



Hong Kong West Cluster



Sharing of AMR control in local public hospital - hurdles and ways to overcome

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 **World Health Organization**

● All WHO
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| | |
|--------------------------------|--|
| Home | The world health report |
| About WHO | WHO > WHO sites > World health report > The world health report 1996 - Fighting disease, fostering development > World health report 1996 press kit |
| Countries | |
| Health topics | printable version |
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| The world health report | Antibiotic resistance |
| Current report | Drug-resistant strains of microbes are having a deadly impact on the fight against tuberculosis, malaria, cholera, diarrhoea and pneumonia - major diseases which together killed more than 10 million people last year. Some bacteria are resistant to as many as 10 different drugs. |
| Previous reports | |
| Press kit | <p>Press release</p> <ol style="list-style-type: none"> 1. Infectious diseases kill over 17 million people a year: WHO warns of global crisis 2. The Ten Biggest Killers 3. The Ten Most Common Infections 4. New Diseases 5. Antibiotic resistance 6. Why diseases are spreading 7. Epidemiology of 1995 8. Infectious diseases and cancer 9. Priorities for action <p>"Disastrously, this is happening at a time when too few new drugs are being developed to replace those that have lost their effectiveness. In the race for supremacy, microbes are sprinting ahead. The gap between their ability to mutate into drug-resistant strains and man's ability to counter them is widening fast", the report says.</p> <p>Many of the most powerful antibiotics have been rendered impotent. The two most common bacteria which are the major cause of death in children through acute respiratory infections, particularly pneumonia, are becoming more and more resistant to drugs.</p> <p>Antibiotic resistance in hospitals worldwide threatens to leave medical and public health workers virtually helpless in the prevention or treatment of many infections. Antibiotic resistant bacteria are responsible for up to 60% of hospital-acquired infections in the United States, for example. Resistance means that people with infections are ill for longer periods, and are at greater risk of dying, and that disease epidemics are prolonged.</p> <p>"All bacteria possess an inherent flexibility that enables them, sooner or later, to evolve genes that render them resistant to any antimicrobial. The implications are awesome: drugs that cost tens of millions of dollars to produce, and take perhaps 10 years to reach the market, have only a limited life span in which they are effective," the report says. "As resistance spreads, that life span shrinks; as fewer new drugs appear, the gap widens between infection and control."</p> <p>A major cause of the antibiotic resistance crisis is the uncontrolled and inappropriate use of antibiotics globally. They are used by too many people to treat the wrong kind of infections at the wrong dosage and for the wrong period of time.</p> |

Worldwide Concern on Improving the containment of Antibiotic Resistance (2001)

“Antibiotics” - “Societal drugs”

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IDSA
Infectious Diseases Society of America

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Bad Bugs, No Drugs
As Antibiotic Discovery Stagnates . . . A Public Health Crisis Brews

[Download white paper \(PDF, 37 pgs\)](#)
The PDF will take a few minutes to download.

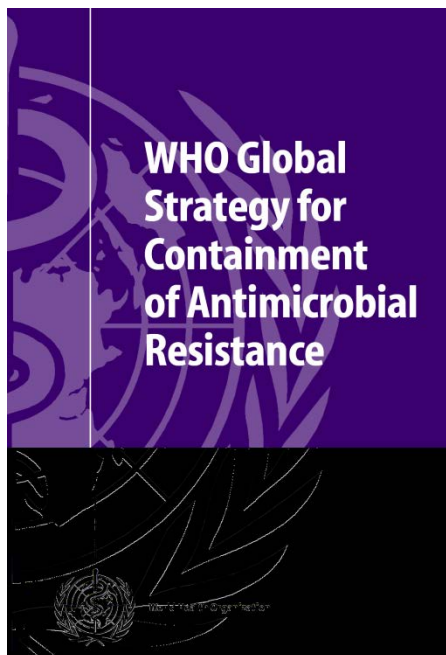
[Read the Executive Summary](#)
Learn about IDSA's concerns about the lack of new antibiotics to fight drug-resistant infections and proposed novel measures to avert this looming crisis.

Advocacy Alert

Critical legislation was introduced in the Senate, on April 28, 2005, to address the "Bad Bugs, No Drugs" problem. IDSA strongly endorses this bill. ([Learn more about the bill and IDSA's support for it.](#)) We ask everyone to send letters or e-mails urging Congress to act. The helpful talking points available at the link below makes it easy, and it only takes three minutes.

Alert: Urge the Senate to Pass the "Project Bioshield II Act"

IDSA Contacts:
Media and the Public: [Diana Olson \(703\) 299-0201](#)
Federal Policymakers: [Robert J. Gudas, JD \(703\) 299-0200](#)



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Campaign to Prevent Antimicrobial Resistance in Healthcare Settings

The 4 Strategies
(click on each piece for description)

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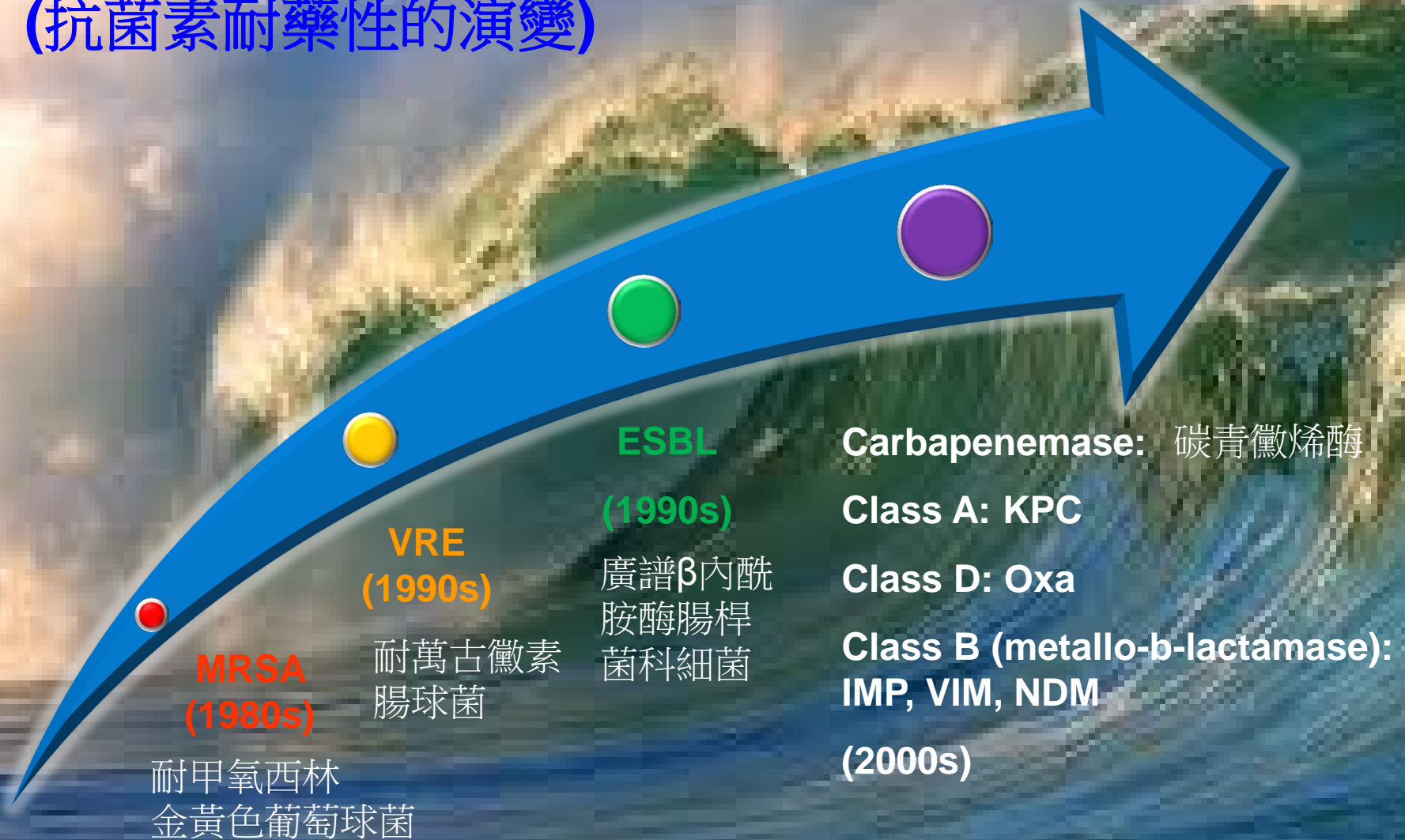
<http://www.cdc.gov/>

<http://www.who.int/en/>

<http://www.idsociety.org/>

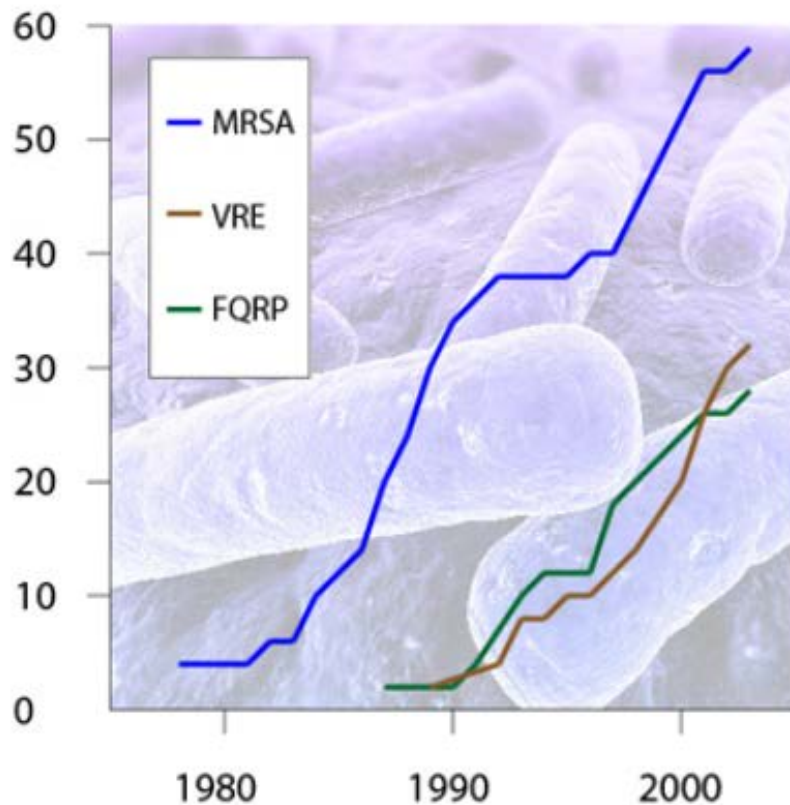
Evolution of antimicrobial resistance

(抗菌素耐藥性的演變)



