

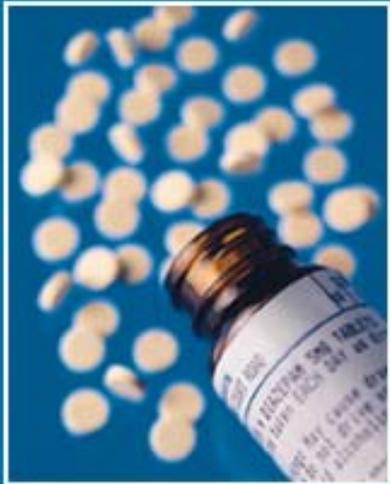
Antibiotic Stewardship Program

Hospital Authority

抗生素導向計劃

醫院管理局

*ASP Workshop
18 January 2011*



Dora Chan
Pharmacist, Chief Pharmacist's Office
Hospital Authority

合理 HIP 中心
使用抗生素
Rational Use of Antibiotics

**確保最佳治療效果
處方前應考慮：**
Tips on Antibiotics Prescription
for optimal treatment results:

按本地的抗生素圖譜及
細菌抗藥情況處方
Prescribe according to local antibiogram
and antibiotic susceptibility test

用有效的狹譜抗生素
代替廣譜抗生素
Use appropriate narrow spectrum antibiotics
instead of broad spectrum ones

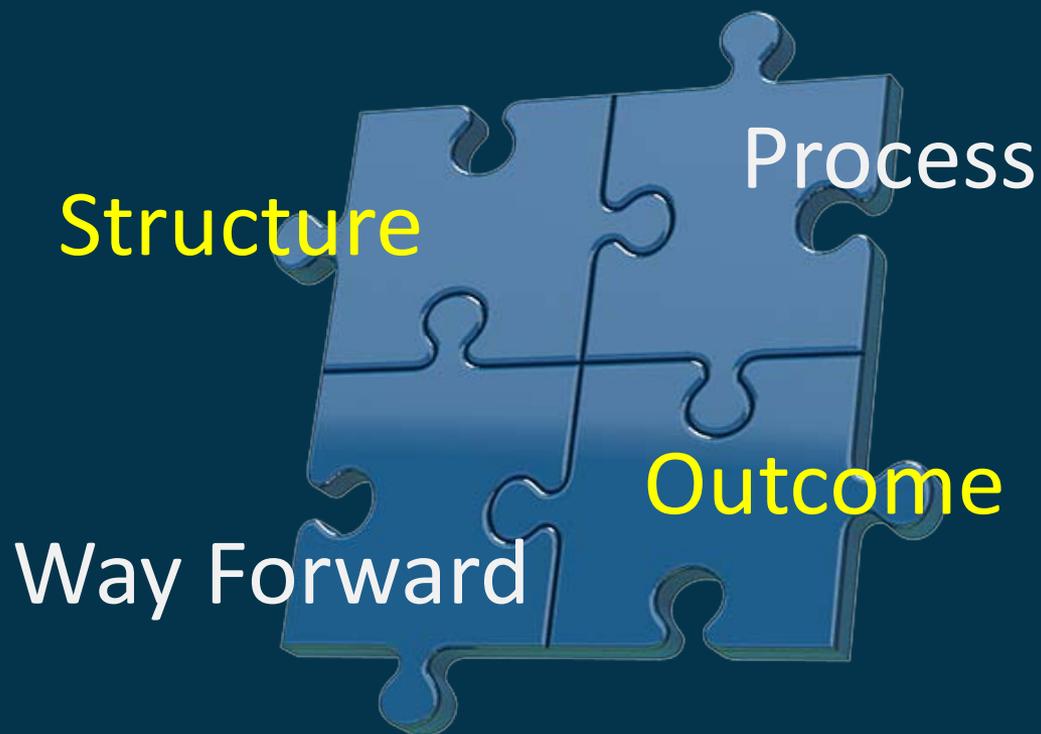
若無細菌感染，不應使用抗生素
Stop antibiotic treatment when
there is no bacterial infection

實踐適當感染控制措施
Observe proper infection control practices

合理 HIP
使用抗生素
Rational Use of Antibiotics



Antibiotic Stewardship Program





Consensus Meeting Group on Antibiotic Stewardship program

Hong Kong Med J. Vol. 12 No 2 April 2006

“The continuous indiscriminate and excessive use of antimicrobial agents promotes the emergence of antibiotic resistant organisms. Antimicrobial resistance substantially raises already-rising health care costs and increases patient morbidity and mortality. Pattern of prescriptions in hospitals can be improved through the implementation of an ‘antimicrobial stewardship program’. A ‘universal’ and ‘continuous’ antimicrobial program should now be established in Hong Kong hospitals”

MEDICAL PRACTICE

Optimising antimicrobial prescription in hospitals by introducing an antimicrobial stewardship programme in Hong Kong: consensus statement

改善醫院內處方抗生素而在香港設立抗生素導向計劃的結論綜述

Objective. To discuss the implementation of an ‘antimicrobial stewardship programme’ as a means to improve the quality of antimicrobial use in a hospital setting in Hong Kong.

Participants. Consensus working group on ‘antimicrobial stewardship programme’. The Scientific Committee on Infection Control, Centre for Health Protection, Department of Health, comprised 11 experts. The remit of the working group was to discuss the rationale and requirement for optimising antimicrobial prescriptions in hospitals by the introduction of an ‘antimicrobial stewardship programme’.

Evidence. PubMed articles, national and international guidelines, and abstracts of international meetings published between January 2000 and December 2004 on programmes for improving the use of antimicrobials in hospitals. Only English medical literature was reviewed.

Consensus process. Data search was performed independently by three members of the working group. They met on three occasions before the meeting to discuss all collected articles. A final draft was circulated to the working group before a meeting on 3 January 2005. Five commonly asked questions about an ‘antimicrobial stewardship programme’ were selected for discussion by the participants. Published information on the rationale, components, outcome measures, advantages, and disadvantages of the programme were reviewed. Recent unpublished data from local studies of an antimicrobial stewardship programme were also discussed. The timing, potential problems, and practical issues involved in the implementation of an antimicrobial stewardship programme in Hong Kong were then considered. The consensus statement was circulated to and approved by all participants.

Conclusion. The continuous indiscriminate and excessive use of antimicrobial agents promotes the emergence of antibiotic-resistant organisms. Antimicrobial resistance substantially raises already-rising health care costs and increases patient morbidity and mortality. Pattern of prescriptions in hospitals can be improved through the implementation of an ‘antimicrobial stewardship programme’. A ‘universal’ and ‘continuous’ antimicrobial stewardship programme should now be established in Hong Kong hospitals.

目的：討論藉着「抗生素導向計劃」改善香港醫院內抗生素的使用率。

參與者：衛生署衛生防護中心轄下感染控制科學委員會內的「抗生素導向計劃」協議工作小組。由十一名專家組成。工作小組討論成立此計劃以改善醫院內處方抗生素的理據和要求。

證據：透過PubMed搜尋系統，搜尋2000年1月至2004年12月期間，關於改善醫院內處方抗生素計劃的文章、全國性或國際指引，以及國際會議的論文摘要（只參考英文文獻）。

結論過程：工作小組其中三人負責獨立搜尋資料和數據。三人在會議前會面了三次，討論搜尋到的所有相關文章，並將宣言草稿在2005年1月3日會議前給予工作小組成員傳閱。參與者討論了五個關於抗生素導向計劃的意見問題，並參考了一

PL Ho 何栢良
JCF Cheng 鄭子豐
PTY Ching 程棟妍
JKC Kwan 關繼祖
WWL Lim 林薇玲
WCY Tong 唐卓恩
TC Wu 胡德超
CWS Tse 謝詠詩
R Lam 林文健
R Yung 翁維雄
WH Seto 司徒永康
Consensus Meeting Group on
Antimicrobial Stewardship
Programme

Key words:
Anti-bacterial agents;
Cross infection;
Drug resistance, microbial;
Hong Kong;
Prescriptions, drug

關鍵詞：
抗菌劑；
交叉感染；
抗藥性，微生物的；
香港；
處方，藥物

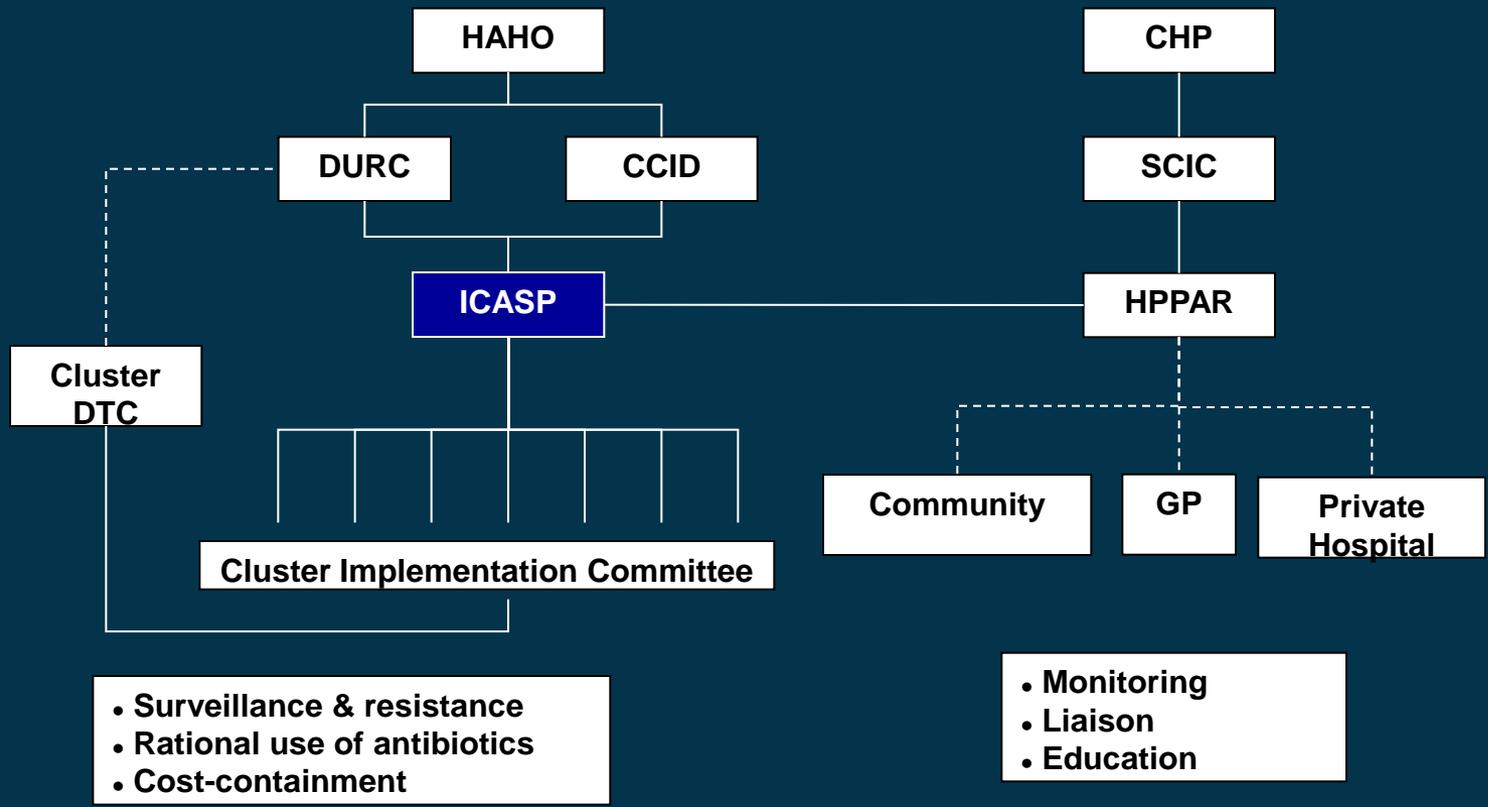
Hong Kong Med J 2006;12:289-94

Subcommittee for Health Protection
Programme on Antimicrobial
Resistance, Centre for Health
Protection, Department of Health
PL Ho, FRCP, MRCPsib
Scientific Committee on Infection
Control, Department of Health
JCF Cheng, FRCS, FRCS (Dental Surgery)
PTY Ching, RN, CDIPQ
JKC Kwan, MBBS, MRCP
WWL Lim, FRCPsib, FRCS (Pathology)
WCY Tong, FRCP, FRCPsib
TC Wu, FRCS, FRCS (Medicine)
CWS Tse, FRCS, FRCS (Pathology)
R Lam, MRCPsib, FRCS (Pathology)
R Yung, FRCPsib, FRCS (Pathology)
WH Seto, FRCPsib, FRCS (Pathology)

