

World-wide inventory of antimicrobial stewardship initiatives:

where we are and how to go on...

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ISC Antimicrobial Stewardship Working Group: just to begin...

- Two years ago, we proposed ourselves to create this WG.
- One of our aims was to create a worldwide web-based compilation of antimicrobial stewardship efforts and activities, the people involved with them, their products and accomplishments.
- We currently have about 30 contributions from our members

<http://inventory.infectionnet.org/>

An ISC Project

 **Antimicrobial Stewardship** *a global inventory*

we're almost up to 30 projects in 20 countries!

Welcome



Click a dot to view the projects for that country.



Which kind of interventions have we collected?

- Antimicrobial Consumption
- Educational
- Restrictive
- Organizational
- Structural

| | |
|--|------------------|
| <u>Antibiotic Consumption in Hospitals of Buenos Aires City</u> | Argentina |
| <u>South Australian Antimicrobial Usage Surveillance Program (SAAUSP)</u> | Australia |
| <u>Newfoundland Optimal Antibiotic Project</u> | Canada |
| <u>Do Bugs Need Drugs?</u> | Canada |
| <u>DANMAP (Danish Integrated Antimicrobial Resistance Monitoring and Research Programme)</u> | Denmark |
| <u>Happy Audit</u> | Denmark |
| <u>Programa de Uso de Antibióticos en el Hospital Carlos Andrade Marín</u> | Ecuador |
| <u>Antimicrobial Use in Latin American countries</u> | Honduras |
| <u>Restriction based on price of Antimicrobials</u> | Hungary |
| <u>Israel ESAC project group</u> | Israel |
| <u>Antimicrobial consumption surveillance program using WHO ATC/DDD system among hospitals in Tokai area, Japan</u> | Japan |
| <u>American University Of Beirut Medical Center Antimicrobial Stewardship Program</u> | Lebanon |

| | |
|---|----------------------|
| <u>Malaysia National Infection and Antibiotic Control</u> | Malaysia |
| <u>Malaysian National Medicines Use Survey</u> | Malaysia |
| <u>Regulation of the sale of antibiotics at drugstores</u> | Mexico |
| <u>A two year audit of vancomycin utilization in surgical and medical ICUs</u> | Saudi Arabia |
| <u>The 4 C's</u> | Scotland |
| <u>Antibiotic Stewardship Committee at public sector hospitals</u> | South Africa |
| <u>Best Care...Always! Campaign: Antibiotic Stewardship initiative</u> | South Africa |
| <u>Swiss hospital antibiotic working group</u> | Switzerland |
| <u>Antimicrobial Stewardship Program Survey of Knowledge, Perceptions and Beliefs towards antimicrobial use and antimicrobial resistance</u> | United States |
| <u>Tan Tock Sen Hospital Antimicrobial Stewardship Program</u> | Singapore |
| <u>Antibiotic use and resistance in children in Vietnam</u> | Vietnam |
| <u>Assessing and improving utilization of antibiotics and other drugs in Vietnam</u> | Vietnam |
| <u>Situation analysis of antibiotic use and resistance in Vietnam</u> | Vietnam |



Antimicrobial Consumption

Antimicrobial Use in Latin American countries

Principal Investigator:

JL Castro

Other Investigators:

Gabriel Levy Hara, Mauro Castro, Sergio Munoz

Primary Country:

Honduras, Nicaragua, Peru and Paraguay

Project Description:

A comparative measure of antibiotic consumption in four Latin American countries utilizing two survey methods:

- Household users — approximately 5000 surveyed in each country.
- Points of sale (mostly pharmacy exit interviews) — same number of people surveyed.

Prevalence of ATB consumption, last 6 months, household survey.

| | Nicaragua | Honduras | Paraguay | Peru |
|--|-----------|----------|----------|-----------|
| Nº of ATB consumers last semester/ N of people surveyed | 1198/5557 | 901/5381 | 851/5724 | 1446/5305 |
| % of people who consumed ATB | 21.5 | 16.7 | 14.9 | 27.3 |
| Households where one member used ATB last 6 months | 28.8 | 43.6 | 23.6 | 40.9 |
| Households where two or more members used ATB last 6 months | 27.2 | 13.2 | 17.0 | 29.8 |
| Nº of ATB treatments received during last 6 months (per person who consumed ATB) | | | | |
| 1 | 41.8 | 59.4 | 65.0 | 37.3 |
| 2 | 26.4 | 23.5 | 20.7 | 31.1 |
| 3 or more | 31.3 | 17.1 | 13.9 | 31.6 |
| N of ATB used by consumers | 1275 | 966 | 907 | 1449 |

ATB used on last occasion, households' survey

| Nicaragua | | Honduras | | Paraguay | | Peru | |
|-----------------------|------|---------------------------|------|-----------------|------|-----------------|------|
| Antibiotic | % | Antibiotic | % | Antibiotic | % | Antibiotic | % |
| Amoxicillin | 46.8 | Amoxicillin | 46.6 | Amoxicillin | 67 | Amoxicillin | 47.4 |
| Benzathine Penicillin | 11.8 | Ampicillin | 10.1 | Cephalexin | 10.6 | Cotrimoxazole | 13.4 |
| Cotrimoxazole | 10.1 | Cotrimoxazole | 8.8 | Chloramphenicol | 4.5 | Ciprofloxacin | 7.6 |
| Ampicillin | 4.1 | Tetracycline | 5.8 | Azithromycin | 3.8 | Ampicillin | 6.2 |
| Tetracycline | 3.7 | Non-Benzathine Penicillin | 4.3 | Cotrimoxazole | 2.4 | Dicloxacillin | 4.6 |
| Dicloxacillin | 3.7 | Dicloxacillin | 2.8 | Ciprofloxacin | 2.2 | Penicillin | 4.1 |
| | | Benzathine Penicillin | 2.3 | Penicillin | 1.4 | Erithromycin | 3.4 |
| | | | | Erithromycin | 1.2 | Chloramphenicol | 2.9 |
| | | | | Cefixime | 0.9 | Cephalexin | 2.0 |

Analysis of adequate use of antibiotics, Households' survey

- According to the algorithm, the proportions of ATB inappropriately used were as follows:
 - ✓ Nicaragua, 748/1275 (58.7%);
 - ✓ Honduras, 603/901 (67%);
 - ✓ Paraguay 537/907 (59.2%)
 - ✓ Peru 1018/1416 (71.9%).