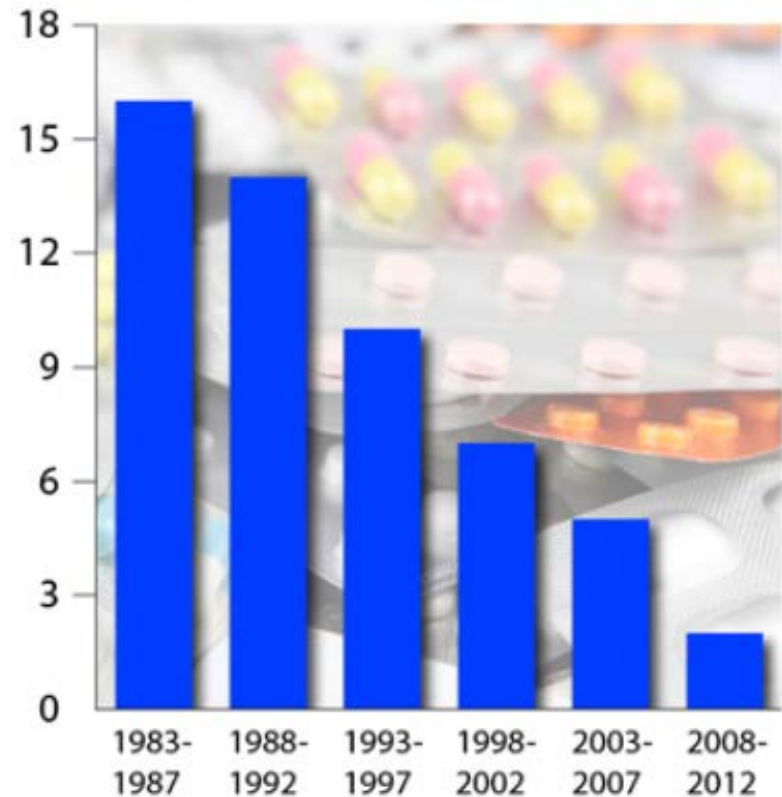
Inverse trajectory of declining antibiotic development

Antibiotic-resistant infections



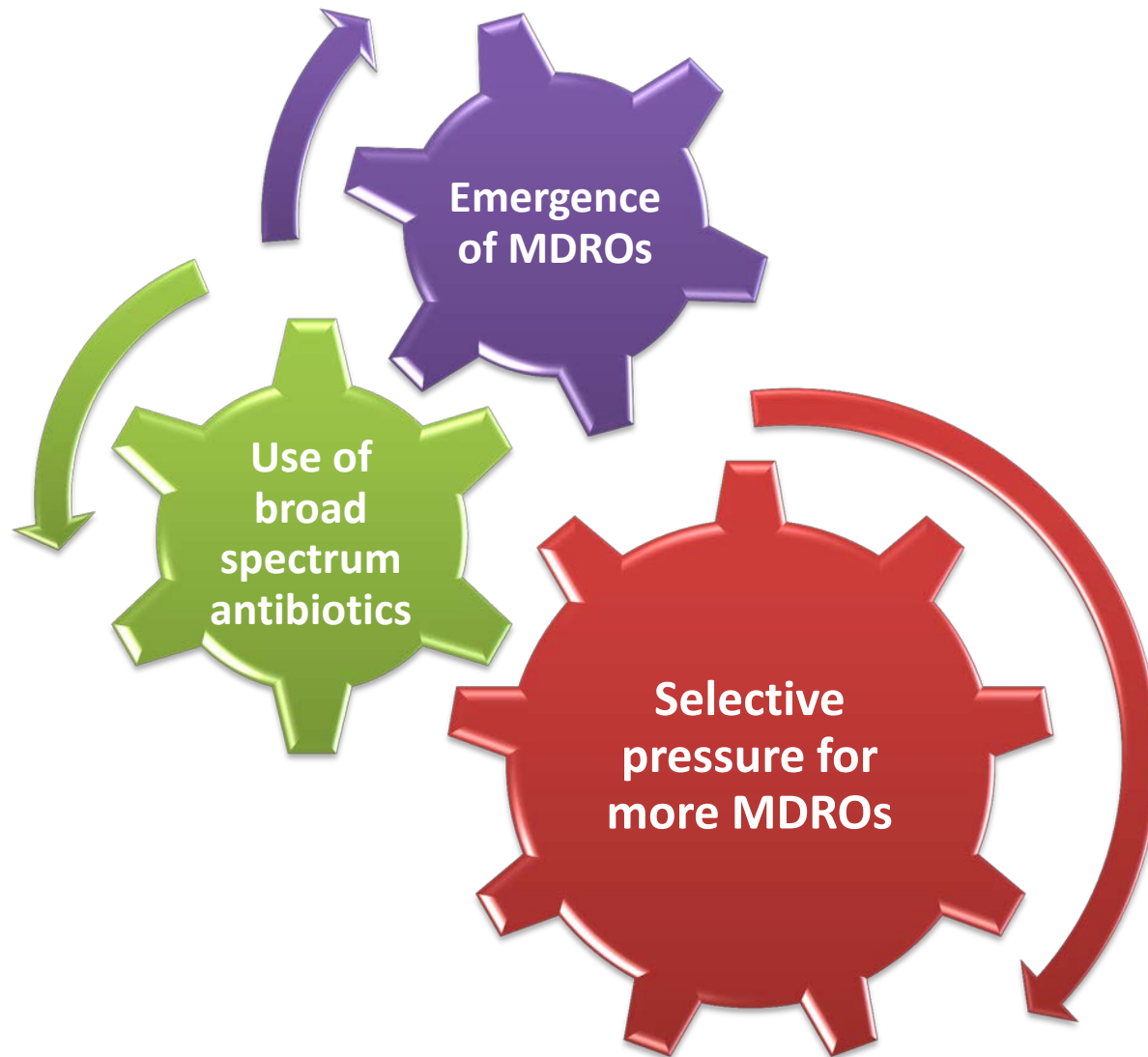
Source: Centers for Disease Control and Prevention

New antibiotics approved by the US Food and Drug Administration

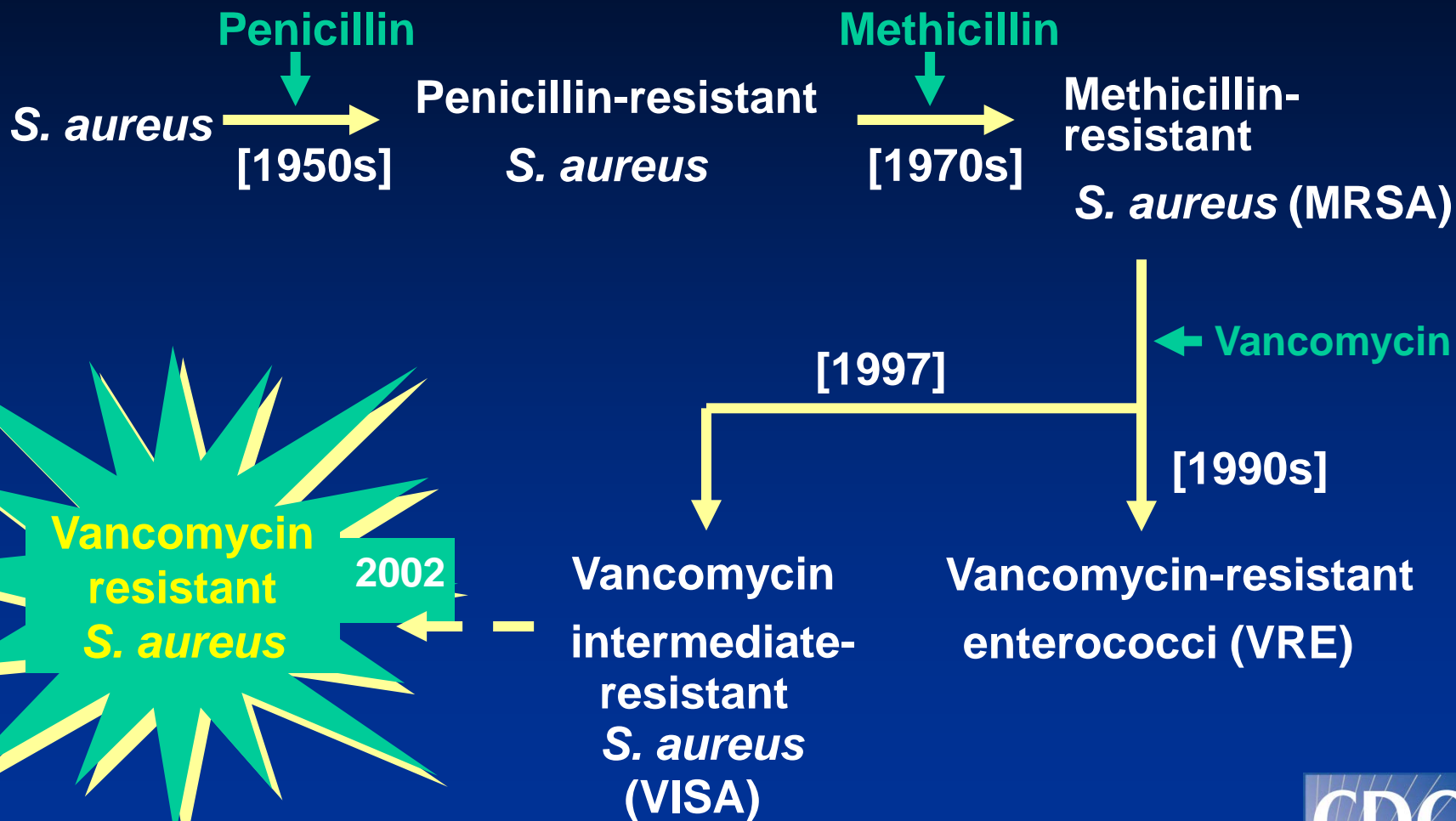


Source: Infectious Diseases Society of America

Antimicrobial stewardship & optimization program: patient safety vs public health concern



Evolution of Drug Resistance in *S. aureus*



GUIDELINES FOR PRESCRIBING VANCOMYCIN & TEICOPLANIN IN ADULTS

Adapted from 1995 CDC recommendations

From the Working Group on Rational Prescribing of Drugs, QMH

(A) Indications for using vancomycin/ teicoplanin

1. Therapy of infections attributed to β -lactam resistant Gram +ve organisms (mainly MRSA & MRSE), viz:
 - a) β -lactam resistant Gram +ve organism confirmed by culture
 - b) suspected infective endocarditis (IE) affecting prosthetic device, awaiting microbiology
2. Empiric treatment of fever in
 - a) neutropenic patient
 - b) ICU patientwith:

| | |
|---|---|
| { | <ol style="list-style-type: none">i) evidence of central line inflammation, orii) Gram +ve cocci revealed by blood culture or smear from appropriate specimens* (until confirmed to be β-lactam sensitive); otherwise consider cloxacillin therapy ** |
|---|---|
3. Serious infections due to Gram +ve bacteria in patients with 'allergy' to β -lactam antimicrobials.
4. Failure of antibiotic associated colitis to respond to metronidazole or if it is life-threatening.
5. Prophylaxis in patients vulnerable to IE and at high risk - during potentially bacteraemic procedures/episodes; i.e. those with
 - a) recent exposure or hypersensitivity to penicillin or
 - b) prosthetic heart valves, vascular shunts or other devices or past history of IE.
6. Prophylaxis against wound infection during major surgery for insertion of prosthetic device (e.g. artificial heart valve, hip).
7. As an additional antibiotic in the empiric treatment of presumed pneumococcal meningitis.