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Governance Structure



- Surveillance & resistance
- Rational use of antibiotics
- Cost-containment

- Monitoring
- Liaison
- Education

- HAHO – Hospital Authority Head Office
- DURC – Drug Utilization Review Committee
- CCID – Central Committee on Infectious Disease
- ICASP – Implementation Committee on Antibiotic Stewardship Program
- CHP – Centre for Health Protection
- SCIC – Scientific Committee on Infection Control
- HPPAR – Health Protection Program on Antimicrobial Resistance



ICASP Membership

- Co-chairmen:

- Dr. W L Cheung
- Dr. S H Liu

- Members:

- Dr. Raymond Yung (2005-2008)
- Dr. T Y Wong (from 2008)
- Dr. Y W Fan
- Dr. S T Lai
- Dr. Florence Yap
- Dr. Ronald Lam (2005)
- Dr. Lawrence Wong (2005-07)
- Dr. Carole Tam (2007-08)
- Dr. K Y Tsang (2008)
- Dr. K W Choi (from 2009)
- Dr. N T Cheung
- Mr. P W Lee (2005-08)
- Ms. Anna Lee
- Mr. Benjamin Kwong (from 2009)
- Ms. Irene Lau
- Ms. Dora Chan- Secretary

- Cluster Representatives:

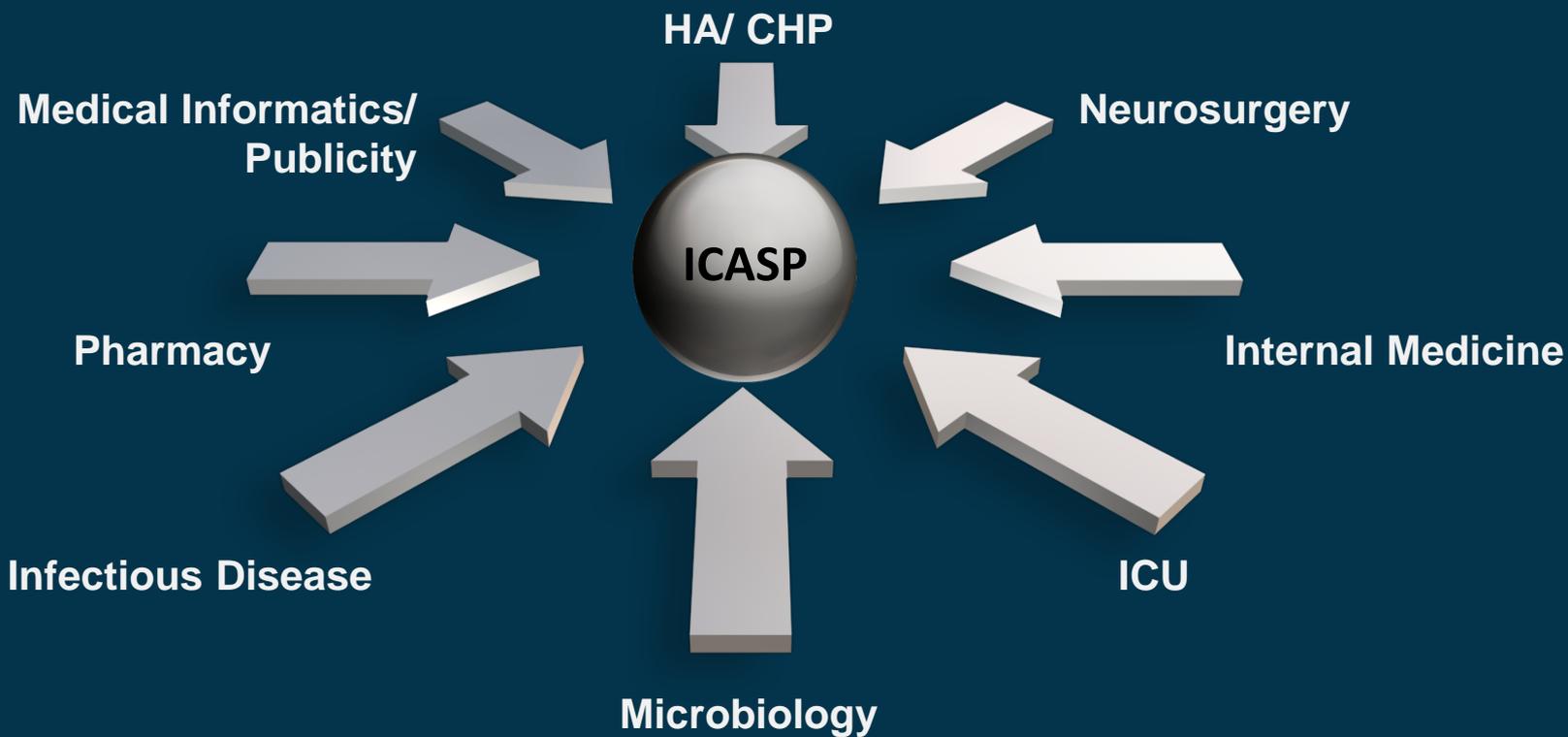
- HKE: Dr. Rodney Lee
- HKW: Dr. P L Ho (2005-08)/ Dr. Vincent Cheng (from 2008)
- KE: Dr. W K Luk
- KC: Dr. T C Wu
- KW: Dr. T K Ng
Dr. W K To
Dr. Cindy Tse
- NTE: Dr. Raymond Lai
Dr. Margaret Ip
- NTW: Dr. T L Que

- Cluster Pharmacy Representatives

- HKE: Mr. S L Chan
- HKW: Mr. William Chui
- KE: Mr. Leo Leung (2005-2009)/ Ms. Kathy Mak (from 2009)
- KC: Mr. K W Ng (2005-08)/ Mr. K M Law (from 2008)
- KW: Ms. Rosa Yao
- NTE: Dr. Benjamin Lee
- NTW: Ms. Pauline Chu



ICASP Membership





Objectives

1. To control the emergence and spread of antibiotic resistance
2. To optimize selection and use of antibiotics

Not only focus on

-reduce use

cost containment

But also to

-minimize unnecessary exposure

-target therapy to the likely pathogens

-reduce redundant therapy

-prescribe the appropriate dosage





Scope

Clusters and Hospitals:

- HKE: PYNEH, RH
- HKW: QMH, TWH
- KE: UCH, TKOH
- KC: QEH, KH
- KW: PMH, CMC, KWH, YCH
- NTE: PWH, AHNH, NDH
- NTW: TMH

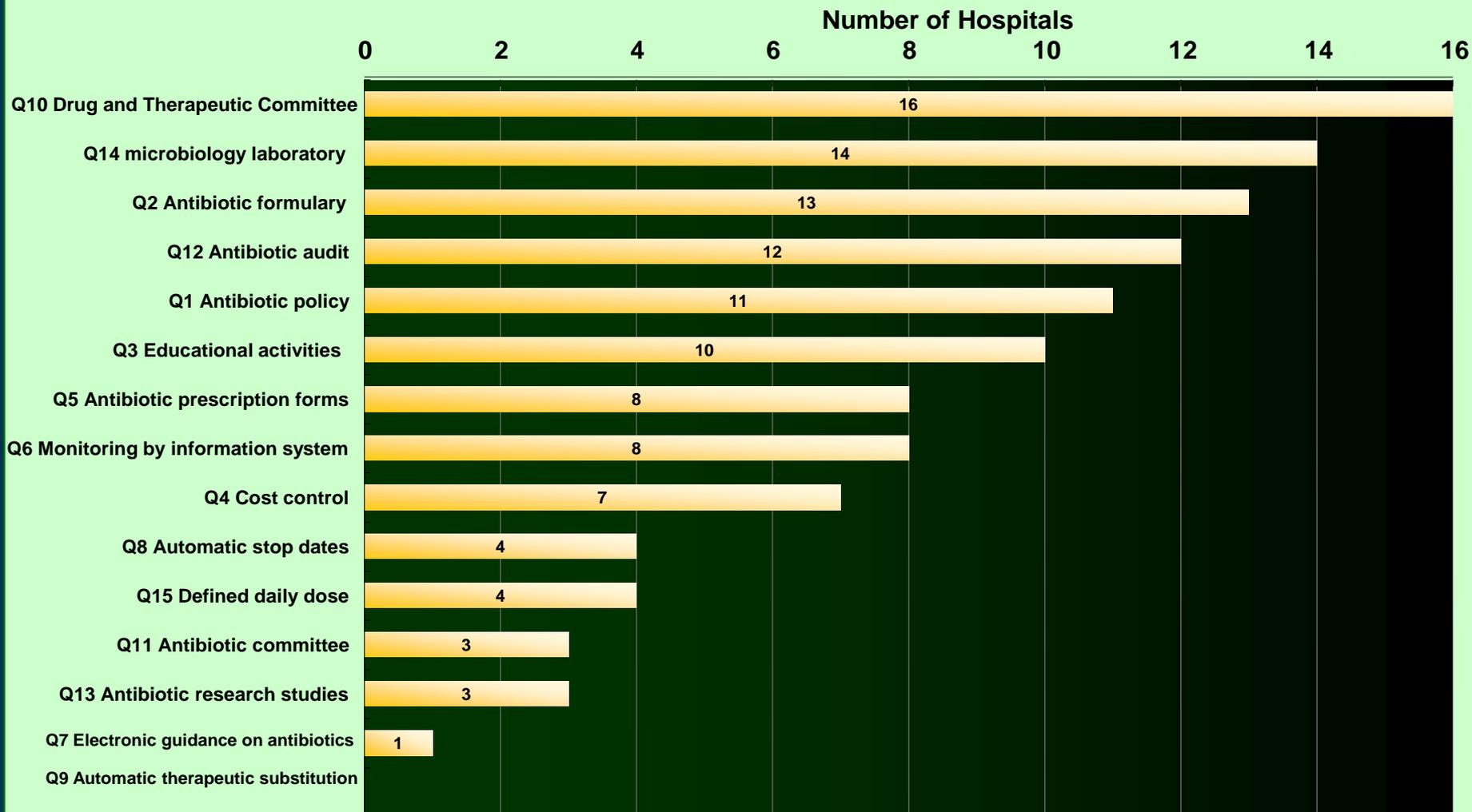
Specialties:

-Medicine / Surgery / Intensive Care Unit / Orthopedics

Use of antibiotics in these hospitals has accounted for over 90% of the whole HA usage in term of antibiotic expenditures



