	2.1 (0.7-6.3)[E]	4.2 (1.9-9.2)
Mount Saint Joseph Hospital	M,C,Y	3.3 (1.9-5.7)	9.4 (6.7-13.0)	3.2 (1.8-5.6)	3.5 (2.1-6.0)
Nanaimo Regional General Hospital	L,R,N	3.0 (2.1-4.3)	4.1 (3.1-5.5)	3.1 (2.2-4.3)	1.9 (1.3-2.9)
Nicola Valley Health Centre	S,C,N	10.3 (3.5-30.2)[E]	3.0 (0.5-17.1)[E]	0.0	2.8 (0.5-16.0)[E]
Northern Haida Gwaii Hospital[iv]	S,C,N	N/A	0.0	22.4 (6.1-81.3)[E]	0.0
Peace Arch Hospital	M,R,N	3.9 (2.7-5.6)	3.4 (2.3-5.0)	2.7 (1.8-4.2)	1.8 (1.1-3.0)
Penticton Regional Hospital	M,R,N	2.2 (1.3-3.9)	2.5 (1.5-4.3)	1.1 (0.5-2.4)	4.2 (2.7-6.3)
Port Hardy Hospital	S,C,N	0.0	3.2 (0.6-18.3)[E]	3.2 (0.6-17.9)[E]	0.0
Port McNeill and District Hospital	S,C,N	0.0	0.0	0.0	0.0
Powell River General Hospital	S,C,N	10.7 (6.0-19.2)	4.9 (2.1-11.4)	14.0 (8.6-22.7)	11.7 (7.0-19.6)
Prince Rupert Regional Hospital[iv]	S,R,N	N/A	4.4 (1.7-11.2)[E]	5.8 (2.6-12.6)	8.2 (4.1-16.1)
Princeton General Hospital	S,C,N	11.7 (3.2-42.6)[E]	6.4 (1.1-36.4)[E]	0.0	0.0
Queen Charlotte Islands Hospital[iv]	S,C,N	N/A	0.0	0.0	0.0
Queen Victoria Hospital and Health Centre	S,C,N	0.2 (0.0-1.1)[E]	3.4 (0.6-19.1)[E]	3.5 (0.6-19.9)[E]	3.2 (0.6-18.1)
Queen's Park Care Centre	M,C,N	2.0 (0.8-4.6)	4.0 (2.4-6.7)	7.2 (4.9-10.6)	5.1 (3.2-8.1)[E]
Richmond Hospital	M,R,Y	3.5 (2.3-5.2)	3.4 (2.3-5.0)	5.1 (3.7-7.0)	6.3 (4.7-8.3)
Ridge Meadows Hospital	M,R,N	4.3 (3.0-6.4)	6.4 (4.7-8.7)	10.4 (8.2-13.1)	9.9 (7.9-12.5)
Royal Columbian Hospital	L,T,Y	4.5 (3.6-5.7)	4.9 (4.0-6.1)	7.0 (5.9-8.4)	5.0 (4.0-6.1)
Royal Inland Hospital	M,T,N	4.5 (3.3-6.2)	5.1 (3.8-6.9)	8.6 (7.0-10.7)	6.5 (5.0-8.3)
Royal Jubilee Hospital	L,T,Y	2.3 (1.6-3.1)	2.9 (2.2-3.9)	2.2 (1.5-3.0)	2.5 (1.8-3.3)
RW Large Hospital	S,C,N	0.0	0.0	0.0	10.5 (1.8-59.0)[E]
Saanich Peninsula Hospital	M,C,N	2.2 (1.0-5.2)	0.4 (0.1-2.4)[E]	2.7 (1.2-5.8)	1.6 (0.5-4.7)[E]
Shuswap Lake General Hospital	S,C,N	1.5 (0.8-2.8)	6.1 (3.3-11.3)	15.4 (10.4-22.7)	14.9 (10.1-21.9)
South Okanagan General Hospital	S,C,N	6.1 (2.4-15.8)[E]	1.4 (0.3-8.1)[E]	1.6 (0.3-9.2)[E]	6.5 (2.5-16.7)[E]
Squamish General Hospital	S,C,N	2.0 (0.4-11.2)[E]	12.0 (5.8-24.7)	1.8 (0.3-9.9)[E]	1.9 (0.3-11.0)[E]
St. John Hospital[iv]	S,C,N	N/A	1.5 (0.3-8.7)[E]	2.8 (0.8-10.4)[E]	2.9 (0.8-10.5)[E]
St. Joseph's General Hospital[v]	M,R,N	N/A	N/A	8.6 (5.5-13.2)	3.7 (2.2-6.1)
St. Mary's Hospital	S,C,N	5.9 (3.1-11.3)	0.7 (0.1-3.9)[E]	7.8 (4.4-14.0)	3.9 (1.8-8.4)