Classification of inadequate use of antibiotics, households' survey

| NICARAGUA | | | | | |
|----------------------------|-------------------|--|---------------------|--|-------|
| | Prescribed | | Unprescribed | | P |
| | N= | % of inadequate use due to this reason | N= | % of inadequate use due to this reason | |
| Lack of precise indication | 415 | 42.3 | 191 | 64.3 | <0.05 |
| Misselection of ATB | 2 | 1.0 | 2 | 1.0 | NS |
| Inadequate duration | 121 | 12.3 | 17 | 5.7 | <0.05 |
| HONDURAS | | | | | |
| Lack of precise indication | 334 | 46.2 | 180 | 68.2 | <0.05 |
| Misselection of ATB | 10 | 2.5 | 12 | 6.2 | NS |
| Inadequate duration | 54 | 7.5 | 13 | 4.9 | NS |

Classification of inadequate use of antibiotics, households' survey

| PARAGUAY | | | | | |
|----------------------------|-------------------|--|---------------------|--|-------|
| | Prescribed | | Unprescribed | | p |
| | N= | % of inadequate use due to this reason | N= | % of inadequate use due to this reason | |
| Lack of precise indication | 324 | 42.6 | 69 | 47.3 | NS |
| Misselection of ATB | 17 | 2.2 | 9 | 6.2 | <0.05 |
| Inadequate duration | 126 | 16.6 | 16 | 11.0 | <0.05 |
| PERU | | | | | |
| Lack of precise indication | 349 | 43.4 | 345 | 56.7 | <0.05 |
| Misselection of ATB | 60 | 7.4 | 11 | 1.8 | <0.05 |
| Inadequate duration | 195 | 24.2 | 117 | 19.2 | <0.05 |

Comparison of misuse of ATB, last 6 months between both surveys (%)

| Nicaragua | | Honduras | | Paraguay | | Peru | |
|-----------|-----|----------|-----|----------|-----|------|-----|
| HS | POS | HS | POS | HS | POS | HS | POS |
| 59 | 55 | 67 | 56 | 59 | 56 | 72 | 72 |

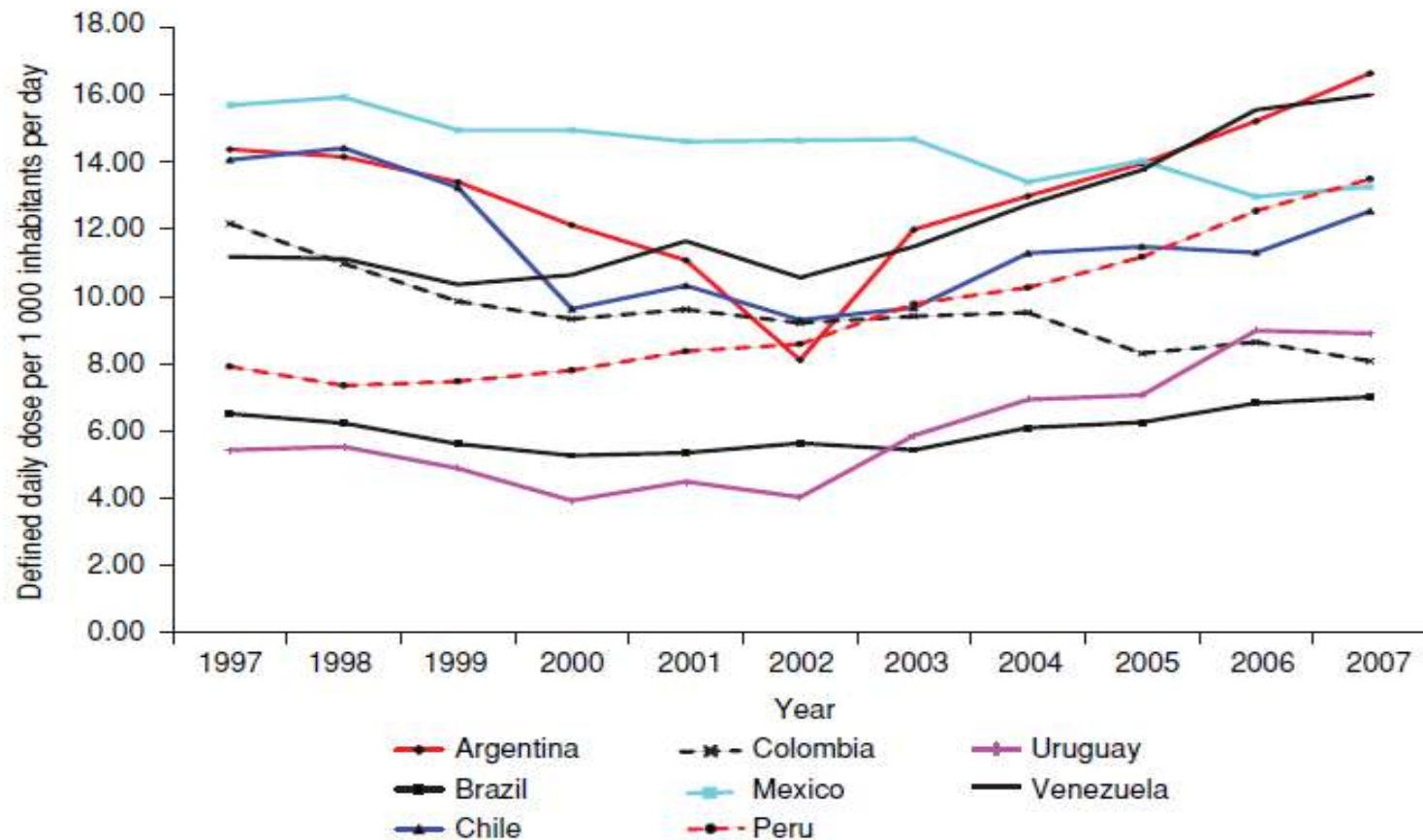
Antimicrobial Use in Latin American countries

Outcome / Result:

- Inappropriate use was very high in all countries ranging from 55 - 75%
- 75 - 80% of antibiotics consumed under prescription — a relatively low prevalence of self-prescription.
- Surprisingly, in most countries the duration of treatment was more likely to be inadequate when antibiotics were consumed under prescription!
- It would appear that prescriber education must be an essential component of strategies aimed at improvement of antibiotic use in these countries.

10-year trends for all antibiotics

FIGURE 1. Trends of national antibiotic utilization in eight Latin American countries, 1997–2007