Background Study: Different Control Measures Adopted in Hospitals

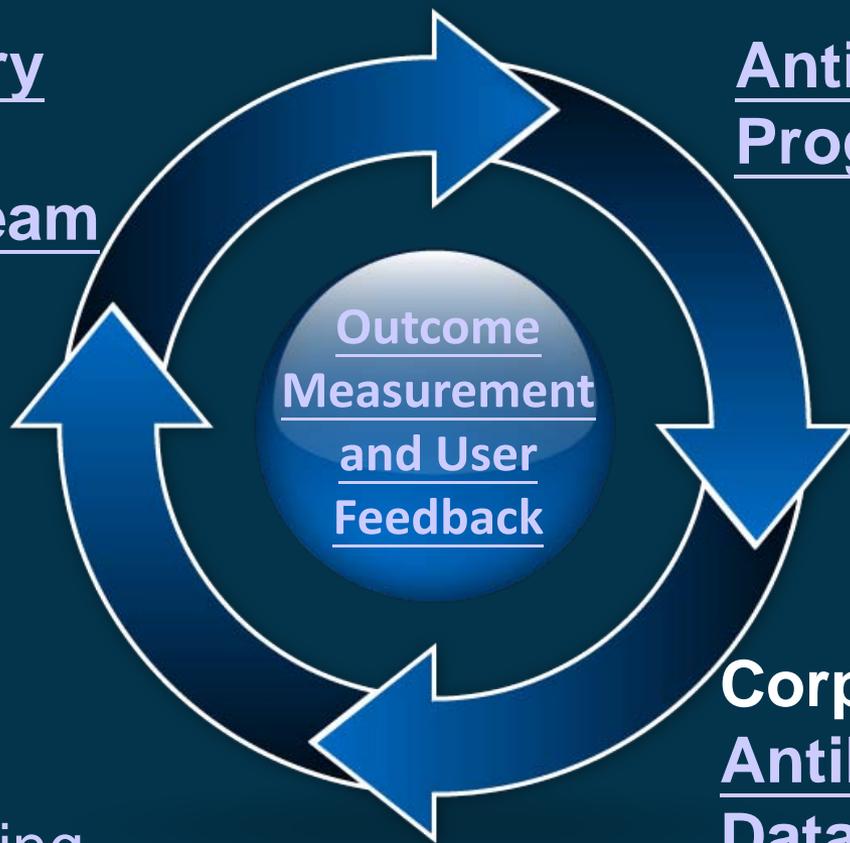




Strategies

Multidisciplinary
Antibiotic
Stewardship Team
(AST)

Antibiotic Monitoring
Program



Education and
consensus building

Corporate Wide
Antibiotic Usage
Database
Antibiotic Resistance
Database



Antibiotic Stewardship Team (AST)

- Microbiologist
- ID physician
- Infection control nurse

- Pharmacist
- Hospital management
- Senior specialty head
- ICU physician

Role of the AST:

Provide expert advice to clinicians

Manage the antibiotic prescription audit

Coordinate educational activities

Provide necessary data to the antibiotic and resistance database

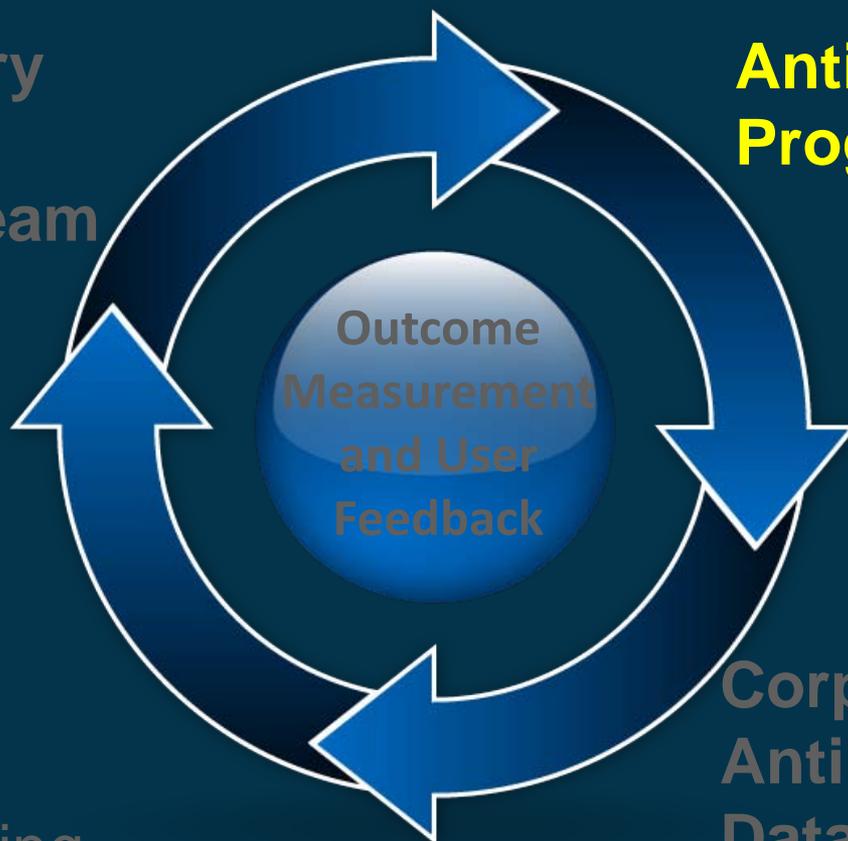
Promote the use of impact guidelines





Strategies

**Multidisciplinary
Antibiotic
Stewardship Team
(AST)**



**Antibiotic Monitoring
Program**

Education and
consensus building

**Corporate Wide
Antibiotic Usage
Database
Antibiotic Resistance
Database**



Antibiotic Monitoring Program

1. Big Gun Antibiotic

Tienam, Meropenem, Ceftazidime, Cefepime,
Tazocin, Sulperazon, Vancomycin, Teicoplanin

2. IV to Oral Switch

Ciprofloxacin, Levofloxacin, Clarithromycin,
Azithromycin, Fluconazole





Recommended Model

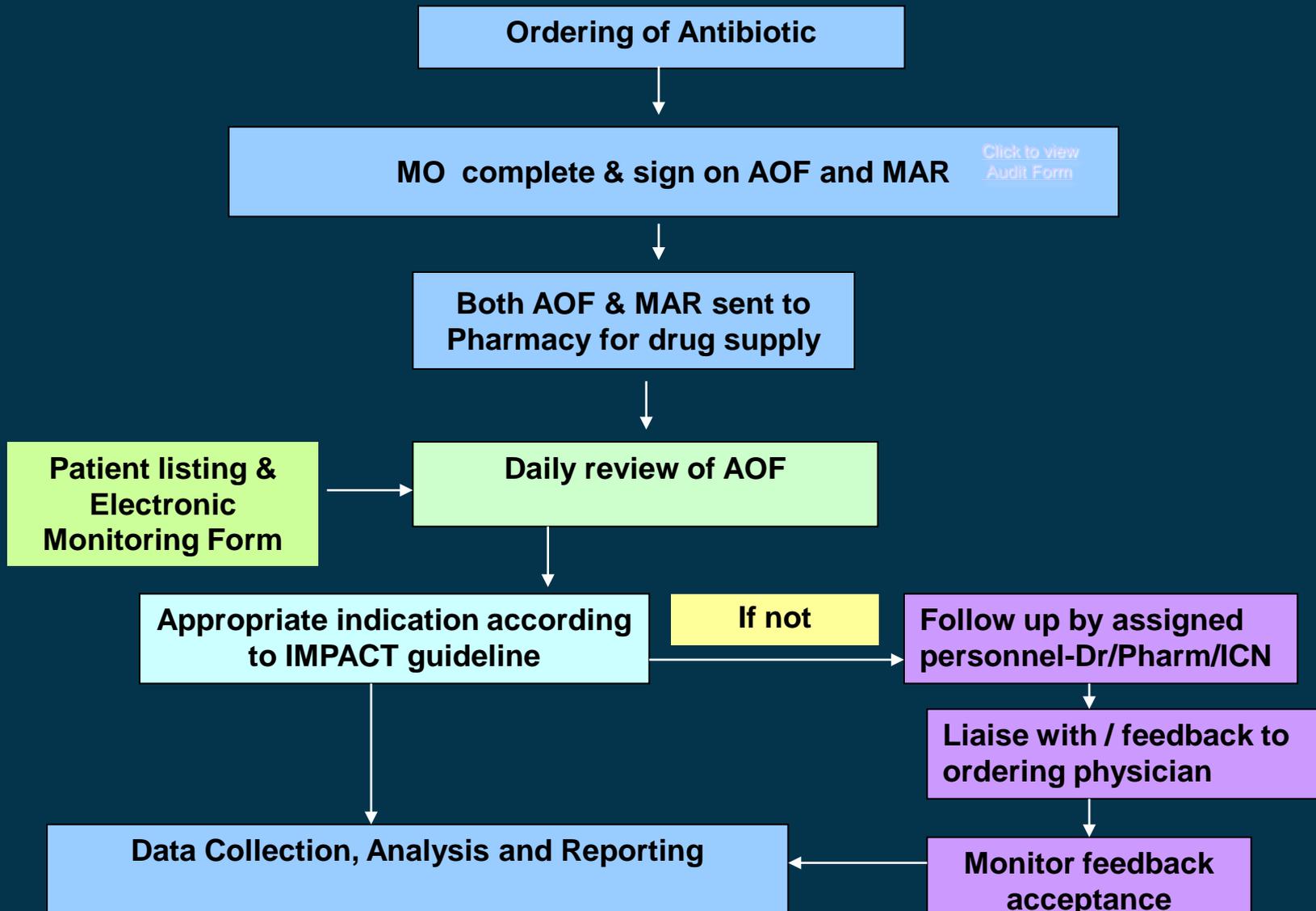
Antibiotic Order Form (AOF)

Immediate
Feedback
(ICF)



Concurrent
Review

Flow Diagram



Audit Form

Antibiotic Stewardship Program Audit Form

ID No: _____		Dr. Signature: _____	
Sex: _____ Age: _____		Dr. Name/Rank: _____	
Patient Name: _____		Dr. Code: _____	
Ward: _____ (Please affix gum label)		Date: _____	
Specialty: _____			
Organ/System involved:	Treatment:	Previous Antibiotic:	Organism isolated:
<input type="checkbox"/> Lung <input type="checkbox"/> Urinary <input type="checkbox"/> Bacteremia <input type="checkbox"/> Others (please specify): _____	<input type="checkbox"/> Intra-abdominal <input type="checkbox"/> IVcatheter-related <input type="checkbox"/> Peritoneal dialysis-related <input type="checkbox"/> Prophylaxis <input type="checkbox"/> Empirical <input type="checkbox"/> Known pathogen treatment	<input type="checkbox"/> Not on antibiotic currently <input type="checkbox"/> Switch from _____ Concurrent Antibiotic: Antibiotic Allergy History:	(if known) Specimen:

<input type="checkbox"/> Tienam <input type="checkbox"/> Meropenem	Dose	Frequency	Intended duration
--	------	-----------	-------------------

- Empirical therapy of hospital acquired infections with history of broad spectrum antibiotics exposure
- Empirical therapy of neutropenic fever in high risk patients
- Treatment of documented infections attributed to ESBL-producing bacteria
- Treatment of documented infections due to pathogens those are resistant to other antibiotics
- Others (please specify): _____

<input type="checkbox"/> Ceftazidime	Dose	Frequency	Intended duration
---	------	-----------	-------------------

- Empirical treatment (monotherapy or in combination with an aminoglycoside) of neutropenic fever
- Treatment of documented *Pseudomonas aeruginosa* infection sensitive to ceftazidime
- Others (please specify): _____

<input type="checkbox"/> Tazocin <input type="checkbox"/> Sulperazon <input type="checkbox"/> Cefepime	Dose	Frequency	Intended duration
---	------	-----------	-------------------

