

VICNISS: a statewide surveillance  
program for hospital-acquired infections in  
acute-care Victorian public hospitals

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# Report of the Victorian Health Department Expert Working Group on Surveillance of Nosocomial Infections 2000

- Components of the US NNIS system to be adopted for the surveillance of hospital-acquired infections in Victorian hospitals >100 beds
- Targeting surgical-site, adult & paediatric intensive care surveillance, & high-risk nursery modules
- Establishment of a Coordinating Centre

# VICNISS Coordinating Centre Functions

- Develop and support a standardised hospital infection surveillance program in acute care hospitals
- Collect & aggregate infection rates, and facilitate hospital/state aggregate comparisons, notify “outliers”
- Feed data back to hospitals (quarterly), Department of Human Services & through publication
- Research

# Consultation Structures

- Advisory Committee of key stakeholders
- Technical Advisory Committee

# VICNISS Data Confidentiality

- Aggregate statewide data released
- De identified hospital level data released this year, identified hospital level data soon
- No surgeon level data reported to VICNISS

# VICNISS: Surveillance of Surgical Site Procedures

- Coronary artery bypass grafts
- Hip replacement
- Knee replacement
- Caesarean section
- Cholecystectomy
- Abdominal aortic aneurysm repair
- Appendicectomy
- Cardiac procedures
- Colon surgery
- Craniotomy
- Femoropopliteal bypass
- Gastric surgery
- Hernia repair
- Mastectomy
- Ventricular shunt insertion

# VICNISS Surgical Data (Nov 02 – Feb 06)

Data on infections after:

- 6031 coronary artery bypass grafts
- 6280 hip prosthesis
- 4071 knee prosthesis
- 9488 Caesarean sections

Surgical antibiotic prophylaxis: > 25,000 procedures

# Risk Adjustment for Surgical Site Infections

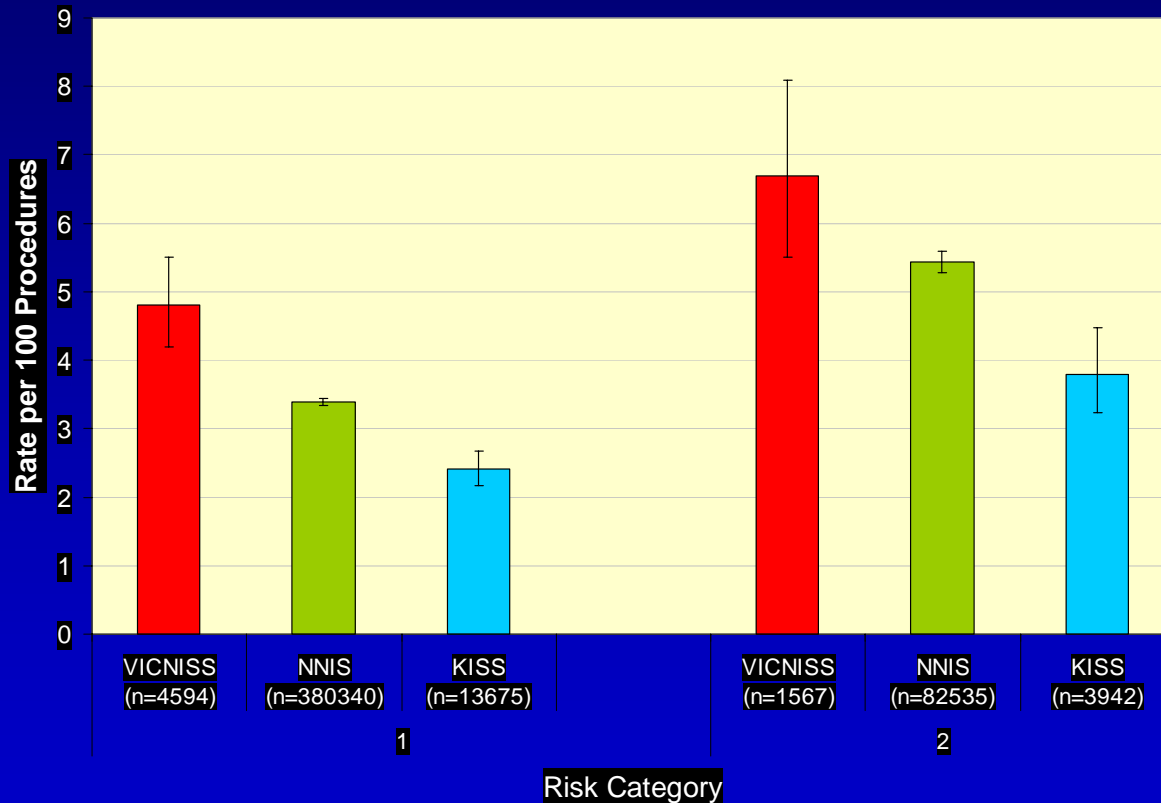
## Basic NNIS SSI Risk Index:

- Wound Class: Contaminated or Dirty
- ASA Score of 3, 4, or 5
- Duration of operation  $> T$  hours, where  $T$  varies by operation, 75th percentile

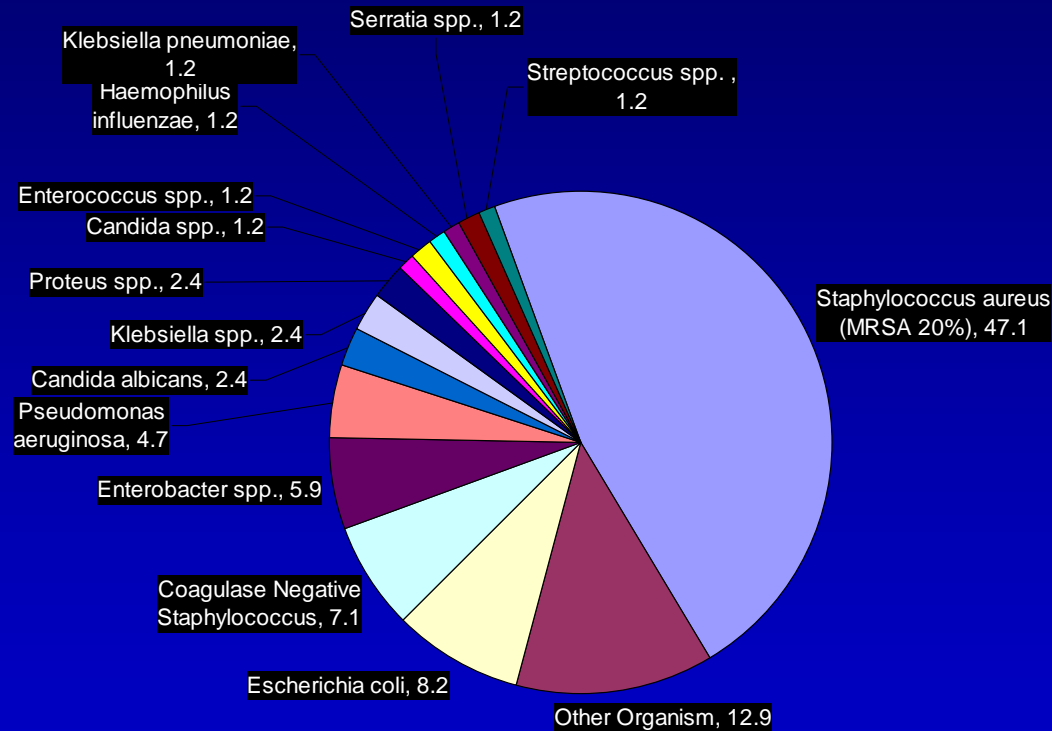
Risk Index predicts infections better than wound class alone