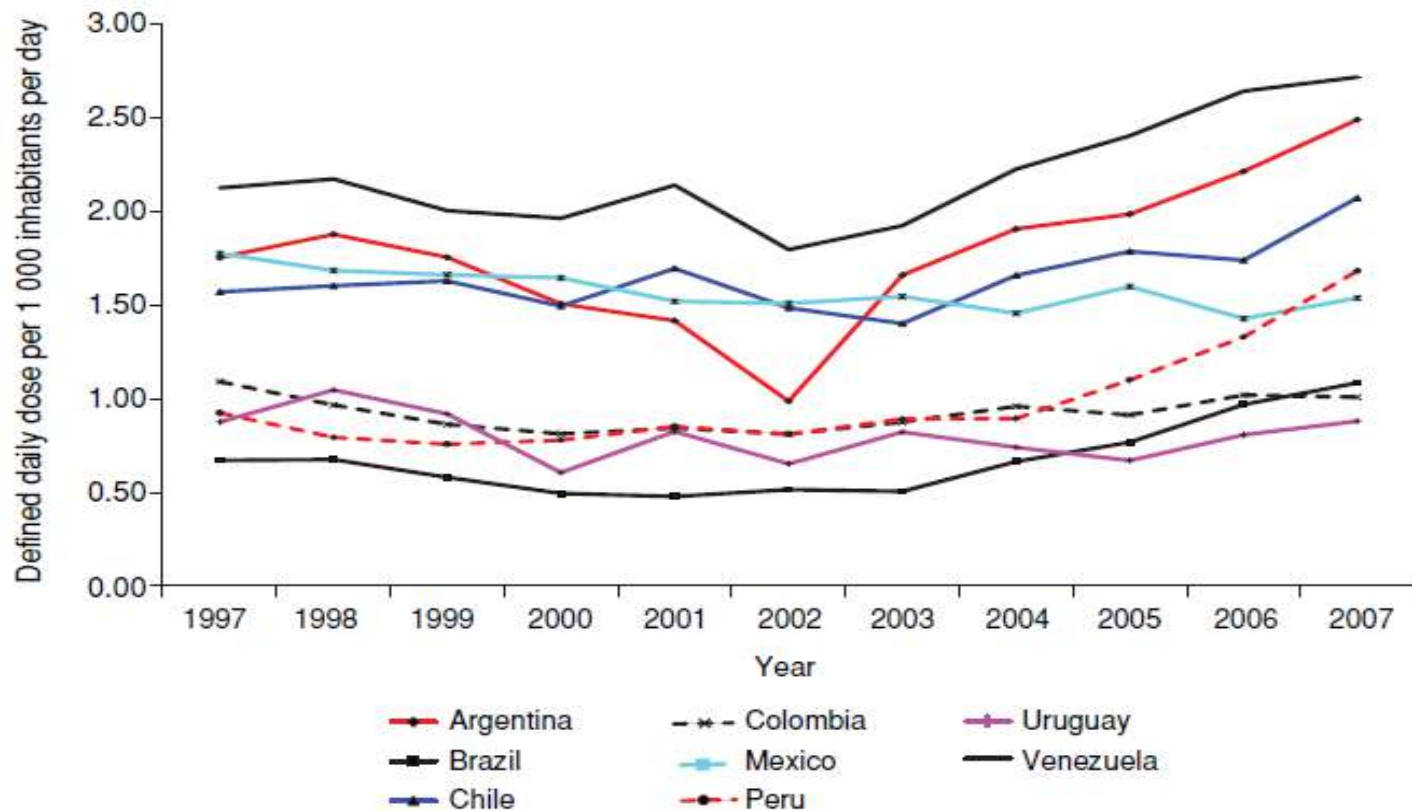
Wirtz VJ, Dreser A, Gonzales R. Trends in antibiotic utilization in eight Latin American Countries, 1997–2007. *Rev Panam Salud Publica*. 2010;27(3):219–25: 220.

10-year trends for macrolides

- Showed large increases in Peru (0.76 DID, +82.1%), Brazil (+0.41 DID, +61.5%), and Argentina (0.74 DID, +42.0%)
- Relatively little change or even decreases in Uruguay, Mexico, and Colombia. (Figure 3).

10-year trends for macrolides

FIGURE 3. Utilization of macrolides, lincosamindes, and streptogramins in eight Latin American countries, 1997–2007

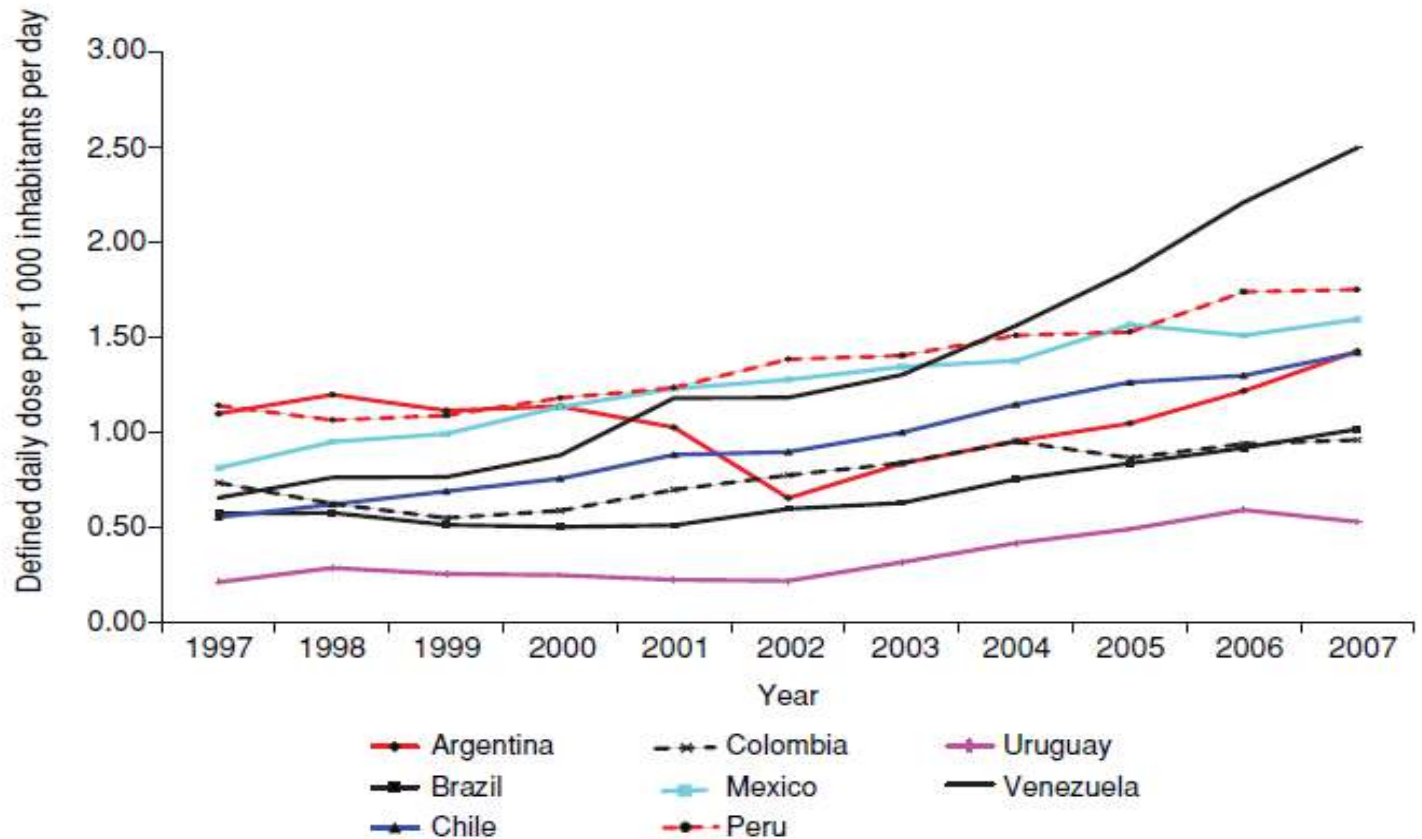


10-year trends for quinolones

- Quinolone utilization increased in all eight countries studied.
- The decrease in overall antibiotic utilization for Chile during the middle of the period studied does not apply to quinolone antibiotics, for which sales have increased evenly over the last 11 years.
- Whereas quinolone utilization in Chile and Uruguay doubled (0.87 DID, +157%; 0.32 DID, +152%, respectively), in Venezuela it tripled (1.86 DID, +282%).
- Quinolone use varied 5-fold among Latin American countries in 2007.
- Again, Venezuela was leading (2.49 DID) and Uruguay (0.53 DID) had the lowest utilization.