GUIDELINES FOR PRESCRIBING VANCOMYCIN & TEICOPLANIN IN ADULTS

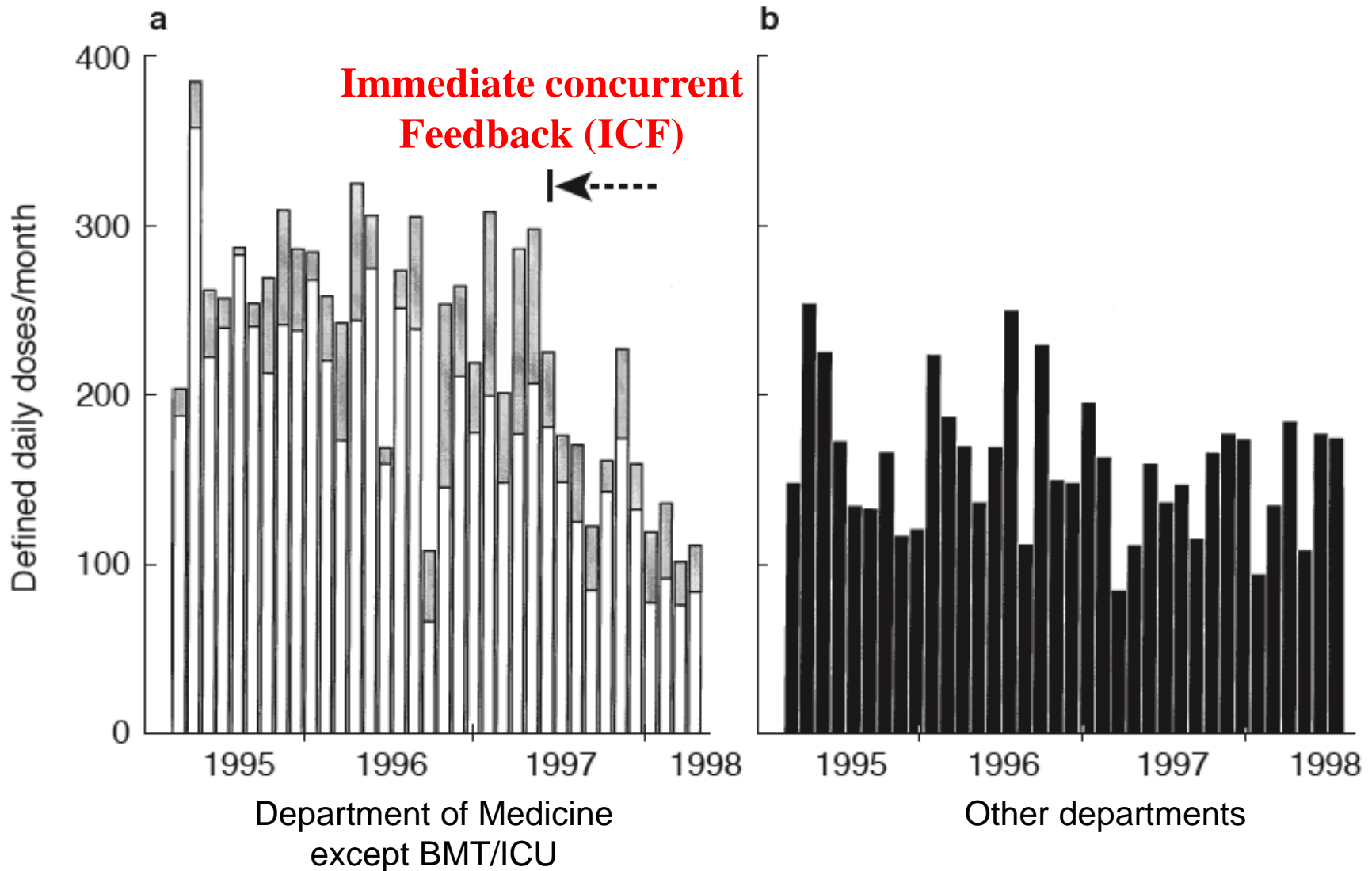
Adapted from 1995 CDC recommendations

From the Working Group on Rational Prescribing of Drugs, QMH

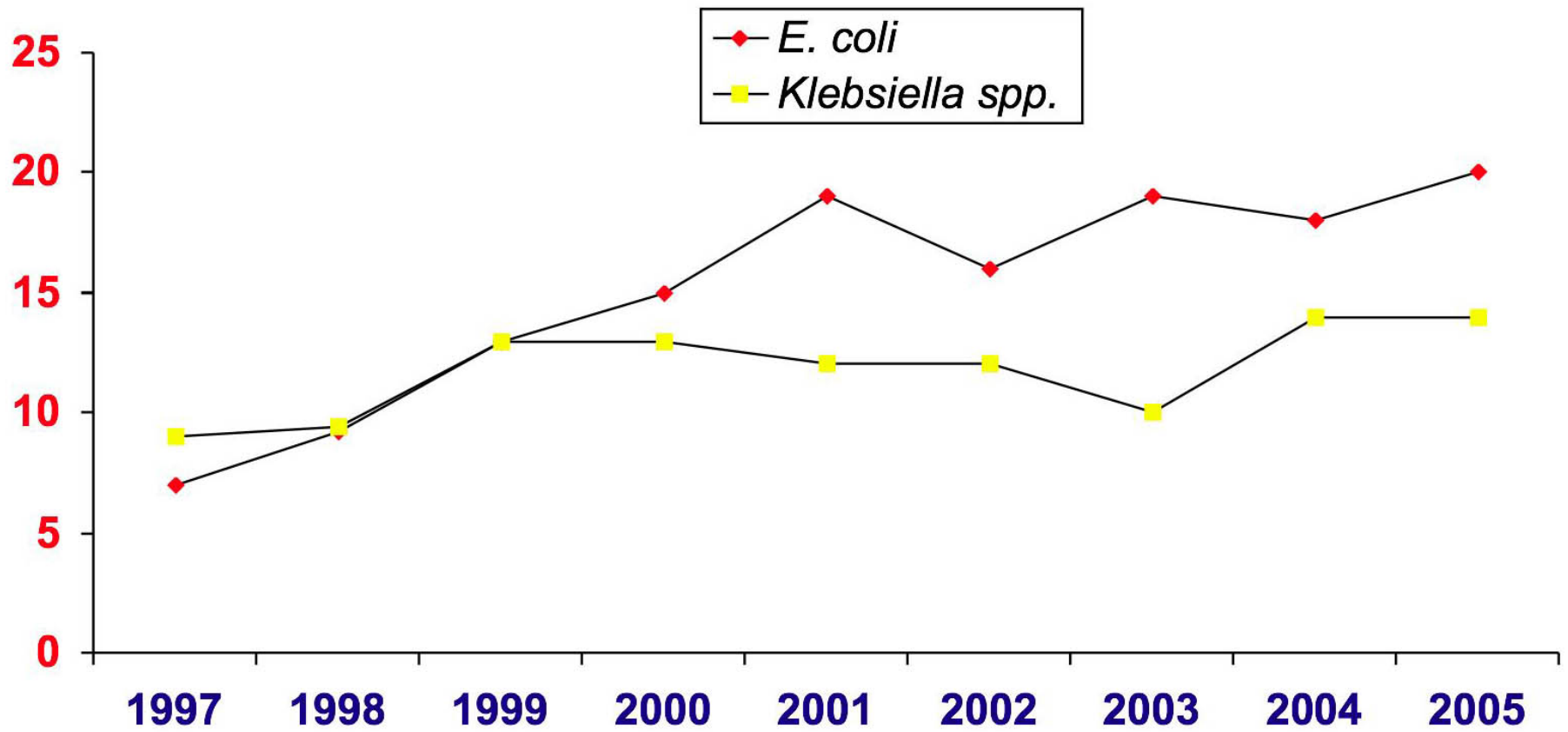
B) Situations/conditions in which vancomycin is not advised

1. Initial empiric treatment of febrile neutropenia, except with central 'IV line' inflammation, or Gram +ve cocci incriminated (see A2).
2. Only one (of at least two blood cultures taken around the same time from 2 distinct sites) is +ve for Coagulase negative Staph (e.g. *S. epidermidis*), *Bacillus species* or diphtheroids.
3. Continued empiric treatment for 'sepsis'/fever, if cultures yield no β -lactam-resistant Gram +ve microbe (after 48 h).
4. Treatment of β -lactam-sensitive microbial infections in renal failure patients.
5. Routine prophylaxis against infection/colonisation: a) of central or peripheral lines (via IV route) and locally (e.g. heparin lock); b) during surgery; c) for gut decontamination; d) for CAPD, haemodialysis or changing Tenckhoffs; e) for low birth weight infants.
6. Eradication of MRSA from colonised surfaces and/or any other form of topical application/irrigation.
7. Primary treatment (orally) of antibiotic associated colitis; metronidazole preferred, except if life-threatening.

