



Canadian Nosocomial Infection Surveillance Program (CNISP)

Surveillance for Vancomycin Resistant Enterococci (VRE) in Patients Hospitalized in Canadian Acute-Care Hospitals Participating in CNISP

2006 Results

In 2006, 50 sentinel hospitals from 9 Canadian provinces participated in the CNISP surveillance for VRE and submitted data on 'newly-identified' VRE cases in hospitalized patients.¹ The VRE cases included in this surveillance consist of only the VRE cases that are identified for the first time in one of the CNISP sentinel hospitals. It does not include VRE cases previously identified at other CNISP sentinel hospitals, cases identified in emergency wards, clinics and outpatient settings or previously identified cases that are re-admitted with VRE.

The denominator data for the calculation of the VRE rates, also submitted from each participating hospital, included the number of patient admissions (N=757,269) and the number of patient days (N=5,963,506).

There were a total of 906 newly identified VRE positive cultures during the 2006 VRE surveillance, of which 43 (4.8%) were identified by infection control professionals as infections and 863 (95.3%) as colonizations.

Demographically, 463 (51.1%) of the positive cultures (906) were from men. The following represents the age breakdown of individuals from whom VRE was isolated: 8 (0.9%) were under 18 years of age, 25 (2.8%) 18-29 years, 207 (22.8%) 30-59 years, 374 (41.3%) 60-79 years and 292 (32.2%) greater than 80 years of age. Regionally, 270 (29.8%) of the positive cultures were from Western Canada, 590 (65.1%) from Central Canada and 46 (5.1%) from Eastern Canada.

Where VRE was acquired was unknown for 35 (3.9%) of the 906 positive cultures. Where the origin was identified (n=871), 838 (96.2%) were healthcare-associated (formerly nosocomial) including acute care hospitals, dialysis units and long-term care facilities and 33 (3.8%) were reported as community-acquired. Of the healthcare-associated positive cultures (n=838), 707 (84.4%) were associated with CNISP hospitals, 106 (12.6%) to other acute care hospitals, and 25 (3%) to long-term care facilities.

VRE incidence Rates

The 2006 incidence rates for VRE are given in Table 1.

Table 1. VRE incidence rates per 1,000 patient admissions and 10,000 patient days for 2006

	Rate per 1,000 admissions (Number)			Rate per 10,000 days (Number)		
	All*	Infection	Colonization	All*	Infection	Colonization
Overall	1.2 (906)	0.06 (43)	1.14 (863)	1.52 (906)	0.07 (43)	1.45 (863)

* includes all newly identified VRE positive cultures (i.e. infections and colonizations).

¹ VRE case definition: All enterococcal isolates with a vancomycin MIC \geq 8 ug/ml. *E. gallinarum* or *E. casseliflavus* are not included in the definition of vancomycin resistant enterococci.

Figure 1. VRE incidence rates per 1,000 patient admissions from 1999 to 2006

There was a significant decrease in the overall incidence of VRE per 1,000 patient admissions to 1.2 per 1,000 patient admissions from 1.32 reported in 2005. This rate remains higher than the cumulative rate of 0.76 per 1,000 patient admissions (all positive cultures 1996-2006).

In 2006, the incidence rate of VRE infection per 1,000 patient admissions is 0.06. Overall the incidence rate of VRE infection per 1,000 patient admissions has remained relatively stable, ranging from 0.02 in 1999 to 0.06 in 2002, 2003 and 2006 with a cumulative incidence of 0.04 (all infections 1999-2006).

The incidence rate of VRE colonization per 1,000 patient admissions in 2006 (1.14) has decreased slightly since 2005 (1.25) however it remains higher than the cumulative incidence rate of 0.71 (all colonizations 1999-2006).