Works reasonably well for many, but not all, operations

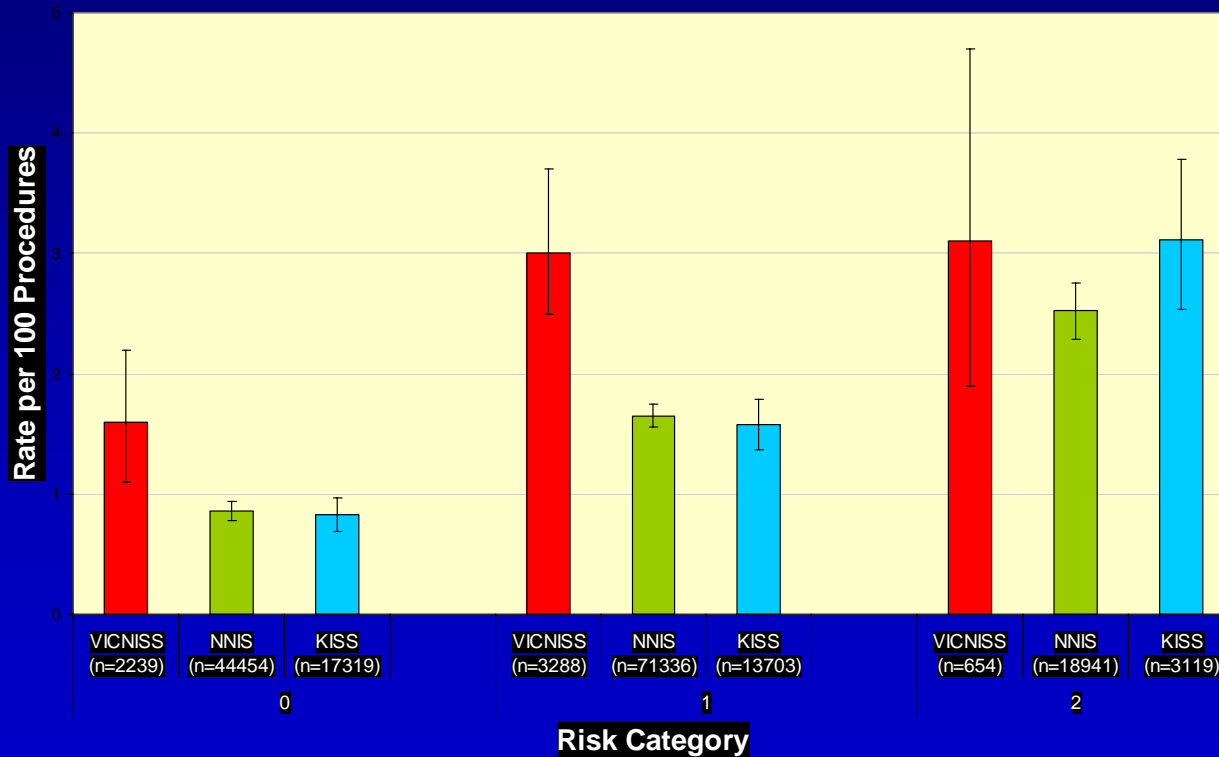
# Comparison of Surgical Site Infection Rates - Coronary Artery Bypass Grafts



