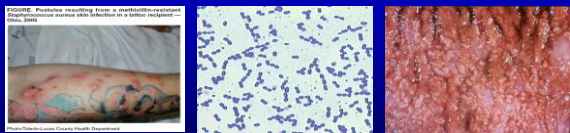


Prevalence of MRSA, VRE, and *Clostridium difficile* in Canadian Hospitals



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I have no disclosures or conflicts to declare.

MRSA, VRE, *C. difficile* Impact

- **attributable mortality and morbidity**
(Cosgrove, Clin Infect Dis 2003; DiazGranados, Clin Infect Dis 2005; Miller, Clin Infect Dis 2010)
- **prolonged length of hospital stay**
(Cosgrove, Infect Control Hosp Epidemiol 2005; McDonald, Emerg Infect Dis 2006)
- **excess/attributable costs**
(Kim, Infect Control Hosp Epidemiol 2001; Carmali, Arch Intern Med 2002; Dubberke, Clin Infect Dis 2008)

MRSA, VRE, and CDI in Canada

Organism	Year	Incidence	
		per 1,000 admissions	per 10,000 patient-days
MRSA ¹	2007	8.2	11.0
VRE ²	2007	2.4	3.3
CDI (nosocomial) ³	2005	4.6	6.5

¹Simor, Infect Control Hosp Epidemiol 2010; ²Embil, ECCMID 2009; ³Gravel, Clin Infect Dis 2009

Objectives

- to determine the prevalence of MRSA, VRE, and CDI in Canadian hospitals
- to determine institutional characteristics associated with MRSA, VRE, and CDI prevalence rates

Methods

- **Design**
1-day point-prevalence survey (Nov. 8-21, 2010)
- **Study population**
adults hospitalized in acute-care hospitals with > 49 inpatient beds

Methods

Case definitions

MRSA/VRE: patients in ARO precautions on the day of the survey; culture-confirmed; NHSN criteria for infection

CDI: patients receiving treatment for lab-confirmed CDI, or PSC within 14 days

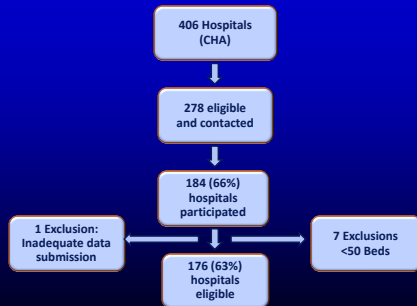
Methods

Data collection

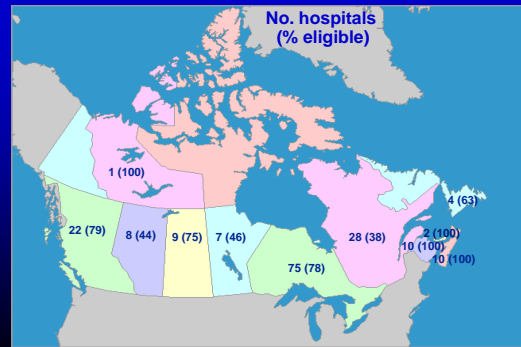
Patients: demographic, clinical, epidemiologic data extracted from medical records

Hospitals: number of inpatients on survey date, hospital characteristics, infection prevention and control policies

Participating Hospitals



Participating Hospitals (176)

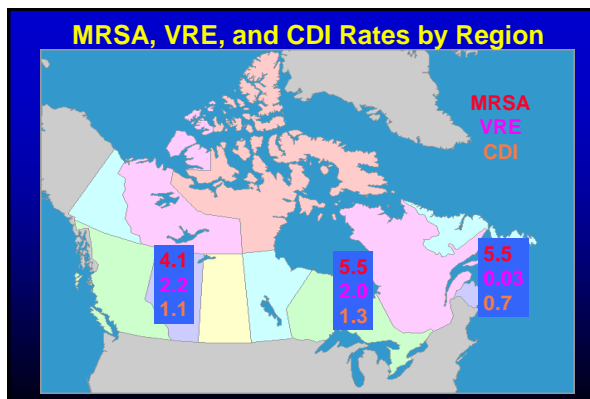
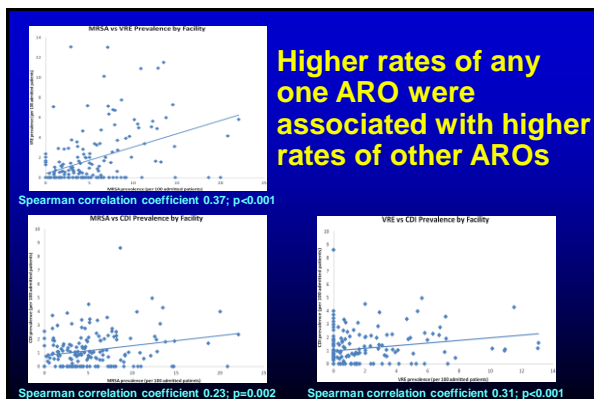