Glycopeptide (vancomycin, teicoplanin) usage in Queen Mary Hospital before and after antibiotic auditing



Overall prevalence of ESBL for *K.pneumoniae* and *E. coli* among all isolates in Queen Mary Hospital



Big-Gun antibiotic audit (2002)

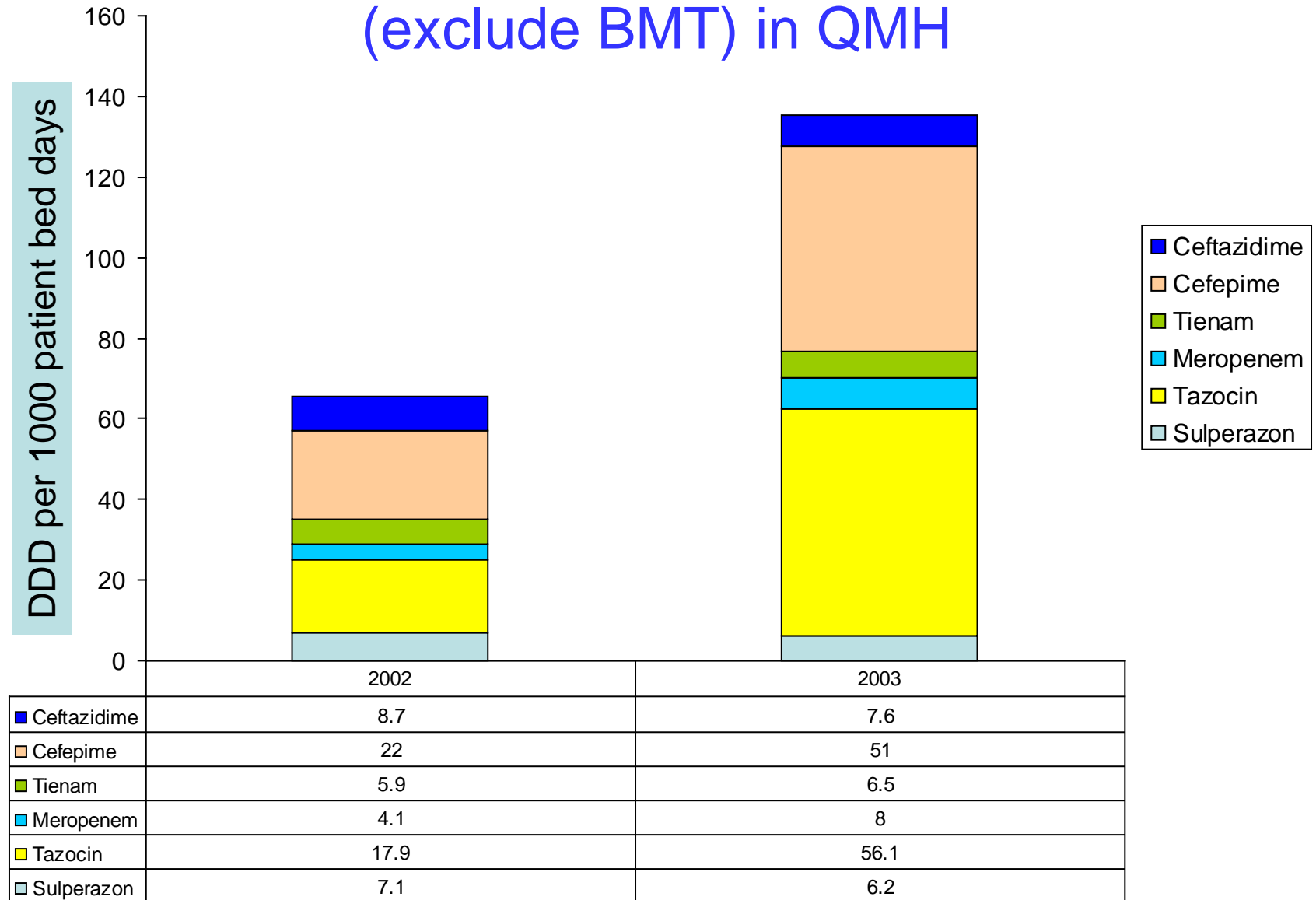


'Big Gun' Antibiotics in General Wards

| ‘Big Gun’ Antibiotic | Appropriate Reason for Preference | |
|----------------------|---|---|
| | Invasive Infection Rx (Known /Suspected Pathogen) | Empirical Rx |
| Imipenem | Atypical Mycobacteria* e.g. <i>M. chelonae</i> | 1. Neutropenic fever (Quant’ & Qual’) 2. Fever in Transplant recipient on immuno-supression + + 3. Severe sepsis 4. Deteriorating or fever persisting ≥72h |
| Meropenem | ESBL (or AmpC β-lactamase) producing organisms | |
| Cefepime | | |
| Ceftazidime | 1. <i>P.aeruginosa</i> † 2. Melioidosis | |
| Tazocin | <i>P.aeruginosa</i> † | |

Preferably with:- *other drugs*^{*} ; *an aminoglycoside*[†] ; *a macrolide or doxycycline*[‡]

Use of broad-spectrum antibiotics in ALL Specialties (exclude BMT) in QMH



Data from Clinical Pharmacy, QMH

T.P.R. & B.P.

B.H. (cm)

Se 1
0

Date

Pulse

Temp °C

140 40°

120 39°

Tazocin

100 38°

80 37°

60 36°

F / 67

AML (diagnosed 4/08)

Chemo (4/08)

Fever

Admit: 4 Jul 08

4 Jul 08

Range

Units

WBC

9.80

4.4 – 10.10

10⁹/L

HGB

10.9

11.7 – 14.8

10¹²/L

PLT

44

170 - 380

10⁹/L

Neu

6.80

2.2 – 6.7

10⁹/L

Lym

1.30

1.2 – 3.4

10⁹/L

Mon

4.60

0.2 – 0.7

10⁹/L

Eso

0.10

0.0 – 0.5

10⁹/L

Baso

0

0.0 – 0.1

10⁹/L



HOSPITAL AUTHORITY
Queen Mary Hospital
Infection Control Unit

From : Working Group on Rational Prescribing of Drugs, Queen Mary Hospital
Tel. : 2855-3553
Fax : 2855-3805

Date : 7th July 2008.

Dear Dr / Prof Ho.

According to an ongoing audit of antibiotic therapy in the Department of Medicine, Queen Mary Hospital, your patient (name) [REDACTED]
in Ward/bed no E6-25 was prescribed Tazam on 4/7/08 and the records suggest / indicate the following:

1. Treatment of colonization and no genuine evidence of infection. ☐
2. Treatment of a non-severe community-acquired infection. ☒
3. Treatment of a non-severe nosocomial infection. ☐
4. Treatment of an infection that is already responding to antibiotic with a narrow spectrum. ☐
5. Continued treatment against pathogen(s) known to be susceptible to antibiotic with a narrower spectrum. ☐
6. Continued treatment with a big gun antibiotic when the clinical course and subsequent finding indicate a viral infection or a non-infectious problem. ☐

Further comments:

Patient is not neutropenic. Please follow
our Hematology guideline & switch to Trimeth.

As such, treatment for your patient did not appear to conform to any of the special indications for such prescribing (see attached guidelines).

PLEASE CONSIDER USING AN ALTERNATIVE AGENT OR DISCONTINUING IT.

Yours sincerely

Dr. SF TANG

M/77

Past health :

IHD

PTB

Bronchiectasis

BPH

T 38 C, BP 130/80, P 79/min

Chest clear

Abd mild loin tenderness on
L side

fever for 2 days

chills and rigor

WCC 15.4

Cr 123

dysuria, hematuria

nausea and vomiting

Septic workup done

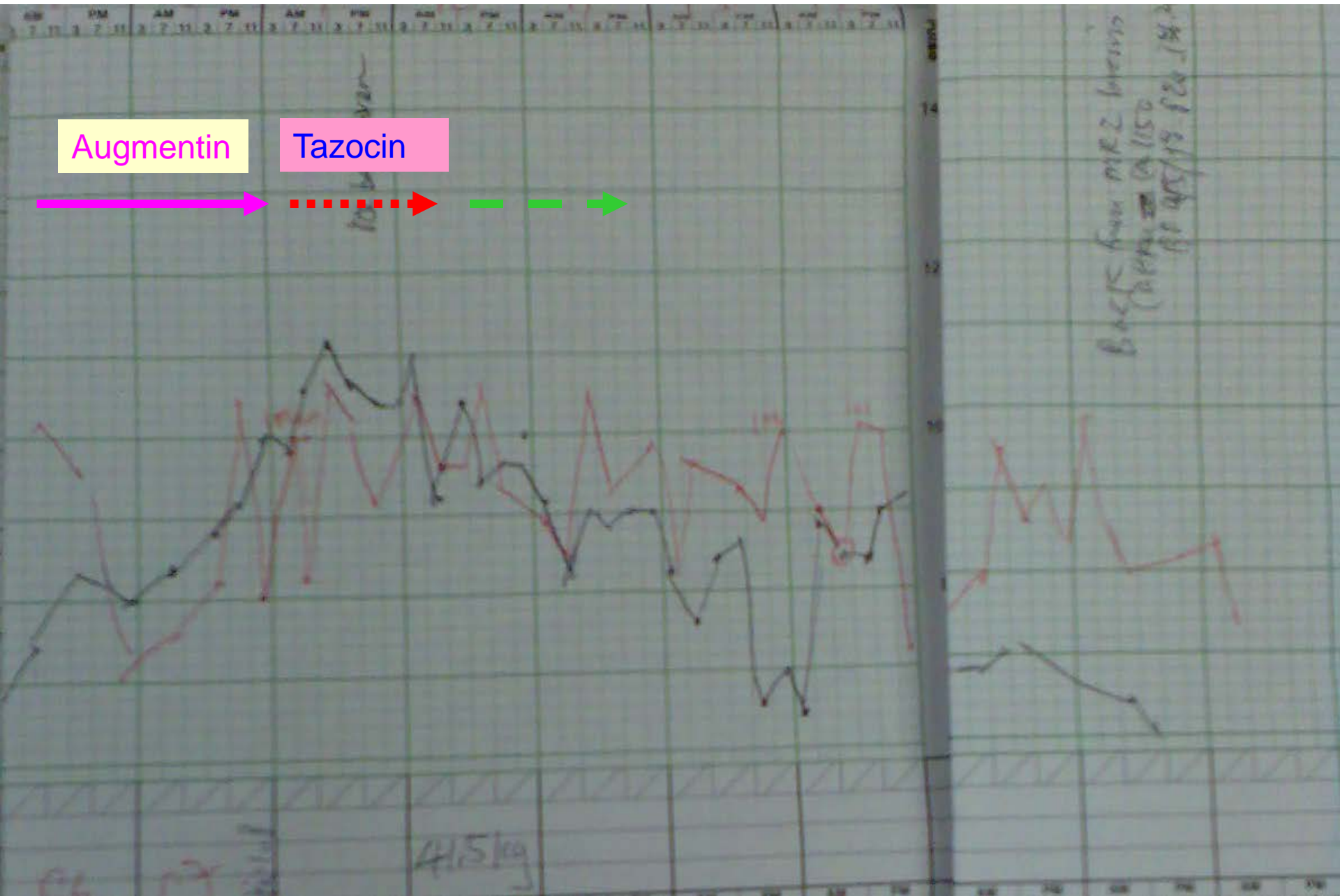
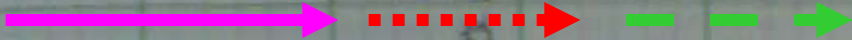
Antibiotic stewardship program



