



Vascular Access-Related Bloodstream Infections in Hemodialysis Patients

Surveillance results: 2015-2016

From April 1st, 2015, to March 31st, 2016, 45 hemodialysis units took part in the surveillance of vascular access-related bloodstream infections (VARBSIs) in hemodialysis (HD) patients, for a combined total of 54,717 patient-periods (Table 1), slightly less than the preceding year. Participating units reported 136 VARBSIs in 129 patients. Patient-periods involving a fistula account for 41.0% of patient-periods. The 2015-2016 VARBSI incidence rates are 0.06 cases per 100 patient-periods for patients with an arteriovenous (AV) fistula, 0.32 for patients with a synthetic fistula (graft), 0.33 for patients with a permanent catheter and 3.34 for patients with a temporary catheter. In 2015-2016, incidence rates are significantly lower than in 2011-2015. This decrease is mainly attributable to a decrease in VARBSIs on AV fistula with buttonhole (rates per 100 patient-periods) and to a decrease of VARBSIs on permanent catheters (rate per 1,000 catheter-days). A minimum of 11 periods of data are to be provided for facilities' data to be included in this surveillance report. Data were extracted on May 31st, 2016.

Table 1 - Participation of Hemodialysis Units in the Surveillance of VARBSIs in Hemodialysis Patients, Québec, 2011-2012 to 2015-2016

	2011 - 2012	2012 - 2013	2013 - 2014	2014 - 2015	2015 - 2016
Units (N)	40	42	42	45	45
Patients monitored (average number per period)	3,855	3,976	3,984	4,303	4,209
Patient-periods* (N)	50,111	51,693	51,791	55,939	54,717
Patient-months (N)	47,037	48,336	48,469	52,316	51,363
Dialysis sessions (N)	604,766	621,465	623,172	672,639	660,376
Catheter-days (N)	750,919	798,816	824,834	891,802	909,792
VARBSIs (cat. 1a, 1b and 1c, N)	214	218	151	154	136
VARBSIs with AV fistulas or grafts (N)	38	46	25	23	19
VARBSIs with permanent or temporary catheters (N)	176	172	126	131	117
Infected patients (N)	205	209	143	141	129

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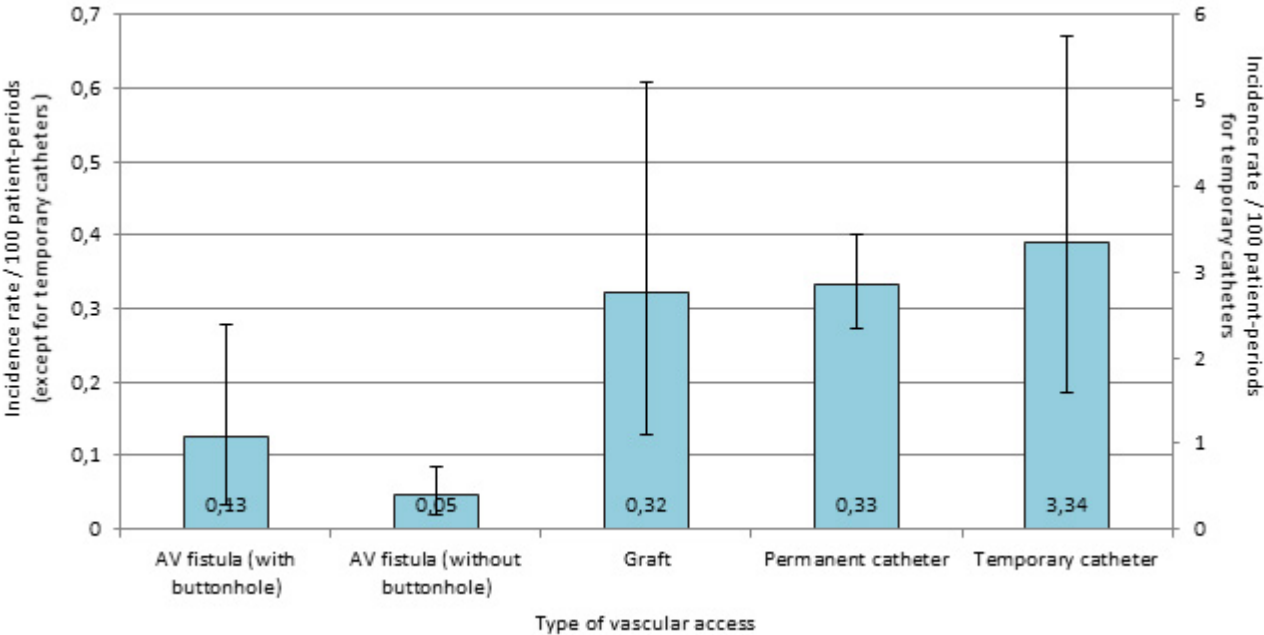
Incidence rates

The 2015-2016 VARBSI incidence rate is 0.25 cases per 100 patient-periods. The incidence rates are 0.06 for patients with an AV fistula, 0.32 for patients with a graft, 0.33 for patients with a permanent catheter and 3.34 for patients with a temporary catheter (Figure 1).

In patients with AV fistulas, the VARBSI incidence rate is higher when the buttonhole technique is used (0.13 per 100 patient-periods versus 0.05). Incidence rate for patients with a graft (0.32) is higher than

for patients with an AV fistula (0.06); incidence rates for patients with AV fistulas remain much lower than for patients with a permanent catheters (0.33). The incidence rate for patients with a temporary catheter is still the highest; it is, however, the least frequently used vascular access (Figures 1 and 2). Patients with a temporary catheter (3.34) present an incidence rate much higher than patients with a permanent catheter (0.33).

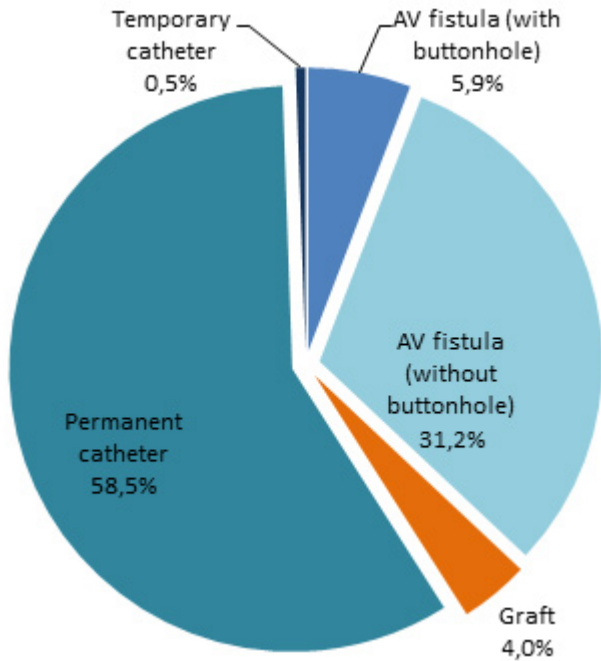
Figure 1 - VARBSI Incidence Rate by Type of Vascular Access, Québec, 2015-2016 (Incidence Rate per 100 Patient-periods [95% CI])



Note: 95% CI: 95% confidence interval

Permanent catheters were the most commonly used type of vascular access, followed by AV fistulas without the use of the buttonhole technique (Figure 2).