10-year trends for quinolones

FIGURE 5. Quinolone utilization in eight Latin American countries, 1997–2007



Antibiotic Consumption in Hospitals of Buenos Aires City

Principal Investigator:

Gabriel Levy Hara

Other Investigators:

D Pryluka, W Vasen, C Carranza, V Ybarra, P Scapellato, A Molina, N Grinberg, B Ricci, R. Agugliaro, C Rodrigues, J Chuluyan, A Sisto, MJ Lopez Furst, J Herrera

Primary Country:

Argentina

11 Buenos Aires Hospitals

Project Description:

- data collected from the ICUs and Internal Medicine Wards of 11 hospitals (more than 70% of the beds of public hospitals of Buenos Aires).
- Consumption was measured in DDD / 1000 patient-days with comparisons made between the first 6 months of 2004 and the first 6 months of 2007.

Antibiotic Consumption in Hospitals of Buenos Aires City

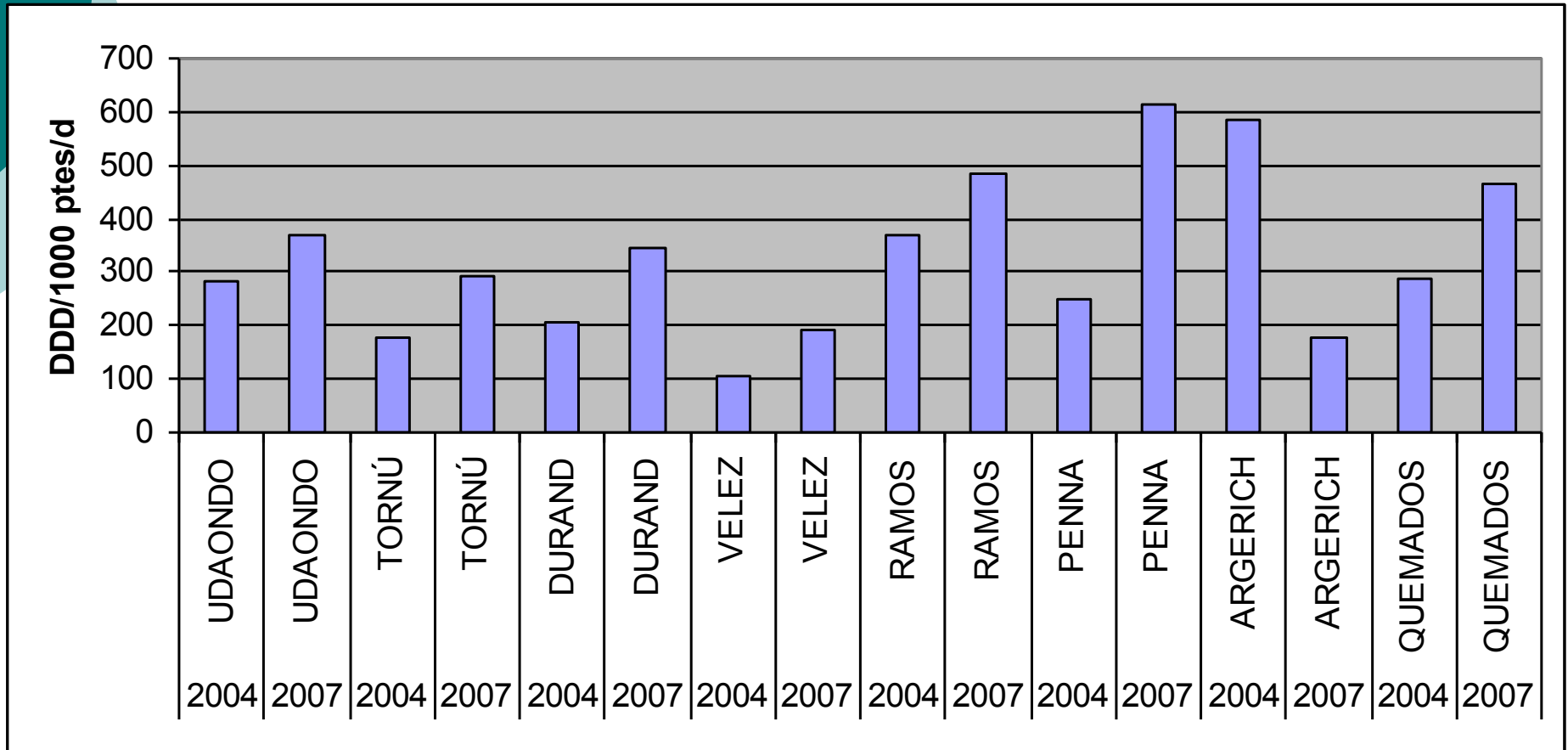
Outcome / Result:

- **Internal Medicine Wards**
- Overall use was similar between the two periods. The consumption of ciprofloxacin and piperacillin/tazobactam significantly increased while ceftazidime and clindamycin were significantly reduced.
- There was an increase consumption of the restricted antibiotics piperacillin/tazobactam, imipenem, meropenem, colistin, tygecyclin, linezolid and vancomycin.

BROADER SPECTRUM ATB USE AGAINST GNB

Intensive Care Units, Buenos Aires

2004- 2007



Antibiotic Consumption in Hospitals of Buenos Aires City

ICU

- Between the two periods global consumption significantly increased in two hospitals, was reduced in two and remained stable in the others.
- However, as with the internal medicine wards, the overall use of the restricted antibiotics piperacillin/tazobactam, imipenem, meropenem, colistin, tygecyclin, linezolid and vancomycin all increased significantly in the majority of hospitals, despite all hospitals having antibiotic stewardship programs.
- We concluded that the lack of resources directed to infection control activities increases transmission of resistant pathogens, directly influencing the changes in antibiotic consumption.



Antimicrobial consumption surveillance program among hospitals in Tokai area, Japan

Principal Investigator:

Hisashi Taki

Other Investigators:

Norio Ohmagari

Primary Country:

Japan

Hospitals in the Tokai area.

Project Description:

An antimicrobial consumption surveillance program utilizing the World Health Organization's ATC/DDD system with antibiotic usage density as an indicator.