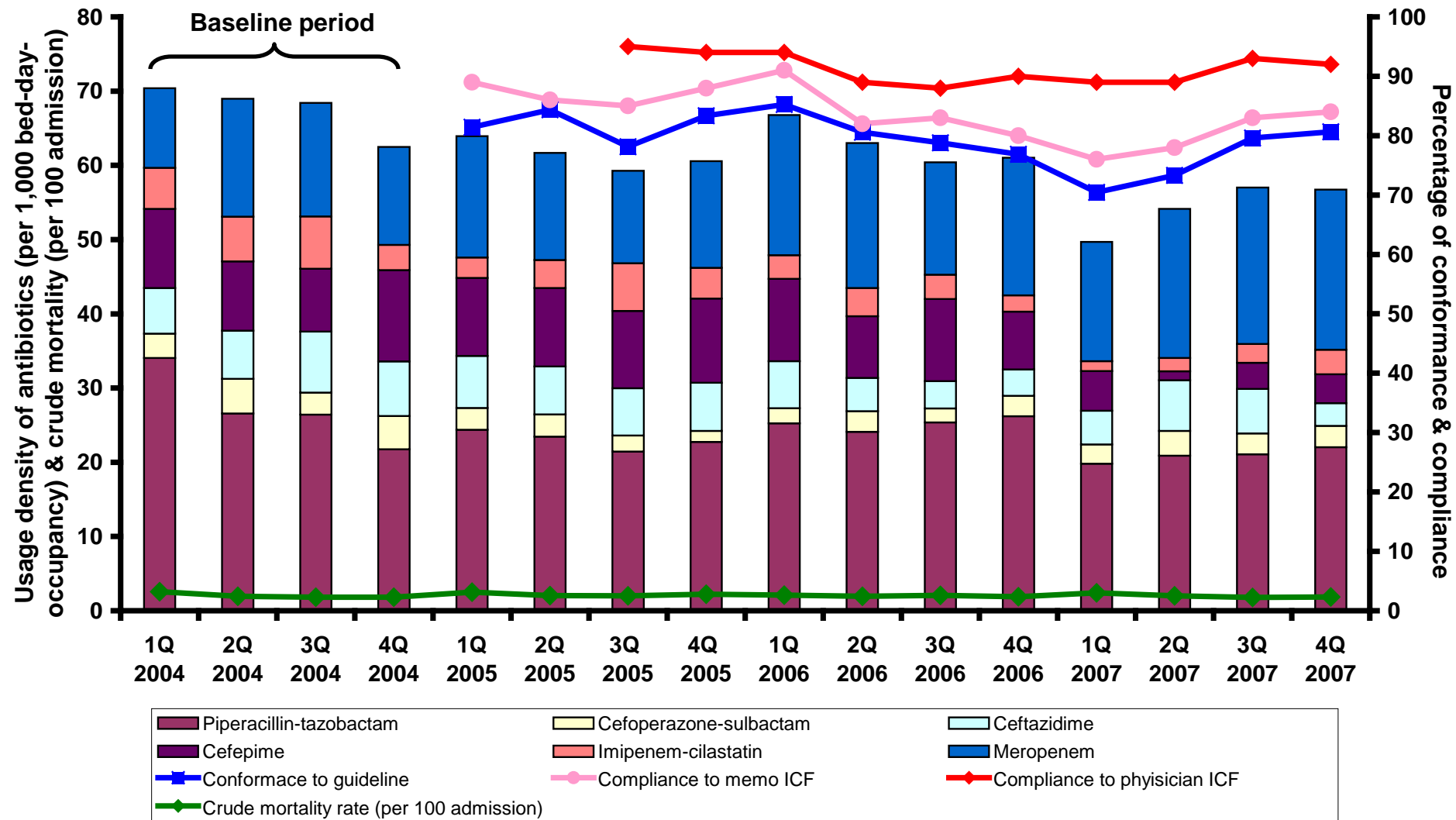
Physician Immediate Concurrent Feedback

Augmentin

Tazocin



Overview of the ASP in a 3-year study period (2005 – 2007)



抗生素導向計劃全港推行

醫院管理局資料顯示，對付「超級惡毒」的8種廣譜（可用於治療多種細菌）抗生素使用量，在過去5年間增加了逾五成，當中使用最多、治理下呼吸道或皮膚組織感染和細菌性敗血症等的哌拉西林（Piperacillin），細菌抗藥性的問題已威脅到救治病人的成效，為防此等「最後救藥」逐一失效，全港14間急症公立醫院和兩間復康醫院，已推行「抗生素導向計劃」作挽救。

瑪麗經驗 抗生素用量跌兩成

衛生防護中心細菌抗藥性衛生防護項目主席何栢良教授警告，「預計未來5年再無新的廣譜抗生素面世」，力阻濫用作為最後防線的廣譜抗生素急不容緩，醫生依指引處方對症下藥是其中一個控制重點。

他指出，以瑪麗醫院04至05年實施抗生素導向計劃的經驗（見流程圖），令去年廣譜抗生素使用量較兩年前下跌兩成。何說，推行計劃後，病人感染抗藥性惡菌的情況亦見減少，高達96%的醫生處方抗生素時會依照指引而行，較04年前遵從率50%大大提升。

8種廣譜抗生素使用情況



資料來源：醫管局

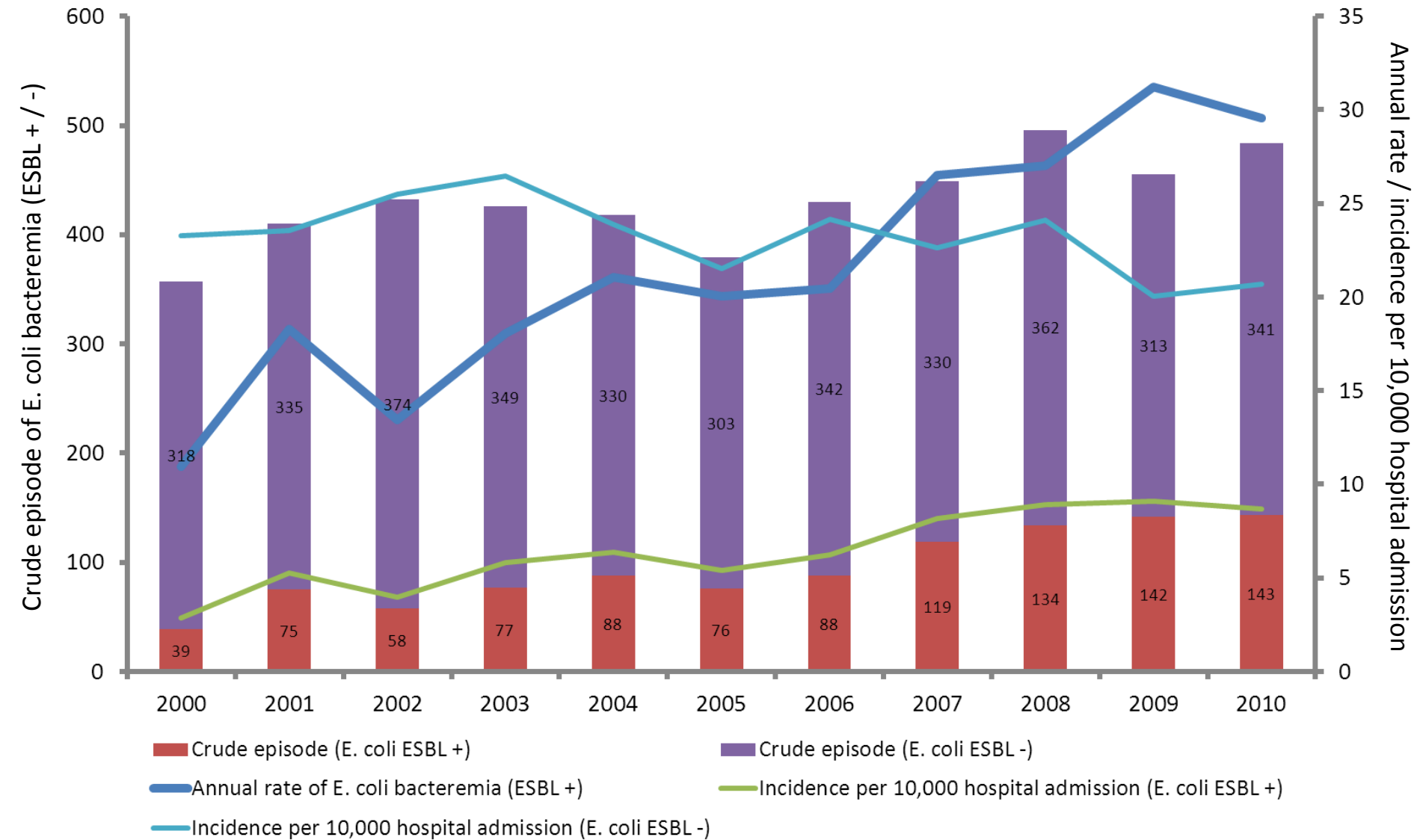
The Antibiotic Stewardship Program Hospital Authority

