

## Data collection forms 2 & 3:

- HAI-specific information
- Isolate information including AMR

**Surgical Site Infection**

Patient's name  
(not included in database)

Q1 Serial number from Survey 112

Q2 Type of SSI

- Superficial  
 Deep  
 Organ space

Q3 Date of operation

/  /

Q4 Endoscopic approach

Yes  No

Q5 General anaesthetic  
this operation

Yes  No

Q6 Date of surgical site infection

/  /

Q7 SSI operation class

- Clean  
 Clean / contaminated  
 Contaminated  
 Dirty / Infected

Q8 Surgical site

- Head / Neck  
 Chest  
 Abdomen  
 Urogenital tract  
 Upper limb  
 Lower limb

Q9 SSI culture result

- Positive  
 Negative  
 Unknown  
 Not done

Q10 Antibiotic RX for infection

Yes  No

Q11 SSI

- Community acquired  
 Hospital acquired

Q12 Certainty of diagnosis

- Possible  
 Probable  
 Certain

Enter isolate information on Survey 20 form



**ISOLATE INFORMATION**

14/01/00

Q1 Link to Survey number: <input type="text"/>	Q2 Link to Serial number: <input type="text"/>	Q3 Date of specimen <input type="text"/> / <input type="text"/> / <input type="text"/>
Q4 Type of specimen received		
<input type="checkbox"/> Blood culture	<input type="checkbox"/> Tissue, organs, bone	<input type="checkbox"/> CSF
<input type="checkbox"/> Incisional site drainage	<input type="checkbox"/> Nonsurgical site drainage	<input type="checkbox"/> Swab
<input type="checkbox"/> Trapped sputum/Trac.sec	<input type="checkbox"/> Expectorated sputum	<input type="checkbox"/> Urine
<input type="checkbox"/> Vascular catheter tip	<input type="checkbox"/> Other specimens	<input type="checkbox"/> Drainage from organ space
<input type="checkbox"/> Fibre optic endoscopy	<input type="checkbox"/> Stool or rectal swab	
Q5 Hospital code <input type="text"/>	Q6 Ward code <input type="text"/>	Q7 Was 1st isolate considered clinically significant? Yes <input type="checkbox"/> No <input type="checkbox"/>
		Q8 Was 1st isolate considered clinically significant? Yes <input type="checkbox"/> No <input type="checkbox"/>
Q9 Sensitivities 1st isolate	Q10 Sensitivities 2nd isolate	Q11 Pathogens
Amikacin	Amikacin	Methicillin Sen S. aureus
Amphotericin	Amphotericin	Methicillin Res S. aureus
Amoxicillin	Amoxicillin	Coag neg staphylococci
Ampicillin	Ampicillin	Group A Streptococcus
Azlocillin	Azlocillin	Group B Streptococcus
Aztreonam	Aztreonam	Strep. pneumoniae
Cefaclor	Cefaclor	Other streptococci
Cefixime	Cefixime	Enterococcus
Cefotaxime	Cefotaxime	S. viridans
Ceftazidime	Ceftazidime	Other Gram positive aerobes
Ceftriaxone	Ceftriaxone	Gram-positive anaerobes
Cefuroxime	Cefuroxime	Citrobacter spp.
Chloramphenicol	Chloramphenicol	Enterobacter spp.
Ciprofloxacin	Ciprofloxacin	E. coli
Clindamycin	Clindamycin	K. pneumoniae
Erythromycin	Erythromycin	Other Klebsiella spp
5-Flucytosine	5-Flucytosine	Proteus mirabilis
Fluconazole	Fluconazole	Other Proteus spp
Fusidic acid	Fusidic acid	S. marcescens
Gentamicin	Gentamicin	Other Serratia spp.
Imipenem	Imipenem	Enterobacter spp
Meropenem	Meropenem	Serratia spp
Methicillin	Methicillin	Acinetobacter spp
Metronidazole	Metronidazole	H. influenzae
Netilmicin	Netilmicin	Pseudomonas aeruginosa
Nitrofurantoin	Nitrofurantoin	Other Pseudomonas spp
Ofloxacin	Ofloxacin	Other Gram negatives
Penicillin	Penicillin	B. fragilis
Piperacillin	Piperacillin	Other Bacteroides spp
Rifampicin	Rifampicin	Clostridium spp
Taz/Pip	Taz/Pip	Other Gram-neg. anaerobes
Teicoplanin	Teicoplanin	Other bacteria
Tetracycline	Tetracycline	Candida albicans
Tobramycin	Tobramycin	Other Candida spp.
Trimethoprim	Trimethoprim	Torulopsis spp.
Vancomycin	Vancomycin	Aspergillus spp.
Extra 1	Extra 1	