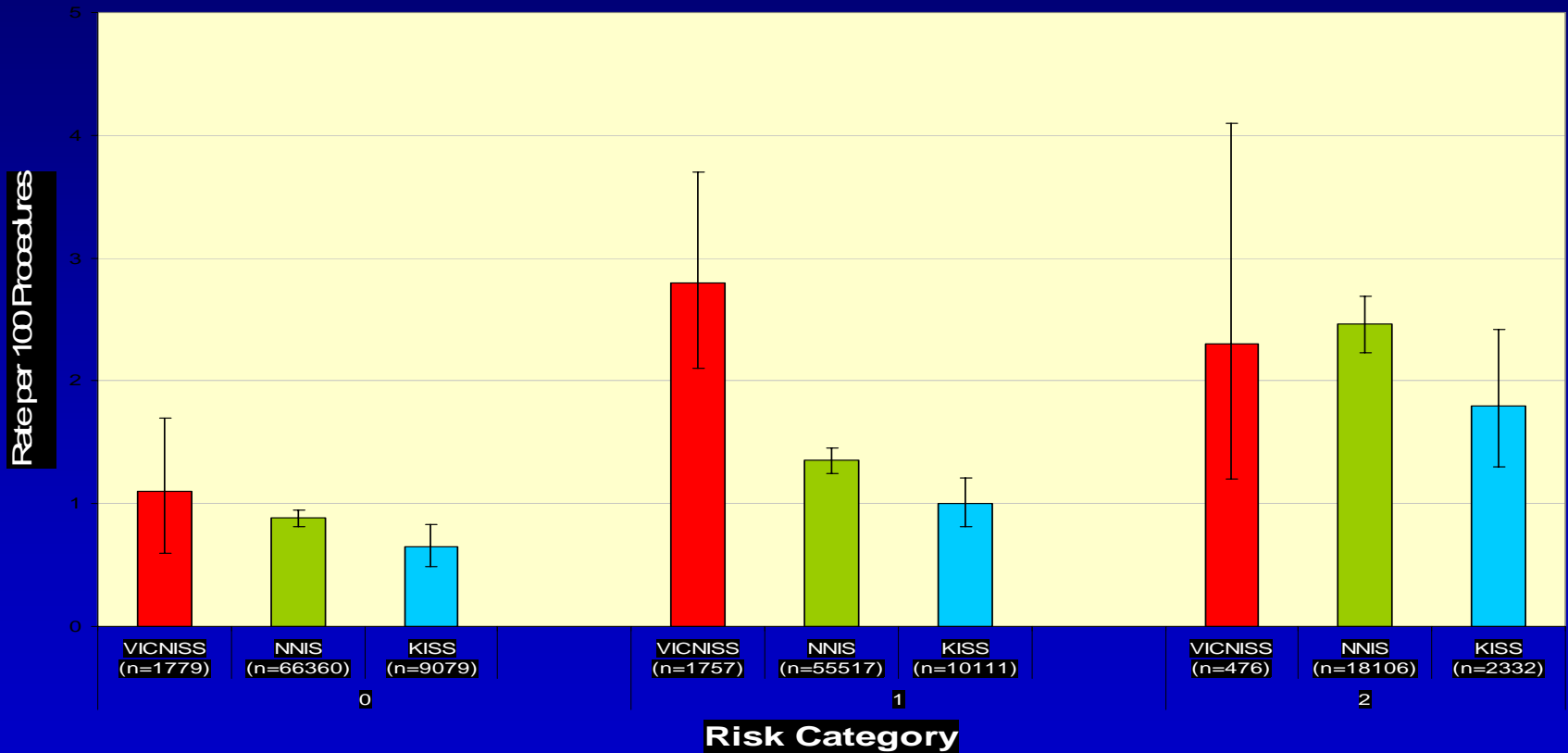
# Pathogen frequency- Coronary Artery Bypass Graft SSIs