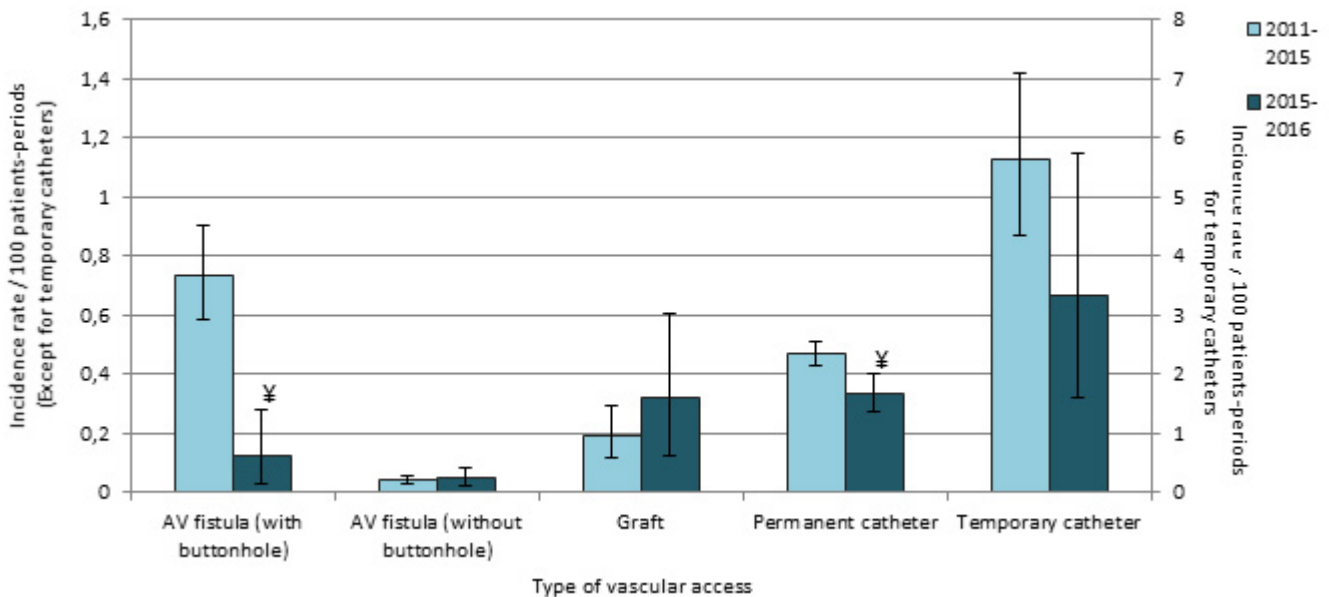
Figure 2 - Breakdown of Patient-periods by Type of Vascular Access, Québec, 2015-2016 (%)



Incidence rate time trends

In 2015-2016, incidence rates are significantly lower than in 2011-2015. This decrease is mainly attributable to a decrease in VARBSIs on AV fistula with buttonhole and to a decrease of VARBSIs on permanent catheters (Table 2 and Figures 3 and 4).

Figure 3 - VARBSI Incidence Rates by Type of Vascular Access, Québec, 2011-2015* and 2015-2016 (Incidence Rate per 100 Patient-periods [95% CI])



*Incidence rates for AV fistulas, with and without buttonhole, are limited to data from 2013-2014 to 2015-2016, as information on the use of the buttonhole technique was not collected before 2013-2014.

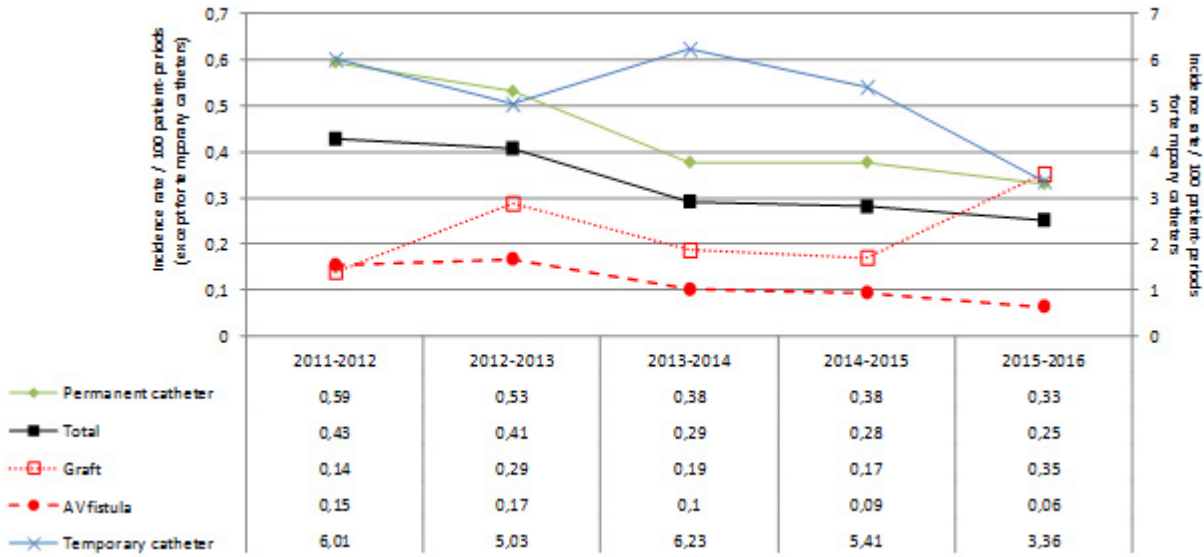
¥ : Significant difference ($p < 0.05$) between 2011-2015 and 2015-2016.

Table 2 - VARBSI Incidence Rates by Type of Vascular Access, Québec, 2011-2015 and 2015-2016 (Incidence Rate per 100 Patient-periods and per 1,000 Vascular-Access Days [95% CI])

Type of Vascular Access	Incidence Rate/100 Patient-periods [95% CI]		Taux d'incidence / 1 000 j.-c. [I.C. 95 %]	
	2011-2015	2015-2016	2011-2015	2015-2016
AV fistula or graft	0.14 [0.12 ; 0.17]	0.09 [0.05 ; 0.13]¥	-	-
AV fistula	0.14 [0.11 ; 0.16]	0.06 [0.03 ; 0.10]¥	-	-
With buttonhole*	0.74 [0.59 ; 0.90]	0.13 [0.03 ; 0.28]¥	-	-
Without buttonhole*	0.04 [0.03 ; 0.06]	0.05 [0.02 ; 0.09]	-	-
Graft	0.19 [0.12 ; 0.29]	0.32 [0.13 ; 0.61]	-	-
Permanent or temporary catheter	0.52 [0.48 ; 0.56]	0.36 [0.30 ; 0.43]¥	0.19 [0.18; 0.19]	0.13 [0.12 ; 0.14]¥
Permanent catheter	0.47 [0.43 ; 0.51]	0.33 [0.27 ; 0.40]¥	0.17 [0.15 ; 0.18]	0.12 [0.10 ; 0.14]¥
Temporary catheter	5.64 [4.36 ; 7.08]	3.34 [1.59 ; 5.74]	2.01 [1.55 ; 2.52]	1.19 [0.57 ; 2.05]
Total	0.35 [0.33 ; 0.38]	0.25 [0.21 ; 0.29]¥	-	-

* Incidence rates for AV fistulas, with and without buttonhole, are limited to data from 2013-2014 to 2015-2016, as information on the use of the buttonhole technique was not collected before 2013-2014.
 ¥ Significant difference ($p < 0,05$) between 2011-2015 and 2015-2016.