Acute care facility	Facility type[i]	2010/2011	2011/2012	2012/2013	2013/2014
St. Paul's Hospital	L,T,Y	6.2 (5.0-7.6)	6.3 (5.1-7.7)	4.9 (3.9-6.2)	4.2 (3.3-5.4)
Stuart Lake Hospital	S,C,N	N/A[d]	6.3 (1.1-35.9)[E]	0.0	11.6 (3.2-42.2)[E]
Surrey Memorial Hospital	L,T,Y	7.4 (6.3-8.7)	6.3 (5.4-7.5)	7.9 (6.8-9.1)	6.3 (5.3-7.4)
Tofino General Hospital	S,C,N	0.0	12.5 (3.4-45.4)[E]	0.0	0.0
UBC Hospital	S,R,Y	1.0 (0.2-5.4)[E]	0.0	1.0 (0.2-5.4)[E]	0.0
University Hospital of Northern BC[iv]	M,T,Y	N/A	3.9 (2.7-5.6)	6.0 (4.5-8.0)	4.8 (3.5-6.6)
Vancouver General Hospital	L,T,Y	7.5 (6.5-8.7)	5.3 (4.5-6.3)	8.9 (7.8-10.1)	8.2 (7.2-9.4)
Vernon Jubilee Hospital	M,R,N	2.5 (1.5-4.2)	1.3 (0.6-2.7)	1.6 (0.9-3.0)	3.8 (2.6-5.7)
Victoria General Hospital	L,T,Y	1.9 (1.3-2.8)	1.5 (1.0-2.4)	1.6 (1.0-2.4)	1.0 (0.6-1.8)
West Coast General Hospital	M,C,N	3.0 (1.4-6.6)	3.6 (1.8-7.5)	5.2 (2.9-9.3)	1.4 (0.5-4.2)[E]
Wrinch Memorial Hospital[iv]	S,R,N	N/A	0.0	15.1 (6.5-35.4)	0.0

i. Letter in the facility type represents: S: hospital with 1-50 beds, M: hospital with 51-250 beds, L: hospital with >250 beds, C: Community hospital, R: Regional hospital, T: Tertiary/Referral hospital, N: Non-teaching hospital, Y: Teaching hospital.

ii. The rate for FY 2010/2011 includes Q1 and Q2 data only and the rate for FY 2011/2012 includes Q3 and Q4 data only. The data were not available from Q3 of FY 2010/2011 to Q2 of FY 2011/2012 due to information system upgrades in progress.

iii. The rate for data for FY 2011/2012 includes Q3 and Q4 data only. The data were not available for Q1 and Q2 of FY 2011/2012 due to information system upgrades in progress.

iv. Data were not available in FY 2010/2011.

v. Data were not available before Q3 of FY 2012/2013.

E. Indicates an estimated rate that the difference between the upper limit and lower limit of 95% confidence interval was greater than twice the rate, thus the rate may not be reliable.

Note: Comparison between individual hospitals is not recommended due to differences in MRSA identification strategy and at-risk population

Discussion

This report presents newly identified inpatient cases of MRSA — either colonization or infection — in BC acute care facilities. The surveillance results indicated that the rate of new MRSA associated with the reporting facility was relatively stable from FY 2010/2011 to FY 2013/2014 in BC acute care facilities. This finding is similar to the trends of overall MRSA incidence between 2008 and 2012 in 57 large, university-affiliated tertiary care hospitals in 10 provinces (including 11 hospitals in BC) participating in the Canadian Nosocomial Infection Surveillance Program (CNISP) [4]. CNISP's data further show that the rate of HCA MRSA infections decreased significantly between 2008 and 2012. Because the MRSA surveillance data submitted to PICNet do not separate the cases of MRSA infection from MRSA colonization, and the MRSA infections developed subsequently following MRSA colonization are not included, further analysis on the MRSA infections in BC acute care facilities was not possible.

Health authorities have intensified MRSA screening in the past several years as a strategy to prevent MRSA spread in the facilities. These measures have included universal screening at admission to certain care units, more frequent screening for high risk patients during their stay, and periodic prevalence surveys. This may result in more MRSA colonization cases being identified.

