
***CAUTI Prevalence Survey In HA Hospitals**

- Infection Rate And Local Practice

(*Catheter Associated Urinary Tract Infections)

Dr. Kitty FUNG

Infection Control Officer,

Kowloon East cluster, Hospital Authority

Jan 17, 2019

Introduction

- Urinary catheter is commonly used in healthcare settings
 - Duration of catheterization is directly related to risk for CAUTI
 - Daily increased risk of developing CAUTI ~3% to 7%
 - Outcomes associated with catheter use
 - CAUTIs - up to 30-40% of healthcare-associated infections
 - Non-infective - urethral inflammation, urethral strictures, mechanical trauma, patient discomfort and mobility impairment
-

Introduction

- CAUTI is one of the most preventable HAI
 - Strategies to prevent CAUTI
 - Prompt removal of unnecessary urinary catheters
 - Minimize unnecessary manipulation, prevent trauma, maintain a closed, patent and non-kinked system
 - Multifaceted interventions
 - Best practice guidelines, staff engagement, education and monitoring
-

2007 HAHO Report



Prevalence Survey of Nosocomial Infections (Hospital Acquired Infections) in Public Hospitals 2007


衛生防護中心
Centre for Health Protection
Infection Control Branch
感染控制處


醫院管理局
HOSPITAL
AUTHORITY
Infection Disease Control
Training Centre
感染病控制培訓中心



Prevalence Survey of Infections 2010

Modified CDC/NHSN surveillance definition used

Ranking Of Types Of HAI In 2007 And 2010 Surveys

Infection Type (2007 N=661; 2010 N=555)	2007 Count (%)	2007 Rank	2010 Count (%)	2010 Rank
Urinary tract infection	206 (31.2%)	1	97 (17.5%)	2
Pneumonia	133 (20.1%)	2	159 (28.6%)	1
Lower respiratory tract infection, other than pneumonia	70 (10.6%)	3	25 (4.5%)	7
Surgical site infection	65 (9.8%)	4	89 (16.0%)	3
Skin & soft tissue infection	64 (9.7%)	5	59 (10.6%)	5

Prevalence Of Urinary Catheter Use

Year of Survey	2007		2010	
Urinary Catheter	1,978	9.9%	2,096	10.3%
Suprapubic catheter	37	0.2%	34	0.2%
Percutaneous nephrostomy	57	0.3%	60	0.3%
*Other bladder instrumentation	44	0.2%	10	<0.1%

*Other bladder instrumentation (Intermittent catheterization, catheterization once, urethral dilation, bladder irrigation, cystoscopy, cystourethrography)

Organisms Causing Hospital-acquired UTI

	2007 Count (%)	2010 Count (%)
<i>Escherichia coli</i>	87 (42.3%)	42 (37.8%)
<i>Enterococcus spp.</i>	20 (9.7%)	9 (8.1%)
<i>Klebsiella spp.</i>	14 (6.8%)	12 (10.8%)
<i>Pseudomonas aeruginosa</i>	14 (6.8%)	13 (11.7%)



衛生防護中心
Centre for Health Protection

Recommendations on Prevention of Catheter-associated Urinary Tract Infection

2nd Edition

Scientific Committee on Infection Control, and
Infection Control Branch, Centre for Health Protection,
Department of Health

March 2017



衛生防護中心乃衛生署
轄下執行疾病預防
及控制的專業架構
*The Centre for Health
Protection is a
professional arm of the
Department of Health for
disease prevention and
control*

Recommendations on Prevention of Catheter-associated Urinary Tract Infection

Contents

Introduction	5
1. Education, Training and Competence Assessment	6
2. Avoid Unnecessary Urinary Catheterization	6
3. Shorten the Duration of Indwelling Urinary Catheterization	7
4. Proper Hand Hygiene and Using of Gloves	7
5. Aseptic Urinary Catheter Insertion	8
6. Maintain Unobstructed Urine Flow	8
7. Maintain a Sterile and Closed Urinary Drainage System	8
8. Individualized Catheter Change Intervals	9
9. Good Meatal Care	9
10. Aseptic Urine Specimen Collection	10
11. Avoid Bladder Washout	10
12. Role of Antimicrobial Agents	11
13. Type of Catheter	11
14. Documentation and Monitoring	11
15. Surveillance and Quality Improvement Programs	12
Appendix I: Hong Kong Bundle to Prevent CAUTI	13
Appendix II: Reminder to wean off Indwelling Urinary Catheter (Sample)	14
References	135

Hong Kong Bundle to Prevent CAUTI

1. The **indication** for urinary catheter needs to be reviewed daily
2. **Nurse to remind** physician stop catheter when no longer indicated
3. Implement **auto-stop reminder** whenever applicable
4. Observe **hand hygiene** before and after urinary catheter care and use **aseptic technique** for insertion of catheter
5. Consider using **bedside ultrasound** to screen for post-voiding residual urine volume before insertion of catheter in selected groups of patients

Improving Quality and Safety of Patient Care in Public Hospitals in Hong Kong

Prevalence Survey on Catheter associated Urinary Tract Infections in Public Hospitals

Protocol
Version 15 May 2018



Aim & Objectives Of Survey

■ Aim

- To study the nature and distribution of **HA-CAUTI** in public hospitals in Hong Kong

■ Objectives

- To monitor **point prevalence** of HA-CAUTI and its **associated risk factors (Part I)**
- To understand the **policy** of urinary catheter care (**Part II**)
- To monitor **compliance** of urinary catheter care (**Part III**)

Methods/Design

- Survey design
 - Point prevalence survey
- Survey population
 - Pilot period: 3 - 13 Oct 2017
 - Survey period: 4-15 Jun 2018
 - All in-patients in wards from public hospitals at 8:30am on survey day were included **except: patients in A&E and observation wards, outpatients, paediatric, psychiatric, mental and infirmary wards.**
- Hospital Survey Team
 - Infection control officer and infection control nurses
 - All members were trained with standard protocol

CDC/NHSN surveillance definition of CAUTI**Symptomatic UTI (SUTI)**

Patient must meet 1, 2, and 3 below:

1. Patient had an indwelling urinary catheter that had been in place for > 2 days on the date of event (day of device placement = Day 1) AND was either:
 - Present for any portion of the calendar day on the date of event,
OR
 - Removed the day before the date of event
2. Patient has at least *one* of the following signs or symptoms:
 - fever (>38.0°C)
 - suprapubic tenderness*
 - costovertebral angle pain or tenderness*
 - urinary urgency ^
 - urinary frequency ^
 - dysuria ^
3. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium of $\geq 10^5$ CFU/ml (See Comments). All elements of the UTI criterion must occur during the Infection Window Period.

* With no other recognized cause (see Comments)

^ These symptoms cannot be used when catheter is in place. An indwelling urinary catheter in place could cause patient complaints of “frequency” “urgency” or “dysuria”.