Figure 4 - VARBSI Incidence Rates by Type of Vascular Access, for Units Participating Since 2011-2012 (N = 38)*, Québec, 2011-2012 to 2015-2016 (Incidence Rate per 100 Patient-periods)

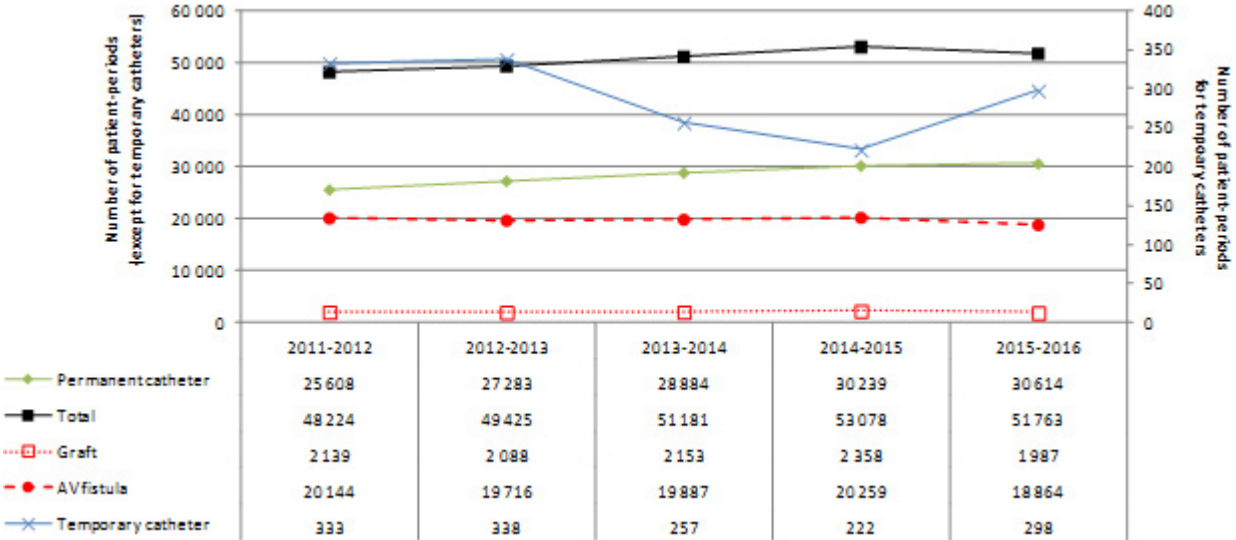


* Data analyzed are data from dialysis units that participated at least 11 periods per year, for every year from 2011-2012 to 2015-2016.

Time trends in patient-periods are presented in Figure 5. As fistula use is decreasing, catheter use has

increased through the last five years. Patient-periods with a temporary catheter, the vascular access presenting the highest incidence rate, had decreased in 2013-2014 and 2014-2015, to increase again in 2015-2016.

Figure 5 - Time Trends in Patient-periods by Type of Vascular Access, for Units Participating Since 2011-2012 (N = 38)*, Québec, 2011-2012 to 2015-2016



* Data analyzed are data from dialysis units that participated at least 11 periods per year, for every year from 2011-2012 to 2015-2016.

Table 3 - Breakdown of Patient-periods by Type of Vascular Access, 2011-2015 and 2015-2016 (%)

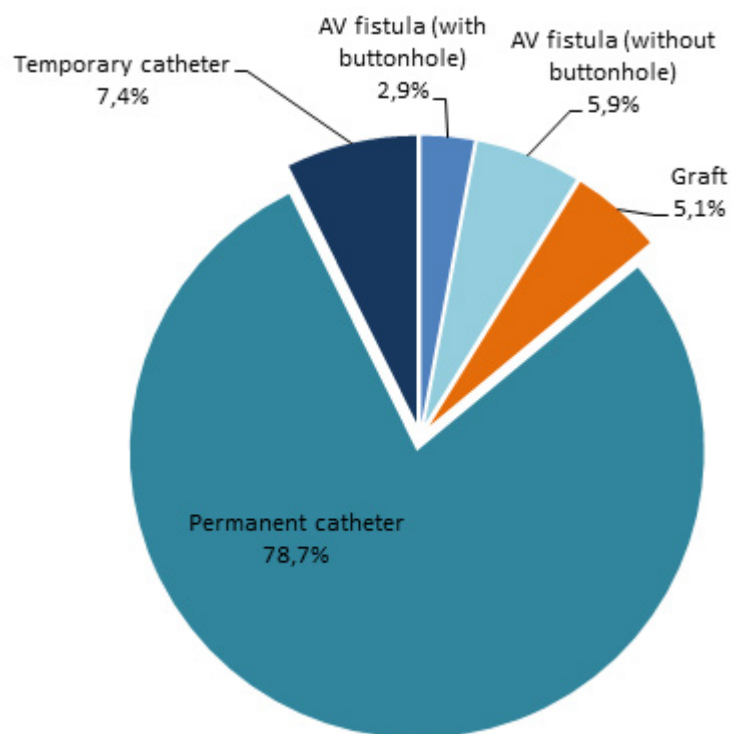
		2011-2015		2015-2016	
	VARBSI (N)	Patient-periods (N, %)	VARBSI (N)	Patient-periods (N, %)	
AV fistula or graft	132	92,980 (44.4 %)	19	22,435 (41.0 %)	
AV fistula	114	83,686 (40.0 %)	12	20,266 (37.0 %)	
With buttonhole*	83	11,262 (5.4 %)	4	3,209 (5.9 %)	
Without buttonhole*	31	72,650 (34.7 %)	8	17,057 (31.2 %)	
Graft	18	9,294 (4.4 %)	7	2,169 (4.0 %)	
Permanent or temporary catheter	605	116,226 (55.6 %)	117	32,310 (59.0 %)	
Permanent catheter	539	115,165 (55.0 %)	107	32,011 (58.5 %)	

Temporary catheter	66	1,171 (0.6 %)	10	299 (0.5 %)
Total (N)	737	209,206	136	54,745

Description of cases

The vast majority (86%, or 117 cases) of VARBSIs occurred in patients who receive their hemodialysis treatment via catheter (Figure 6). Only 9% of cases occurred in patients with an AV fistula. The buttonhole technique is used in a third of cases.

Figure 6 - Breakdown of VARBSIs by Type of Vascular Access, Québec, 2015-2016 (N = 136)



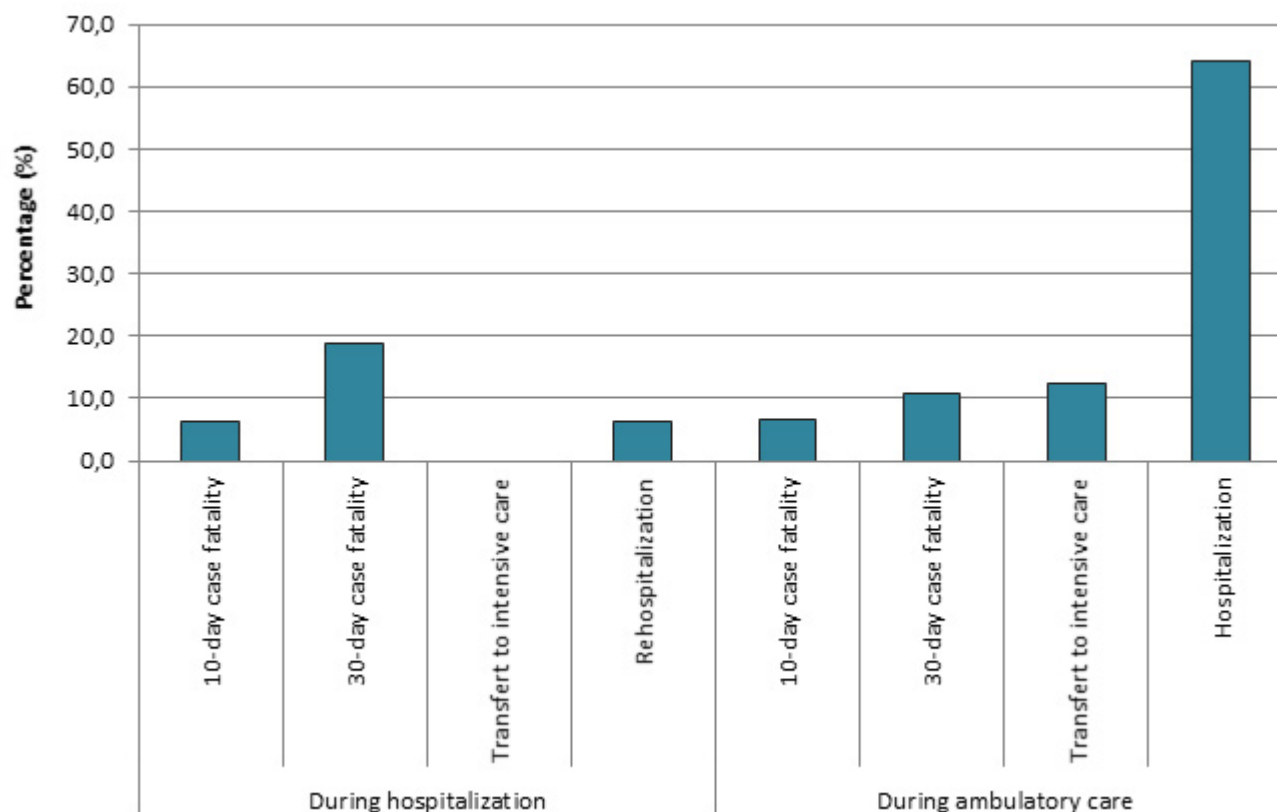
A majority of cases occurred in ambulatory care and two thirds (64.2%) of these cases were subsequently admitted. Overall, 11.8% of VARBSI cases resulted in death within 30 days following the onset of bacteremia. Death occurred in 18.8% of cases of VARBSI among hospitalized patients (Table 4 and Figure 7), compared with 10.8% of cases among patients receiving ambulatory care.

