

# An investigation into a cluster of surgical site infections following orthopaedic surgery



VICPA Conference 2009

VICNISS Coordinating Centre

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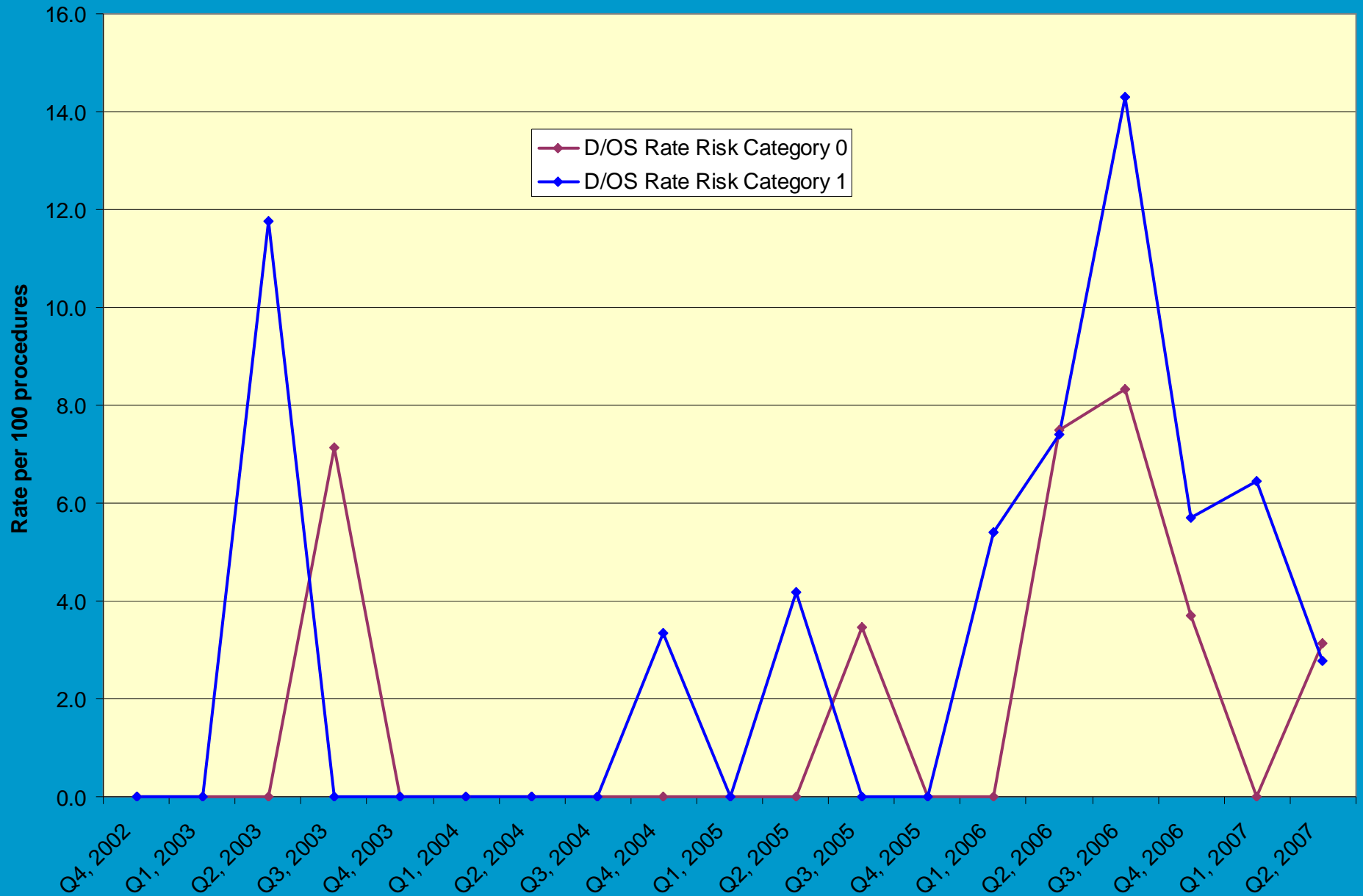
# Background

- VICNISS routinely collects data from 28 VICNISS participating Type 1 hospitals (>100 beds). Quarterly data is collated, analysed, compared to State aggregate data, and fed back to hospitals.
- 2006 - investigated a cluster of deep and organ space SSIs following joint arthroplasty at a participating VICNISS hospital where a higher than expected number of infections had occurred for the quarter.