Note:

Fever is a non-specific symptom of infection and cannot be excluded from UTI determination because it is clinically deemed due to another recognized cause.

Asymptomatic Bacteremic UTI (ABUTI)

Patient must meet 1, 2, and 3 below:

1. Patient with an indwelling urinary catheter* has no signs or symptoms of SUTI
2. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium of $\geq 10^5$ CFU/ml (see Comments)
3. Patient has organism identified** from blood specimen with at least *one* matching bacterium to the bacterium identified in the urine specimen, or meets [LCBI criterion 2](#) (without fever) and matching common commensal(s) in the urine. All elements of the ABUTI criterion must occur during the Infection Window Period.

* Patient had an indwelling urinary catheter in place for >2 calendar days on the date of event, with day of device placement being Day 1, and catheter was in place on the date of event or the day before.

** Organisms identified by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST)).



Part I

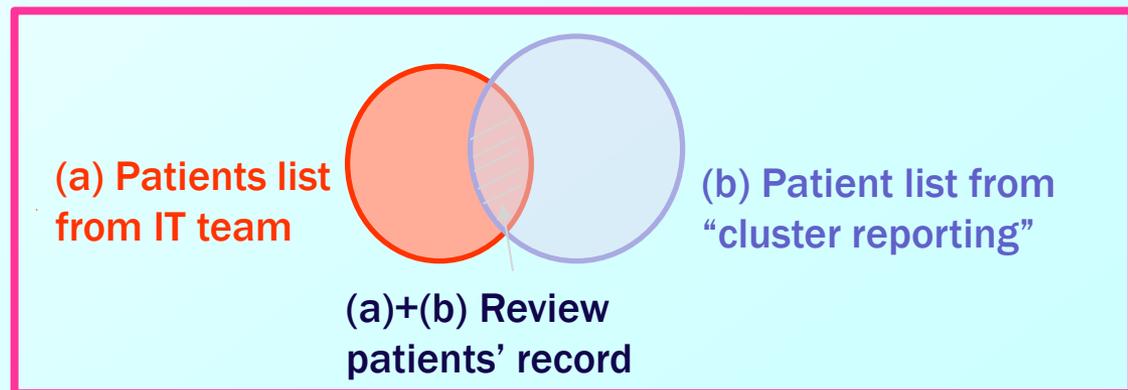
HA-CAUTI Rate



Methodology

■ Data collection and collation

- IT team provided patient list at 8:30am on survey date (a)
- Hospital survey team retrieved patients with **positive urine culture over 9 days (survey day and 8 days before survey day)** from “Cluster Reporting” system (b)
- Hospital survey team reviewed patients’ records if they were in both lists (a) and (b).
- For those who fulfilled **the surveillance definition of HA-CAUTI**, related data would be entered to E-survey form for analysis.



QUEEN MARY HOSPITAL

Name: PATIENT, 305184

病人

DOB: 1934

Prevalence Survey Form (Blank Form)

Sex: F Age: 84y



Ward: B2

Spec: MED

[HKID]

Date of Survey: 14/08/1998 19:30

Urinary Catheter Status

- In place – Urinary catheter in place > 2 days on the date of event Removed – Urinary catheter in place > 2 days but removed the day before / on the date of event

- Long term catheter (catheters stay in for >30 days and are changed regularly as part of the care strategy)

Event Details

Sign or Symptom of UTI:

- Symptomatic UTI (SUTI) Fever (>38°C) Urinary urgency* Suprapubic tenderness*
 Dysuria Urinary frequency* Costovertebral angle pain or tenderness*

AND

Laboratory Criteria:

- 1 positive urine culture with no more than 2 species of organisms,[#] at least one of which is a bacterium of $\geq 10^5$ CFU/ml

Criteria 1

Laboratory Criteria:

- Asymptomatic Bacteremic UTI (ABUTI) 1 positive urine culture with no more than 2 species of organisms,[#] at least one of which is a bacterium of $\geq 10^5$ CFU/ml ; AND
 At least one matching organism from blood culture.

OR

Criteria 2

Sign or symptom of Laboratory-Confirmed Bloodstream Infection (LCBI)

- Chills Hypotension ; AND

Laboratory Criteria:

- Common commensal(s) in urine culture ; AND
 Matching common commensal(s) from at least 2 blood cultures

Date of Event:

Date of First Sign or Symptom:

Date of Positive Urine Culture:

Urine Specimen Type:

Organism 1:

Organism 2:

Date of Positive Blood Culture(1):

Organism:

Date of Positive Blood Culture(2):

Organism:

Antimicrobial Treatment for UTI: Yes No

Antibiotic 1:

Antibiotic 2:

[#]These symptoms cannot be used when catheter is in place.
[#]Exclude Candida species, mold, dimorphic fungi or parasites.

*With no other recognized cause.

Logon to CMS



Useful Links

[TKOH Intranet Home Page \(SP1\)](#)

[Welcome to Virtual Hospital \(SIT\)](#)

[CMS Newsletter](#)

[Clinical Data Access - FAQs](#)

[Drugs Ingredient Search](#)

[SIT VH Sybase 15.7 in IP](#)

[CHEERS](#)

[CLW - For Contingency & Emergency](#)



Logon ID:

Password:

Logon

Important Notes

1. All patient information is strictly confidential
2. Staff may only use the CMS for authorised purpose
3. All access to CMS is logged
4. Please logoff immediately after use
5. Please ensure you have verified the content before you sign the computer printouts
6. Please change your password on a regular basis

[User Guide](#)

[Clinical Dashboard](#)

[CMS feedback 任你講](#)

[HA IT Call Centre](#)

[VH](#)

VH is now the first production site of CMS in IP

Display Prevalence Survey Form

File ▾ 1.Clinical ▾ 2.Investigation ▾ 3.Enquiry ▾ 4.Booking ▾ 5.DT ▾ 6.Report ▾ 7.Doc./Print ▾ 8.Other System ▾ 9.Info. ▾ 0.Admin. ▾

Logoff Close PSP Bed Assign Transfer Discharge Dx/Px HKPMI IPMOE IPMOE d/c eMAR Ward eMAR Pat Rx ePR OP Book Lab Result Ix Request IPMOE Hx Next Patient

Patient-specific Function(s)

病人 **PATIENT, 208403** Unknown Details +Alert

M 27y DOB: 15-Jul-1989 Y246913(6) PAE K7S-10 Adm: 11-Aug-1998 HN98057431(3)

Prevalence Survey Form ×

Hospital: QMH Case: HN980574313 Survey Date and Time: 14/08/1998 19:30 Last Updated Date: 21/02/2017 Status: New

Infection Risk Assessment Medical Device Wound Related Info Antimicrobial Medication Info Infection Information