Table 4 - 30-Day Case Fatality, Percentage of Transfers to ICU and Percentage of Hospitalizations and Rehospitalizations During a VARBSI Episode, by Origin of Acquisition, Québec, 2015-2016 (N, %)

Origin of Acquisition	Complication	Number of VARBSI Cases Monitored	Presence of Complication	
			N	%

During hospitalization	Death within 10 days	16	1	6.3
	Death within 30 days	16	3	18.8
	Transfer to ICU	16	0	0
	Rehospitalization	16	1	6.3
During ambulatory care	Death within 10 days	120	8	6.7
	Death within 30 days	120	13	10.8
	Transfer to ICU	120	15	12.5
	Hospitalization	120	77	64.2

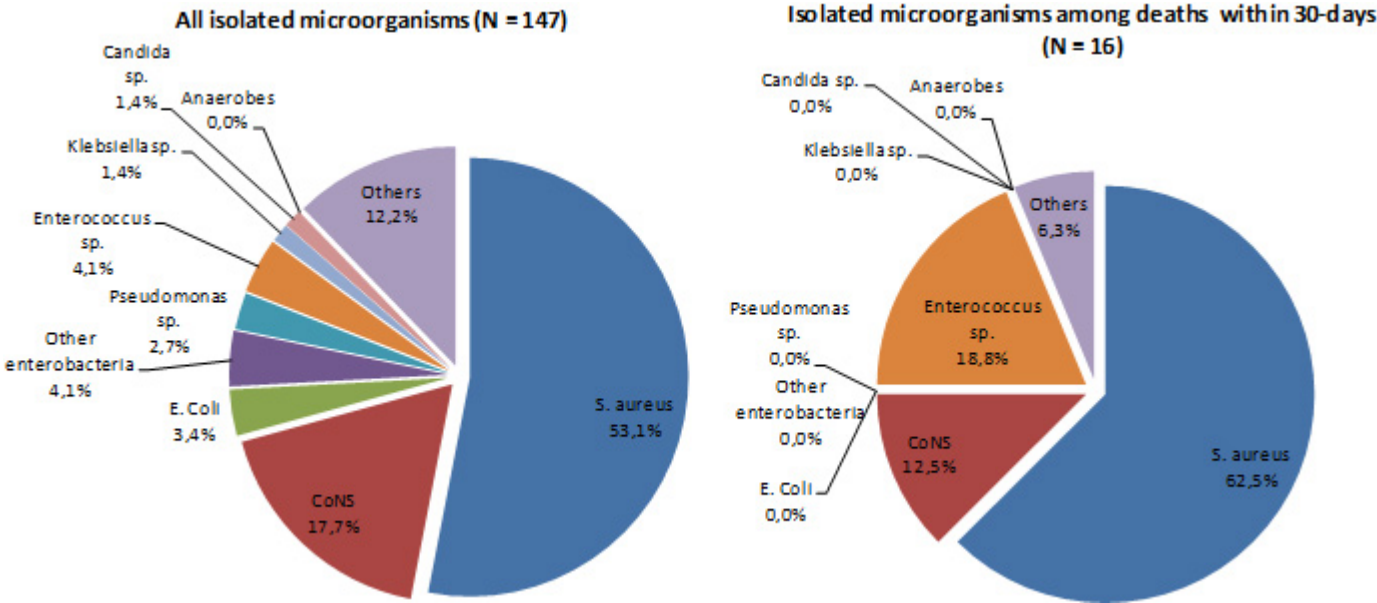
Figure 7 - 30-Day Case Fatality, Percentage of Transfers to ICU and Percentage of Hospitalizations and Rehospitalizations During a VARBSI Episode, by Origin of Acquisition, Québec, 2015-2016 (%)



Microbiology

Figure 8 shows that *Staphylococcus aureus* was the most frequently isolated microorganism in all VARBSI cases (n=78; 53%); followed by coagulase-negative *Staphylococcus* (CoNS; n= 26; 14%) and enterobacteria. *S. aureus* was the most frequently isolated microorganism in cases resulting in death (62.5%).

Figure 8 - Categories of Isolated Microorganisms in All Reported Cases (N = 147) and Cases Resulting in Death Within 30 Days (N = 16), Québec, 2015-2016 (%)



In 2015-2016, among VARBSI cases, 15.4% of *S. aureus* strains are oxacillin-resistant and no vancomycin-resistant *Enterococcus* was identified (Table 5 and Figure 9). An important increase in resistance to quinolones and to third-generation cephalosporins can be observed in enterobacteria, but no resistance to carbapenems is reported.

Tableau 5 - Percentage of Strains Tested and Percentage of Resistance to Antibiotics for Certain Isolated Microorganisms, Québec, 2015-2016 (N, %)

Microorganism	Antibiotic	Isolated N	Tested		Resistant	
			N	%	N	%
<i>Staphylococcus aureus</i>	Oxacilline	78	78	100.0	12	15.4
<i>Enterococcus</i>	Vancomycine	7	7	100.0	0	0.0
<i>Enterococcus faecalis</i>	Vancomycine	5	5	100.0	0	0.0
<i>Enterococcus faecium</i>	Vancomycine	2	2	100.0	0	0.0
	CSE 4	2	2	100.0	0	0.0
<i>Klebsiella sp.</i>	Imipenem ou meropenem	2	2	100.0	0	0.0
	Multiresistant 1	2	2	100.0	0	0.0
	CSE 4	5	5	100.0	2	40.0
<i>Escherichia coli</i>	Fluoroquinolones 3	5	4	80.0	2	50.0
	Imipenem ou meropenem	5	3	60.0	0	0.0
	Multiresistant 1	5	5	100.0	1	20.0

	CSE 4	1	1	100.0	0	0.0
<i>Enterobacter sp.</i>	Imipenem ou meropenem	1	0	0.0	0	-
	Multiresistant 1	1	1	100.0	0	0.0
	Carbapénèmes	1	1	100.0	0	0.0
	Amikacine. gentamicine ou tobramycine	4	3	75.0	0	0.0
	CSE 2	4	4	100.0	0	0.0
<i>Pseudomonas sp.</i>	Fluoroquinolones 2	4	4	100.0	0	0.0
	Imipenem ou meropenem	4	4	100.0	0	0.0
	Piperacilline-tazobactam	4	2	50.0	0	0.0
	Multiresistant 2	4	4	100.0	0	0.0
<i>Acinetobacter sp.</i>	Imipenem ou meropenem	0	0	-	0	-
	Multiresistant 3	0	0	-	0	-

CSE 2 : cefepime or ceftazidime;

CSE 4: cefepime, cefotaxime, ceftazidime or ceftriaxone;

Fluoroquinolones 2: ciprofloxacin or levofloxacin;