Malaysian National Medicines Use Survey

Principal Investigator:

Pharmaceutical Services Division and the Clinical Research Centre, Ministry of Health Malaysia

Other Investigators:

Victor Lim

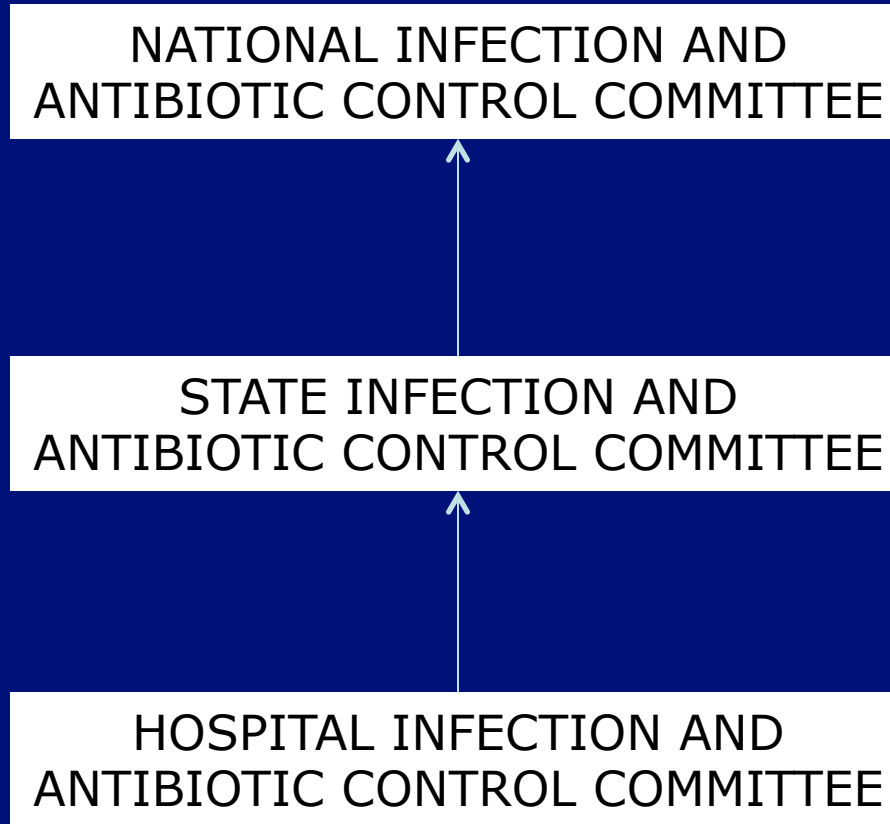
Project Description:

This involves multiple surveys at the different levels of the medication supply and distribution chain. The detailed methodology is described in the annual reports which are available on-line at www.crc.gov.my

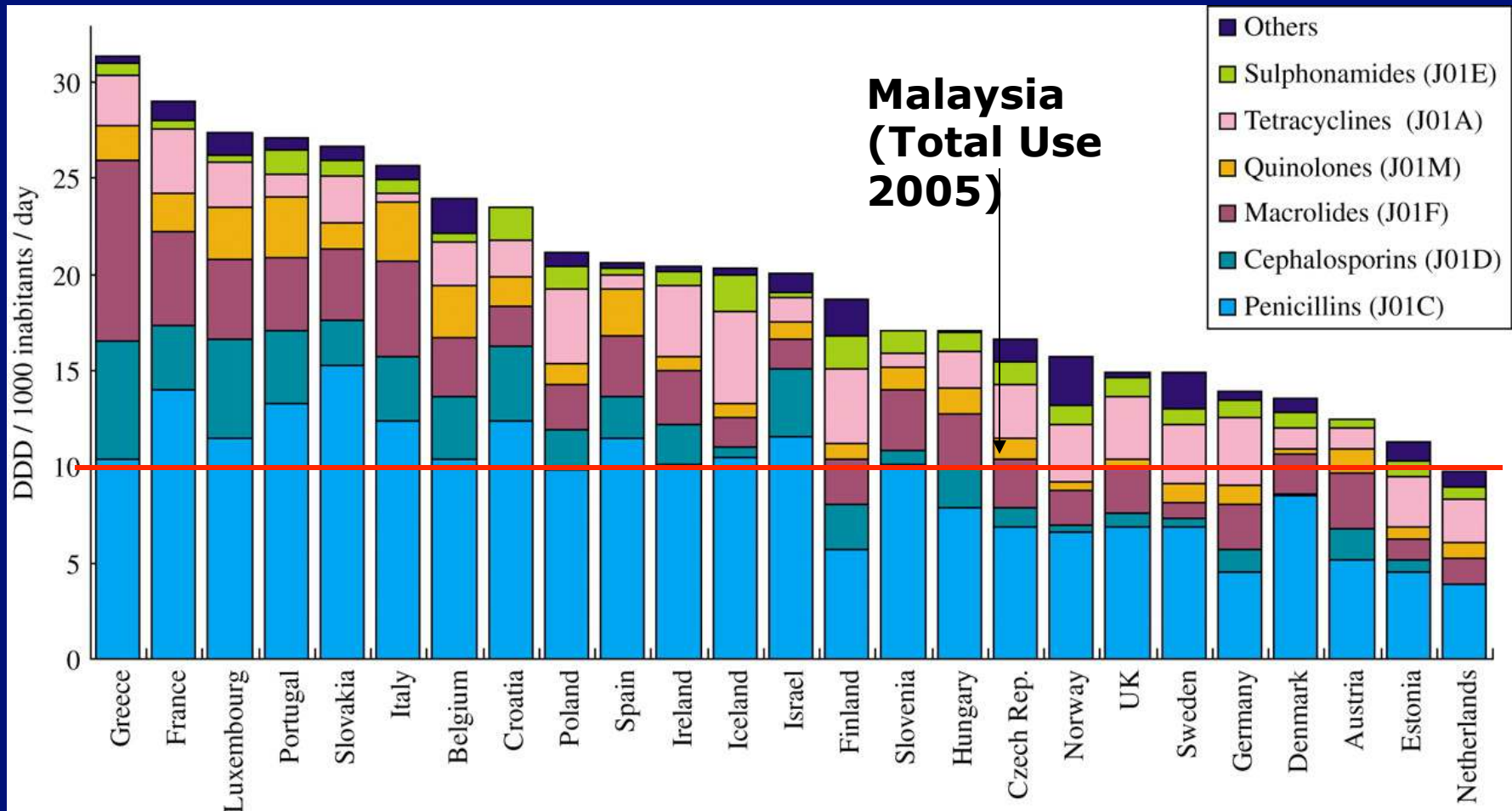
Outcome / Result:

The consumption of antibiotics in 2006 was estimated to be 8.93 DDDs per 1000 population/day

Governance and Management



OUTPATIENT ANTIBIOTIC UTILISATION IN EUROPE (2003)