- Empirical therapy of suspected hospital acquired infections with history of broad spectrum antibiotics exposure
- [Tazocin Only] Empirical therapy (in combination with an aminoglycoside) of neutropenic fever
- Treatment of documented gram-negative infections attributed to organisms that are resistant to 1st line antimicrobial agents (e. g. Unasyn, Augmentin, Cefuroxime)
- Others (please specify): _____

<input type="checkbox"/> Vancomycin <input type="checkbox"/> Teicoplanin	Dose	Frequency	Intended duration
--	------	-----------	-------------------

- Treatment for serious infections caused by β -lactam resistant gram positive bacteria (e. g. MRSA, MRSE)
- Treatment for infections due to gram-positive organisms in patients with **SERIOUS** beta-lactam allergy
- Prophylaxis for endocarditis in high risk cardiac patients with beta-lactam allergy
- [Oral vancomycin only] For treatment of antibiotic-associated colitis in patient that has failed/is intolerant to metronidazole therapy
- Others (please specify): _____

Vancomycin is NOT recommended for: 1) eradication of MRSA carrier or colonization, 2) use in response to single positive coagulase-negative Staph. blood culture, 3) use in renal patient just for dosing convenience





Big Gun Patient List

Antibiotic Stewardship Program - Big Gun Program - Windows Internet Explorer

http:// /AntibioticStewardShip/BGMain.aspx

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Antibiotic Stewardship Program - Big Gun Program

Page Tools

Antibiotic Stewardship Program - Big Gun Program

Big Gun Program

IV-to-oral Switch Program

Search Information by HKID

Search Big Gun Program by SN

Search IV-to-oral Switch by SN

Hospital Search by date from to include old report

Type	Patient_Name	HKID	Dispense Date	HN Number	Ward	Spec	SN	IPAS Ward	Bed No	Drug Name	Dose	Report Date	Time	Refresh	View/ Data_Entry	Not for Review
Edited	HO, PI	B0	27/07/2008	HN08054	F2	MEDA	1000	F2	16	PIPERACILLIN + TAZOBACTAM	4.5G	28/07/2008	06:01:02	refresh	Edit	Not Review
	CHENG, W	G4	27/07/2008	HN08061	F2	MEDB	1004	F2	14	VANCOMYCIN (HCL)	500MG	28/07/2008	06:01:08	refresh	Edit	Not Review
	NG, W	C4	27/07/2008	HN08061	C6	MHEM	1002	C6	09	SULPERAZON (OR EQUIV)	1G	28/07/2008	06:01:06	refresh	Edit	Not Review
Edited	LI, Y	C2	27/07/2008	HN08061	OH4N	ONC	1003	H4S	34	PIPERACILLIN + TAZOBACTAM	4.5G	28/07/2008	06:01:07	refresh	Edit	Not Review
	MUI, K	D6	27/07/2008	HN08050	D5	ORTB	999	D5	27	PIPERACILLIN + TAZOBACTAM	4.5G	28/07/2008	06:01:00	refresh	Edit	Not Review

Hospital Authority Antibiotic Stewardship Program Big Guns Monitoring Program Audit Report



Patient Demographic

HKID: B0	HN: HN08054	SN: 1000
Sex: M	Age: 73	Date: 28/07/2008 06:01:02
Name: HO, P	DOB: 11/08/19	Adm.Date: 01/07/2008
PHS Spec: MEDA	PHS Ward: F2	Weight: KG
IPAS Spec: MEDA	IPAS Ward: F2	

Admission Source: Home OAH Other acute HA hospital Other tenable/extended care HA hospital
 Transfer from private hospital Others

Allergy History: No Known Drug Allergy

Recent Adm. PMH;HN08047 (08/06/2008-10/06/2008)

Clinical / Laboratory Data and Antibiotic Treatment

Past Medical History: DM HT IHD COAD ESRF Others non-Hodgkin's lymphoma, carcinoma of larynx, gout
 Immunocompromised Yes (Transplant On long term Steroid/immunosuppressants)
 No HIV Chemotherapy Others

Admission/Infection Diagnosis: Ca lung w/ lung collapse, pneumonia, ACS

Clinical Information: cough w/ sputum sound, SOB, afebrile

Body Temp: °C Ventilator No Yes Inotrope: Septic Shock No Yes

Category of Infection: Community Acquired Hospital Acquired Others

WBC: 16.50 x10 ⁹ /L (H) 27/07/2008	ANC: 14.60 x10 ⁹ /L (H) 27/07/2008	Neu: 88.10 % (H) 27/07/2008	ESR:
ALT: 40.00 U/L 27/07/2008	ALP: 215.00 U/L (H) 27/07/2008	Bill: 25.00 umol/L (H) 27/07/2008	CRP:
Ur: 5.30 mmol/L 27/07/2008	Cr: 81.00 umol/L 27/07/2008	Pit: 376.00 x10 ⁹ /L 27/07/2008	Cal CrCl:

Dr.Name:	Organ/System Involved:	Treatment:	Antibiotic Status:
Dr.Rank: Resident/MO	<input checked="" type="checkbox"/> Lung <input type="checkbox"/> Intra-abdominal <input type="checkbox"/> Urinary <input type="checkbox"/> IV Catheter-related <input type="checkbox"/> Bacteremia <input type="checkbox"/> PD-related <input type="checkbox"/> Soft tissue <input type="checkbox"/> CNS <input type="checkbox"/> Others :	<input type="radio"/> Prophylaxis <input checked="" type="radio"/> Empirical <input type="radio"/> Known Pathogen	<input type="radio"/> Not on Antibiotic Previously <input type="radio"/> Switch from: <input type="radio"/> Concurrent Antibiotic:
Dr.Code:			

Antibiotic Name: PIPERACILLIN + TAZOBACTAM	Dose: 4.5G	Frequency: EVERY EIGHT HOURS	Start Date: 27/07/2008 21:11:04	Intended Duration:
---	---------------	---------------------------------	------------------------------------	--------------------

Indication:

- Empirical therapy of hospital acquired infections with history of broad spectrum antibiotics exposure
- Empirical therapy of neutropenic fever
- Treatment of documented gram-negative infections attributed to organisms that are resistant to 1st line antimicrobial agents (e.g. Unasyn, Augmentin, Ceftazoxime)
- Other:

Disclaimer: The information provided is as of 28/07/2008 15:09:48 and intended for reference only

Automatic data retrieval



Hospital Authority Antibiotic Stewardship Program Big Guns Monitoring Program Audit Report



Patient Demographic

HKID:	P6 [redacted]	HN:	HN08 [redacted]	SN:	PMHBG2148
Sex:	F	Age:	[redacted]	Date:	17/11/2008 08:31:29
Name:	APIN [redacted]	DOB:	01/01/19 [redacted]	Weight:	
PHS Spec:	REN	PHS Ward:	P3	Adm.Date:	06/11/2008
IPAS Spec:	MNEP	IPAS Ward:	P3F	Bed No.:	24

Culture Result

Specimen	Lab Number	Specimen Date	Reference Date	Report Date	Organism	Antibiotics	Sensitive	Antibiotics	Sensitive
Peritoneal Fluid	08MB077324	06/11/2008 12:09:00	06/11/2008 12:09:00	14/11/2008 17:34:00	E coli	Ampicillin	Resistance	Cefuroxime (Oral)	Sensitive
						Cefuroxime (Parenteral)	Sensitive	Gentamicin	Sensitive
						Levofloxacin	Sensitive	Trimethoprim / Sulfamethoxazole	Sensitive
						Augmentin	Sensitive		
						Streptococcus anginosus	Sensitive	Penicillin (MIC)	Sensitive

Automatic data retrieval on culture results

Other Concurrent Medication

Antibiotic Name:	Dose:	Frequency:	Start Date:	Intended Duration:

Outcome Measures

<input checked="" type="radio"/> Not Done <input type="radio"/> Pending for Doctor Input : <input type="radio"/> Undetermined <input checked="" type="radio"/> Appropriate Prescription <input type="radio"/> Inappropriate Prescription	
Immediate Concurrent Feedback to Prescriber: <input type="radio"/> Yes <input type="radio"/> No	
<input type="checkbox"/> Recommendation followed (eg switch to suggested antibiotic, dose, etc) <input type="checkbox"/> Change prescription but not follow specific recommendation <input type="checkbox"/> Recommendations not followed, ie no change of antibiotic, dose, etc <input type="checkbox"/> Not applicable - patient transfer / discharge / death / treatment already stopped <input type="checkbox"/> Modify concurrent antibiotics; recommendation followed <input type="checkbox"/> Modify concurrent antibiotics; recommendation not followed <input type="checkbox"/> Others (Specify)	<input type="checkbox"/> Deteriorating patient condition <input type="checkbox"/> Not applicable - patient transfer / discharge / death / treatment already stopped <input type="checkbox"/> Others (Specify)
Data Collected By: Daniel Ip	Audited By: Daniel Ip
Date: 28/07/2008	Date: 28/07/2008

Miscellaneous

Accuracy of Information Provided:	<input checked="" type="radio"/> Correct <input type="radio"/> Incorrect	<input type="checkbox"/> Treatment <input type="checkbox"/> Organism isolated <input type="checkbox"/> Indication <input type="checkbox"/> Previous Antibiotic Treatment <input type="checkbox"/> Sensitivity <input type="checkbox"/> Others
Reason for Appropriate Prescription: <input checked="" type="radio"/>	<input type="checkbox"/> According to ST <input checked="" type="checkbox"/> Nosocomial Infection <input type="checkbox"/> CAPD Peritonitis <input type="checkbox"/> Allergy History <input type="checkbox"/> Failure of 1st Line Antibiotics <input type="checkbox"/> Others	<input type="checkbox"/> Immunocompromised <input type="checkbox"/> Empirical Treatment for Neutopenic Fever <input type="checkbox"/> Recommended by Microbiologist / ID Physicians <input type="checkbox"/> Severe Clinical Infection <input type="checkbox"/> Oral Intake / Absorption Unreliable / Impossible
Reason for Inappropriate Prescription: <input type="radio"/>	<input type="checkbox"/> No evidence of infection/alternative Dx <input type="checkbox"/> Colonization / contamination <input type="checkbox"/> Redundant combination <input type="checkbox"/> Inappropriate route <input type="checkbox"/> Inappropriate choice <input type="checkbox"/> Others	<input type="checkbox"/> Use as prophylactic agent <input type="checkbox"/> Spectrum too broad <input type="checkbox"/> Inappropriate coverage <input type="checkbox"/> Inappropriate dosage

Remarks: Previous abx: AUG PO(7-14/7), CLX PO(5-14/7)
 pending lab:521625, no recent CBC pending
 OGD w/biopsy done 16/7
 palliative chemo for cancer
 Last +ve culture: MSSA in sputum, Sen to CLX,ERY,GEN,SXT, WBC+++/Epi. cell-

<input type="radio"/> Prescribing specialty:	<input type="radio"/> Resp <input type="radio"/> Hematology <input type="radio"/> Renal <input type="radio"/> GI <input type="radio"/> Endocrine <input type="radio"/> Geriatric <input type="radio"/> Cardiac <input type="radio"/> ID/SMS <input type="radio"/> Oncology <input type="radio"/> Others
<input type="radio"/> General	<input type="checkbox"/> TLC / DNR Senior MO pager

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Outcome data capture

IV-PO Switch Patient List

Antibiotic Stewardship Program - IV-to-oral Switch Program - Windows Internet Explorer

http:// /AntibioticStewardShip/IVMain.aspx

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Antibiotic Stewardship Program - IV-to-oral Switch Pro...