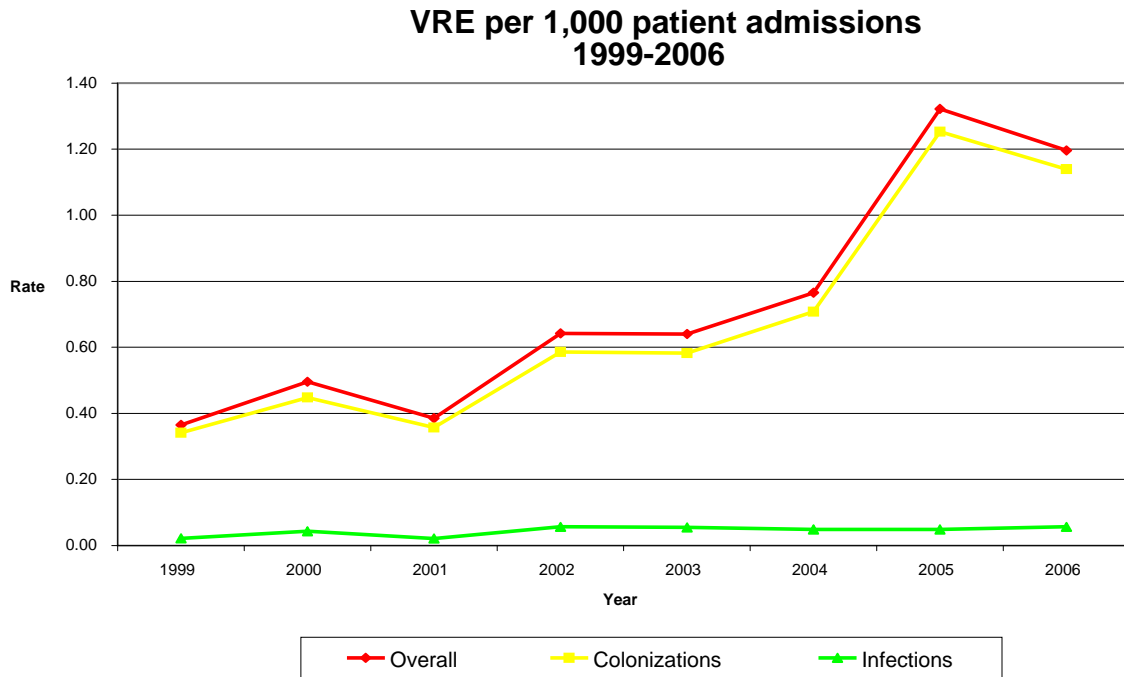
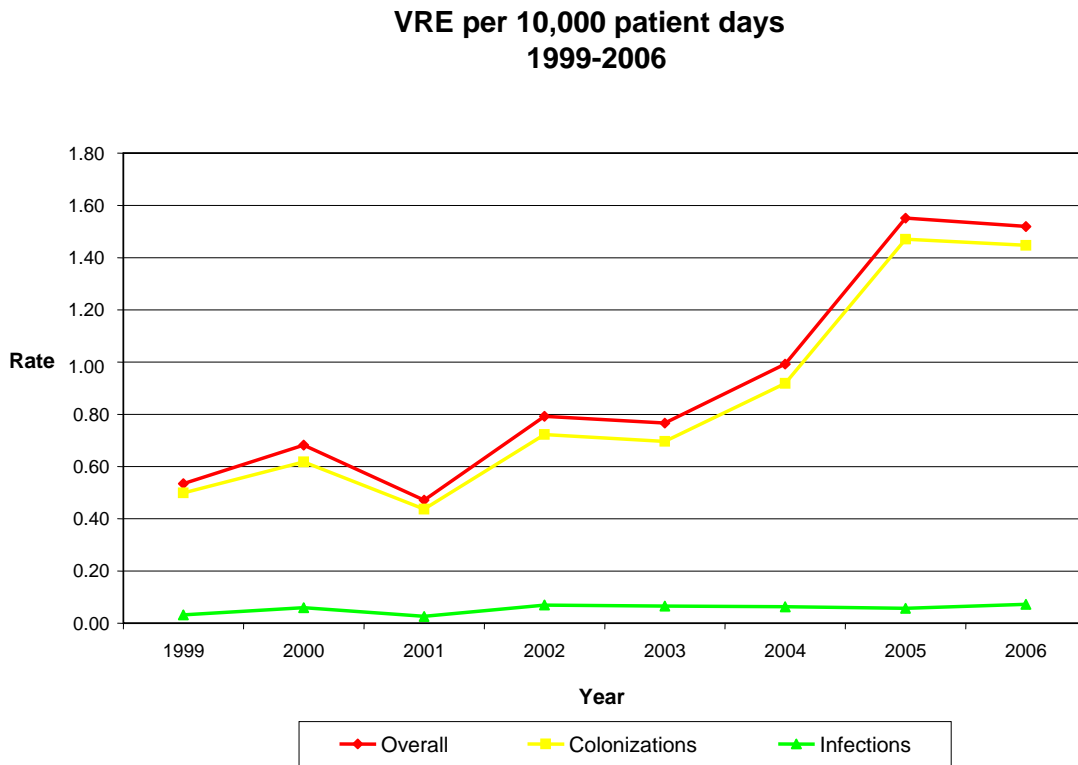


Figure 2. VRE incidence rates per 10,000 patient days from 1999 to 2006

The overall incidence rate of VRE per 10,000 patient days in 2006 was 1.52, slightly lower than the 1.55 reported in 2005. The overall incidence rate remains higher than the cumulative incidence of 0.90 per 10,000 patient days (all positive cultures 1996-2006).

Overall the incidence rate of VRE infection per 10,000 patient days in 2006 has remained relatively stable ranging from a low of 0.03 in 2001 to its current rate of 0.07 in 2006, with a cumulative incidence of 0.06 (all infections 1999-2006).