Direct comparison of rates between HAs or individual facilities should be avoided. The rates of MRSA in this report were not risk-adjusted and the report is subject to the data limitations described below in the section "About MRSA surveillance program". Due to unique challenges in the populations served and environment of each facility, each HA is in the best position to respond to the MRSA rates in its region and in its affiliated healthcare facilities.

Acknowledgements

PICNet wishes to thank all participants in each HA and their affiliated healthcare facilities for their ongoing support and participation in the provincial HAI surveillance program.

PICNet recognizes important contributions from the members of PICNet's Surveillance Steering Committee on development of the provincial MRSA surveillance program and associated reports, especially Dr. Guanghong Han, PICNet's epidemiologist, for compiling this report.

About the MRSA surveillance program

Purpose of MRSA surveillance

The provincial MRSA surveillance program is a collaboration between PICNet and all BC health authorities, and involves all 80 acute care facilities in the province. The main purpose of this MRSA surveillance program is to collect data on MRSA incidence (either infection or colonization) for monitoring the rates and trends of healthcare-associated MRSA in BC acute care facilities, and providing the provincial epidemiological information to assist HA in the development and evaluation of MRSA intervention programs.

Population under surveillance

The population under surveillance consists of inpatients in acute care facilities in BC. This includes patients admitted to the emergency department awaiting placement (e.g. patients admitted to a service who are waiting for a bed), patients in alternative level of care beds, patients in psychiatric beds, and patients in labour and delivery beds.

Excluded are outpatient visits to acute care facilities, patients in extended care beds housed in acute care facilities, and patients with short-term emergency room admissions.

Data collection and reporting

The provincial MRSA surveillance protocol, including case definitions and core data elements, was developed by the PICNet Surveillance Steering Committee (SSC) to standardize data collection with minimum burden to the HAs. Each HA incorporated the core data elements into their MRSA surveillance form and database. Data on individual MRSA cases are collected daily by infection control practitioners (ICP) and managed at each HA. Every quarter, the HAs aggregate their MRSA cases by facility and MRSA classification, and submit the data to PICNet along with facility-specific denominators. PICNet then consolidates the aggregated data for provincial analysis and reporting. At the end of each fiscal year, the HAs provide updates on their quarterly data submissions. Data updates submitted after the data submission deadline may not be reflected in this report, but will be presented in future reports.

Data limitations

This report is subject to at least the following limitations:

Firstly, the intensity of MRSA screening varies from hospital to hospital, which greatly affects the identification of MRSA. Hospitals which conduct more intense screening of patients (such as universal screening to all patients admitted to certain units, more frequent screening at-high risk patients) may identify more MRSA cases than those which screen patients in specific situations only. The sensitivity of laboratory methods used in identifying MRSA may also differ by hospital.

Secondly, MRSA colonization and MRSA infection were not distinguished in the surveillance. Only newly identified MRSA cases, either colonizations or infections, were reported. Not included were infections developed after colonizations; infections and/or colonizations identified in different body sites or from another strain of MRSA; re-infections; or re-colonizations. The data in this report represent the incidence of MRSA in BC acute care facilities.

Thirdly, variation exists among the HAs in how MRSA case definition and classification is applied. A twelve-month look-back period and >48 hours (or two calendar days, with the day of admission counted as the first day) after admission to classify MRSA associated with the reporting facility is employed by all HAs except PHC and FHA, which use more >72 hours after admission. PHC applied a four-week look-back period in FY 2010/2011 and FY 2011/2012. For MRSA to be classified as HCA with a previous encounter with the reporting facility, the previous encounter requires hospitalization for a period of at least one overnight (or >24 hours) stay. There are variations in this classification: VCHA and VIHA employ hospitalization of >48 hours in the past twelve months; FHA modified to >24 hours from >48 hours in October 2013; IHA, FHA and PHSA include frequent visits to outpatient clinics and any admissions to the healthcare facility. From Q1 of FY 2012/2013 to Q2 of FY 2013/2014, IHA did not separate the MRSA cases that were associated with reporting facility between the current admission and a previous encounter, and assigned the cases that were associated with another IHA facility to the appropriate facilities, the cases that were associated with the facilities out of IHA as "associated with another facility", and the remaining cases as "Community-associated" during that period. PHC defines another facility as a facility within PHC. The MRSA cases that were not associated with a PHC facility were classified as "Not-PHC-associated", which were merged into the category "Unknown" in this report. PHSA classifies all MRSA cases other than those associated with the reporting facility as "Community-associated" or "Unknown", including those cases associated with another facility. All the cases of "Community-associated" or "Unknown" were combined as "Community-associated/Unknown" in this report.