Infection Risk Assessment Get Data i

Patient's ADT Info

EIS Specialty code PAE PAS Specialty code PAE Date of admission 11/ 08/ 1998 Ward K7S

Elderly Home code Ward Reported Source of admission A&E

If patient is < 1 month old

Gestational age (weeks) Birth weight (grams)

* Medical Device Yes No

* Wound Related Information Yes No

* Antimicrobial Medication Information Yes No

* Infection Information Yes No

View OTRS Data i

View PHS Data i

View Lab Result i

Patient's Present Problem i

Admission diagnosis

Patient medical condition

Active malignancy i

Parenteral nutrition

Patient's Physical Examination Findings

Oral Temp or equivalent * (Highest Temp within 24 hours) °C

* Conversion reading from Axillary temp: +0.5 °C Rectal/Tympanic temp: -0.5 °C

Patient's Past Medical History i

Significant past medical history

Patient's Investigation Results

WBC reading (10⁹ / L) Highest 20.3

(reading within 7 days) Lowest 9.86

Significant investigation findings:

Delete Save Sign Undo Print Blank Form Report Close

Methodology

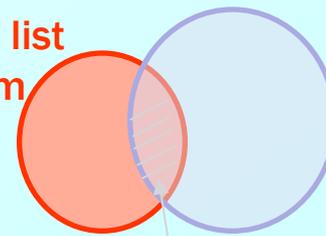
■ External Validation

- ❑ ICB conducted external validation in 17 hospitals (including at least one major tertiary hospital from each cluster) on survey day for all seven clusters
- ❑ ~ 50% of cases identified by (a) and (b) were reviewed for validation
- ❑ In case of query, the PS work group would be consulted and the case discussed.
- ❑ Sensitivity and specificity between hospital survey team and external validation team (ICB) were calculated.

$$\text{Sensitivity} = \frac{\text{True positive}}{\text{True positive} + \text{False negative}}$$

$$\text{Specificity} = \frac{\text{True Negative}}{\text{True negative} + \text{False positive}}$$

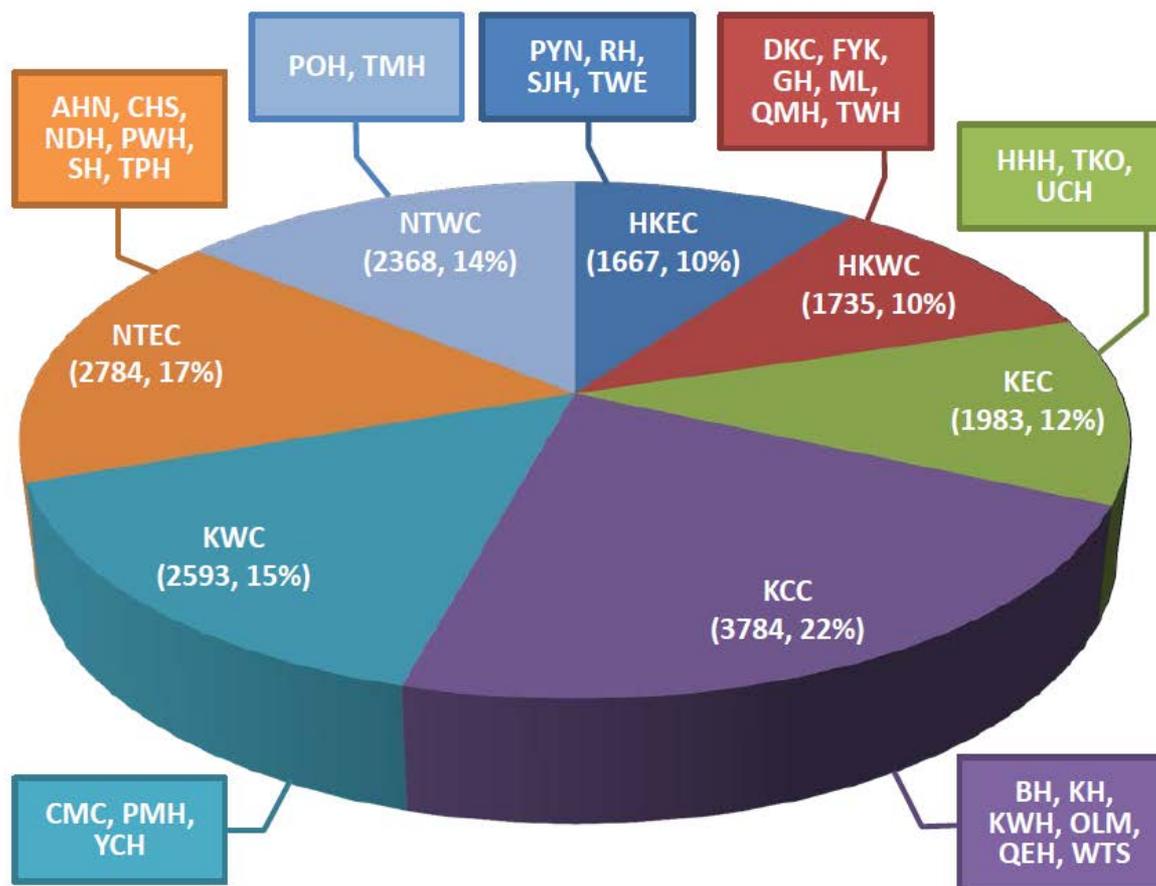
(a) Patients list
from IT team



(b) Patient list
from cluster
reporting

(a)+(b) Review
patients' record

Distribution Of Surveyed Patients By Cluster (N=16,914) External Validation (100% match)



Results: HA-CAUTI rate

- Number of symptomatic HA-CAUTI: 46
- Number of asymptomatic bacteraemic HA-CAUTI: 0

- Number of patients in ward at 0830: 16,914
- Number of patients in ward for >2 days: 13,583

- Prevalence of symptomatic HA-CAUTI (all patients):
 $46/16914 = 0.27\%$; 95% CI: (0.20% - 0.36%)
- Prevalence of symptomatic HA-CAUTI (patients with length of stay >2 days):
 $46/13583 = 0.34\%$; 95% CI: (0.25% - 0.45%)

- Prevalence of symptomatic HA-CAUTI (among patients with Foley) (proxy):
 $46/2517^* = 1.83\%$; 95% CI: (1.34% - 2.43%)

Comparison With Previous Local Studies

Year	2007 (N=20,001)	2010 (N=20,355)	2018 (N=16,914)
Prevalence of hospital-acquired urinary tract infection (HAI)	1.03%	0.48%	NA
Prevalence of urinary tract infection acquired from other hospital (OHAI)	0.24%	0.10%	NA
Prevalence of hospital-acquired catheter-associated urinary tract infection (CAUTI)	NA	NA	0.27%
Prevalence of urinary catheter use	9.9%	10.3%	14.9%
Odds ratio for UTI with urinary catheter use with 95% CI	NA	9.3 (6.4-13.7) P<0.005	NA