The incidence rate of VRE colonization per 10,000 patient days in 2006 (1.45) has decreased slightly since 2005 (1.47) however it remains higher than the cumulative incidence rate of 0.90 (all colonization 1999-2006).



A trend analysis was conducted to see if the rates of VRE differ significantly over the past 8 years (1999-2006) and the past 2 years (2005 & 2006). The overall number of cases per year and the Chi-square test for trend results are presented in Table 2.

Table 2.

	1999	2000	2001	2002	2003	2004	2005	2006	X ²	p-value
Overall	215	263	234	375	430	519	1001	906	1307.57	<.0001
Overall							1001	906	4.73	0.03

Table 3. 2006 VRE incidence rates by region²

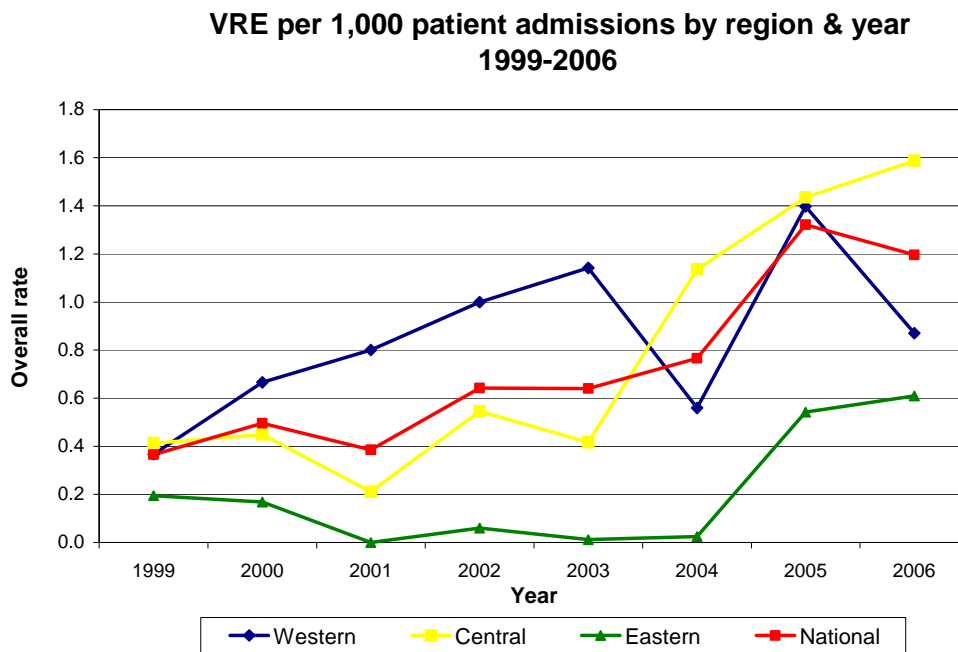
In 2006, VRE incidence rates (per 1,000 patient admissions & 10,000 patient days) in Central Canada were higher than the national rate.

	Rate per 1,000 admissions (number)			Rate per 10,000 days (Number)		
	All*	Infection	Colonization	All*	Infection	Colonization
Western	0.87 (270)	.07 (21)	0.8 (249)	1.30 (270)	0.10 (21)	1.20 (249)
Central	1.59 (590)	0.05 (19)	1.54 (571)	1.86 (590)	0.06 (19)	1.79 (571)
Eastern	0.61 (46)	0.04 (3)	0.57 (43)	0.64 (46)	0.04 (3)	0.59 (43)
Overall	1.20 (906)	0.06 (43)	1.14 (863)	1.52 (906)	0.07 (43)	1.45 (863)

* includes all newly identified VRE positive cultures (i.e. infections and colonizations).

Figure 3. VRE incidence rates per 1,000 patient admissions by region and year from 1999-2006

Since 2003, both Central and Eastern Canada show an upward trend in VRE incidence per 1,000 patient admissions.



² **Western** includes CNISP hospitals in British Columbia, Alberta, Saskatchewan, Manitoba; **Central** includes CNISP hospitals in Ontario and Quebec; and **Eastern** includes CNISP hospitals in Newfoundland and the Maritimes.