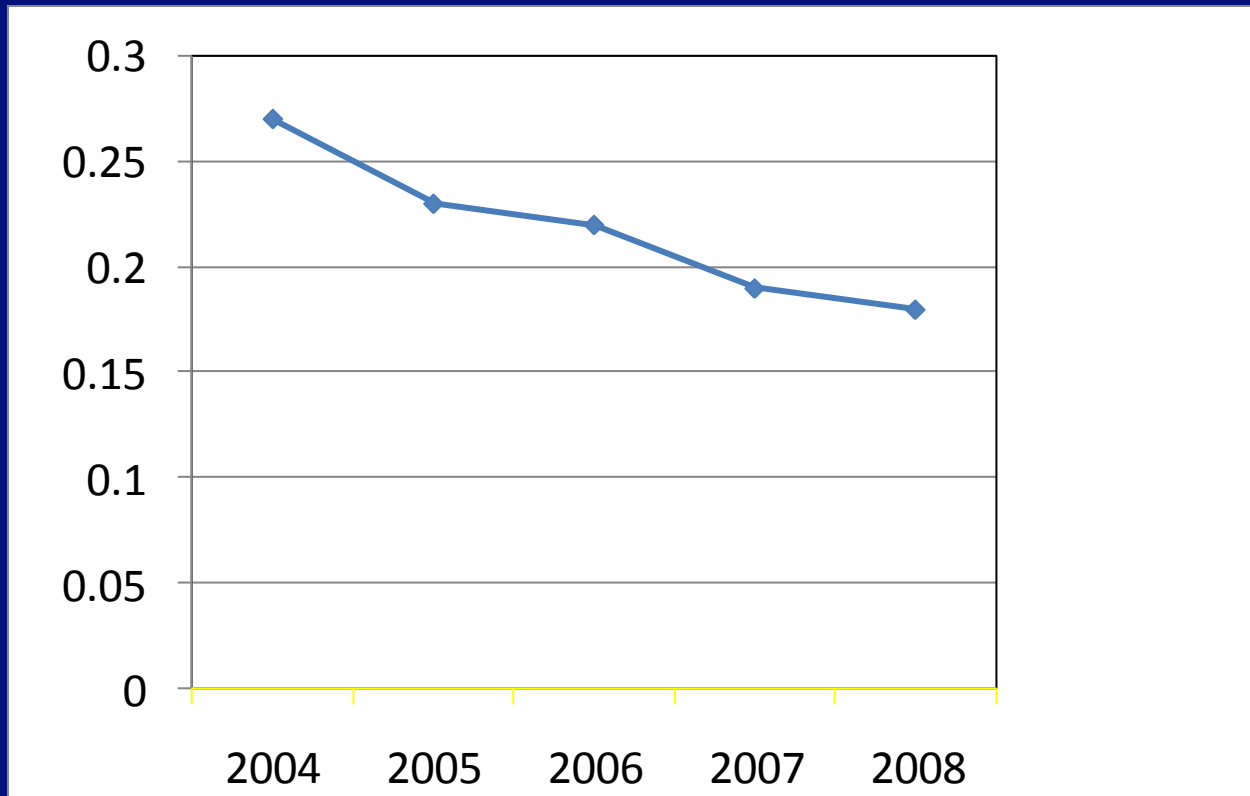
ANTIBIOTIC USE IN MALAYSIAN GOVERNMENT HOSPITALS DDD/100 ADMISSIONS IN 2005

| ANTIMICROBIAL CLASS | MEAN USAGE | Dutch Hospitals (2001)* |
|-------------------------------|---------------|----------------------------|
| CEPHALOSPORINS | 48.18 | 42.3 |
| QUINOLONES | 5.48 | 38.0 |
| CARBAPENEMS | 2.72 | 2.4 |
| GLYCOPEPTIDES (VANCOMYCIN) | 1.91 | 3.2 |

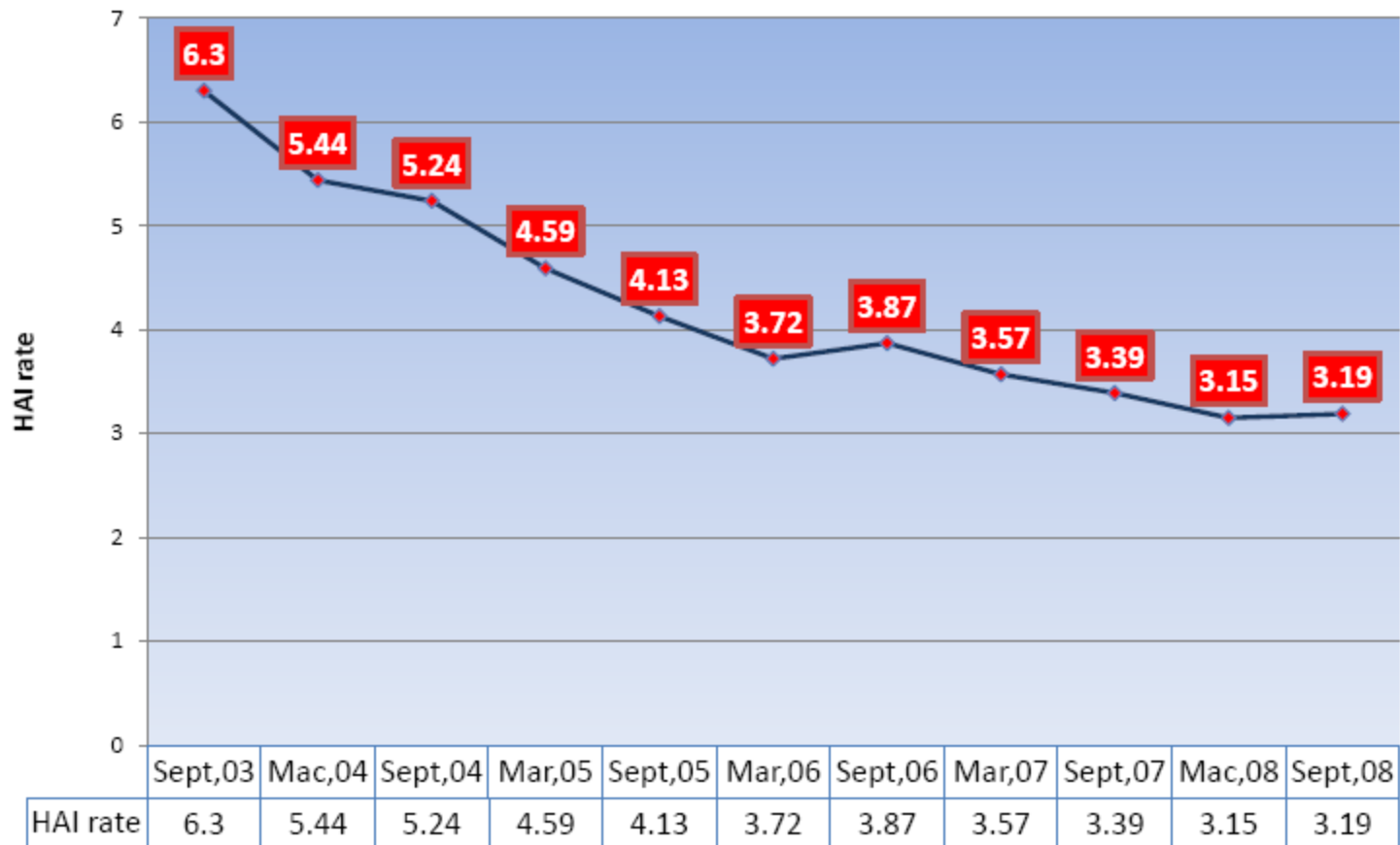
*Filius et al. J. Antimicrob. Chemother 2005; 55: 805 - 808

5 Year National Trend of MRSA Rates in Malaysia (2004 – 2008)

No new patients infected or colonised/100 admissions



National Trend of HAI prevalence rates over 5 years (2004-2008)



National Australian Antimicrobial Usage Surveillance Program (NAUSP)

The NAUSP collects antimicrobial consumption data from a growing number of Australian principal referral hospitals (currently 29, equivalent to 50% of major city principal referral hospitals in Australia). Data is derived from pharmacy dispensing records and is confined to usage in acute care settings. Usage rates are reported as Defined Daily Doses (WHO ATC criteria) per 1000 Occupied Bed Days.