*The Implementation Committee on
Antibiotic Stewardship Program
HAHO*

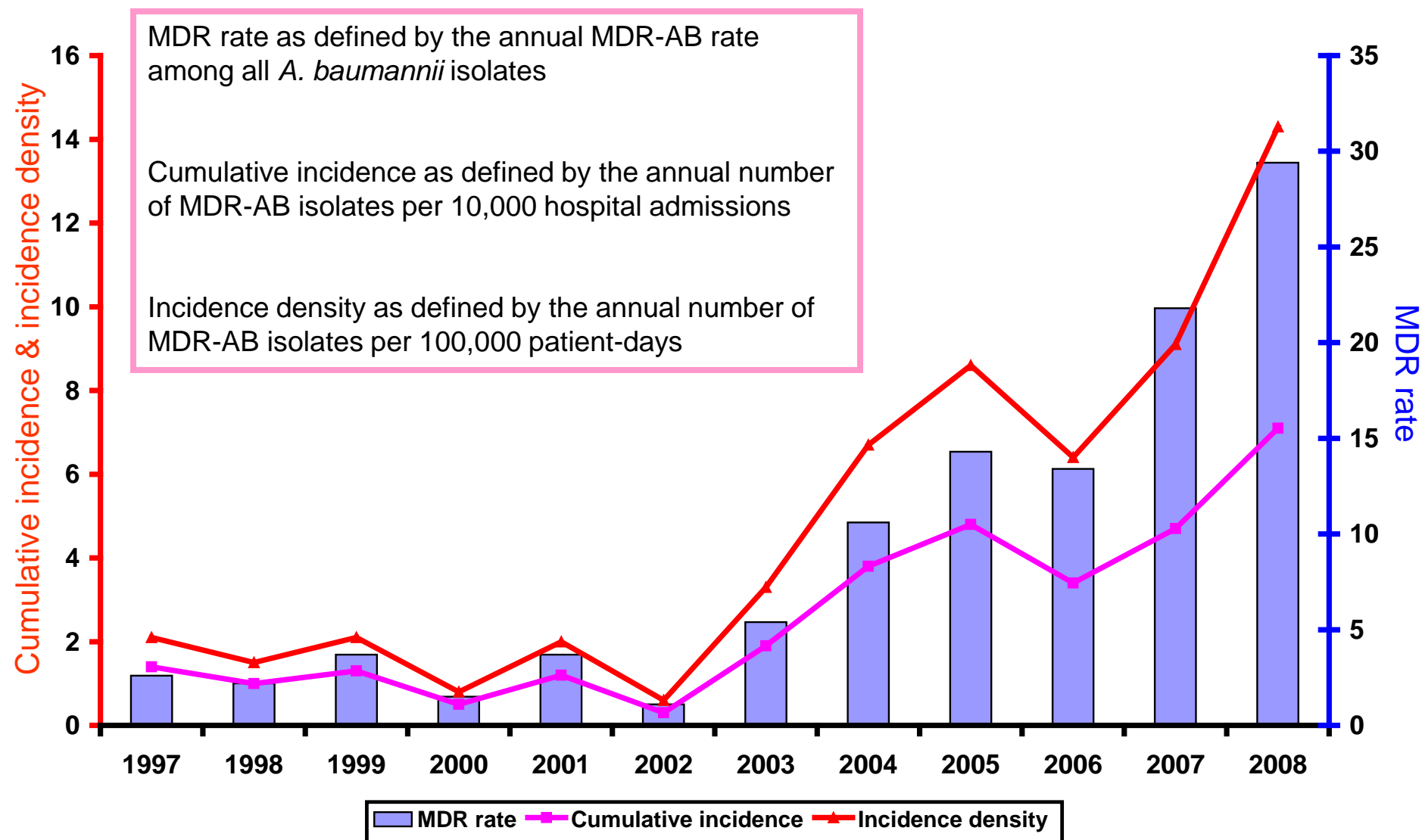


2006

ESBL-positive *E. coli* bacteraemia in Hong Kong, 2000-2010

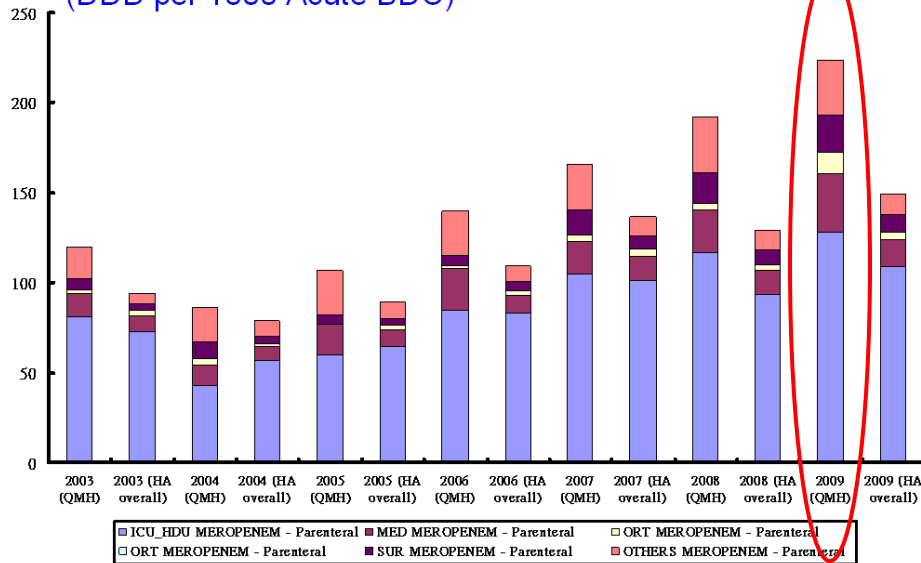


Changes in the rate, cumulative incidence and incidence density of MDR-AB according to definition: resistance to carbapenems class (imipenem, meropenem)



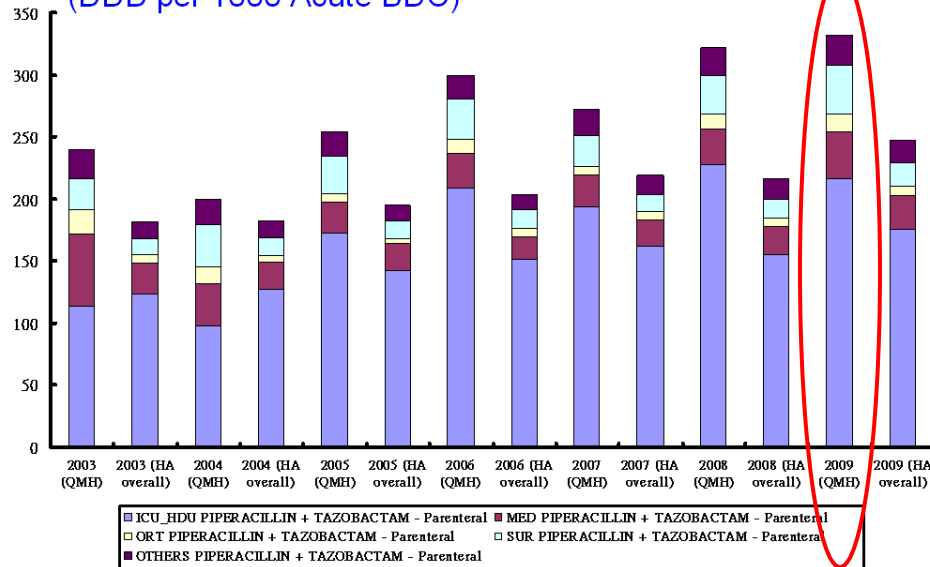
Antibiotic stewardship program in Queen Mary Hospital

Meropenem consumption in QMH & HA
(DDD per 1000 Acute BDO)



Data from CDARS, HAHO

Piperacillin / tazobactam consumption in QMH & HA
(DDD per 1000 Acute BDO)



Data from CDARS, HAHO

Observation:

↑ consumption of meropenem & piperacillin / tazobactam in QMH > HA hospitals

Recommendation:

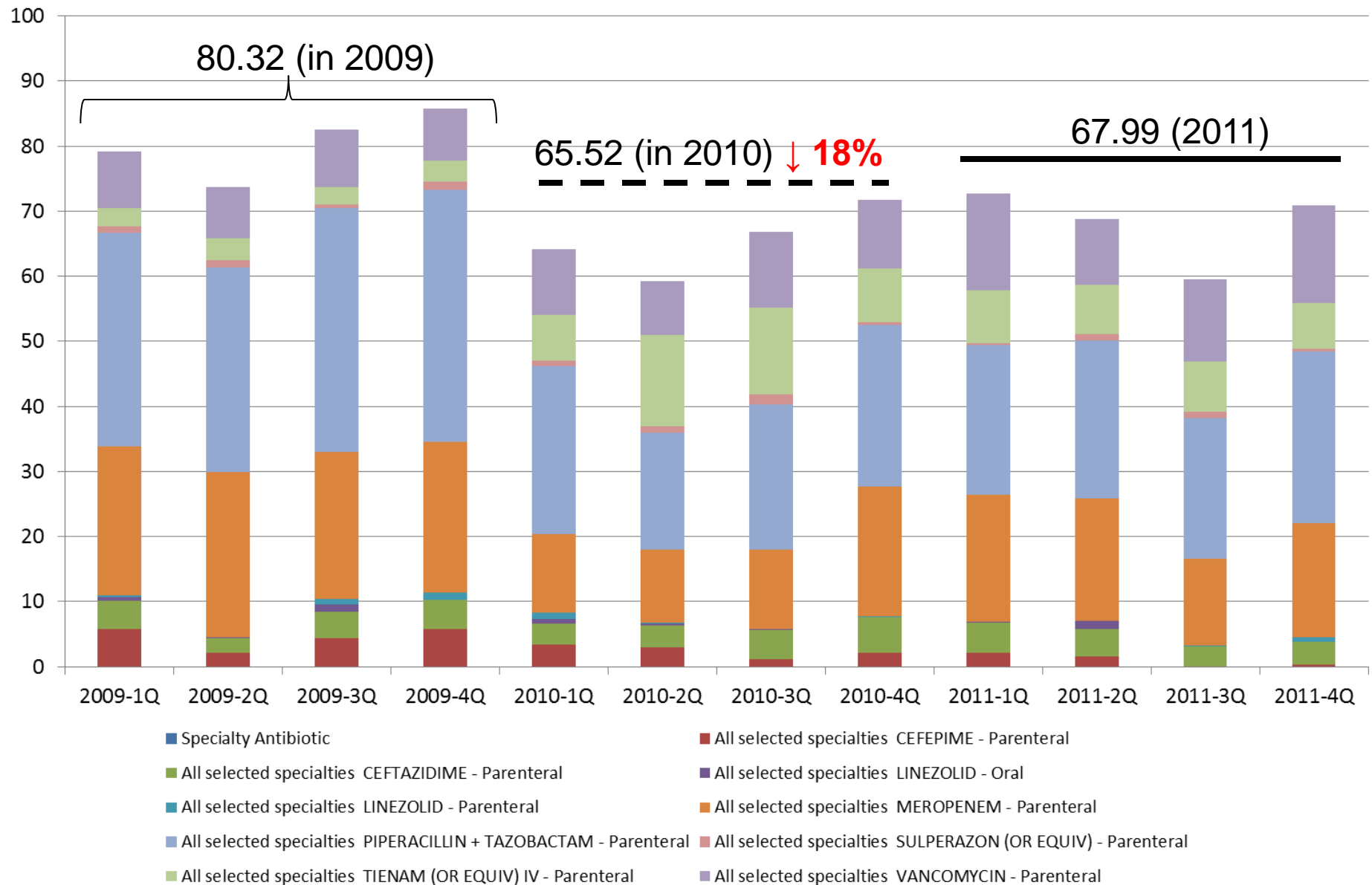
Empirical regimen of "A T & I" or "A T & T"

Stable patients: Amoxicillin / clavulanate (Augmentin®) as first line therapy

Not responding to first line therapy: Ticarcillin / clavulanate (Timentin®)