Figure 4. VRE incidence rates per 10,000 patient days by region & year from 1999-2006

Since 2003, both Central and Eastern Canada show an upward trend in VRE incidence per 10,000 patient days

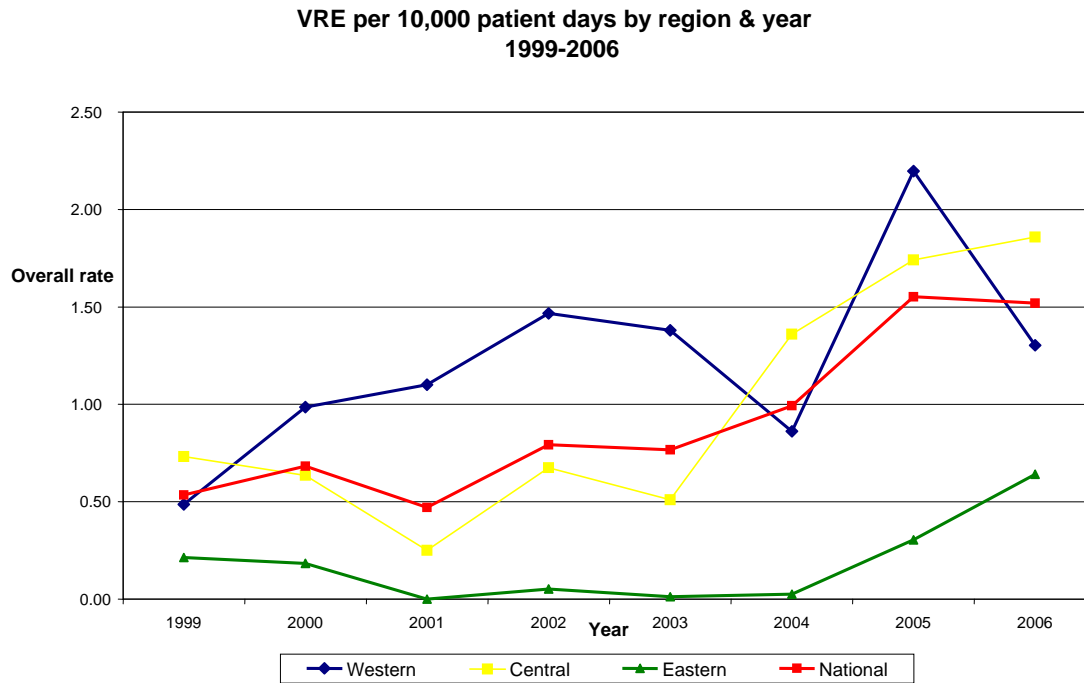
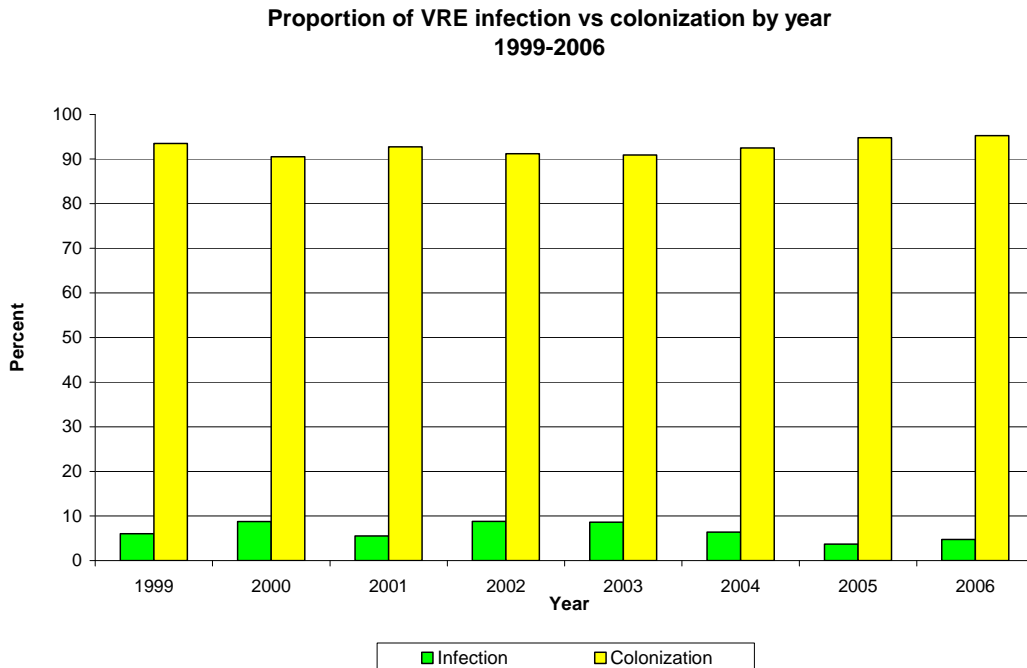


Figure 5. VRE infection and colonization 1999-2006

Among all newly identified positive cultures, the proportion identified as representing a VRE infection has ranged from a low of 3.7% (2005) to 8.8% (2002). In 2006, 4.75% of all positive VRE cultures were identified as coming from an infected site, less than the cumulative percentage of infection of 5.88% (all infections 1999-2006).



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 - Janeway Site
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