# Comparison of Surgical Site Infection Rates - Hip Arthroplasty



# Comparison of Surgical Site Infection rates - Knee Arthroplasty

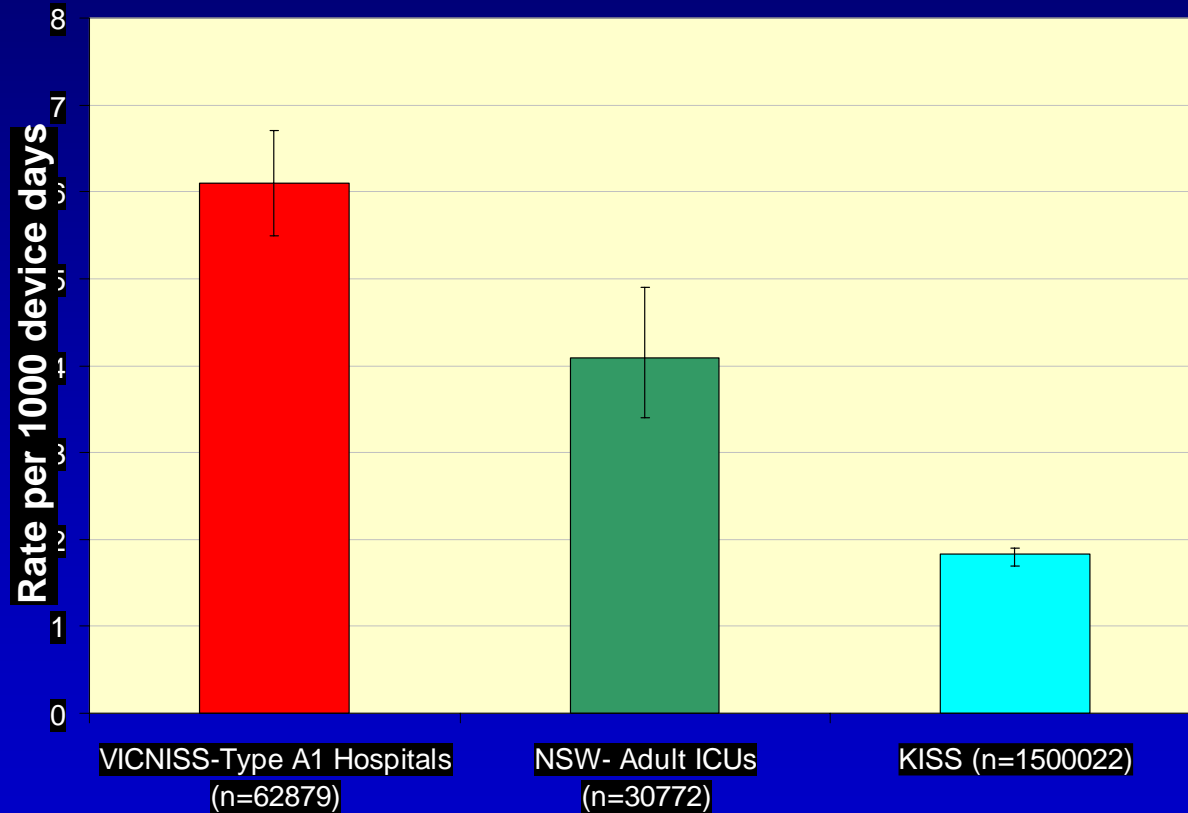


# ICU Reports

## Adult ICUs:

- Central line-associated bloodstream infections
- Ventilator-associated pneumonia
- ICUs grouped by type

# ICU Central- line associated Bloodstream Infections



# Surgical Prophylaxis- Antibiotic Choice

2002-2005

<b>Surgical Procedure/ Number</b>	<b>Concordant (%)</b>	<b>Adequate not concordant (%)</b>	<b>Inadequate (%)</b>	<b>Unknown (%)</b>
Appendicectomy (474)	8.0	11.4	76.4	4.2
Cardiac (3866)	46.5	45.8	2.3	5.4
Cholecystectomy (1640)	53.8	10.1	34.8	1.3
Colon (1644)	36.5	41.1	21.5	1.0
Hysterectomy (980)	41.3	0.5	56.7	1.4
Orthopaedic (9818)	68.3	22.3	8.6	0.8