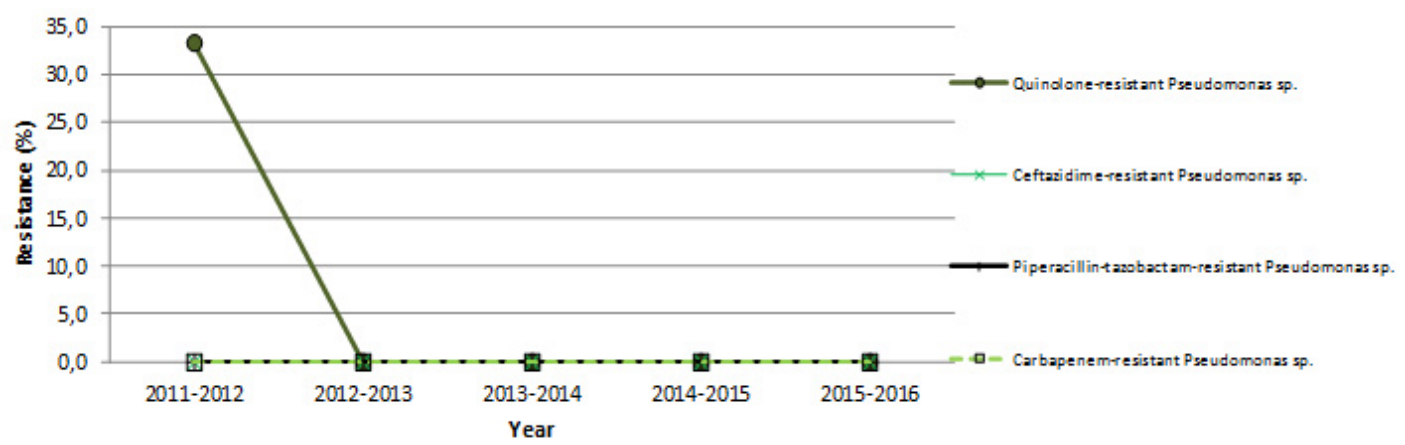
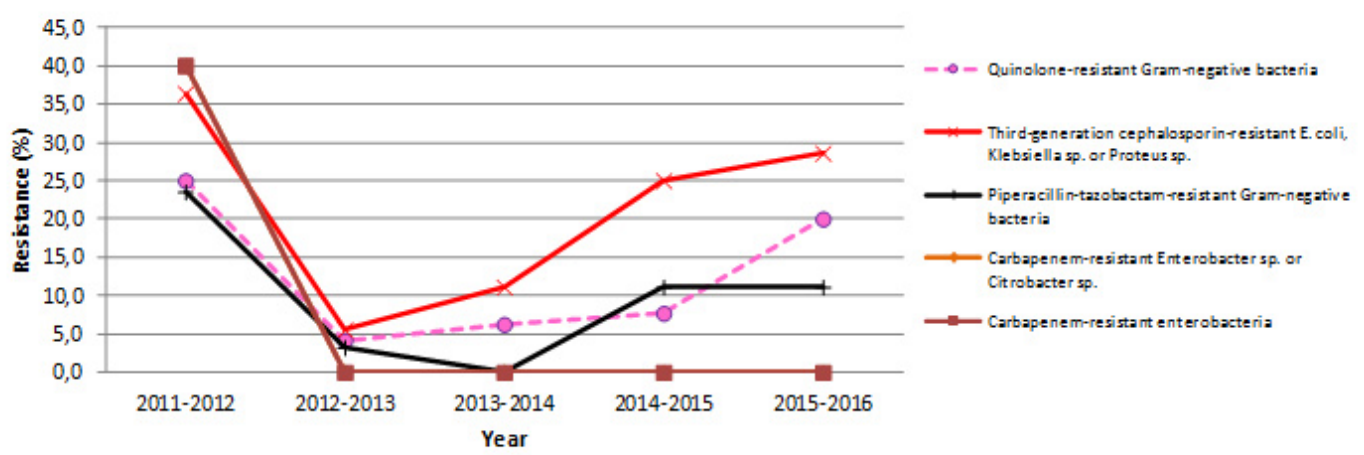
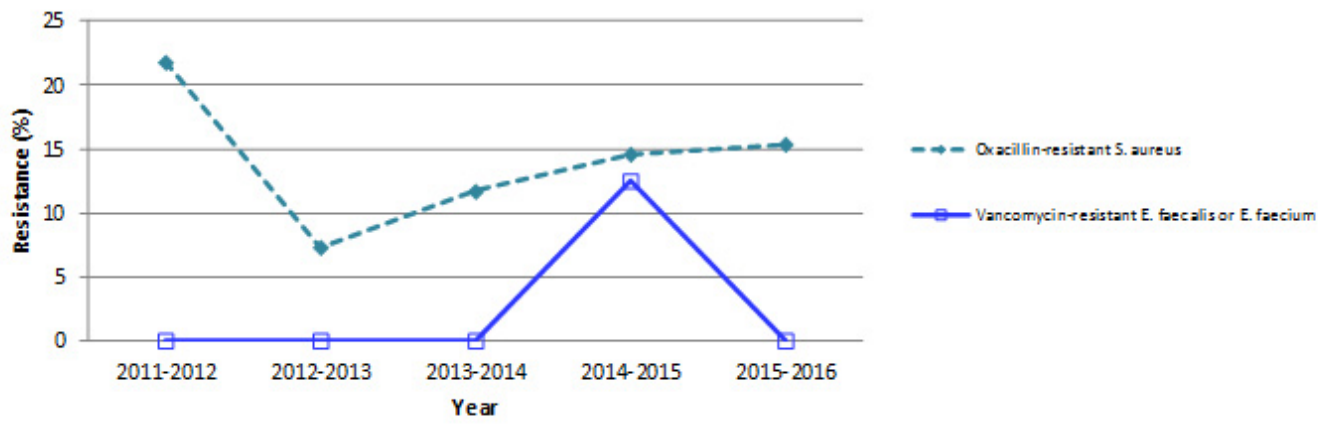
Fluoroquinolones 3: ciprofloxacin, levofloxacin or moxifloxacin;

Multiresistant 1: intermediate or resistant to an agent in three of the following five categories: cephalosporins 4, fluoroquinolones 3, aminoglycosides, carbapenems, piperacillin or piperacillin/tazobactam.

Multiresistant 2: intermediate or resistant to an agent in three of the following five categories: cephalosporins 2, fluoroquinolones 2, aminoglycosides, carbapenems, piperacillin or piperacillin/tazobactam.

Multiresistant 3: intermediate or resistant to an agent in three of the following six categories: cephalosporins 2, fluoroquinolones 2, aminoglycosides, carbapenems, piperacillin or piperacillin/tazobactam, ampicillin/sulbactam.

Figure 9 - Percentage of Antibiotic Resistance in Certain Gram-Positive Bacteria, Certain Gram-Negative Bacteria and *Pseudomonas sp.*, Québec, 2011-2012 to 2015-2016 (%)



Note: Resistance proportion computations are based on small numbers, leading to a great volatility in results.

Results per healthcare facility

Figures 10 and 11 show the breakdown of patient-periods monitored in 2015-2016, by type of vascular access and by healthcare facility. In 2015-2016, the percentage of fistulas decreased in 13 healthcare

facilities and increased in 7 (Table 6). Twelve facilities reported a rate of 0 VARBSI per 100 patient-periods, and five reported a rate higher than the 90th-percentile mark for 2011-2015 (Figure 12 and Table 7). Four of these five facilities have small dialysis units and declared only one or two VARBSIs in 2015-2016. Facilities with an incidence rate of 0 had small dialysis units of 5 to 11 chairs.