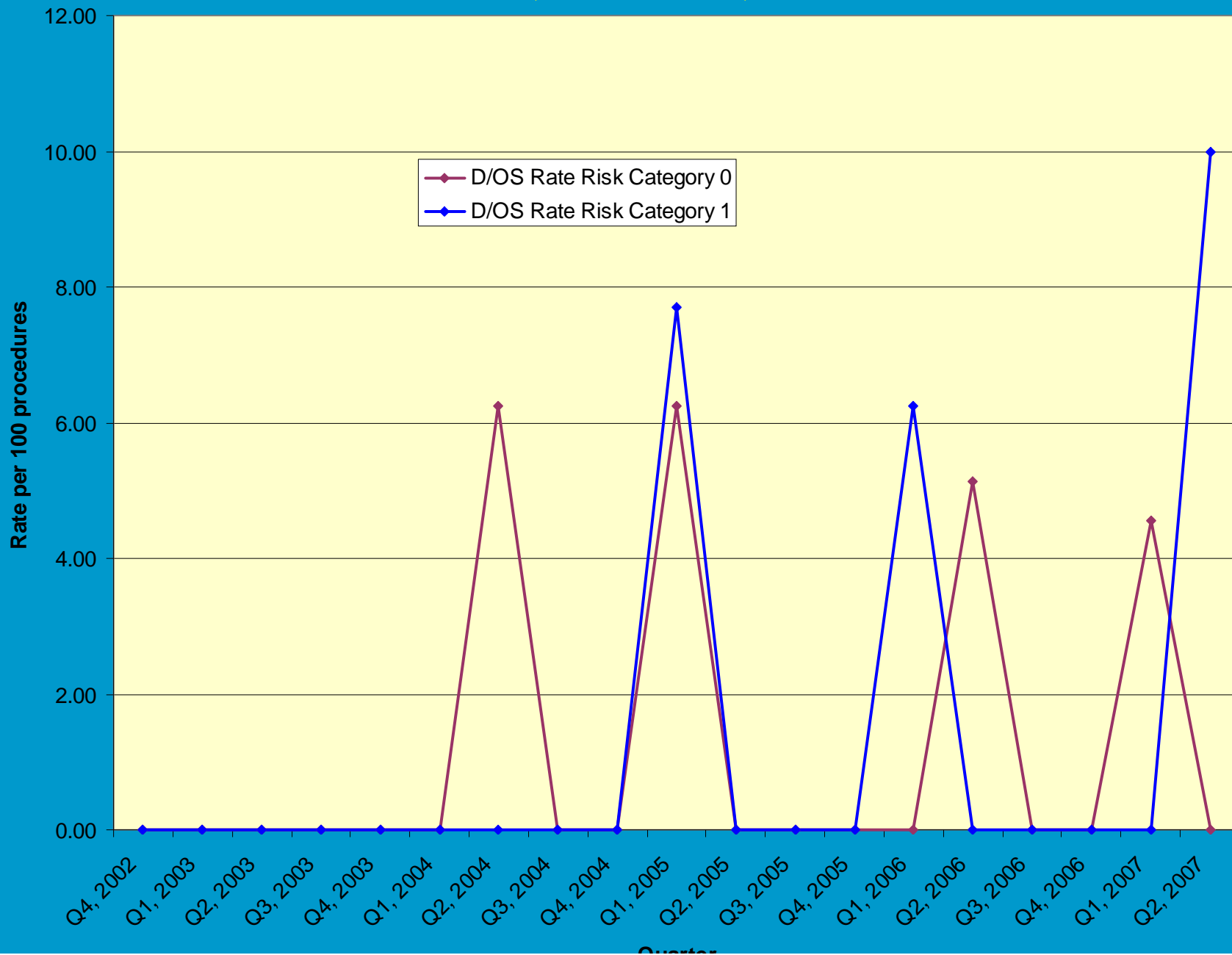
# Objectives

- Investigate potential outbreak
- Review available retrospective surgical site infection data
- Observe joint replacement procedures
- Make recommendations for improved policy and practice to reduce SSIs in joint surgery.