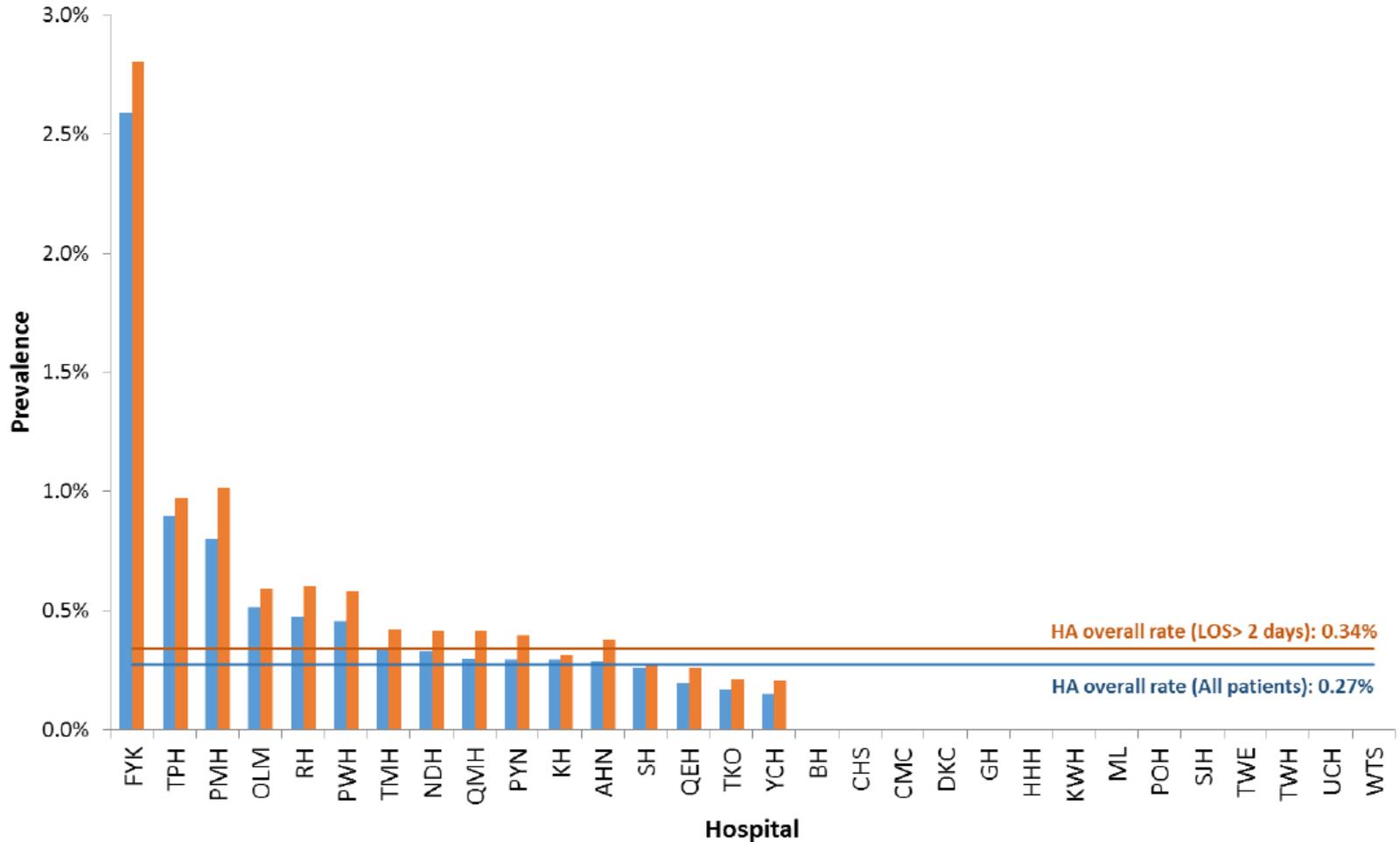
Comparison with Overseas Studies

HA overall results : **Prevalence = 0.27% (95%CI: 0.20%-0.36%)**

Country	Year of survey	Year of publication	Setting	Sample size	CAUTI Prevalence
Australia	2015	2016	82 acute care facilities	1,320	0.2%
Australia	2013	2014	3 public and 3 private hospitals	1,109	0.9%
29 EU/EEA Member States and Croatia*	2011-2012	2013	1149 acute hospitals	231,459	0.73%
England*	2011	2012	98 NHS acute trusts and 5 independent sector organisations	52,443	0.50%
USA	2011	2014	183 acute hospitals from 10 states	11,282	0.22%
UK	2006	2008	270 hospitals on adult wards	75,694	0.93%

* Numerator = no. of HA-UTI cases with urinary catheter either in situ or within the previous 7 days

Prevalence Of CAUTI By Hospital



Organisms (amongst 46 HA-CAUTI cases)

Organism	N	%
<i>Escherichia coli</i> ¹	18	34.6%
<i>Enterococcus species</i> ²	11	21.2%
<i>Pseudomonas aeruginosa</i>	6	11.5%
<i>Acinetobacter baumannii</i>	3	5.8%
<i>Staphylococcus aureus</i> ³	3	5.8%
<i>Enterobacter species</i> ⁴	3	5.8%
<i>Klebsiella species</i> ⁵	3	5.8%
<i>Proteus species</i> ⁶	2	3.8%
Coagulase negative <i>Staphylococcus</i>	1	1.9%
<i>Citrobacter species</i>	1	1.9%
Diphtheroids	1	1.9%

¹4 cases were *E.coli* [ESBL]

²*Enterococcus species* included *Enterococcus faecium* (6, one of which was VRE), and *Enterococcus faecalis* (4)

³2 cases were MRSA

⁴*Enterobacter species* included *Enterobacter cloacae complex* (1)

⁵*Klebsiella species* included *Klebsiella pneumoniae* (2)

⁶*Proteus species* included *Proteus mirabilis* (1)

Antibiotics (amongst 46 HA-CAUTI cases)

Antibiotics	N	%
AUGMENTIN	24	52.2%
PIPERACILLIN + TAZOBACTAM	8	17.4%
MEROPENEM	6	13.0%
VANCOMYCIN	6	13.0%
CIPROFLOXACIN	4	8.7%
LEVOFLOXACIN	4	8.7%
CEFTRIAZONE	3	6.5%
AMIKACIN	2	4.3%
COLISTIN	2	4.3%
NITROFURANTOIN	2	4.3%
SULPERAZON	2	4.3%
TIMENTIN	2	4.3%
AMPICILLIN	1	2.2%
CEFEPIME	1	2.2%
CEFTAZIDIME	1	2.2%
CEFUROXIME	1	2.2%
CLOXACILLIN	1	2.2%
COTRIMOXAZOLE	1	2.2%
LINEZOLID	1	2.2%