# Why automated data entry (ADE) using manual questionnaires & optical scanning?

- System accessible to all HCFs – once questionnaires completed, sent to centralized data processing unit -> cost effective; rapid feedback
- Patient-based, not isolate-based
- ICN at cold interface; not in office / laboratory
- Improved speed & accuracy of data entry; substantial cost savings [[Infect Control Hosp Epidemiol. 1997 Jul; 18\(7\):486-491](#)]
  - 22-fold productivity increase cf. manual data entry (MDE) with validation
  - Saving of \$ 0.63 [~ R 4.12] per questionnaire in clerical time
  - After validation, error rate of < 0.2 errors / 1000 responses (ADE) vs. 12.4 errors / 1000 responses (MDE)

# Active infections (# 2672 patients):

- Surgical site infection
  - 3.0%
- Bloodstream infection
  - 5.01%
- Urinary tract infection
  - 1.53%
- Respiratory tract infection
  - 2.88%



# Service groups and infection rates:

Service groups	BSI rate	UTI rate	RTI rate	SSI-all	SSI-surgical	Prevalence rate for 4 active infections surveyed
Medical	4.7	3.0	1.6	0.3	0.5	8.7
Surgical	4.1	0.9	2.2	2.7	3.5	8.4
Intensive Care	12.5	4.5	17.9	1.8	2.3	28.6
Gynaecology and Obstetrics	0.6	0.6	0.9	1.7	3.3	3.5
Paediatrics	10.2	1.1	4.9	0.2	0.3	16.5
Other services	2.2	0.4	1.8	0.4	0.9	4.02

# Risk factors: 63.9% (1695/2652) of patients had 1/> listed risk factors:

- Urinary catheter: 19.9% of patients
  - Median duration of catheter = 4 days
  - 4.2% of patients with urinary catheter developed a UTI
  - 0.8% of patients without urinary catheter developed a UTI
- Peripheral vascular catheter: 52.9% of patients
  - Median duration of PVC = 3 days
  - 6.4% of patients with PVC developed BSI
  - 3.4% without PVC developed BSI
- Central intravascular catheter: 7.85%
  - Median duration of CVC = 5 days
  - 15.9% of patients with CVC developed BSI
  - 4.1% without CVC developed BSI

# Risk factors: 63.9% (1695/2652) of patients had 1/> listed risk factors:

- Mechanical ventilation: 4.2% of patients
  - 20.5% of patients with mech vent developed a LRTI
  - 2.0% without developed LRTI
- Others:
  - Immunodeficiency: 12.1% of patients
  - Parenteral nutrition: 2.8% of patients
  - Neutropaenia: 2.7% of patients
  - Non-surgical skin breaks: 13.3% of patients
  - Non-surgical invasive procedures: 14.7% of patients
- Antibiotics: 56.8% (1494/2630) of patients received antimicrobials during this admission
  - Indication: Specific 16.6%; Empirical: 67.8%; Surgical prophylaxis: 9.7%; Other: 5.9%