Fourthly, review of medical charts is required to apply MRSA case definitions and classification. The ability to determine the healthcare encounter history of a patient for the past twelve months relies on availability and accessibility of the patient information system used in each hospital and HA. The quality of medical chart documentation varies by facility and by healthcare provider. The inclusion criteria for classifying MRSA in chart reviews may also vary among HAs or by infection control practitioners (ICP). Furthermore, double-reporting may occur if the same MRSA case was identified in a number of HAs.

Lastly, both MRSA cases and denominator data were aggregated by HA at the facility level by fiscal quarter with the exception of PHSA, which aggregated the data by calendar quarter. The data were not available for NHA in FY 2010/2011 because a standard case definition for MRSA surveillance was not in place in NHA prior to April 1, 2011, and for some facilities in IHA for certain periods from Q3 of FY 2010/2011 to Q2 of FY 2011/2012 due to information system upgrades. St Joseph's General Hospital in VIHA participated in the provincial MRSA surveillance program and submitted the data from Q3 of FY 2012/2013.

PICNet and each HA and their healthcare facilities have been continuously working together to enhance the surveillance and reporting mechanisms that monitor MRSA and other HAIs, in an effort toward improving our understanding of MRSA epidemiology in British Columbia.

Glossary

Acute care facility

Acute care is a branch of healthcare where a patient receives active but short-term treatment for a severe injury or episode of illness, an urgent medical condition, or during recovery from surgery or specialist diagnostic procedures. In this report, acute care facility refers to the hospitals in BC that provide acute care to the patients who are admitted to the facility for a short period of time, e.g. ≥24 hours or at least overnight stay. The patient is discharged as soon as they are healthy and stable.

Colonization

Colonization is the presence of MRSA on tissue without observable clinical symptoms or immune reaction. Common sites of colonization include the nostrils, belly button, underarms, groin, etc.

Community-associated (CA) (Not healthcare-associated)

- An MRSA case (as defined above) identified ≤48 hours (or ≤2 days) after the patient was admitted to your acute care facility, **AND** there was no documented history for any of following healthcare exposure within the last twelve months:
- Admitted to an acute care facility
- Residence in a long-term care facility or rehab centre
- Frequent visits to an outpatient clinic (e.g., dialysis, oncology) in the healthcare facilities
- Use of indwelling catheters or other medical device

Confidence interval (CI)

A confidence interval gives an estimated range of values that is likely to include an unknown population parameter to indicate the reliability of an estimate. The 95% CI of the rate and proportion in this report are calculated using Wilson score intervals[11].

Fiscal quarter and calendar quarter

Fiscal quarter (FQ) is a specified period within a budget or financial year. There are four FQs in a fiscal year. Start and end dates of each FQ vary from year to year. Calendar quarter is a period of three consecutive months starting on the first day of January, April, July or October. Below are the start and end dates of each quarter for the fiscal year from 2009/2010 to 2011/2012:

Start and end date of quarters for this report

Fiscal year	Quarter code	Fiscal quarter		Calendar quarter	
		Start date	End date	Start date	End date
2010/2011	**Q1**	01-Apr-2010	24-Jun-2010	01-Apr-2010	30-Jun-2010
	Q2	25-Jun-2010	16-Sep-2010	01-Jul-2010	30-Sep-2010
	Q3	17-Sep-2010	09-Dec-2010	01-Oct-2010	31-Dec-2010
	Q4	10-Dec-2010	31-Mar-2011	01-Jan-2011	31-Mar-2011
2011/2012	**Q1**	01-Apr-2011	23-Jun-2011	01-Apr-2011	30-Jun-2011

	Q2	24-Jun-2011	15-Sep-2011	01-Jul-2011	30-Sep-2011
	Q3	16-Sep-2011	08-Dec-2011	01-Oct-2011	31-Dec-2011
	Q4	09-Dec-2011	31-Mar-2012	01-Jan-2012	31-Mar-2012
2012/2013	**Q1**	01-Apr-2012	21-Jun-2012	01-Apr-2012	30-Jun-2012
	Q2	22-Jun-2012	13-Sep-2012	01-Jul-2012	30-Sep-2012
	Q3	14-Sep-2012	06-Dec-2012	01-Oct-2012	31-Dec-2012
	Q4	07-Dec-2012	31-Mar-2013	01-Jan-2013	31-Mar-2013
2013/2014	**Q1**	01-Apr-2013	20-Jun-2013	01-Apr-2013	30-Jun-2013
	Q2	21-Jun-2013	12-Sep-2013	01-Jul-2013	30-Sep-2013
	Q3	13-Sep-2013	05-Dec-2013	01-Oct-2013	31-Dec-2013
	Q4	07-Dec-2013	31-Mar-2014	01-Jan-2014	31-Mar-2014