Associating Factors

	Univariate Odds ratio (95% CI)	Univariate P-value	Multivariate Odds ratio (95% CI)	Multivariate P-value
By Specialty				
MED	(Ref group)	(Ref group)	(Ref group)	(Ref group)
SUR	1.34 (0.53 – 3.40)	0.537	1.70 (0.67 – 4.33)	0.265
ORT	1.37 (0.54 – 3.49)	0.504	1.16 (0.46 – 2.95)	0.755
REH	1.95 (0.57 – 6.68)	0.285	1.02 (0.30 – 3.51)	0.978
O&G	NA	NA	NA	NA
ONC	2.76 (0.64 – 12.01)	0.175	3.11 (0.71 – 13.60)	0.131
NS	9.18 (3.60 – 23.43)	<0.001	5.97 (2.30 – 15.51)	<0.001
Hospice	3.22 (0.74 – 13.99)	0.119	1.75 (0.40 – 7.65)	0.460
ICU / HDU	7.32 (2.13 – 25.16)	0.002	6.61 (1.91 – 22.92)	0.003
OPH/ENT/Dental	NA	NA	NA	NA
CTS	3.92 (0.52 – 29.68)	0.186	3.72 (0.49 – 28.39)	0.205
By Length of Stay (days)				
>2-7	(Ref group)	(Ref group)	(Ref group)	(Ref group)
8-14	4.76 (1.63 – 13.94)	0.004	4.62 (1.57 – 13.58)	0.005
15-28	6.71 (2.33 – 19.34)	<0.001	6.53 (2.25 – 18.93)	0.001
29-365	11.93 (4.47 – 31.82)	<0.001	10.40 (3.84 – 28.19)	<0.001
366+	NA	NA	NA	NA

*NA due to no CAUTI cases

Associating Factors

	No. of CAUTI cases	All patients		LOS > 2 days	
		N	Prevalence (%; 95% CI)	N	Prevalence (%; 95% CI)
By Specialty					
MED	17	9,016	0.19 (0.11-0.30)	7,422	0.23 (0.13-0.37)
SUR	6	2,374	0.25 (0.09-0.55)	1,712	0.35 (0.13-0.76)
ORT	6	2,318	0.26 (0.10-0.56)	1,921	0.31 (0.11-0.68)
REH	3	816	0.37 (0.08-1.07)	790	0.38 (0.08-1.11)
O&G	0	756	0 (0-0.49)	399	0 (0-0.92)
ONC	2	385	0.52 (0.06-1.86)	309	0.65 (0.08-2.32)
NS	6	352	1.70 (0.63-3.67)	329	1.82 (0.67-3.93)
Hospice	2	331	0.60 (0.07-2.17)	311	0.64 (0.08-2.30)
ICU/HDU	3	220	1.36 (0.28-3.93)	182	1.65 (0.34-4.74)
OPH/ENT/Dental	0	210	0 (0-1.74)	96	0 (0-3.77)
CTS	1	136	0.74 (0.02-4.03)	112	0.89 (0.02-4.87)

Associating Factors

	No. of CAUTI cases	All patients		LOS > 2 days	
		N	Prevalence (% , 95% CI)	N	Prevalence (% , 95% CI)
By Ward Nature					
Acute	30	11,739	0.26 (0.17-0.36)	8,816	0.34 (0.23-0.49)
Convalescent	14	4,134	0.34 (0.19-0.57)	3,929	0.36 (0.19-0.60)
Mixed Acute and Convalescent	2	1,041	0.19 (0.02-0.69)	838	0.24 (0.03-0.86)
By Source of Admission					
Elderly home	7	2,359	0.30 (0.12-0.61)	2,033	0.34 (0.14-0.71)
Others	39	14,555	0.27 (0.19-0.37)	11,550	0.34 (0.24-0.46)
By Length of Stay					
>2 – 7	5	NA	NA	6,452	0.08 (0.03-0.18)
8 – 14	10	NA	NA	2,718	0.37 (0.18-0.68)
15 – 28	11	NA	NA	2,123	0.52 (0.26-0.93)
29 – 365	20	NA	NA	2,182	0.92 (0.56-1.41)
366+	0	NA	NA	108	0 (0-3.36)

Associating Factors

- **Neurosurgery and ICU/HDU patients** had significantly **higher risk** of developing CAUTI compared with Medical patients
- Higher odds ratio was observed for **longer Length of Stay**.
- No association was found for other factors such as sex, age, cluster, ward nature and source of admission.

Part 2:

Urinary Catheter Care Policy

Methodology

- Complete a **questionnaire** regarding policy of urinary catheter care (**Appendix 3A**)
 - Data were analyzed using **hospital as unit**
 - **Classification of Responses**
 - ✓ Yes - Represent all wards of the hospital responded “Yes” to a question
 - ✓ No - Represent all wards of the hospital responded “No” to a question
 - ✓ Some – Represent some wards responded “Yes “ and some wards responded “No” or “NA” to a question
-

Results: Urinary Catheter Care Policy (N=30)

Questions	Responses n (%)		
	Yes	Some	No
1. Written Standard Operating Procedures on urinary care	24 (80%)	6 (20%)	0 (0%)
2. Surveillance system to monitor CAUTI rate in the department	3 (10%)	13 (43%)	14 (47%)
3. Monitor the necessity of urinary care			
a. Written policy on indication of insertion	14 (47%)	13 (43%)	3 (10%)
b. Documentation of indication in patients' record	26 (87%)	4 (13%)	0 (0%)
c. Daily review of the indication for urinary catheter	18 (60%)	10 (33%)	2 (7%)
d. Written policy on documentation of date of planned removal of the catheter	6 (20%)	17 (57%)	7 (23%)
4. Use of reminder system*			
a. Auto-stop reminder	10 (33%)	14 (47%)	6 (20%)
b. Electronic reminder	2 (7%)	14 (47%)	14 (47%)
c. Nurse reminder	21 (70%)	8 (27%)	1 (3%)

*Multiple options are allowed

Results: Urinary Catheter Care Policy (N=30)

5. Infection control practice for urinary catheter			
a. Requirement to perform hand hygiene before and after catheter care	30 (100%)	0 (0%)	0 (0%)
b. Wearing sterile glove for insertion	30 (100%)	0 (0%)	0 (0%)
c. Antiseptic solution used to clean peri-urethral skin before insertion	30 (100%)	0 (0%)	0 (0%)
i. Chlorhexidine gluconate 0.05%*	19 (63%)	9 (30%)	2 (7%)
ii. Tisept (Chlorhexidine 0.015% with Cetrimide 0.15%)*	4 (13%)	8 (27%)	18 (60%)
6. Use of bedside ultrasound to screen for post-voiding residual urine before insertion	21 (70%)	9 (30%)	0 (0%)
7. Use of designative urine collecting container to empty collecting bag for each patient	28 (93%)	2 (7%)	0 (0%)