Participating Hospitals (176)

- Region:**
 - East: 26 (15%)
 - Central: 103 (59%)
 - West: 46 (26%)
- Size:**
 - ≤ 200 beds: 92 (52%)
 - 201-500 beds: 74 (42%)
 - > 500 beds: 10 (6%)
- Type:**
 - teaching: 55 (31%)
 - non-teaching: 121 (69%)

Point-Prevalence Results

Organism	No. patients	Prevalence per 100 inpatients (95% CI)
Any ARO	2,895	7.5 (7.2-7.8)
MRSA		
Overall	1,930	5.0 (4.8-5.2)
Infection	246	0.6 (0.5-0.7)
VRE		
Overall	782	2.0 (1.9-2.1)
Infection	24	0.06 (0.04-0.08)
CDI	485	1.3 (1.2-1.3)



MRSA, VRE, and CDI Prevalence Rates

- MRSA, VRE, and CDI rates did not vary by:
 - hospital size
 - annual # admissions
 - teaching vs nonteaching facility
 - # FTE ICPs or # ICPs/100 beds
 - presence of a hospital epidemiologist

MRSA, VRE, and CDI Prevalence in Canadian Hospitals

Variable	MRSA	VRE	CDI
Mean age (yrs)	70.4	71.0	75.8
% male	55	53	44
% infected	13	3	100
% community acquisition	21	4	16
% 1 st identified, current admission	43	56	
% another ARO	12	12	20

Impact of Infection Prevention and Control Policies on ARO Prevalence

- screening ICU patients associated with higher prevalence of MRSA (6.1% vs 4.4%; p=0.006) and VRE (2.6% vs 1.3%; p<0.001)
- use of surgical mask (3.3% vs 5.6%; p=0.002) and decolonization (3.2% vs 5.5%; p=0.008) associated with lower MRSA rates
- enhanced housekeeping/cleaning associated with lower VRE rates (1.2% vs 2.7%; p=0.001)

Prevalence of MRSA, VRE, and CDI in Canadian Hospitals

Study strengths

- case-ascertainment complete (or nearly so)
- representative, cross-Canada sample
- data regarding prevalent colonized and infected cases
- will permit analysis of hospital variables associated with prevalent rates

Prevalence of MRSA, VRE, and CDI in Canadian Hospitals

Study limitations

- cultures not necessarily confirmed on survey day (may overcall MRSA, VRE)
- adults only; not pediatrics, and not rehab, psychiatric, or long-term care facilities

Prevalence of MRSA, VRE, and CDI in Canadian and US Hospitals

Organism	Prevalence (per 100 inpatients)	
	CAN	US ^{1,2}
MRSA		
overall	5.0	4.6
infected	0.6	3.4
VRE		
overall	2.0	¹ Jarvis, AJIC 2007 (1,237 [24%] hospitals)
infected	0.06	² Jarvis, AJIC 2009 (648 [12.5%] hospitals)
CDI	1.3	1.3

Summary

- 1st national prevalence data for MRSA, VRE, and CDI in Canadian adult acute-care hospitals
- the organisms were most often nosocomial or healthcare-associated
- MRSA and VRE most often from colonized patients identified during hospital screening

Summary

- regional differences in ARO screening and hospital infection prevention and control policies across the country
- impact of the various measures on prevalence rates needs to be better understood