Antibiotic Stewardship Program - IV-to-oral Switch Program

Big Gun Program IV-to-oral Switch Program Search Information by HKID Search Big Gun Program by SN Search IV-to-oral Switch by SN

Hospital: Search by date from to include old report

Type	Patient_Name	HKID	Dispense Date	HN Number	Ward	Spec	SN	IPAS Ward	Bed No	Drug Name	Dose	Report Date	Time	Refresh	View/ Data_Entry	Not for Review
	LEE, C	G1	27/07/2008	HN08061	OH5	EM	11246	H5EM	14A	CIPROFLOXACIN (LACTATE)	200MG	28/07/2008	06:01:45	<input type="button" value="refresh"/>	<input type="checkbox"/> Edit	<input type="button" value="Not Review"/>

Local intranet 100%

Hospital Authority Antibiotic Stewardship Program IV-to-oral Switch Program Audit Report



Patient Demographic

HKID:	G1	HN:	HN0806	SN:	11246
Sex:	M	Age:	53	Date:	28/07/2008 06:01:45
Name:	LEE, C	DOB:	23/08/19	Adm.Date:	27/07/2008
PHS Spec:	EM	PHS Ward:	OH5	Weight:	KG
IPAS Ward:	EM	IPAS Ward:	H5EM		

Allergy History:	No Known Drug Allergy
Recent Adm.	
Admission/Infection Diagnosis:	
Clinical Information:	
Surgical Procedure:	

Clinical / Laboratory Data and

WBC: 4.80 x10 ⁹ /L <small>27/07/2008</small>	ANC: 2.90 x10 ⁹ /L <small>27/07/2008</small>	Neu: 60.20 % <small>27/07/2008</small>	ESR:
ALT:	ALP:	Bill:	CRP:
Ur: 3.80 mmol/L <small>27/07/2008</small>	Cr: 88.00 umol/L <small>27/07/2008</small>	Plt: 144.00 x10 ⁹ /L (L) <small>27/07/2008</small>	Cal CrCl:
Dr. Name:	Organ/System Involved: <input type="checkbox"/> Lung <input type="checkbox"/> Intra-abdominal <input type="checkbox"/> Urinary <input type="checkbox"/> IV Catheter-related <input type="checkbox"/> Bacteremia <input type="checkbox"/> PD-related <input type="checkbox"/> Soft tissue <input type="checkbox"/> CNS <input type="checkbox"/> Others :	Treatment: <input type="radio"/> Prophylaxis <input type="radio"/> Empirical <input type="radio"/> Known Pathogen	Antibiotic Status: <input type="radio"/> Not on Antibiotic Previously <input type="radio"/> Switch from: <input type="radio"/> Concurrent Antibiotic:
Dr. Rank:			
Dr. Code:			
Antibiotic Name: CIPROFLOXACIN (LACTATE)	Dose: 200MG	Frequency: ONCE	Start Date: 27/07/2008 12:45:47
			Intended Duration:

Other Concurrent Medication

Antibiotic Name:	Dose:	Frequency:	Start Date:	Intended Duration:

Disclaimer: The information provided is as of 28/07/2008 06:01:45 and intended for reference only

Checklist for IV-to-oral Switch	Day 2	Day 3	Day 4
i) No specific indication for prolonged IV therapy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii) Afebrile for at least 24 hours	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii) WBC count is normalizing (towards normal range of 3.5 to $10 \times 10^9/L$) (1) $4.80 \times 10^9/L$ on date 27/07/2008 11:08:00	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv) Signs and symptoms (e.g. cough, pain, dyspnea) related to infections are improving.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
v) Patient is not neutropenic ($ANC > 2 \times 10^9$)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vi) Patient is eating/Able to take drugs by mouth (non-NPO) <N/G feeding is OK>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
vii) No continuous N/G suctioning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
viii) No severe nausea, vomiting, diarrhea, swallowing problems, GI obstruction, motility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ix) No malabsorption syndrome	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
x) No pancreatitis or active GI bleeding or other conditions that C/I the use of oral medications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meet IV to Oral Switch Criteria	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No

Intervention

ICF Date:	Recommended PO Regimen:	Antibiotic Name:	Dose:	Frequency:
Possible Drug Interaction with existing oral medication: <input type="radio"/> No <input type="radio"/> Yes [give drug name(s) :]				

Outcome Measures

<input type="radio"/> Not Done	<input type="radio"/> Pending for Doctor Input :	<input type="radio"/> Undetermined
<input type="radio"/> Patient not fulfilling switching criteria (Appropriate Prescription)		<input type="radio"/> Patient fulfilling switching criteria (Inappropriate Prescription)
<input type="radio"/> With immediate concurrent feedback		<input type="radio"/> Without immediate concurrent feedback
<input type="checkbox"/> Recommendation followed on date _____ (within _____ day). <input type="checkbox"/> Change prescription but not follow specific recommendation <input type="checkbox"/> Recommendations not followed <input type="checkbox"/> Not applicable-patient transfer / discharge / death / treatment already <input type="checkbox"/> Modify concurrent antibiotics; recommendation followed <input type="checkbox"/> Modify concurrent antibiotics; recommendation not followed <input type="checkbox"/> Others (Specify)		<input type="checkbox"/> Not applicable-patient transfer / discharge / death / treatment already stopped <input type="checkbox"/> Other Intervention - Refer to microbiologist <input type="checkbox"/> Others (Specify)

Disclaimer: The information provided is as of 28/07/2008 06:01:45 and intended for reference only

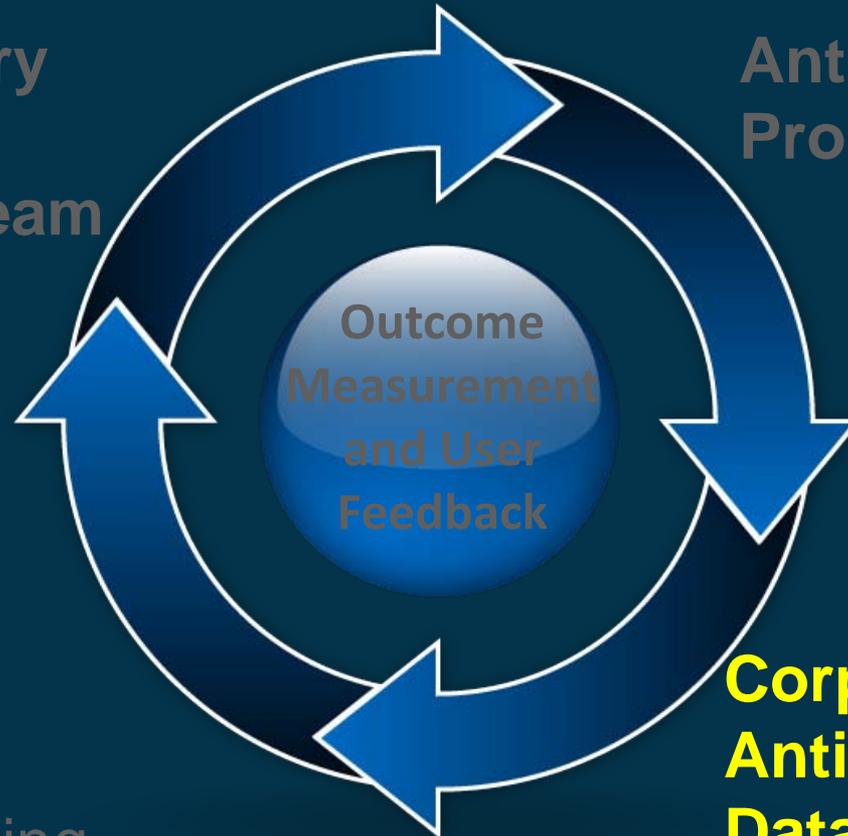




Strategies

**Multidisciplinary
Antibiotic
Stewardship Team
(AST)**

**Antibiotic Monitoring
Program**



Education and
consensus building

**Corporate Wide
Antibiotic Usage
Database
Antibiotic Resistance
Database**



Antibiotic Usage

- DDD is defined as:
 - the assumed average maintenance dose in gram per day for a specific antibiotic used for its main indication in adults

$$\text{Consumption in DDD} = \frac{\text{Dispensed Quantity} \times \text{Unit Strength}}{\text{DDD Factor (WHO)}}$$

- Usage density figure:
 - DDD / 1,000 BDO
 - DDD / 100 admission
- A fixed unit of measurement independent of price, formulation, workloads enabling fair comparison between hospitals/populations

Monthly report generated by CDARS by hospital/specialty/antibiotic

CDARS -- CHAN KAM TING, DORA login at 14:01, 14/10/2010 - Windows Internet Explorer

Clinical Data Analysis and Reporting System

Report History

Standard Report

Please specify reporting criteria for the chosen standard report

Antibiotic Usage

Step 1 : Specify the Reporting Period by:

Reporting Period Type: Monthly Quarterly Yearly

Selected Reporting Period: From: Oct 09 To: Sep 10

Step 2 : Specify Study Hospital:

Hospitals and Institutions

- HKEC
 - CHC
 - PYN
 - RH
 - SJH
 - TSK
 - TWE
 - WCH
- HKWC
 - DKC
 - FYK
 - GH
 - ML
 - NLH
 - QMH
 - TWH
 - TYH
- KCC
 - BH
 - HKE
 - KH

All Specialties

- MED
- ICU_HDU
- SUR
- ONC
- ORT
- PAE+NEO
- Others

All Antibiotics and Antifungal Drugs

- ANTIFUNGAL DRUGS
- Big Gun
 - CEFEPIME - Parenteral
 - CEFTAZIDIME - Parenteral
 - LINEZOLID - Oral
 - LINEZOLID - Parenteral
 - MEROPENEM - Parenteral
 - PIPERACILLIN + TAZOBACTAM - Paren
 - SULPERAZON (OR EQUIV) - Parenteral
 - TEICOPLANIN - Parenteral
 - TIENAM (OR EQUIV) IV - Parenteral
 - VANCOMYCIN - Parenteral
- IVPO
- MISC.
 - AMKICIN - Parenteral
 - AMKICIN - Oral
 - AMPICILLIN - Oral
 - AMPICILLIN - Parenteral
 - AZTREONAM - Parenteral
 - BACAMPICILLIN - Oral

44 institutions

6 specialties

Over 300 items

Step 3 : Specify Measurement:

	Total	DDD	Acute DDD	Ward-Return DDD
		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
BDO (a)	<input type="checkbox"/>	<input checked="" type="checkbox"/> / 1000(a)	<input type="checkbox"/> / 1000(a)	<input checked="" type="checkbox"/> / 1000(a)
Acute BDO (b)	<input type="checkbox"/>	<input type="checkbox"/> / 1000(b)	<input checked="" type="checkbox"/> / 1000(b)	<input checked="" type="checkbox"/> / 1000(b)
Admission (c)	<input type="checkbox"/>	<input type="checkbox"/> / 100(c)	<input type="checkbox"/> / 100(c)	<input type="checkbox"/> / 100(c)
Admission + Transfer-in (d)	<input type="checkbox"/>	<input type="checkbox"/> / 100(d)	<input type="checkbox"/> / 100(d)	<input type="checkbox"/> / 100(d)

Antibiotic Usage

Report Period : from 2005-12 to 2006-02

For the Hospital: [REDACTED]

For the Specialty: MED

For the Antibiotic: CEFEPIME, CEFTAZIDIME, MEROPENEM, SULPERAZON, TAZOCIN, TEICOPLANIN, TIENAM, VANCOMYCIN

For the Measurement: DDD per 1000 BDO

For the Layout: Hospital >> Specialty >> Antibiotic

[Export](#)

 [Print](#)

[◀ Back](#)

Hospital: [REDACTED]