Figure 10 - Patient-periods Followed, by Healthcare Facility, Québec, 2015-2016 (%)

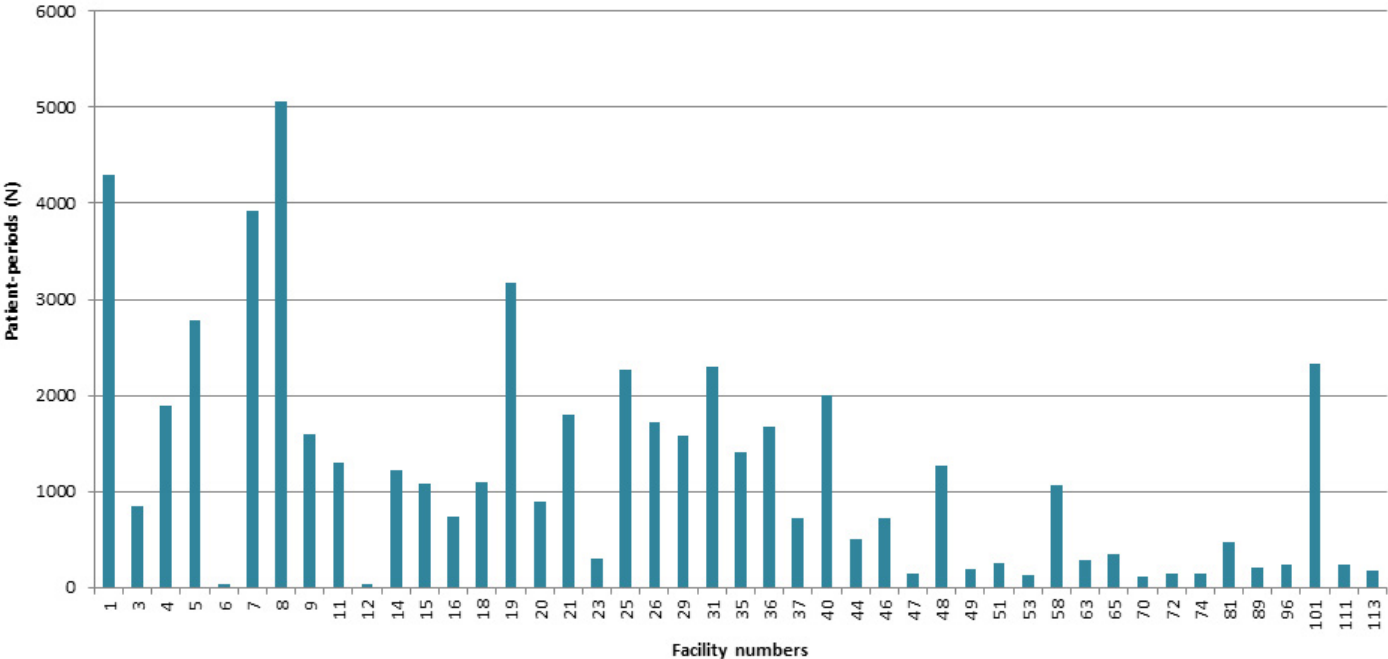


Figure 11 - Breakdown of Patient-periods Monitored by Type of Vascular Access and by Healthcare Facility, Québec, 2015-2016 (N)

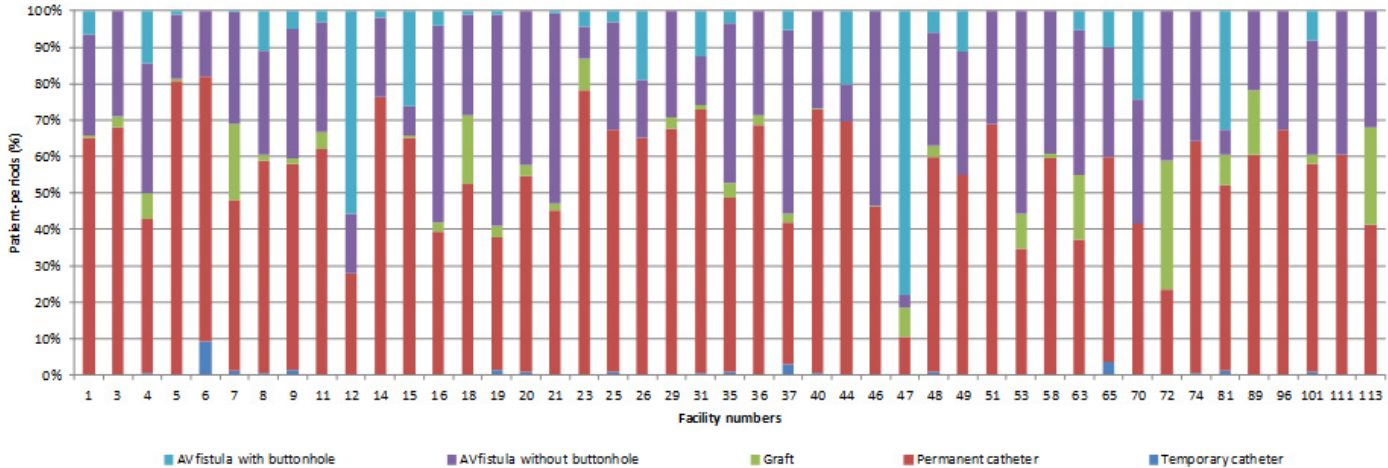


Figure 12 - VARBSI Incidence Rate per Healthcare Facility (2015-2016) and Incidence Rate Percentile (2011-2012 to 2014-2015), Québec, 2015-2016 (Incidence Rate per 100 Patient-periods)

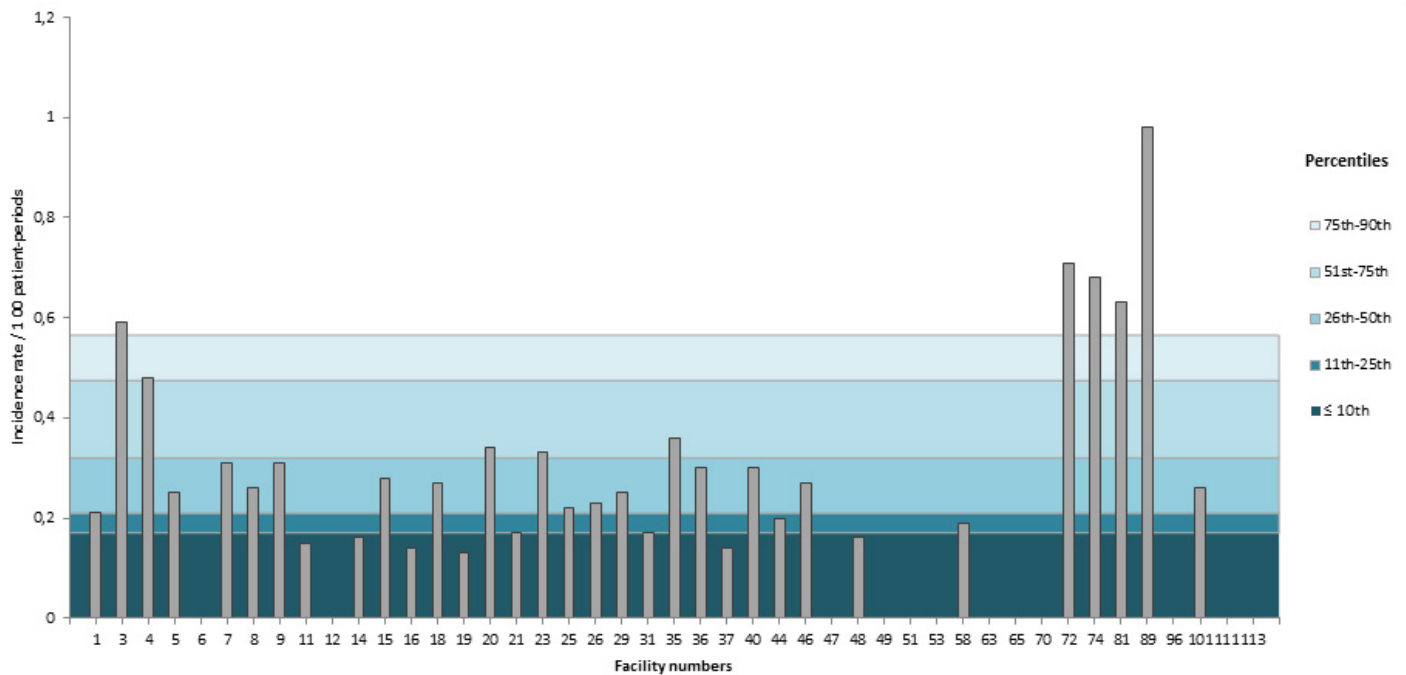


Table 6 - Number of Patient-periods Monitored and Percentage of Fistulas, by Healthcare Facility, Québec, 2011-2015 and 2015-2016 (N, % [95% CI])