# AN OVERVIEW OF THE GAUTENG PROVINCIAL MULTI-HOSPITAL PREVALENCE SURVEY





# Survey findings: general comments

- The need to obtain consent was discarded after discussions
- The overall response rate was 48.5 % (5828 survey questionnaires out of 12000 distributed questionnaires were returned in total upon completion of the survey)
- Hospitals with response rate of 30% and less: 7 (30%)
- Number of forms discarded on the basis of missing values (not filled in at all/inappropriately filled in) in vital categories of the survey questionnaire: 1500 (26% of the available data set)
- Hospitals that returned less than 10 antibiogram forms in total = 19 (82.6%)
- Hospitals that returned survey forms with less than 2% HCAI observed: 19 (82.6%)
- Hospitals that returned forms with 0% HCAI observed = 7 (30.4%)

## OVERALL PREVALENCE OF HCAI:

Prevalence Survey	Total no. of patients surveyed	No. of patients with HCAI	Prevalence rate	95% CI
4 hospitals	1921	167	8.7%	8.6-8.8

## GENERAL PREVALENCE BY INFECTION TYPE:

Infection type	Prevalence of HCAI by infection type	95% CI
Surgical site infection	1.6	1.59 – 1.61
Primary blood stream infection	3.5	3.46 – 3.53
Urinary tract infection	1.0	0.99 – 1.01
Pneumonia	2.6	2.57 – 2.63

## SERVICE GROUPS AND INFECTION RATES:

Service groups (n= total number of surveyed patients)	PBI rate	UTI rate	RTI rate	SSI rate	Prevalence rate of HCAI
Critical Care Medicine (276)	12.0	0.7	5.4	0.7	18.1
Paediatric Medicine (188)	2.7	3.2	6.9	0.0	11.7
Neurosurgery (60)	1.7	5.0	8.3	3.3	18.3
Burns Care (81)	14.8	0.0	2.4	6.2	22.2
Trauma & Orthopaedics(280)	2.5	0.7	0.4	2.9	6.4
General Medicine (448)	1.1	0.7	2.2	0.0	4.0
General Surgery (247)	0.4	0.0	0.0	2.4	3.2



## DEVICE USAGE IN SURVEYED PATIENTS:

Risk factor	Total number of patients	% of patients	Pilot Study results: % of patients
Peripheral vascular catheter (PVC)	1212	63.1%	52.9%
Central venous catheter (CVC)	127	6.6%	7.85%
Urinary catheter (UC)	431	22.4%	19.9%
Mechanical ventilation	130	6.8%	4.2%

## ANTIBIOTIC USAGE PATTERNS IN ASSOCIATION WITH HCAI:

Hospital	% of patients on IV antibiotics	% of patients with HCAI on IV antibiotics
Hospital#1	37.5	57.0
Hospital#2	29.8	70.5
Hospital#3	40.9	72.7
Hospital#4	48.5	72.7

## MICRO-ORGANISMS ISOLATED:

- The three most isolated pathogens were *S. aureus* (16.8%), *P. aeruginosa* (14.5%) and *K. pneumoniae* (14.5%)
- The most isolated gram positive-organism was *S. aureus* and the most isolated gram-negative organisms were *P. aeruginosa* and *K. pneumoniae*
- The predominant ESBL-producing organism was *K. pneumoniae* (37.0%) of the total *K. pneumoniae* isolates
- Other organisms of note were *A. baumannii* (10.7%) and *E.coli* (8.4%)



## INFECTION TYPE AND PATHOGEN PROFILE:

- *E. coli* was isolated from 43.8% of cases of UTIs reported,
- *S. aureus* in 36.4% of cases of reported SSIs,
- *P. aeruginosa* in 40% of reported pneumonia cases, and
- *S. aureus* and *K. pneumoniae* made up 24.0% and 27.3% respectively of cases of reported PBIs

## Feedback:

- Lack of motivation - no incentives provided and not given freedom from other duties during the conduct of the survey
- Pressure to finish at a certain time and were often rushed, hence more prone to mistakes
- „Step-down wards or hospitals’ were often not surveyed
- A longer length of training, and more regular training exercises
- More time to conduct the survey