Specialty	Antibiotic	2005-12	2006-01	2006-02
		DDD per 1000 BDO	DDD per 1000 BDO	DDD per 1000 BDO
MED	CEFEPIME	11.56	9.36	13.22
	CEFTAZIDIME	0.47	1.40	0.99
	MEROPENEM	10.79	10.02	13.51
	SULPERAZON	10.29	16.41	8.44
	TAZOCIN	19.90	27.40	24.01
	TEICOPLANIN	0.00	0.00	0.00
	TIENAM	1.61	2.83	2.93
	VANCOMYCIN	10.20	7.34	9.96

Antibiotic Usage Report exported to Excel

Microsoft Office Word 2003 interface showing the menu bar (File, Edit, View, Insert, Format, Tools, Data, Window, Help) and the toolbar. The active window is titled "Clinical Data Analysis and Reporting System" and contains the following text:

Clinical Data Analysis and Reporting System
Antibiotic Usage
Report Period : from 2005-12 to 2006-02
For the Hospital: [Redacted]
For the Specialty: MED
For the Antibiotic: CEFEPIME, CEFTAZIDIME, MEROPENEM, SULPERAZON, TAZOCIN, TEICOPLANIN, TIENAM, VANCOMYCIN
For the Measurement: DDD per 1000 BDO
For the Layout: Hospital >> Specialty >> Antibiotic

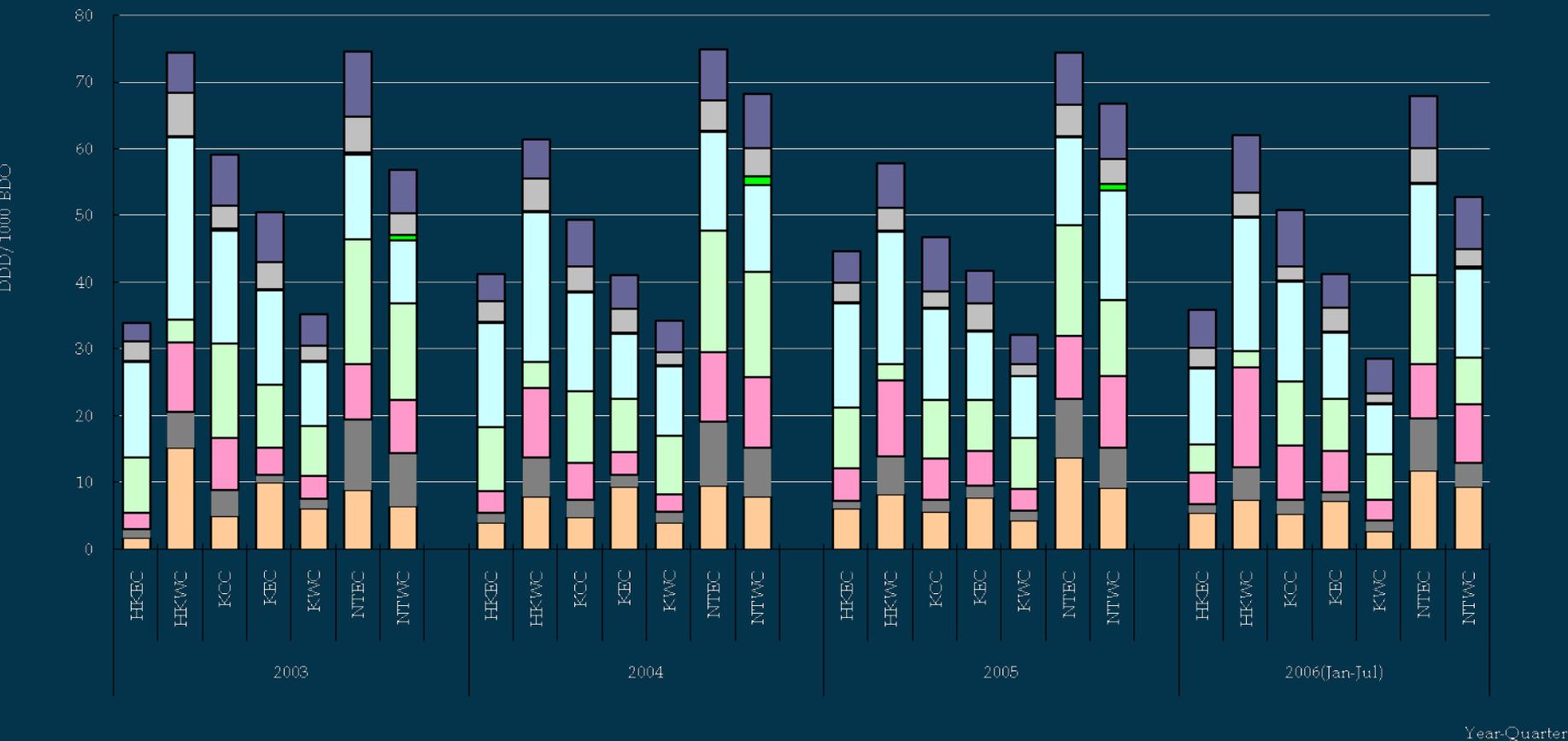
Hospital	Specialty	Antibiotic	Year Month	DDD per 1000 BDO
[Redacted]	MED	CEFEPIME	Dec-05	11.56
[Redacted]	MED	CEFEPIME	Jan-06	9.36
[Redacted]	MED	CEFEPIME	Feb-06	13.22
[Redacted]	MED	CEFTAZIDIME	Dec-05	0.47
[Redacted]	MED	CEFTAZIDIME	Jan-06	1.4
[Redacted]	MED	CEFTAZIDIME	Feb-06	0.99
[Redacted]	MED	MEROPENEM	Dec-05	10.79
[Redacted]	MED	MEROPENEM	Jan-06	10.88





Trend of Big Guns Usage in Clusters

AllSpecialties





Antibiotic Resistance Database

To report HA wide/cluster/hospital specific data on

- Overall sensitivity/resistance pattern of organism, irrespective of their sites of infection
- Sensitivity/resistance pattern of organism isolated in different types of clinical specimen
- Sensitivity of selected organisms
 - *E.coli*, *Pseudomonas aeruginosa*, *Streptococcus pneumoniae*, *Acinetobacter* species, *Enterococcus* species, *Klebsiella* species, *Staphylococcus aureus* and *Haemophilus influenzae*

Standard Report

Please specify reporting criteria for the chosen standard report

Cumulative Report on Antibiotic Susceptibility

Step 1 : Specify the Reporting Period by:

Reporting Period Type	<input type="radio"/> Quarterly	<input type="radio"/> Half-yearly	<input type="radio"/> Yearly
Selected Reporting Period	From: Jan 06	To: Apr 06	

Step 2 : Specify Isolation Criteria:

Isolation Criteria	<input checked="" type="radio"/> 1st Isolation by Organism Only	<input type="radio"/> 1st Isolation by Organism & Specimen
---------------------------	---	--

Step 3 : Specify Study Hospital and Specialty:

Hospital *	<input type="checkbox"/> All Hospitals and Institutions	Specialty	<input type="checkbox"/> All Following Specialties
	<input checked="" type="radio"/> by Cluster <input type="radio"/> by Group		<input type="checkbox"/> HKEC <input type="checkbox"/> HKWC <input type="checkbox"/> KCC <input type="checkbox"/> KEC <input type="checkbox"/> KWC

Step 4 : Specify Study Organism and Specimen:

Organism	<input type="checkbox"/> All Following Organism	Specimen	<input type="checkbox"/> All Following Specimen
	<input type="checkbox"/> Acinetobacter species <input type="checkbox"/> E. coli <input type="checkbox"/> Enterococcus spp <input type="checkbox"/> Klebsiella species <input type="checkbox"/> Haemophilus influenzae		<input type="radio"/> All Specimens <input checked="" type="radio"/> Specified Specimens

Step 5 : Specify Layout:

Report Layout	1. Organism
----------------------	-------------

Back

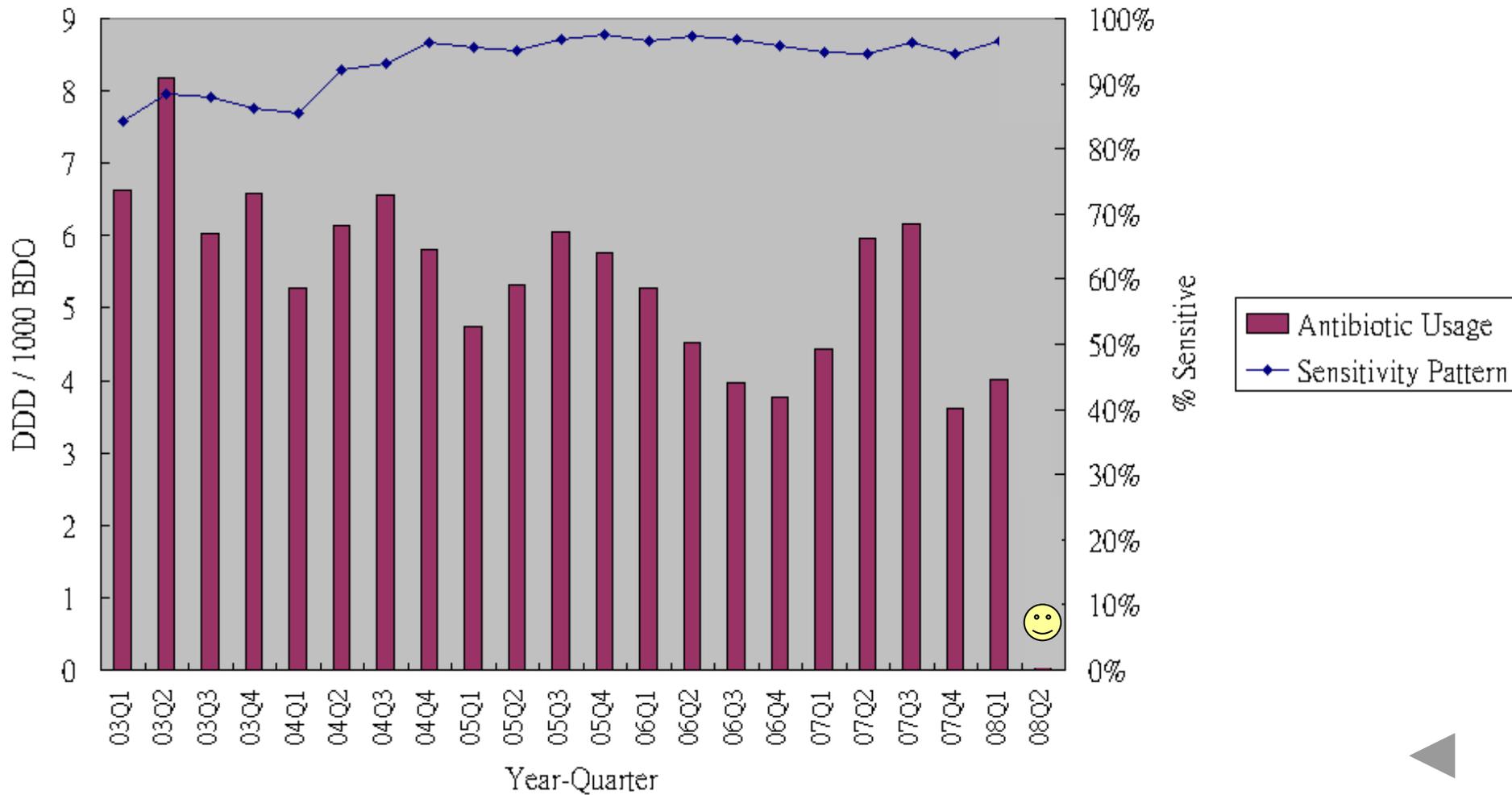
Reset

Submit



Pseudomonas aeruginosa/ Ceftazidime

Pseudomonas aeruginosa / Ceftazidime





Strategies

**Multidisciplinary
Antibiotic
Stewardship Team
(AST)**

**Antibiotic Monitoring
Program**



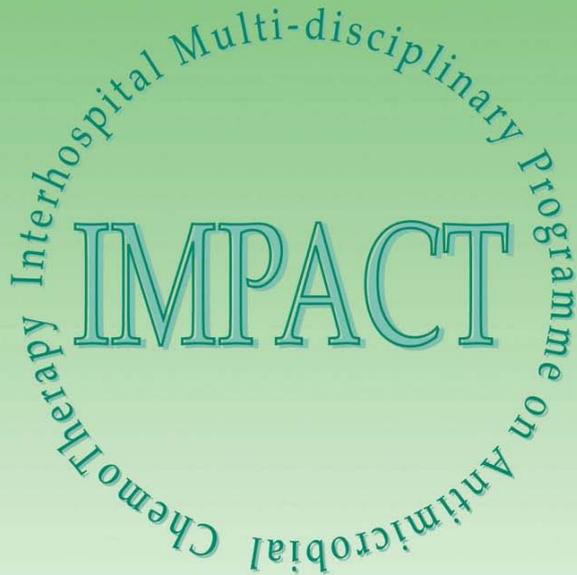
**Education and
consensus building**

**Corporate Wide
Antibiotic Usage
Database
Antibiotic Resistance
Database**



IMPACT Guideline (Third Edition)