# Surgical Prophylaxis- Antibiotic Timing 2002-2005

Surgical Procedure/ Number	Concordant (%)	Non- concordant (%)	Unknown (%)
Appendectomy (225)	28.9	23.5	47.6
Cardiac (3789)	57.8	15.6	26.6
Cholecystectomy (1195)	31.6	42.5	25.8
Colon (1513)	50.1	20.1	29.8
Hysterectomy (844)	47.0	33.2	19.8
Orthopoedic (9082)	68.7	11.1	20.1

# Influenza vaccination uptake in health care workers Victoria 2005:

State aggregate results (n=67):

Major category	Minor category	Number of staff	Percentage vaccinated
Clinical	Medical	5408	29.7
	Nursing	19380	35.8
	Allied	4529	46.0
	Other	7226	50.9
Non Clinical		5529	37.4
Laboratory		740	41.6

# Hospital Performance Indicators

- Timeliness
- Data quality
- Data volume

# Limitations

- Validation of data collection,
- Risk adjustment validation and refinement
- Incompleteness of documentation
- Surveillance definitions
- Completeness
  - pathogens, post discharge SSIs
- Sample size
- Operation duration – international differences
- Comparison NNIS hospitals, not all US hospitals

# “Type 2” Hospitals

90 smaller predominately rural hospitals

limited surgery, no ICUs

3 Hospital subcategories

- Small (1-14 acute beds)
- Medium (15-49 acute beds)
- Large (50-100 acute beds)

# Type 2 Surveillance Program (2006)

## *Process surveillance modules*

- Surgical Antibiotic Prophylaxis
  - Choice
  - Timing
  - Duration
- HCWs Measles Vaccination
- HCWs Hepatitis B Vaccination
- Peripheral Venous Catheter Use

# Type 2 Surveillance Program (2006)

## *Outcome Indicator Surveillance Modules*

1. Surgical Site Infections
2. Surgical Infection Report
3. Primary Laboratory Confirmed Bloodstream Infections
4. Multi Resistant Organisms (MRSA & VRE infections)
5. Outpatient Haemodialysis Events
6. Occupational Exposures to bloodborne pathogens

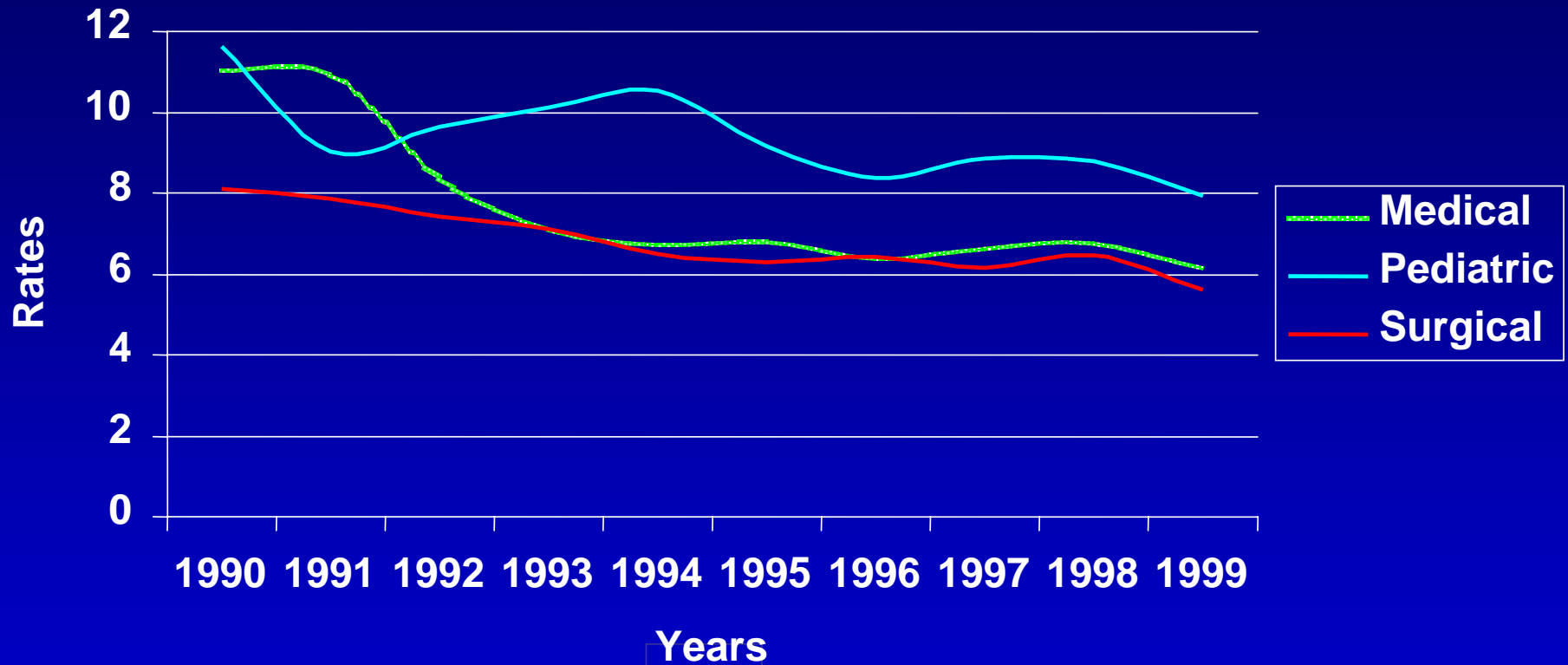
# Hepatitis B Vaccination- Type 2 Hospitals