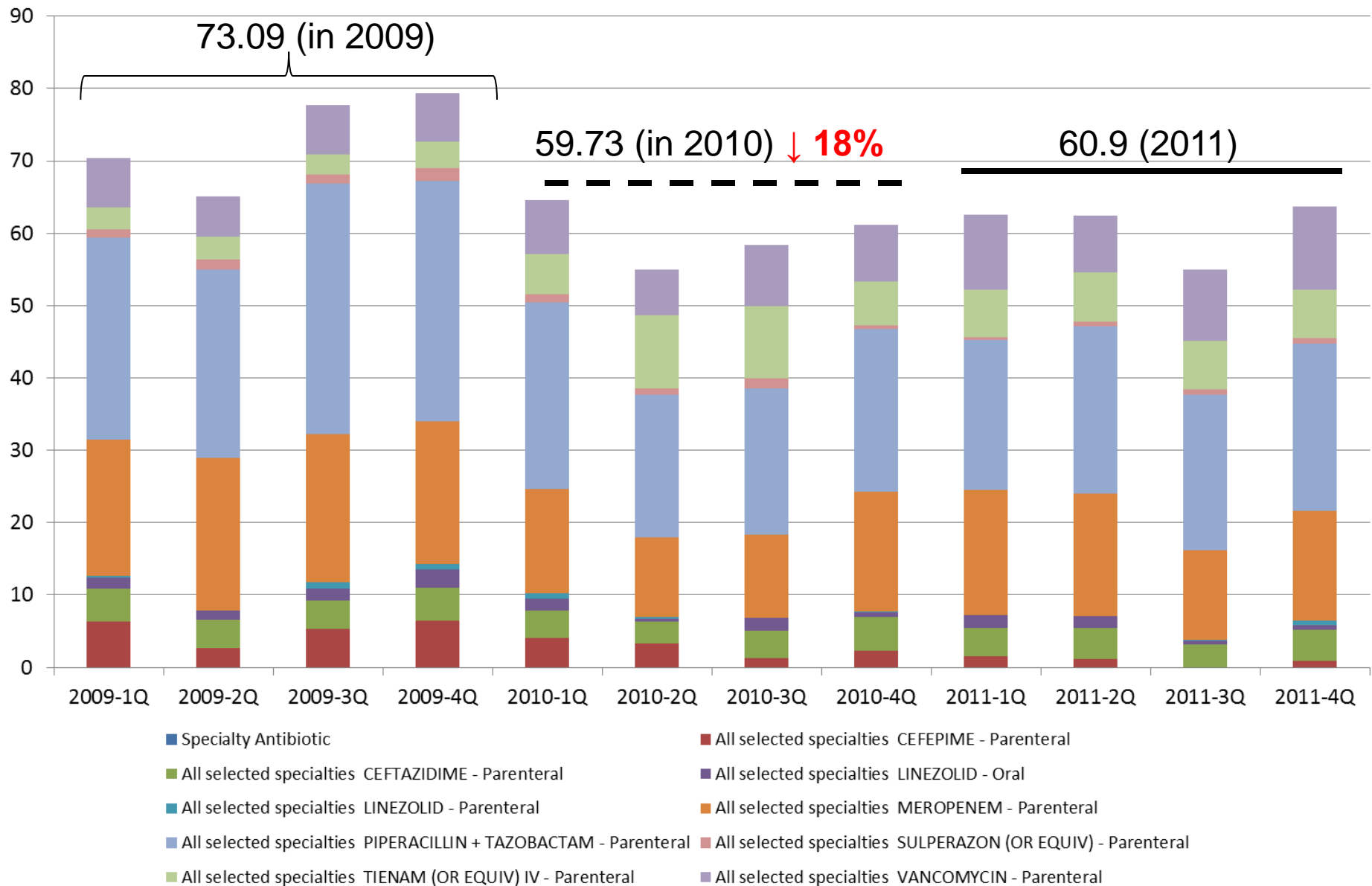
Critically ill patients: Imipenem / cilastatin (Tienam®)

Big Gun antibiotics consumption (6 Big Gun & Van / Lin) in QMH (MED / SUR / ORT / ONC / ICU & HDU) (DDD per acute 1000 BDO)



Data from CDARS, HAHO

Big Gun antibiotics consumption (6 Big Gun & Van / Lin) in HKWC (MED / SUR / ORT / ONC / ICU & HDU) (DDD per 1000 BDO)



Data from CDARS, HAHO

Antibiotic Stewardship Program (AT&T in 2010-2011)



Daily cost: \$ 222.6



Daily cost: \$ 163.5

Drugs with similar pharmacodynamic / kinetic profile / susceptibility profile



Daily cost: \$ 318



Daily cost: \$ 222

Antibiotic Stewardship Program vs Cost-Effective Usage



Daily cost: \$ 66.6

???????



Daily cost: \$ 163.5

Drugs with similar pharmacodynamic / kinetic profile / susceptibility profile



Daily cost: \$ 90

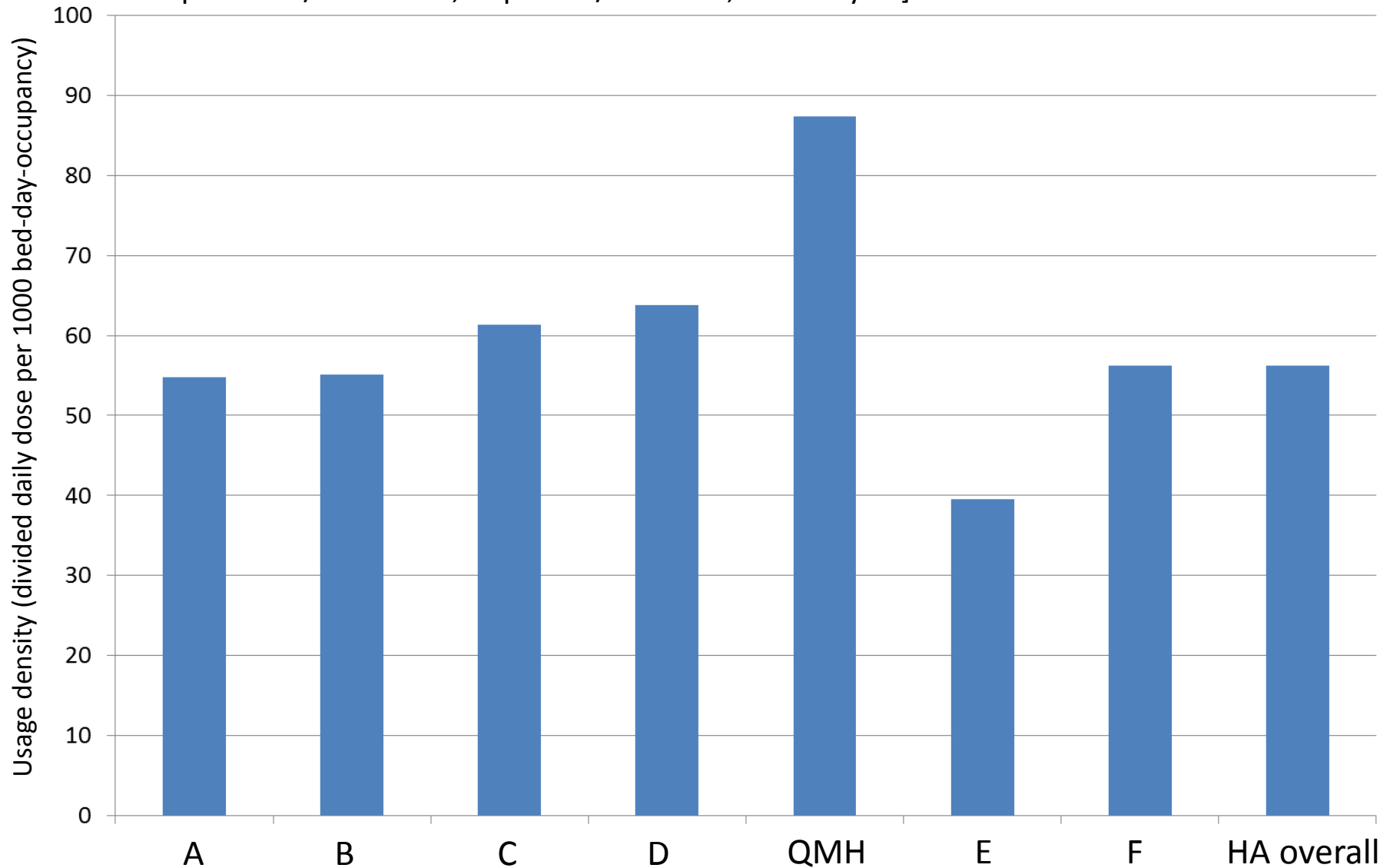
???????



Daily cost: \$ 189

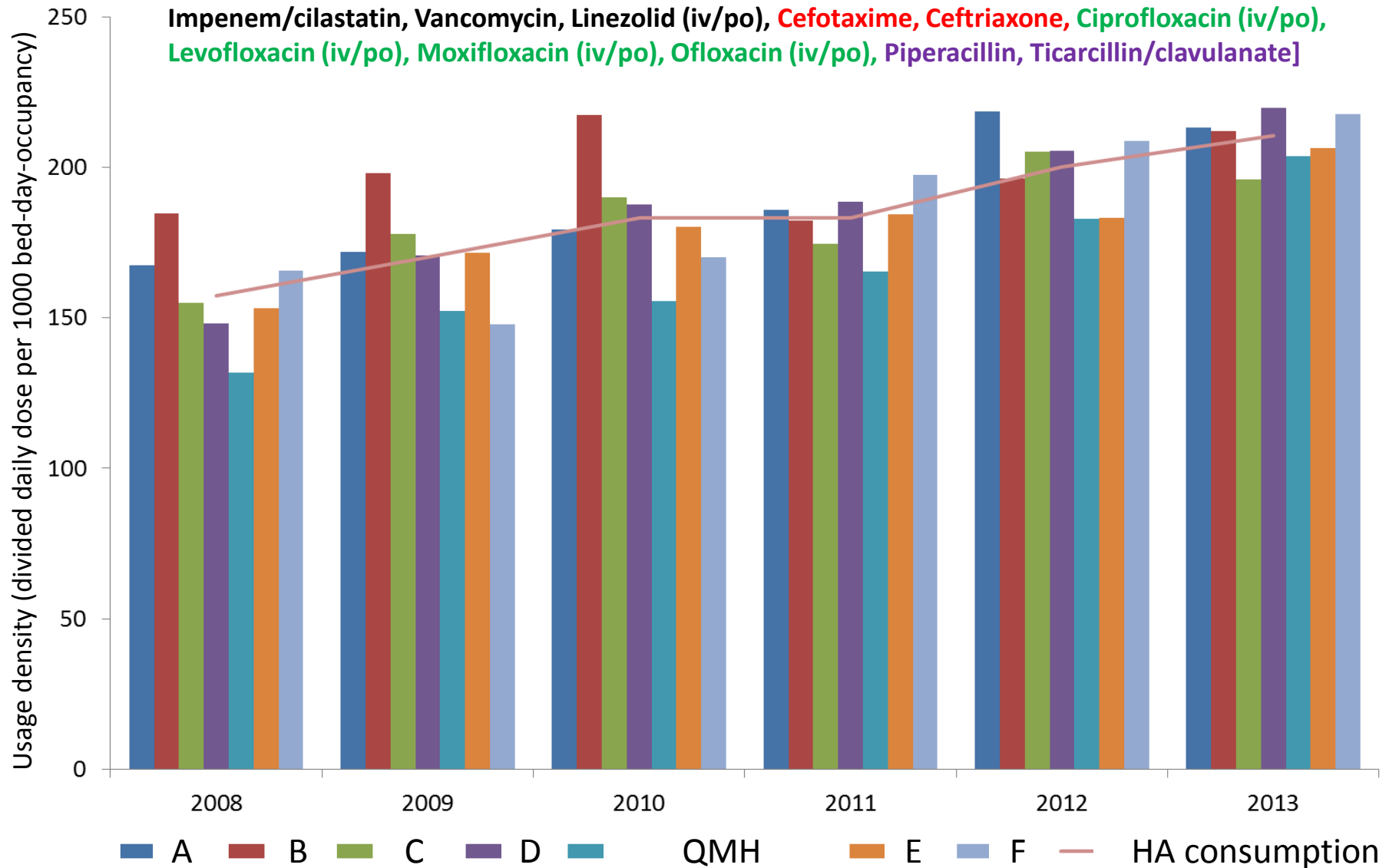
Consumption of Big Gun Antibiotics in All Specialties at 7 Hospitals of HA (2012)