Reducing bacterial resistance
with



Third Edition (version 3.0)

Local Key Reference for

- Antibiotic resistance
- Antibiotic stewardship program
- Selected antimicrobial use
- Empirical therapy of common infections
- Known-pathogen therapy
- Surgical prophylaxis
- Cost and dosage of antimicrobial agents



Publicity

合理 **HP**
 醫院管理局 HOSPITAL AUTHORITY 衛生防護中心
使用抗生素
 Rational Use of Antibiotics

確保最佳治療效果
處方前應考慮：
 Tips on Antibiotics Prescription for optimal treatment results:

按本地的抗生素圖譜及細菌抗藥情況處方
 Prescribe according to local antibiogram and antibiotic susceptibility test

用有效的狹譜抗生素代替廣譜抗生素
 Use appropriate narrow spectrum antibiotics instead of broad spectrum ones

若無細菌感染，不應使用抗生素
 Stop antibiotic treatment when there is no bacterial infection

實踐適當感染控制措施
 Observe proper infection control practices

合理 **HP**
 醫院管理局 HOSPITAL AUTHORITY 衛生防護中心
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 醫院管理局 HOSPITAL AUTHORITY 衛生防護中心
使用抗生素
 Rational Use of Antibiotics

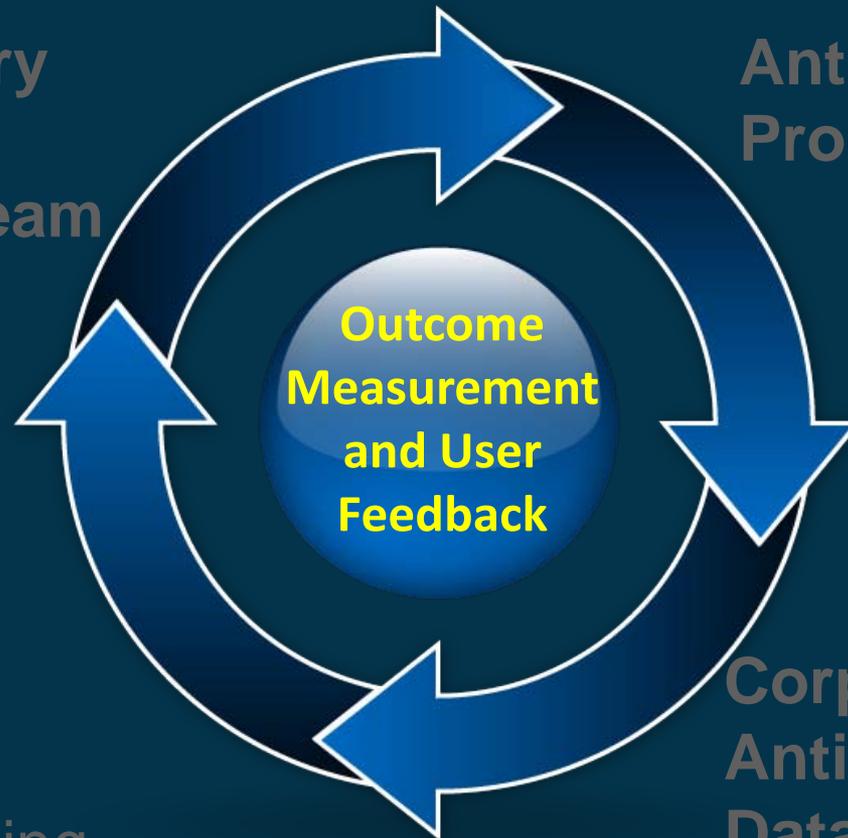




Strategies

**Multidisciplinary
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(AST)**

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Program**



**Education and
consensus building**

**Corporate Wide
Antibiotic Usage
Database
Antibiotic Resistance
Database**



Outcome

1. Antibiotic consumption
2. Resistance pattern
3. Relative proportion of appropriate / inappropriate prescribing
4. Feedback acceptance



Utilization of big gun antibiotics by specialties (2005-2008)

DDD per 1,000 BDO

Specialty	2005 (baseline)	2006	06 vs baseline	2007	2008	08 vs. baseline
All	46.71	45.51	-3%	46.93	46.97	1%
Medicine	62.57	55.78	-11%	55.93	57.24	-9%
Surgery	37.32	40.83	9%	40.12	40.60	9%
Ortho	29.81	30.7	3%	30.92	29.59	-1%
ICU_HDU	350.29	374.48	7%	403.88	393.64	12%



Utilization of big gun antibiotics in acute hospitals

DDD per 1,000 BDO

Hospital	2004	2005 (baseline)	2006	06 vs baseline	2007	2008	08 vs. baseline (vs. 4Q03)
All Acute hospitals	46.99	46.71	45.51	-3%	46.93	46.97	1%
A	35.02	38.08	40.07	5%	47.69	49.56	30%
B	41.21	46.75	31.46	-33%	38.51	50.72	8%
C	73.04	68.52	71.51	4%	64.01	72.28	5%(-5%)
D	59.88	56.83	65.87	16%	69.30	61.12	8%(-18%)
E	47.15	46.03	42.17	-8%	35.11	32.71	-29%
F	34.33	35.60	34.63	-3%	32.82	34.64	-3%
G	24.35	26.68	21.45	-20%	21.52	24.82	-7%
H	24.87	25.25	26.25	4%	23.47	25.84	2%
I	38.85	33.65	36.48	8%	40.88	40.58	21%
J	28.77	25.28	19.13	-24%	25.80	19.58	-23%
K	43.78	40.34	37.81	-6%	41.16	28.06	-30%
L	47.17	54.76	47.59	-13%	46.86	41.92	-23%
M	81.19	79.55	75.96	-5%	73.82	66.3	-17%
N	60.47	61.12	50.79	-17%	51.79	55.85	-9%



Antibiotic Audit

- **Total no. of reviewed big gun order:**

Year 2006: 15,929

Year 2007: 15,018

Year 2008: 12,401

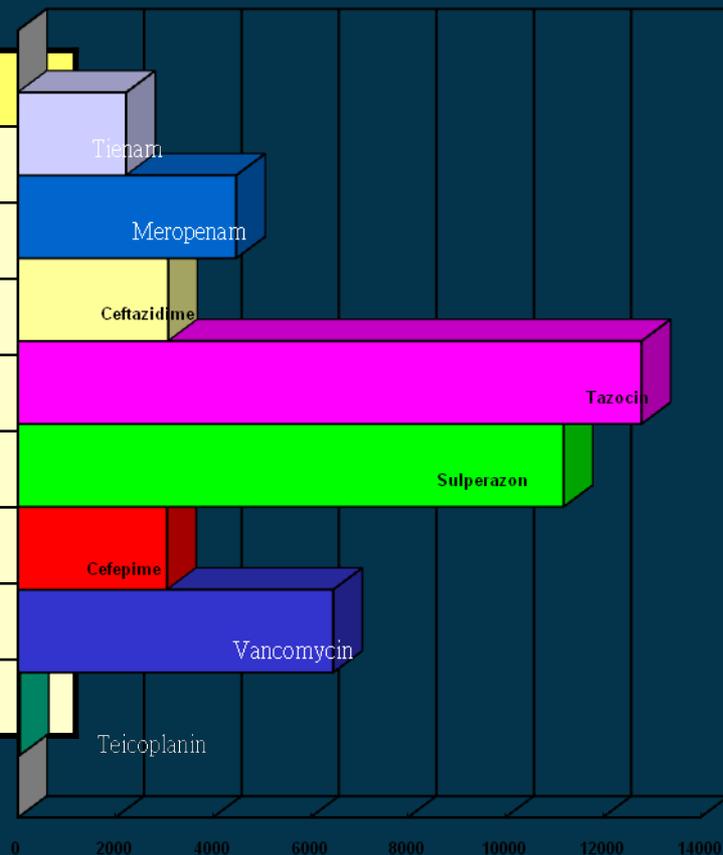
Total: 43,348

<i>Specialties</i>	<i>No. (%)</i>
ICU	1351 (3)
Medicine	32,447 (75)
Orthopedics	2,259 (5)
Surgery	5,508 (13)
Others	1,783 (4)



Antibiotics

N=43,348	No (%)
Tienam	2,221 (5)
Meropenam	4,480 (10)
Ceftazidime	3,085 (7)
Tazocin	12,798 (30)
Sulperazon	11,198 (26)
Cefepime	3,060 (7)
Vancomycin	6,471 (15)
Teicoplanin	35 (0)