Facility	2011-2015 Patient-periods (n)	% with fistula	2015-2016 Patient-periods (n)	% with fistula	Variations (p < 0.05)
1 HÔPITAL CHARLES LEMOYNE	16,185	41.3 [40.9 ; 41.6]	4,293	34.8 [34.1 ; 35.5]	diminution
3 GLEN - ROYAL VICTORIA	7,374	43.2 [42.7 ; 43.8]	851	32.2 [30.6 ; 33.8]	diminution
4 HÔPITAL NOTRE-DAME DU CHUM	9,377	64.2 [63.8 ; 64.7]	1,893	57.2 [56.1 ; 58.3]	diminution
5 HÔPITAL GÉNÉRAL JUIF	10,209	23.9 [23.4 ; 24.3]	2,783	19.2 [18.5 ; 19.9]	diminution
6 GLEN - ENFANTS	164	31.7 [28.1 ; 35.3]	33	18.2 [11.6 ; 24.8]	
7 PAVILLON L'HÔTEL-DIEU DE QUÉBEC	14,776	53.9 [53.5 ; 54.3]	3,918	52.1 [51.3 ; 52.8]	diminution
8 PAVILLON MAISONNEUVE/PAVILLON MARCEL-LAMOUREUX	19,273	46.7 [46.4 ; 47.1]	5,065	41.2 [40.5 ; 41.8]	diminution
9 HÔPITAL DU HAUT-RICHELIEU	5,884	44.1 [43.5 ; 44.7]	1,591	42.0 [40.8 ; 43.2]	
11 HÔPITAL PIERRE-LE GARDEUR	4,256	41.8 [41.1 ; 42.5]	1,299	38.0 [36.6 ; 39.3]	diminution
12 CENTRE HOSPITALIER UNIVERSITAIRE SAINTE-JUSTINE	230	14.3 [12.1 ; 16.6]	43	72.1 [65.4 ; 78.8]	augmentation
14 CENTRE HOSPITALIER RÉGIONAL DE LANAUDIÈRE	4,916	25.3 [24.7 ; 26.0]	1,215	23.6 [22.4 ; 24.8]	
15 HÔPITAL FLEURIMONT	5,198	30.8 [30.2 ; 31.5]	1,088	34.9 [33.5 ; 36.3]	augmentation
16 HÔPITAL RÉGIONAL DE RIMOUSKI	2,658	56.3 [55.4 ; 57.3]	736	60.7 [59.0 ; 62.5]	augmentation
18 HÔTEL-DIEU DE LÉVIS	4,168	46.7 [46.0 ; 47.5]	1,101	47.5 [46.0 ; 49.0]	
19 HÔPITAL CITÉ DE LA SANTÉ	11,618	66.3 [65.9 ; 66.7]	3,173	62.1 [61.2 ; 62.9]	diminution
20 HÔPITAL DE CHICOUTIMI	3,965	55.9 [55.1 ; 56.7]	892	45.4 [43.8 ; 47.0]	diminution
21 HÔPITAL SAINT-LUC DU CHUM	5,390	61.5 [60.9 ; 62.2]	1,793	54.8 [53.7 ; 56.0]	diminution
23 HÔTEL-DIEU D'ARTHABASKA	1,165	34.5 [33.1 ; 35.9]	302	21.9 [19.5 ; 24.2]	diminution
25 HÔPITAL DU SACRÉ-COEUR DE MONTRÉAL	9,320	29.6 [29.2 ; 30.1]	2,268	32.6 [31.6 ; 33.5]	augmentation
26 HÔPITAL DE VERDUN	6,530	47.0 [46.4 ; 47.6]	1,716	34.7 [33.6 ; 35.9]	diminution
29 HÔPITAL GÉNÉRAL DE MONTRÉAL	5,742	33.3 [32.7 ; 33.9]	1,582	32.2 [31.1 ; 33.4]	
31 PAVILLON SAINTE-MARIE	8,139	28.7 [28.2 ; 29.2]	2,299	27.1 [26.2 ; 28.0]	
35 HÔPITAL HONORÉ-MERCIER	4,243	52.8 [52.1 ; 53.6]	1,404	51.4 [50.1 ; 52.7]	
36 HÔPITAL GÉNÉRAL DU LAKESHORE	5,304	36.9 [36.2 ; 37.5]	1,675	31.4 [30.3 ; 32.5]	diminution
37 HÔTEL-DIEU DE SOREL	2,528	55.7 [54.7 ; 56.6]	724	58.3 [56.5 ; 60.1]	
40 HÔPITAL DE HULL	9,178	29.4 [28.9 ; 29.9]	2,007	27.0 [26.0 ; 28.0]	diminution
44 HÔPITAL SAINTE-CROIX	1,996	42.3 [41.2 ; 43.4]	505	30.5 [28.5 ; 32.5]	diminution

Facility	2011-2015		2015-2016		Variations (p < 0.05)
	Patient-periods (n)	% with fistula	Patient-periods (n)	% with fistula	
46 HÔPITAL DE GRANBY	2,509	53.4 [52.4 ; 54.3]	729	53.8 [52.0 ; 55.6]	
47 HÔPITAL DE ROUYN-NORANDA	687	68.0 [66.2 ; 69.7]	145	89.7 [87.2 ; 92.1]	augmentation
48 CENTRE HOSPITALIER DE ST. MARY	4,243	43.7 [42.9 ; 44.4]	1,272	40.0 [38.7 ; 41.4]	diminution
49 CENTRE DE SANTÉ ET DE SERVICES SOCIAUX MEMPHRÉMAGOG	761	47.2 [45.4 ; 48.9]	195	45.1 [41.6 ; 48.6]	
51 HÔPITAL DE MANIWAKI	809	36.0 [34.3 ; 37.6]	247	31.2 [28.3 ; 34.1]	
53 HÔPITAL DE CHANDLER	103	41.7 [37.0 ; 46.5]	133	65.4 [61.4 ; 69.5]	augmentation
58 HÔPITAL DU SUROÏT	4,186	54.7 [53.9 ; 55.4]	1,069	40.4 [38.9 ; 41.9]	diminution
63 HÔPITAL DE SAINT-GEORGES	576	49.7 [47.6 ; 51.7]	286	62.9 [60.1 ; 65.7]	augmentation
65 HÔPITAL ET CLSC DE VAL-D'OR	1,596	47.6 [46.4 ; 48.8]	355	40.3 [37.7 ; 42.8]	diminution
70 CENTRE DE SOINS DE COURTE DURÉE LA SARRE	444	58.3 [56.0 ; 60.6]	111	58.6 [54.0 ; 63.1]	
72 HÔPITAL ET CENTRE D'HÉBERGEMENT DE SEPT-ÎLES	434	58.1 [55.7 ; 60.4]	141	76.6 [73.1 ; 80.1]	augmentation
74 HÔPITAL DE DOLBEAU-MISTASSINI	251	37.5 [34.5 ; 40.4]	148	35.8 [31.9 ; 39.7]	
81 HÔPITAL DE MONT-LAURIER	1,595	51.7 [50.4 ; 52.9]	473	48.0 [45.7 ; 50.2]	
89 HÔPITAL DE MONTMAGNY	144	43.8 [39.7 ; 47.8]	205	39.5 [36.2 ; 42.9]	
96 CENTRE DE SANTÉ DE CHIBOUGAMAU	967	34.3 [32.8 ; 35.8]	235	32.8 [29.8 ; 35.8]	
101 HÔPITAL RÉGIONAL DE SAINT-JÉRÔME	9,281	44.4 [43.9 ; 44.9]	2,335	42.1 [41.1 ; 43.1]	diminution
111 HÔPITAL DE PAPINEAU	235	33.6 [30.6 ; 36.6]	233	39.5 [36.3 ; 42.6]	
113 HÔPITAL DE THETFORD MINES	599	59.3 [57.3 ; 61.2]	184	58.7 [55.1 ; 62.3]	
Québec	209,206	44.4 [44.3 ; 44.6]	54,745	41.0 [40.8 ; 41.2]	