Results: Urinary Catheter Care Policy (N=30)

8. Whether to use disinfectant to disinfect the outlet of the drainage bag before or after opening	30 (100%) Alcohol swab	0 (0%)	0 (0%)
9. Whether to use disinfectant to disinfect the catheter-tubing junction before disconnecting the drainage system for change of urinary bag	28 (94%)	1 (3%)	1 (3%)
10. Daily cleansing of meatal area*	28 (93%)	2 (7%)	0 (0%)
a. Soap and water	10 (33%)	15 (50%)	5 (17%)
b. Detergent wipes	10 (33%)	15 (50%)	5 (17%)
c. Normal saline	2 (7%)	10 (33%)	18 (60%)
d. Chlorhexidine gluconate 0.05%	0 (0%)	9 (30%)	21 (70%)
e. Tisept (Chlorhexidine 0.015% with Cetrimide 0.15%)	0 (0%)	8 (27%)	22 (73%)

Results: Urinary Catheter Care Policy (N=30)

Questions	Responses n (%)		
	Yes	Some	No
11. Collecting urine sample for culture			
a. For long term catheter, insert a new catheter before saving urine	16 (53%)	12 (40%)	2 (7%)
b. Sample site for urine culture*			
i. Sampling port	9 (30%)	16 (53%)	5 (17%)
ii. Distal end of the urinary catheter (with the closed drainage system intact)	13 (43%)	14 (47%)	3 (10%)
iii. Distal end of the urinary catheter (disconnecting the drainage bag from the catheter)	4 (13%)	10 (33%)	16 (53%)
iv. Drainage bag	0 (0%)	3 (10%)	27 (90%)
c. Whether to use disinfectant to disinfect the collection site	30 (100%) Alcohol Swab	0 (0%)	0 (0%)
12. Whether to use antibiotics to treat asymptomatic catheter associated bacteriuria	1 (3%)	11 (37%)	18 (60%)

Part 3

Compliance of Urinary Catheter Care

Methodology

■ Survey population

- On the survey day, hospital survey team **identified patients who had urinary catheter** and record their bed numbers (**Appendix 3B**)
- Survey would be conducted for patients with urinary catheter and with **bed number end with 1, 4, 7** (**systematic sampling**)
- Care process and compliance of urinary catheter would be **monitored with the checklist** (**Appendix 3C**)

Audit checklist for urinary catheter care compliance (Ward)

Please fill in the following information for each ward:

Date:		
Hospital:		
Department:		
Ward/Unit:		
No. of patients in the ward:	Male:	Total:
	Female:	
No. of patients with urinary catheter:	Male:	Total:
	Female:	
Bed no. of patients with urinary catheter		
Name / Rank		

Optional: Mark the bed no. and affix the gum label of patient with urinary catheter on next pages

Appendix 3C

Audit checklist for urinary catheter care compliance (Patient)

Date: _____	Name: _____	HN: _____
Please "✓" where appropriate	Sex: _____	Age: _____
	Hospital: _____	Ward: _____
	Department: _____	
	Date admitted to hospital: _____	

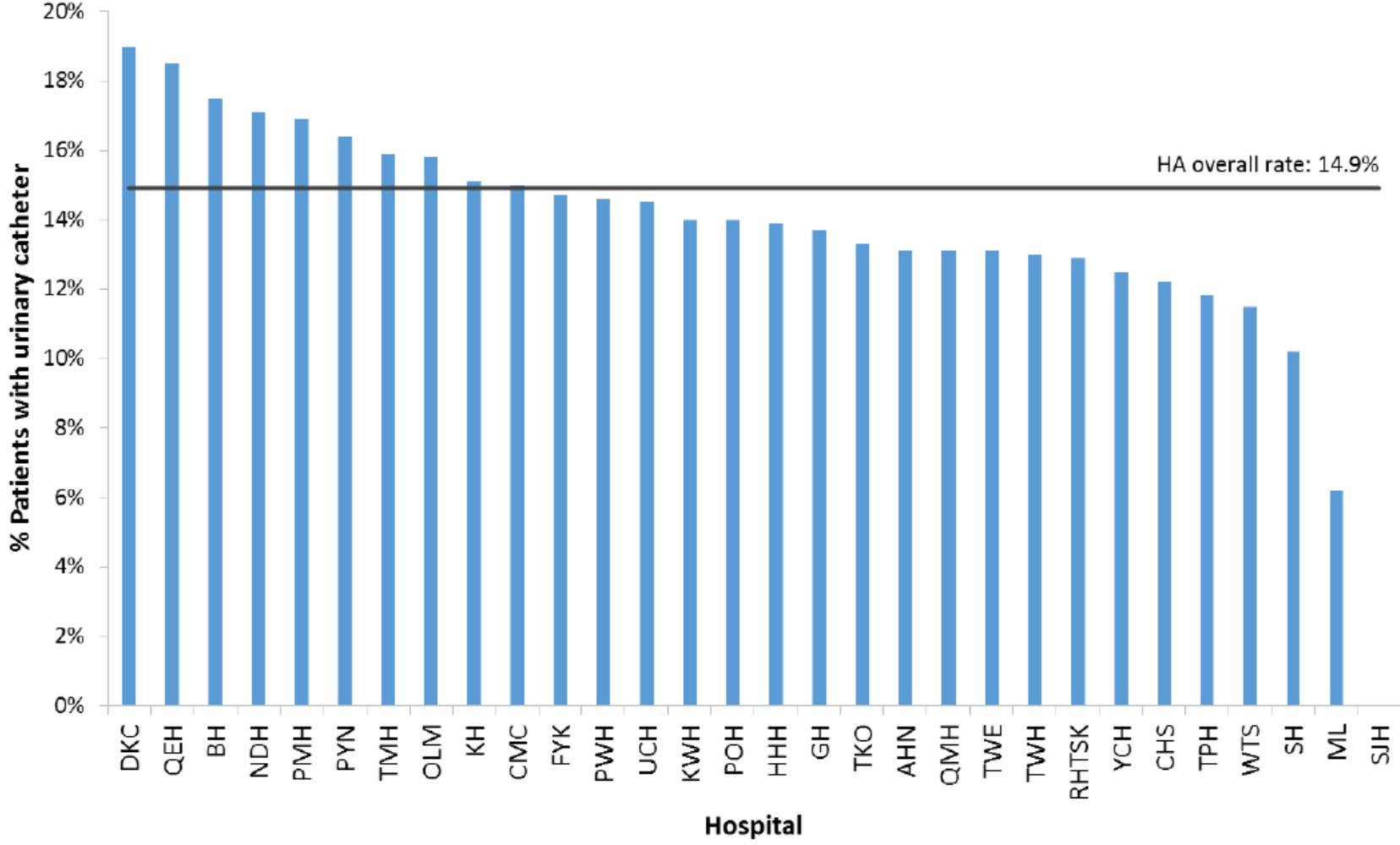
(ONLY for patients with bed number ending with 1, 4, 7, E.g. 1, 4, 7, 11, 14, 17, 27A, 31B, 44A, etc.)