[Cefepime, Ceftazidime, Linezolid (oral & intravenous), Meropenem, Piperacillin/tazobactam, Cefoperazone/sulbactam, Impenem/cilastatin, Vancomycin]

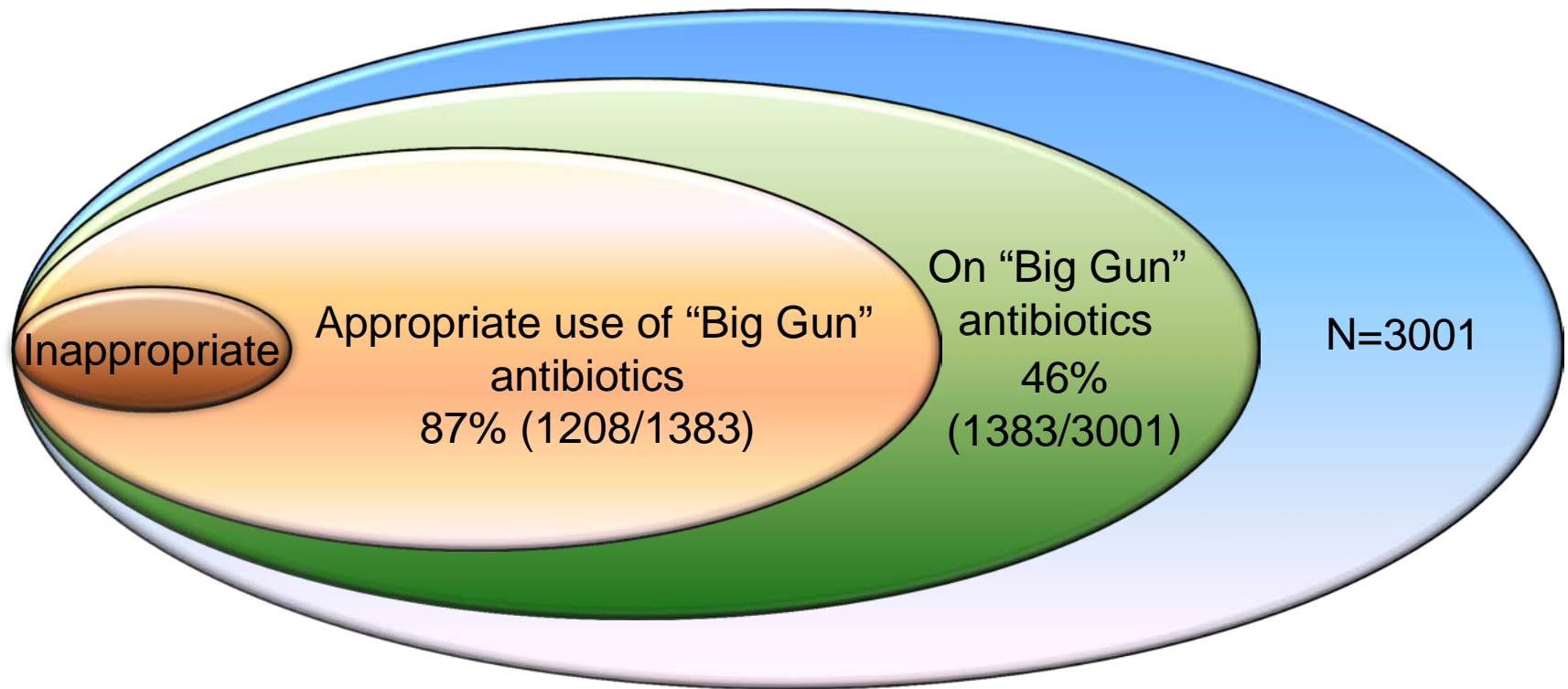


Consumption of ALL Broad Spectrum Antibiotics with potential for selecting MDROs in All Key Specialties (ICU & HDU / MED / ONC / ORT / SUR) at 7 Hospitals of HA (2008 - 2013)

[Cefepime, Ceftazidime, Cefoperazone/sulbactam, Piperacillin/tazobactam, Meropenem, Imipenem/cilastatin, Vancomycin, Linezolid (iv/po), **Cefotaxime**, **Ceftriaxone**, **Ciprofloxacin (iv/po)**, **Levofloxacin (iv/po)**, **Moxifloxacin (iv/po)**, **Ofloxacin (iv/po)**, Piperacillin, Ticarcillin/clavulanate]



Microbiology & Infectious Disease Consultation between 1 Jan and 31 Jul 2014 (Queen Mary Hospital)



Integration of ASP into daily clinical consultation

IMPACT Guidelines (Third Edition)



Local Key References for

- Antibiotic resistance
- Antibiotic stewardship program
- Selected antimicrobial use
- Empirical Rx of common infections
- Known-pathogen therapy
- Surgical prophylaxis
- Cost & dosage of antimicrobials

Click here to view full guidelines

<http://ha.home/ho/ps/impact.pdf>

IV to oral switch

Fluoroquinolones

Ciprofloxacin



Bioavailability ~70-80%

IV to PO regimen

200mg IV q12h → 250mg PO q12h
400mg IV q12h → 500mg PO q12h
400mg IV q8h → 750mg PO q12h

Levofloxacin



Bioavailability ~99%

IV to PO regimen

The Oral and IV route of administration is interchangeable

Moxifloxacin

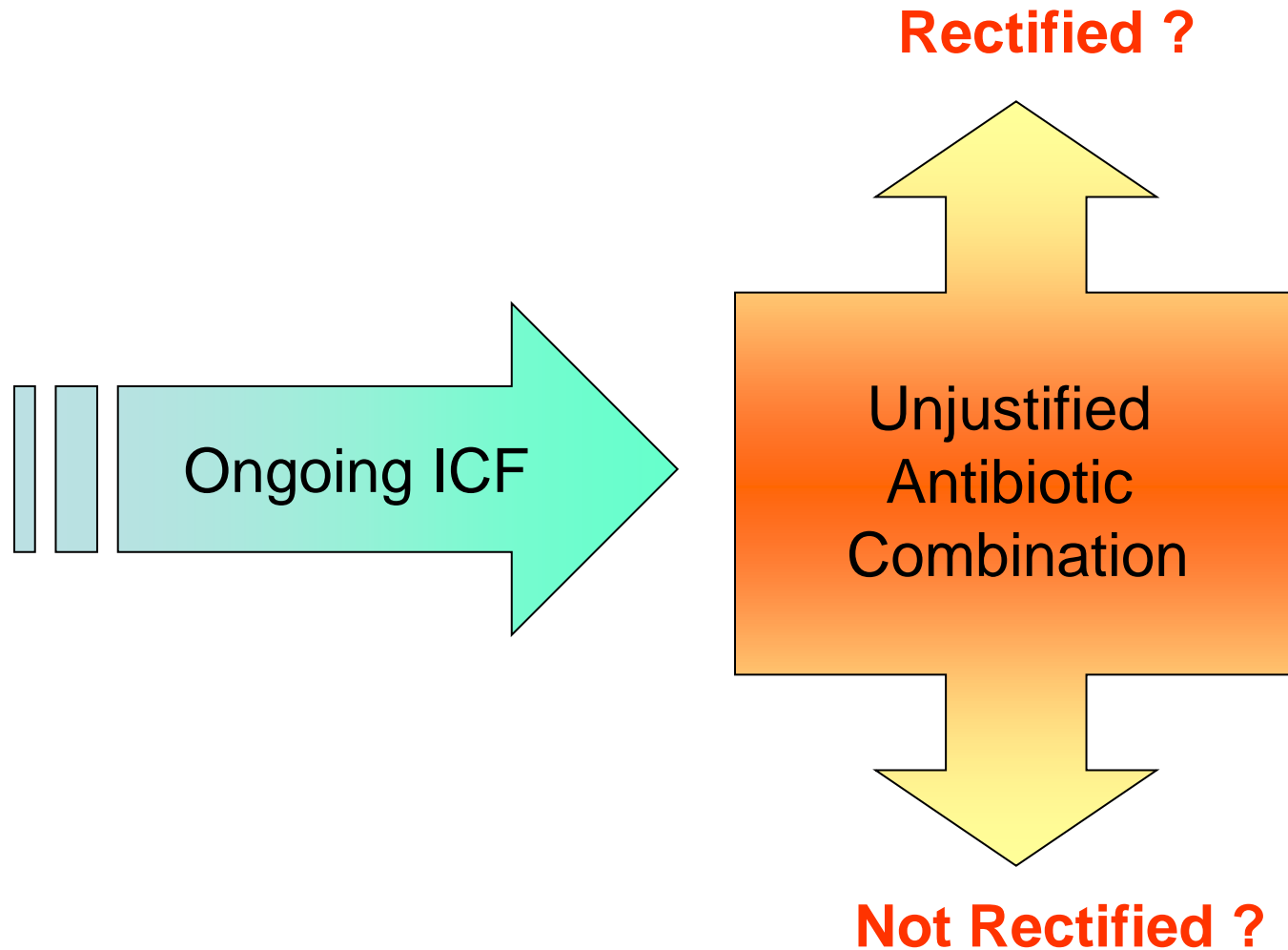


Bioavailability ~90%

IV to PO regimen

400mg IV q24h → 400mg PO q24h

After IV to oral switch...



Trust and collaboration