Intervention Outcome

43,348 Case Review

39,093 (90%)
Appropriate

4,255 (10%)
Inappropriate

919 (22%)
Without ICF

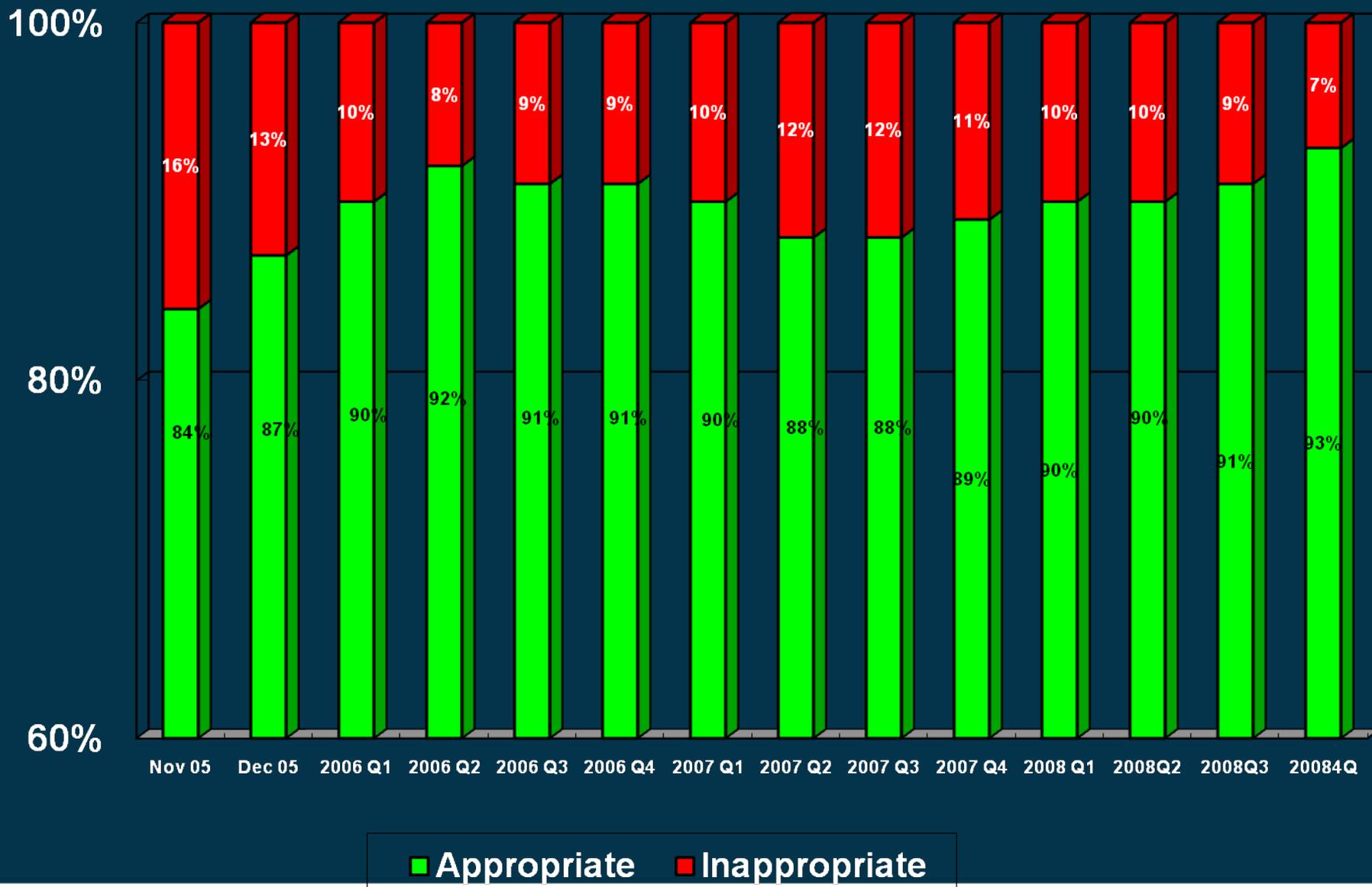
3,336 (78%)
With ICF

- Deteriorating patient condition 19 (2%)
- Not applicable 734 (80%)
- Others 166 (18%)

- Follow recommendation 2,509 (75%)
- Switch to other antibiotics 98 (3%)
- Not follow recommendation 325 (10%)
- Not applicable 266 (8%)
- Others 138 (4%)



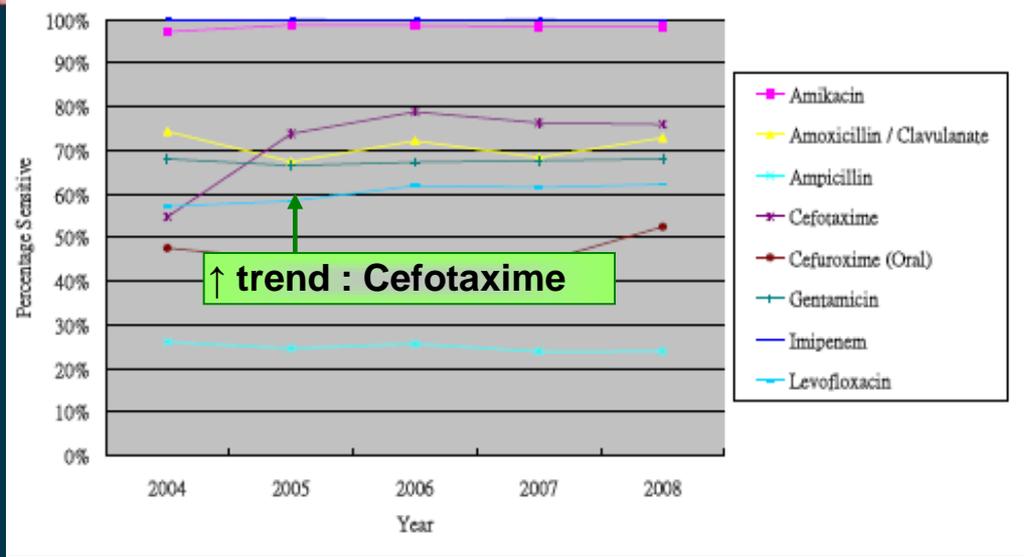
Appropriate prescription



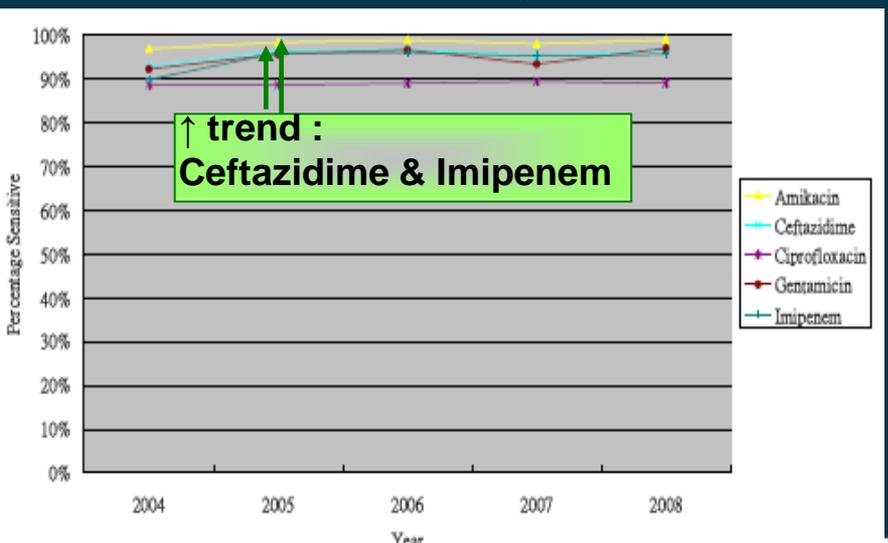


Antibiotics Sensitivity Pattern

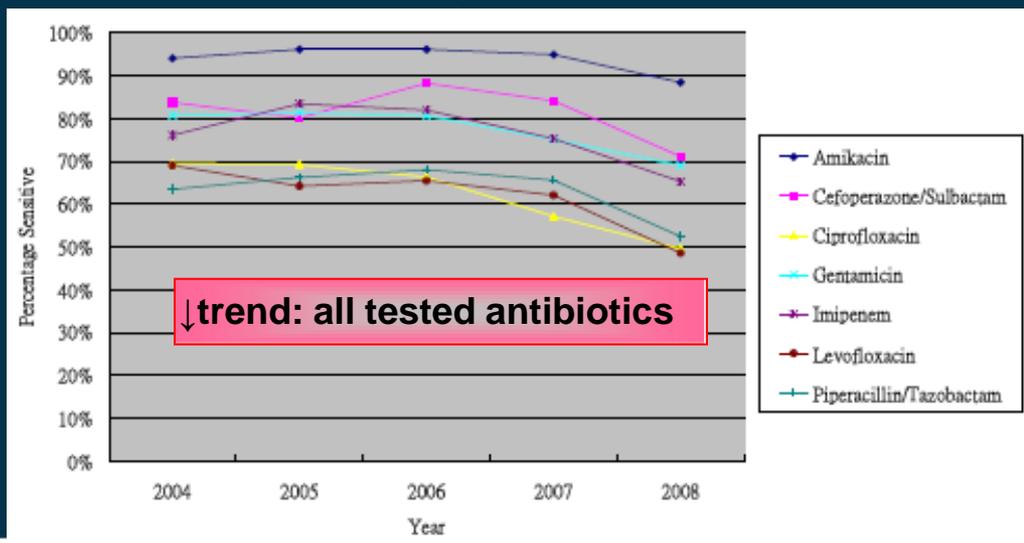
Percentage Sensitive to E. coli



Percentage Sensitive to Pseudomonas aeruginosa



Percentage Sensitive to Acinetobacter Species





Way Forward for the ASP



Big Gun Groups

GROUP 1 (Corporate KPI)

- Cefepime
- Ceftazidime
- Meropenem
- Tazocin
- Sulperazon
- Tienam
- IV Fluoroquinolone (FQ)- to be confirmed

Group 2

- Timentin
- Piperacillin
- Cefotaxime
- Ceftriaxone

Group 3

- Vancomycin
- Linezolid



Central Level

Working group on Antibiotic Stewardship Program

- Membership:
 - CICO/Chief Pharmacist Co-Chair,
 - Head of ICB
 - Representatives from 7 clusters
 - Representatives from COC
- Terms of Reference:
 - To provide strategic advice on the development of ASP in HA
 - To advise on the development of reference KPI indicators for antibiotic usage monitoring
 - To advise on clinical guidelines/protocols for the use of antibiotics
 - To advise on IT need and data/research priorities
 - To facilitate promulgation/coordination of ASP or related programs



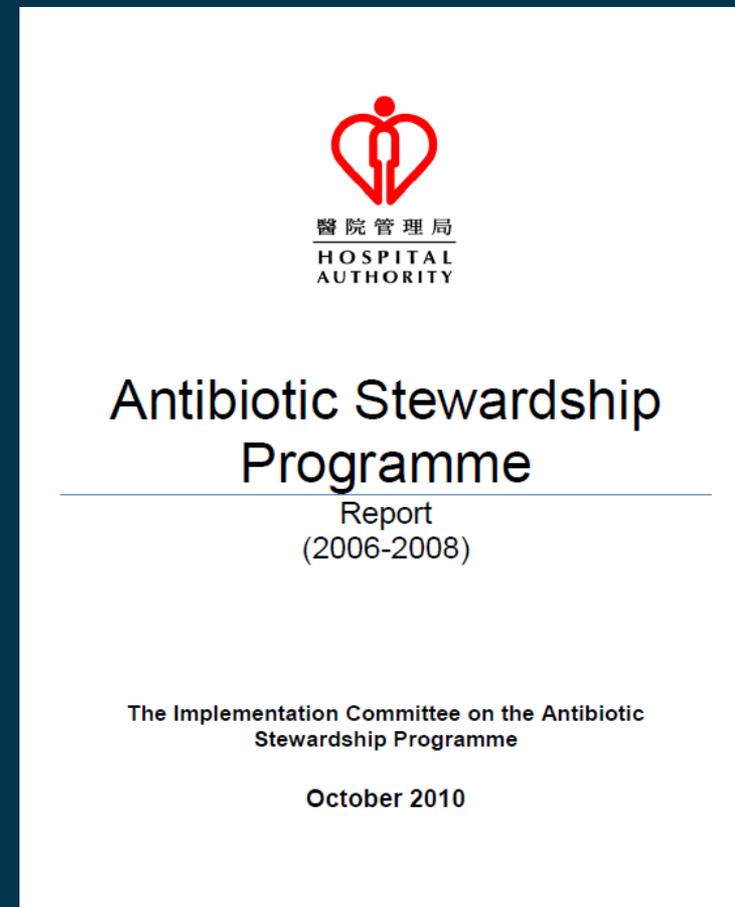
Hospital Level

- Hospital Level
 - Local ownership of ASP
 - Individual institution to tailor specific initiatives to address particular antibiotic resistance problem in accordance to HA Task Force on Infection Control guidelines on the subject
 - WHO's 3rd challenge “ Control of antibiotics resistance ”



“The Report”

- The Report will be distributed to relevant stakeholders
 - HAHO
 - DURC
 - CCIDER
 - CHP
 - HPPAR
 - Cluster
 - CCE
 - ICASP





TEAMWORK

COMING TOGETHER IS A BEGINNING;
KEEPING TOGETHER IS PROCESS;
WORKING TOGETHER IS SUCCESS.

HENRY FORD



THE END.