South Australian Antimicrobial Usage Surveillance Program (SA AUSP)

Principal Investigator:

Vicki McNeil

Other Location Information:

Adelaide, South Australia

Project Description:

- The SA AUSP collects antimicrobial consumption data from 13 SA metropolitan hospitals (7 public and 6 private) and 20 regional hospitals.
- Usage rates are reported utilizing the WHO ATC methodology in Defined Daily Doses per 1000 Occupied Bed Days.
- Individual contributors use the SA AUSP reports to benchmark their usage against their peers.
- Depending on the casemix of their hospital and local resistance patterns, they are able to decide if misuse of antibiotics is a possibility, and decide if more detailed intervention is warranted.

South Australian Antimicrobial Usage Surveillance Program (SA AUSP)

Outcome / Result:

- Reporting for the metropolitan hospitals occurs every 2 months (regional hospitals less frequently):
 - ✓ third/fourth generation cephalosporins
 - ✓ glycopeptides
 - ✓ carbapenems
 - ✓ fluoroquinolones
 - ✓ aminoglycosides
 - ✓ antipseudomonal penicillin/beta-lactamase inhibitors.
- The comparator for each of these time series charts is the aggregate usage rate of all contributors.
- Separate usage rates are given for consumption in Intensive Care Units (ICUs), and non-ICU services where possible.

South Australian Antimicrobial Utilisation Surveillance Program and National Antimicrobial Utilisation Surveillance Program (NAUSP)

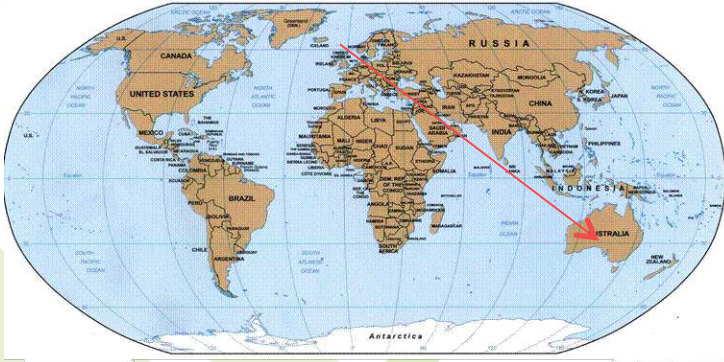
Information from Vicki McNeil,
Infection Control Service,
Communicable Disease Control Branch,
SA Health.



**Government
of South Australia**

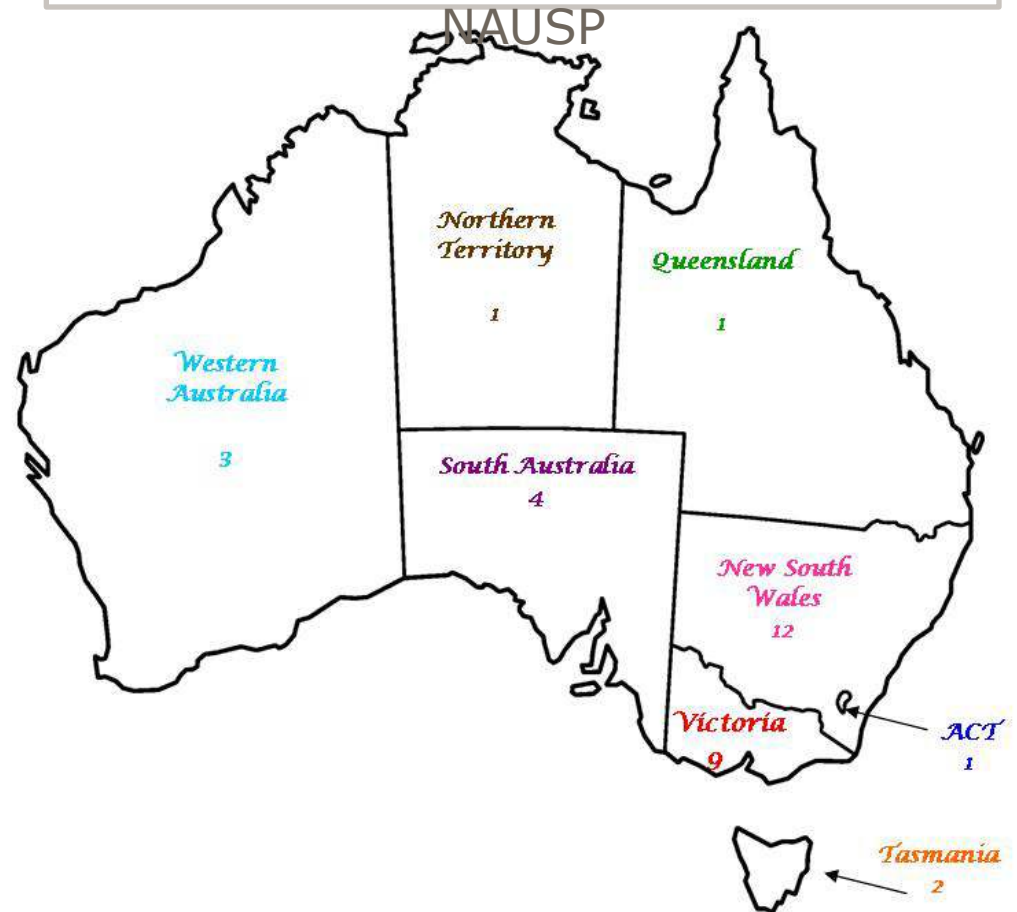
SA Health

National and South Australian program (NAUSP and SA AUSP)



33 tertiary referral hospitals contribute antibiotic usage data to

SA AUSP: 13 major metropolitan hospitals (7 public and 6 private)