Fiscal year (FY)

A term used to differentiate a budget or financial year from the calendar year. The fiscal year in BC runs from April 1 of the prior year through March 31 of the next year. For example: FY 2010/2011 is from April 1, 2010 to March 31, 2011.

Healthcare-associated with current admission in the reporting facility

An MRSA case identified >48 hours (or >2 calendar days) after the patient was admitted to your acute care facility

Healthcare-associated with previous encounter with the reporting facility

- An MRSA case identified ≤48 hours (or ≤2 calendar days) after the patient was admitted to your acute care facility, **AND** one of the followings
    - The patient was admitted to your acute care facility for a period of at least overnight (or >=24 hours) within the last twelve months, OR
    - Presence of indwelling catheters or other medical device at time of admission, which was inserted by your facility, OR
    - Documented history of weekly visits to an outpatient clinic (e.g., dialysis, oncology) in your facility in the last twelve months

Healthcare-associated with another facility:

- An MRSA case identified ≤ 48 hours (or ≤2 calendar days) after the patient was admitted to your acute care facility, **AND** one of the followings
    - The patient had an encounter with another healthcare facility, either as an inpatient (including acute care and long-term care in the facilities either within or outside the health authority) or as an outpatient (e.g., for dialysis, oncology), within the last twelve months, OR
    - Presence of indwelling catheters or other medical device at time of admission, which was inserted by another facility

Health authority (HA)

A Health Authority manages and delivers healthcare services. There are five regional Health Authorities which govern, plan, and coordinate services regionally within sixteen health service delivery areas, and a Provincial Health Services Authority which coordinates and/or provides provincial programs and specialized services (please note, in this report, PHC is analyzed separately from VCHA due to differences in case definition).

The six HAs in BC are:

- Interior Health Authority (IHA)
- Fraser Health Authority (FHA)
- Northern Health Authority (NHA)
- Vancouver Coastal Health Authority (VCHA) [includes Providence Health Care (PHC)]
- Vancouver Island Health Authority (VIHA)
- Provincial Health Services Authority (PHSA)

Hospital category

The hospital category in this report is based on the healthcare services that the hospital provides and the population to be served, including:

- **Tertiary/Referral hospital** refers to a major hospital that provides a wide range of acute in-patient and out-patient specialist services together with the necessary support systems for the patients across the health authority. Patients will often be referred from smaller hospitals for major operations, consultations with specialists and sub-specialists and when sophisticated intensive care facilities are required.
- **Regional hospital** typically provides healthcare services to the patients in its region, with a large number of beds for intensive care and long-term care, and also providing specialist and sub-specialist services, such as surgery, plastic surgery, childbirth, bioassay laboratories, and so forth.
- **Community hospital** offers an appropriate range of integrated health and social care designed to meet the needs of local people. Medical care is predominantly provided by general practitioners working with consultant medical colleagues.

Infection

Infection refers to the invasion of bacteria into tissue with the manifestation of clinical symptoms of infection, such as increased white blood cell counts, fever, lesions, furuncles, drainage from a break in skin continuity, or erythema. Infections require treatment.

Isolate

A bacterial or fungal strain that has been isolated in the laboratory from a specimen collected from a patient.

Inpatient day

An accounting unit used by healthcare facilities and healthcare planners. Each day represents a unit of time during which the services of the institution or facility are used by a patient; e.g. 50 patients in a hospital for 1 day would represent 50 inpatient days.