# Hip arthroplasty infection rates pre and post investigation Q4, 2002 - Q2, 2007



# Knee arthroplasty infection rates pre and post investigation Q4, 2002 - Q2, 2007





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# Methods

3 site visits to the hospital

- review of practices and actions undertaken by the local Infection Control Consultant
- Meetings with key stakeholders
- case control study which included
- patient and surgical risk factors,
- pathogens isolated
- antibiotic prophylaxis.

# Results

- Review of deep and/or organ space SSI following HPRO demonstrated a substantial increase in rates in Quarter 3 and, when compared to the VICNISS aggregate.
- Only factor identified in the case control study where the odds ratio was high and the result was statistically significant was admission to hospital prior to the day of procedure.

# Hip arthroplasty deep/OS SSI rates by quarter and cumulative number

<i>Quarter</i>	<i>Deep &amp; OS SSIs</i>	<i>Total procedures</i>	<i>Rate/ 100</i>
Q2, 2006	5	67	7.5
Q3, 2006	6	50	12.0
Q4, 2006	2	73	2.7
<b>Cumulative</b>	<b>21</b>	<b>822</b>	<b>2.6</b>

# Risk factors with an odds ratio > 2.0

Risk Factors	OR	P value	95% CI
<i>Admitted day prior</i>	<i>9.5</i>	<i>0.02</i>	<i>1.03 - 87.96</i>
Staff member A present vs absent	7.5	0.04	0.76 - 74.16
Fracture present	6.5	0.12	0.44 - 95.82
>3 Units blood products	5.3	0.15	0.55 - 50.02
Cutifilm vs Tegaderm (Dressing Type)	4.5	0.19	0.47 - 42.70
Staff member B present vs absent	4.5	0.22	0.32 - 63.94
Steroids < 12 months	3.75	0.09	0.74 - 18.95
Emergency operation	2.75	0.32	0.35 - 21.76
No pre-operative wash	2.75	0.32	0.35 - 21.76
Diabetes (Type2)	2.75	0.27	0.42 - 18.24

# Recommendations

- Give vancomycin SAP for ALL joint replacement surgeries - review after 3/12
- Immediate engagement of a specialist consultant to conduct a review of sterilising services against AS 4187 Keep traffic in and out of theatre during procedures to a minimum
- Keep staff numbers in theatre during procedure to a minimum
- Cease use of flash steriliser immediately
- Admit patients on same day of surgery
- Segregation of pre-op and post-op patients to decrease risk of colonisation
- Maintain high index of suspicion for SSI for all patients following TJRs
- Typing of all MRSA and MSSA organisms isolated from TJRs
- Appropriate ABPx, administered on time and does not exceed 24 hours post procedure
- Remove drain tubes at 24 hours post procedure and, re-infusion drain tubes at 6 hours

# Recommendations cont..

- Ensure optimum pre-op glucose control in all diabetic patients
- Ensure patient core temperature maintained
- Consider 1 pre-op wash for every day in hospital to reduce risk of skin colonisation
- Infection Control resources be increased to ensure optimum levels of surveillance for hospital acquired infections are maintained and that leave is adequately covered
- Engineering reports which include HEPA filter maintenance and testing results and, air exchanges achieved per hour in the orthopaedic theatre to be routinely forwarded to Infection Control

# Conclusion

- Case control study results - unlikely due to a single source outbreak, but occurred due to several sources related to a number of processes.
- VICNISS recommended a number of preventative measures:
  - change antibiotic prophylaxis prescribing,
  - comprehensive review of theatre and sterilising practices,
  - enhanced engineering controls
  - targeted staff education.
- Further analysis of trends over time demonstrated an intermittent rise in knee arthroplasty SSI in Risk Category 1 despite a number of recommendations and interventions put in place.
- VICNISS and the health service continues to monitor the data review practices and recommend ongoing interventions.



“To address this mistake we must use root-cause analysis. I’ll begin by saying it’s not my fault.”

# Acknowledgements

- Staff at regional hospital, particularly ICC
- DHS Victoria
- Ann Bull VICNISS (Case Control)