Type of Urinary Catheterization	Yes	No
1. Long-term (>30 days) urinary catheter		
2. First catheter insertion date:		
Standard Criteria (Individual Level)		
3. Documentation		
a Indication for insertion of urinary catheter documented in patients' record		
b What are the indications? (can <input checked="" type="checkbox"/> more than one)		
<input type="checkbox"/> to relieve urinary obstruction and/or acute urinary retention		
<input type="checkbox"/> to monitor urine output in critically ill patients		
<input type="checkbox"/> to aid in urologic surgery		
<input type="checkbox"/> in urinary incontinent patients with open wounds or skin graft in the sacral and/or perineal area		
<input type="checkbox"/> in terminally ill patients, as request for comfort care		
<input type="checkbox"/> Others (please specify): _____		
For short-term catheterization		
c. Daily review indication for urinary catheter		
d Date of planned removal of the catheter documented		
4. Observation		
a Secure the urethral catheter properly If yes, which site: <input type="checkbox"/> abdomen <input type="checkbox"/> thigh		
b Closed drainage system		
c. Unobstructed urine flow and a tube free from kinking		
d Tubing and bags are kept below level of bladder		
e. Drainage bag and outlet kept above the floor		
f. Prevention of overfilling of the drainage bag (not more than 3/4 full)		

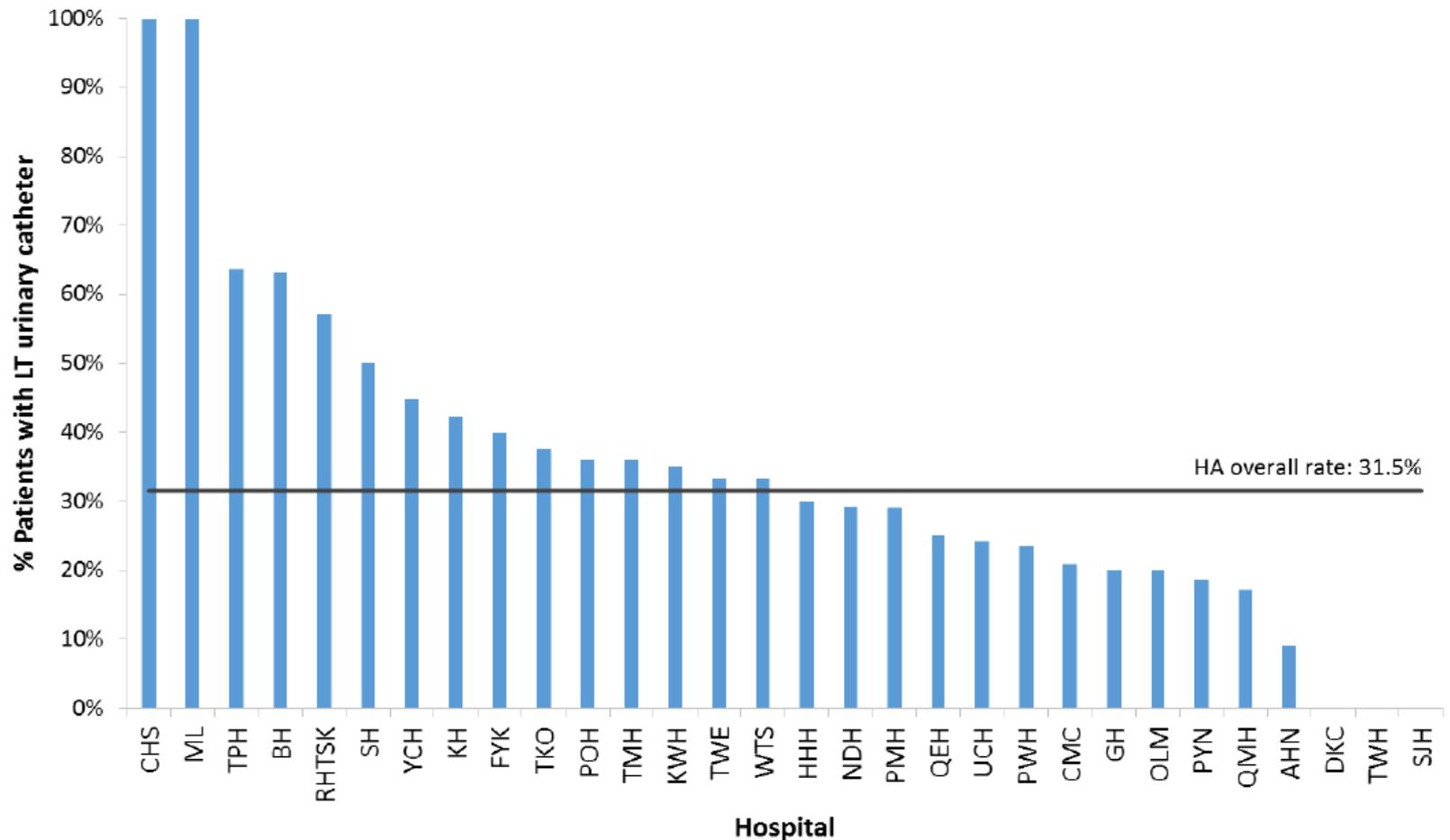
Results: Number of Observations

- **541 wards from 30 public hospitals fulfilling the inclusion criteria participated with 100% response rate (by ward)**
- **Total number of patients in survey wards on survey day: 16,949**
- **Total number of patients with catheter in survey wards: 2,517 (14.9%)**
- **Total number of patients with catheter sampled: 709 (28.2%)**

Proportion Of Patients With Urinary Catheters By Hospital



Proportion Of Long-term Catheters Among Patients With Catheters By Hospital



*long term catheter are catheters expected to stay in for >30 days and are changed regularly as part of the care strategy