<b>Objective (35 participating hospitals)</b>	<b>Frequency</b>
Documented Hepatitis B policy	97.1%
Hepatitis B policy consistent with guidelines	68.6%
Total staff vaccinated with confirmatory blood tests	61.7%

# Peripheral Venous Catheter Use- Type 2 Hospitals

<b>Objective (11 participating hospitals)</b>	<b>Frequency</b>
Hospitals with usage guidelines	100%
Insertion Site- upper limb	87.3 %
PVCs with no topical antimicrobial	87.7%
PVCs with sterile dressing	91.6%
Daily inspection of PVCs	86.0%
PVCs removed or replaced within 96 hours	89.2%
Infectious Complications/ Phlebitis	7.4%

# Trends in Bloodstream Infection Rates\* by Type of ICU\*\*. NNIS System, 1990-1999



\* Central line associated bloodstream infections per 1000 central-line days

\*\* MMWR Vol. 49 (8), March 3, 2000

# Sustained Reduction of Central Line Associated Bloodstream Infections in a large Healthcare System (Pittsburgh 2006)

## Bundles:

- Documented barriers and antisepsis
- Mandatory education
- Chlorhexidine antisepsis and CHG/Ag catheters
- Maximal barrier precautions- large drape, sterile gown, mask, hat
- Monthly process measure compliance goals and rates

# ICU CL-Bloodstream infections/1000CL Days

Pittsburgh

	Baseline 1/02-6/02	FY 04	FY06
Med/Surg	2.4	0.9	0.5
Med/Surg teaching	4.0	1.0	0.9
Total of all ICU Types	4.2	1.2	1.3
Use of 5 MBPs	NC, 03- 39.6%	88.6%	97.5%

# Issues/Problems/Challenges

- Hospital software
- Communication with large numbers stakeholders
- Acceptance of definitions and methods by stakeholders (mainly VAP)
- Data validation studies
- Public reporting of hospital level data
- National consensus on methods
- Promotion of use of data to improve practise

# Conclusions

- Standardised surveillance program for hospital-acquired infection has been established in all Victorian Public hospitals, allowing hospitals to compare their risk adjusted infection rates with statewide and international data
- Examination of important process measures has identified areas for potential improvement in practise
- The program requires ongoing support and development to fulfill its full potential role in contributing to decreased infection rates and public reporting

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