# AN OVERVIEW OF THE GAUTENG PRIVATE MULTI-HOSPITAL STUDY



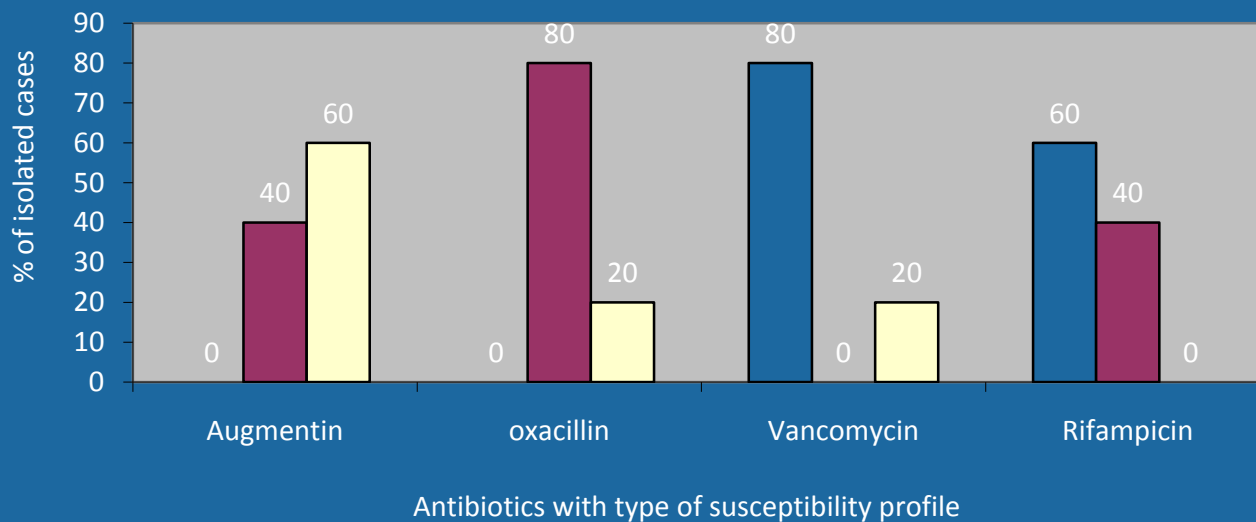


Prevalence Survey	Total no. of patients surveyed	No. of patients with HCAI	Prevalence rate	95% CI
3 hospitals	691	51	7.40%	7.32-7.48

Hospital	Total patients surveyed (% from the total number = 691)	Number of patients with HCAI (% from the total number = 51)	Prevalence rate	95% confidence interval
1	211 (30.5%)	23 (45.1%)	10.90	10.83 – 11.06
2	194 (28.1%)	13 (25.5%)	6.70	6.67 – 6.80
3	286 (41.4%)	15 (29.4%)	5.24	5.21 – 5.32

Infection type	Prevalence of HCAI by infection type (95% CI)	Percentage of infection to the total number of patients that had an HCAI present at the time of survey (n=51)
Surgical site infection	2.60 (2.58-2.64)	35.30%
Primary blood stream infection	1.01 (1.00-1.03)	13.72%
Urinary tract infection	1.59 (1.58-1.60)	21.56%
Pneumonia	2.16 (2.15-2.19)	29.42%
Total for all infection types	7.40 (7.32-7.48)	100%

MRSA : Results shown based on those isolates with available susceptibility patterns



■ Sensitive to antibiotic ■ Resistant to antibiotic ■ No available susceptibility profile

# Reducing HCAs: why are we not doing better?

- **Failure to relate education to practice**
- **Infection control procedures compromised in the face of –**
  - High patient throughput
  - Low staff: patient ratio
  - High level of patient movement from hospital- to- hospital and ward-to-ward
- **Insufficient unit-based instruction and supervision**
- **Inadequate quality control for cleaning services**
- **Insufficient data available to monitor outcomes**





**Global  
Antibiotic  
Resistance  
Partnership**



**THANK YOU !**