Methicillin-Resistant *Staphylococcus aureus* (MRSA)

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a type of staph bacteria that is resistant to certain antibiotics called beta-lactams. These antibiotics include Methicillin and other more common antibiotics such as oxacillin, penicillin, and amoxicillin. PICNet's MRSA surveillance program focuses on newly identified MRSA cases, which must meet ALL of the following criteria:

- Laboratory identification of MRSA, including *Staphylococcus aureus* cultured from any specimen that tests oxacillin-resistant by standard susceptibility testing methods; or by a positive result for penicillin binding protein 2a (PBP2a); or molecular testing for mecA. Positive results of specimens tested by other validated polymerase chain reaction (PCR) tests for MRSA may also be included
- The patient must be admitted to an acute care facility
- The MRSA must be newly identified at the time of hospital admission or identified during hospitalization, either as infection or colonization

This includes:

- MRSA infection or colonization identified for the first time during their hospital admission
- Patients identified in the emergency department and then admitted to the reporting acute care facility
- Patients that have been identified as being positive for MRSA in outpatient clinics (including ambulatory care) or other healthcare facilities were admitted to the reporting acute care facility with MRSA

This DOES NOT include:

- Patients that were previously identified as being positive for MRSA in the reporting acute care facility or other acute care facilities before current admission
- Cases identified in the emergency department or outpatient clinics but are not admitted to the reporting acute care facility
- Cases re-admitted with MRSA
- MRSA cases transferred from another acute care facility

Nosocomial infection

Infection associated with admission to the reporting healthcare facility.

Rate for MRSA associated reporting facility per 10,000 inpatient days

$$\text{Rate per 10,000 inpatient days} = \frac{\text{Number of MRSA associated with the reporting facility within a defined period}}{\text{Sum of inpatient days during the same period}} \times 10{,}000$$

A defined period can be a quarter or several quarters, or a year (annual rate).

Statistical significance

In statistics, a result is called statistically significant if it is unlikely to have occurred by chance. In this report, the difference is considered as statistically significant if the 95% confidence intervals of the

two rates, proportions, percentages, or means do not overlap (i.e., the lower limit of one confidence interval is greater than the upper limit of the other confidence interval).

Teaching hospital

A teaching hospital combines assistance to patients with teaching to medical and nurse students, and other healthcare professionals, and is often linked to a medical school, nursing school, or university. A teaching hospital can be a community hospital, or regional hospital, or tertiary/referral hospital.

Trend test

Trend test is an aspect of statistical analysis that tries to determine whether there is a statistically significant trend upwards or downwards over a period of time or among specific ordinal categories. This report uses Mantel-Haenszel Chi-square test for linear trend at a statistically significant level of $p < 0.05$.

Unknown association

A MRSA case where there is insufficient information on healthcare exposure history to classify as a healthcare-associated case or community-associated.

Surveillance Steering Committee

The Provincial Infection Control Network of British Columbia (PICNet) is a provincially supported professional collaborative that provides guidance and advice on healthcare-associated infection prevention and control in British Columbia. Under the aegis and accountability framework of the Provincial Health Services Authority, PICNet connects healthcare professionals from across the province to develop and create guidelines and tools, with a focus on surveillance, education, and evidence-based practice.

PICNet's **Surveillance Steering Committee** consists of representatives from each health authority and related organization, and provides guidance to PICNet's surveillance programs and assists the PICNet Management Office in implementation within the participating health authorities. The committee members during fiscal year 2013/2014 were:

- Jun Chen Collet, Provincial Health Services Authority
- Tara Donovan, Fraser Health Authority
- Leslie Forrester, Vancouver Coastal Health Authority
- Bruce Gamage (Co-Chair), Provincial Infection Control Network of BC
- Dr. Guanghong Han(Co-chair), Provincial Infection Control Network of BC
- Deanna Hembroff, Northern Health Authority
- Dr. Bonnie Henry, Provincial Health Services Authority
- Dr. Linda Hoang, BC Association of Medical Microbiologists
- Anthony Leamon, Vancouver Island Health Authority
- Dr. Julie Mori, Interior Health Authority
- Dr. Elisa Lloyd-Smith, Providence Health Care

References

1. Chen LF. The changing epidemiology of methicillin-resistant *Staphylococcus aureus*: 50 years of a superbug. American Journal of Infection Control 2013; 41:448-51
2. Stryjewski ME and Corey GR. Methicillin-resistant *Staphylococcus aureus*: An evolving pathogen. Clinical Infectious Diseases 2014; 58(S1):S10–9
3. Kang J, Sickbert-Bennett EE, Brown VM, Weber DJ, and Rutala WA. Changes in the incidence of health careeassociated pathogens at a university hospital from 2005 to 2011. American Journal of Infection Control 2014; 42:770-5
4. Public Health Agency of Canada. Antimicrobial-resistant organisms surveillance – Surveillance report for data from January 1 2007 to September 30 2013. Updated April 2014

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