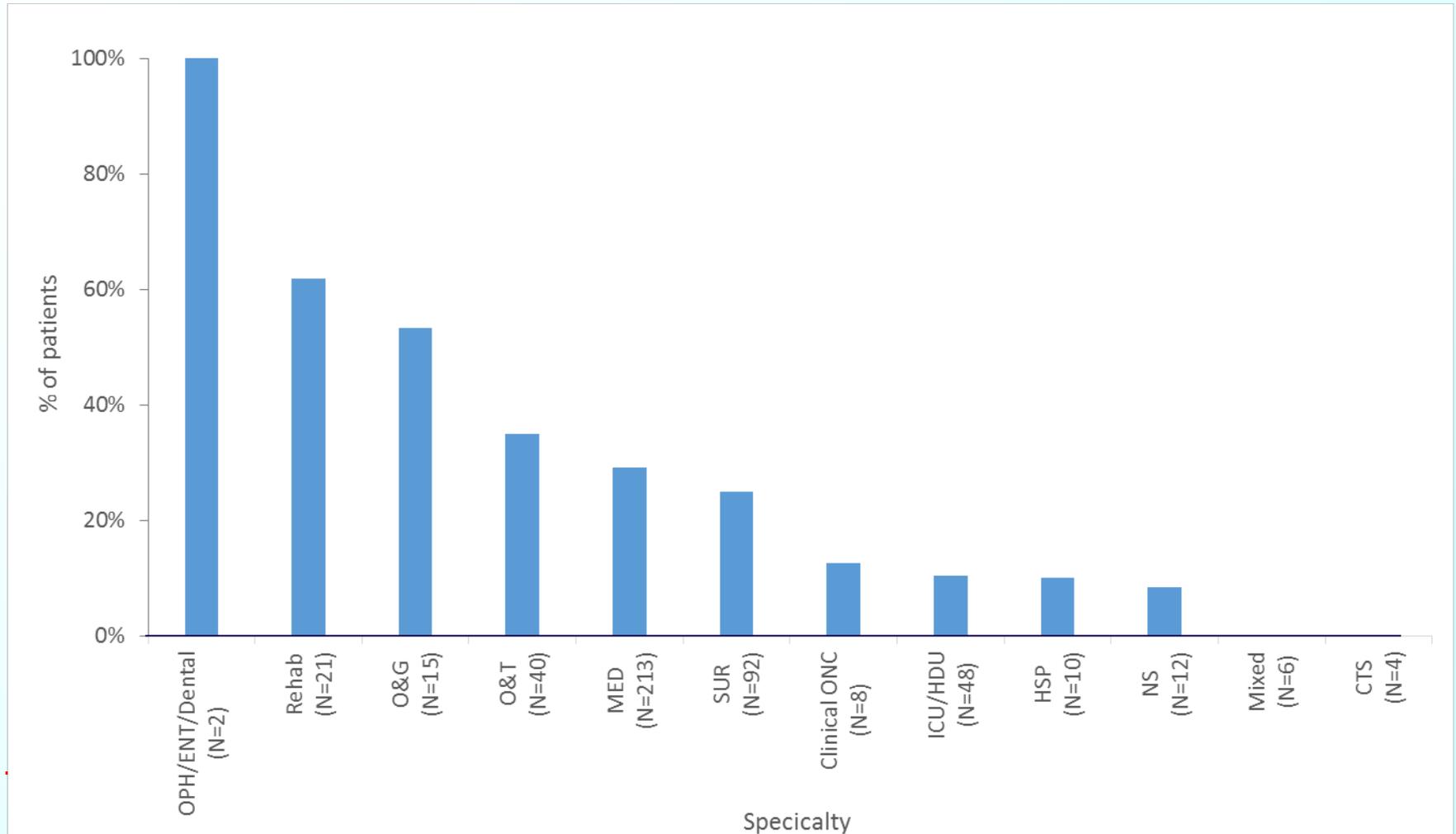
Results: Compliance to Catheter Care

Documentation	% among patients with non-LT catheter
Documentation of indication	96.6%
Daily Review of Indication	71.0%
Date of planned removal	27.6%

Indication for catheter insertion*	% among patients with indication documented
Relieve urinary obstruction	52.2%
Monitor urine output in critically ill patients	22.2%
Monitor urine output in non-critically ill patients	14.2%
Standard operative procedure / post-operative monitoring	6.1%
For patients with neurological problems	2.9%
In urinary incontinent patients with open wounds or skin graft	2.0%
Aid in urologic surgery	1.8%
In terminally ill patients	1.5%
Failed to wean off urinary catheter	1.4%
Monitor haematuria and/or for bladder irrigation	0.6%
Suspected UTI / recurrent UTI	0.3%
Others	1.1%

* Can be more than one indication

% of patients with date of planned removal of the urinary catheter [non-long term] documented by specialty



Results: Compliance to Catheter Care

Observation	% among patients with catheter	
Secure the urethral catheter properly	51.1%	
Which site?	Male	Female
Abdomen	42.2%	38.9%
Thigh	57.8%	61.1%
Closed drainage system	100%	
Unobstructed urine flow and a tube free from kinking	99.7%	
Tubing and bags are kept below level of bladder	98.9%	
Drainage bag and outlet kept above the floor	99.6%	
Prevention of overfilling of the drainage bag	99.7%	

Recommended site of securement of urinary catheter

Organisation	Year	Country / Territory	Recommended site of securement	
			Male	Female
Hospital Authority Tung Wah Group Hospitals Fung Yiu King Hospital Geriatrics Nurse Clinic (Continence) ²⁴	2017	Hong Kong	Lower abdomen or inner thigh	Inner thigh
European Association of Urology Nurses ²⁵	2012	European Union	Abdomen	Leg
National Institutes of Health Clinical Center ²⁶	2007	USA	Lower abdomen or upper thigh	Thigh
Wound Ostomy and Continence Nurses Society ²⁷	2016	USA	Abdomen or thigh (for both men and women)	
National Health Service Southern Health NHS Foundation Trust ²⁰	2017	UK	Thigh	
Strategy for the Control of Antimicrobial Resistance in Ireland ²⁸	2011	Ireland	Abdomen or leg	
Australia and New Zealand Urological Nurses Society Inc. ²⁹	2013	Australia and New Zealand	Abdomen or upper thigh	

Discussion

■ Part 1

- The CAUTI rate in HK is not high when comparing with overseas data.
- Individual hospital has variations.
- Special attention can be focused to NS and ICU/HDU on infection prevention for CAUTI.

■ Part 2

- Regular surveillance of CAUTI should be considered in NS (0% have surveillance) and ICU/HDU (25% have surveillance)

Discussion

■ Part 3

- Documentation: date of planned removal 27.6%
- Observation
 - Very good compliance of catheter care (99%) in general except securing the catheter
 - Measures on proper securing of urinary catheter should be promulgated (51.5% secure properly)

Limitations

- **Some patients were not available for observation due to various reasons, e.g. operation**
- **The patient list was not exactly the same as the one used for CAUTI survey**
 - **Discrepancy between time of patient list generation (830 am) and time of survey at the survey day**
 - **Newly discharge or admission of patients**

Thank You