Table 7 - Number of VARBSI Cases and Incidence Rate by Healthcare Facility, and Percentile Ranking, Québec, 2011-2015 and 2015-2016 (Incidence Rate per 100 Patient-periods [95% CI])

Facility	2011-2015			2015-2016	
	Number of cases	Mean number of cases per year	Rate/100 pp	Number of cases	Rate/100 pp
1 HÔPITAL CHARLES LEMOYNE	40	10	0.25 [0.18 ; 0.33]	9	0.21 [0.10 ; 0.37]
3 GLEN - ROYAL VICTORIA	42	10.5	0.57 [0.41 ; 0.76]	5	0.59 [0.19 ; 1.22]
4 HÔPITAL NOTRE-DAME DU CHUM	46	11.5	0.49 [0.36 ; 0.64]	9	0.48 [0.22 ; 0.84]
5 HÔPITAL GÉNÉRAL JUIF	17	4.3	0.17 [0.10 ; 0.26]	7	0.25 [0.10 ; 0.47]
6 GLEN - ENFANTS	0	0	0	0	0
7 PAVILLON L'HÔTEL-DIEU DE QUÉBEC	50	12.5	0.34 [0.25 ; 0.44]	12	0.31 [0.16 ; 0.51]
8 PAVILLON MAISONNEUVE/PAVILLON MARCEL-LAMOUREUX	74	18.5	0.38 [0.30 ; 0.47]	13	0.26 [0.14 ; 0.42]
9 HÔPITAL DU HAUT-RICHELIEU	18	4.5	0.31 [0.18 ; 0.47]	5	0.31 [0.10 ; 0.64]
11 HÔPITAL PIERRE-LE GARDEUR	24	6	0.56 [0.36 ; 0.81]	2	0.15 [0.01 ; 0.43]
12 CENTRE HOSPITALIER UNIVERSITAIRE SAINTE-JUSTINE	11	2.8	4.78 [2.37 ; 8.02]	0	0
14 CENTRE HOSPITALIER RÉGIONAL DE LANAUDIÈRE	14	3.5	0.28 [0.15 ; 0.45]	2	0.16 [0.01 ; 0.46]
15 HÔPITAL FLEURIMONT	24	6	0.46 [0.29 ; 0.66]	3	0.28 [0.05 ; 0.68]
16 HÔPITAL RÉGIONAL DE RIMOUSKI	6	1.5	0.23 [0.08 ; 0.45]	1	0.14 [0 ; 0.54]
18 HÔTEL-DIEU DE LÉVIS	7	1.8	0.17 [0.07 ; 0.32]	3	0.27 [0.05 ; 0.66]
19 HÔPITAL CITÉ DE LA SANTÉ	28	7	0.24 [0.16 ; 0.34]	4	0.13 [0.03 ; 0.29]
20 HÔPITAL DE CHICOUTIMI	10	2.5	0.25 [0.12 ; 0.43]	3	0.34 [0.07 ; 0.83]
21 HÔPITAL SAINT-LUC DU CHUM	25	8.3	0.46 [0.30 ; 0.66]	3	0.17 [0.03 ; 0.41]
23 HÔTEL-DIEU D'ARTHABASKA	2	0.5	0.17 [0.02 ; 0.49]	1	0.33 [0 ; 1.30]
25 HÔPITAL DU SACRÉ-COEUR DE MONTRÉAL	50	12.5	0.54 [0.40 ; 0.70]	5	0.22 [0.07 ; 0.46]
26 HÔPITAL DE VERDUN	21	5.3	0.32 [0.20 ; 0.47]	4	0.23 [0.06 ; 0.51]
29 HÔPITAL GÉNÉRAL DE MONTRÉAL	26	6.5	0.45 [0.29 ; 0.64]	4	0.25 [0.06 ; 0.56]

Facility	2011-2015			2015-2016	
	Number of cases	Mean number of cases per year	Rate/100 pp	Number of cases	Rate/100 pp
31 PAVILLON SAINTE-MARIE	26	6.5	0.32 [0.21 ; 0.45]	4	0.17 [0.04 ; 0.38]
35 HÔPITAL HONORÉ-MERCIER	16	4	0.38 [0.22 ; 0.59]	5	0.36 [0.11 ; 0.74]
36 HÔPITAL GÉNÉRAL DU LAKESHORE	10	2.5	0.19 [0.09 ; 0.33]	5	0.30 [0.10 ; 0.62]
37 HÔTEL-DIEU DE SOREL	18	4.5	0.71 [0.42 ; 1.08]	1	0.14 [0 ; 0.55]
40 HÔPITAL DE HULL	27	6.8	0.29 [0.19 ; 0.41]	6	0.30 [0.11 ; 0.59]
44 HÔPITAL SAINTE-CROIX	7	1.8	0.35 [0.14 ; 0.66]	1	0.20 [0 ; 0.78]
46 HÔPITAL DE GRANBY	6	1.5	0.24 [0.09 ; 0.47]	2	0.27 [0.02 ; 0.78]
47 HÔPITAL DE ROUYN-NORANDA	1	0.3	0.15 [0 ; 0.58]	0	0
48 CENTRE HOSPITALIER DE ST. MARY	8	2	0.19 [0.08 ; 0.34]	2	0.16 [0.02 ; 0.46]
49 CENTRE DE SANTÉ ET DE SERVICES SOCIAUX MEMPHRÉMAGOG	1	0.3	0.13 [0 ; 0.51]	0	0
51 HÔPITAL DE MANIWAKI	3	0.8	0.37 [0.07 ; 0.91]	0	0
53 HÔPITAL DE CHANDLER	0	0	0	0	0
58 HÔPITAL DU SUROÏT	8	2	0.19 [0.08 ; 0.34]	2	0.19 [0.02 ; 0.54]
63 HÔPITAL DE SAINT-GEORGES	1	0.3	0.17 [0 ; 0.67]	0	0
65 HÔPITAL ET CLSC DE VAL-D'OR	9	2.3	0.56 [0.25 ; 0.99]	0	0
70 CENTRE DE SOINS DE COURTE DURÉE LA SARRE	0	0	0	0	0
72 HÔPITAL ET CENTRE D'HÉBERGEMENT DE SEPT-ÎLES	1	0.3	0.23 [0 ; 0.90]	1	0.71 [0 ; 2.78]
74 HÔPITAL DE DOLBEAU-MISTASSINI	1	0.5	0.40 [0 ; 1.57]	1	0.68 [0 ; 2.66]
81 HÔPITAL DE MONT-LAURIER	2	0.5	0.13 [0.01 ; 0.37]	3	0.63 [0.12 ; 1.55]
89 HÔPITAL DE MONTMAGNY	0	0	0	2	0.98 [0.09 ; 2.80]
96 CENTRE DE SANTÉ DE CHIBOUGAMAU	0	0	0	0	0
101 HÔPITAL RÉGIONAL DE SAINT-JÉRÔME	52	13	0.56 [0.42 ; 0.72]	6	0.26 [0.09 ; 0.51]
111 HÔPITAL DE PAPINEAU	2	2	0.85 [0.08 ; 2.44]	0	0
113 HÔPITAL DE THETFORD MINES	3	1	0.50 [0.09 ; 1.23]	0	0
Québec	737	188.9	0.35 [0.33 ; 0.38]	136	0.25 [0.21 ; 0.29]
Percentiles					
10 th percentile			0.17		0.15
25 th percentile			0.21		0.19
50 th percentile			0.32		0.26
75 th percentile			0.48		0.33
90 th percentile			0.57		0.63

* Changes in rates within individual facilities were not subjected to statistical analysis, given the small number of cases involved.

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- [3] http://cclin-sudest.chu-lyon.fr/Reseaux/DIALIN/Resultats/rapport_annuel_2011_V2.pdf
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