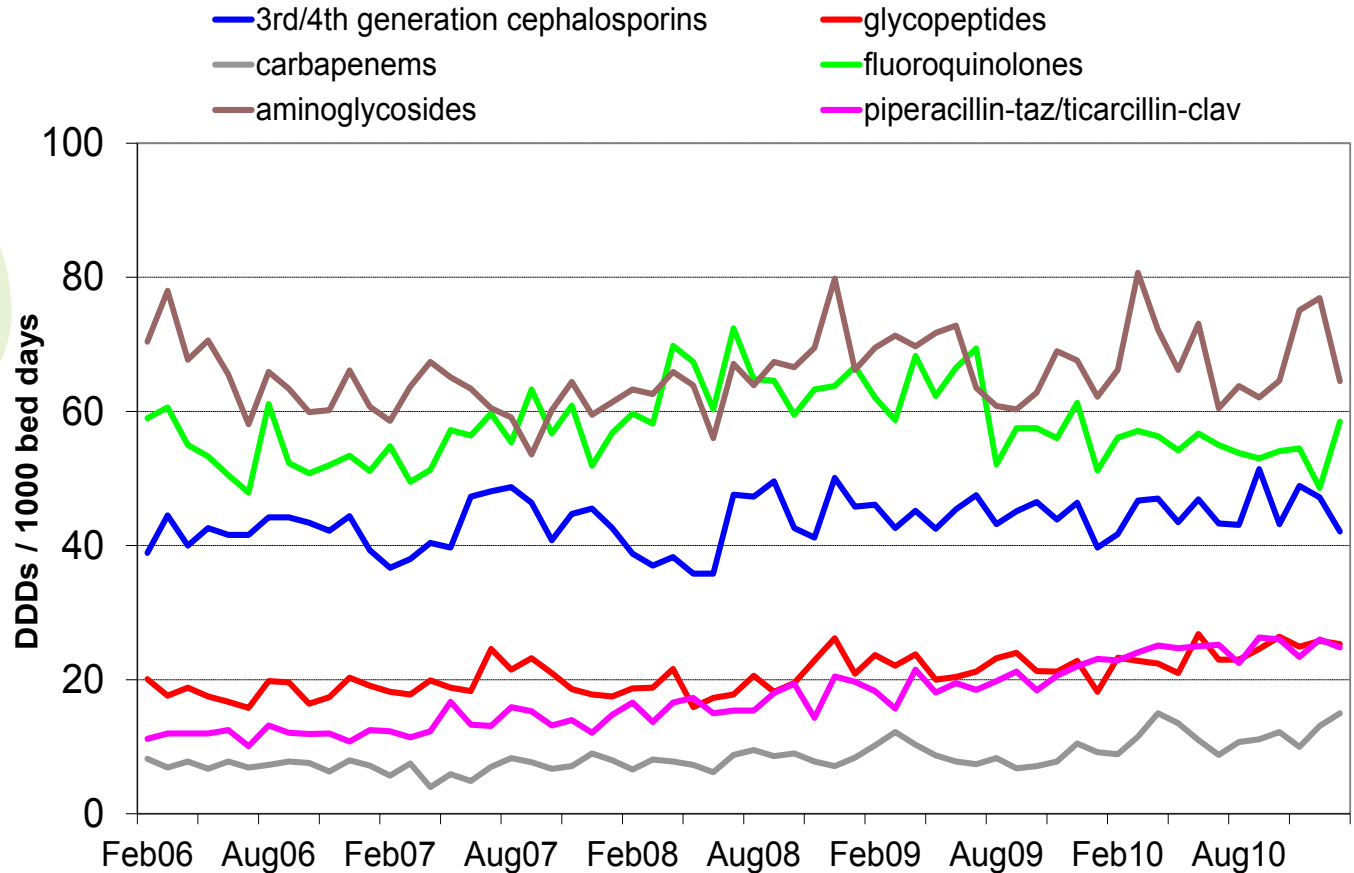


SA Health

South Australian Antimicrobial Utilisation Surveillance Program

- > Data since November 2001
- > Usage data obtained from pharmacy dispensing records for acute-care inpatients
- > Converted to Defined Daily Doses (DDD) via custom-built database, then to a rate per 1000 Occupied Bed Days
- > Longitudinal data may be used to monitor trends
- > Benchmarking
 - Between hospitals
 - Between state and national averages
 - International

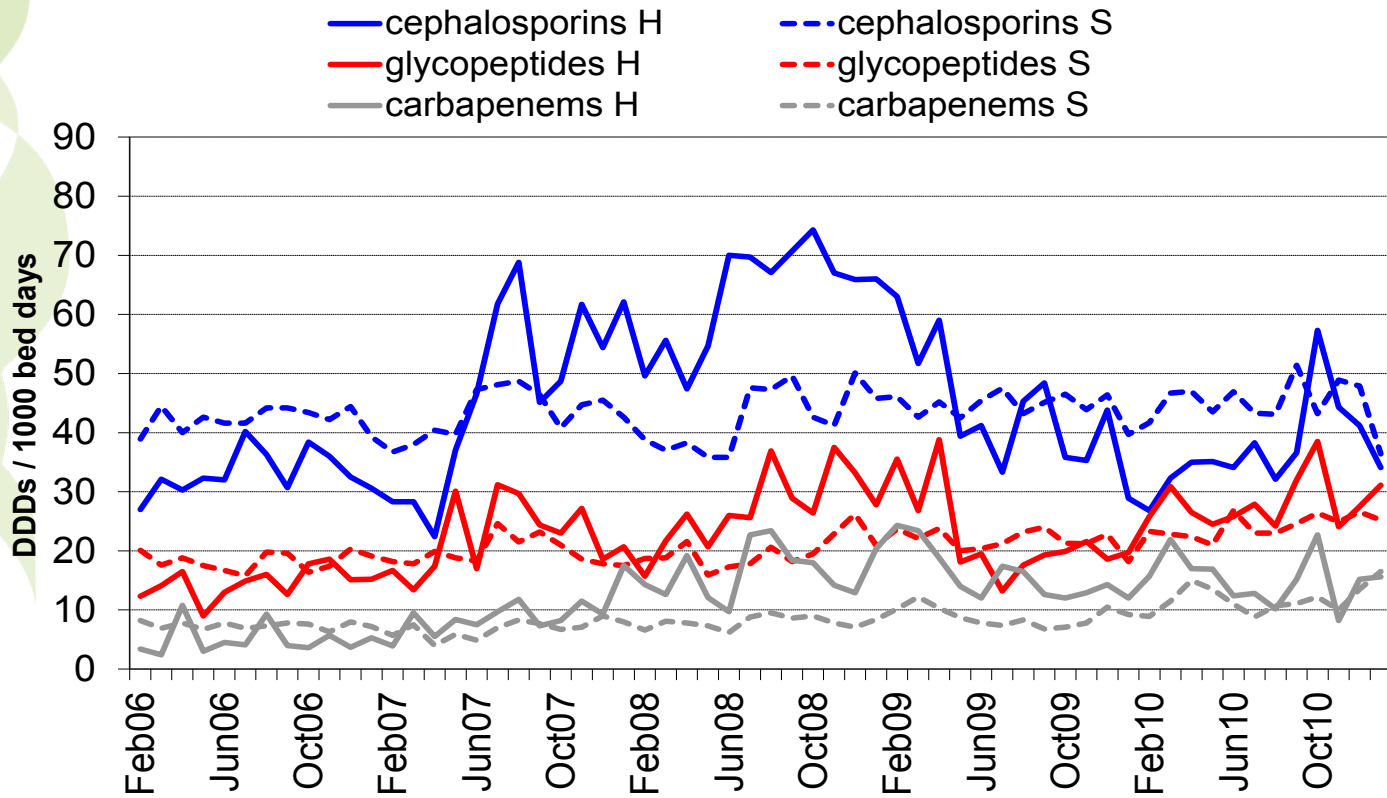
South Australian Antimicrobial Utilisation Surveillance Program – longitudinal data



Note: steady increase in piperacillin/taz & ticarcillin/clav over 5 years

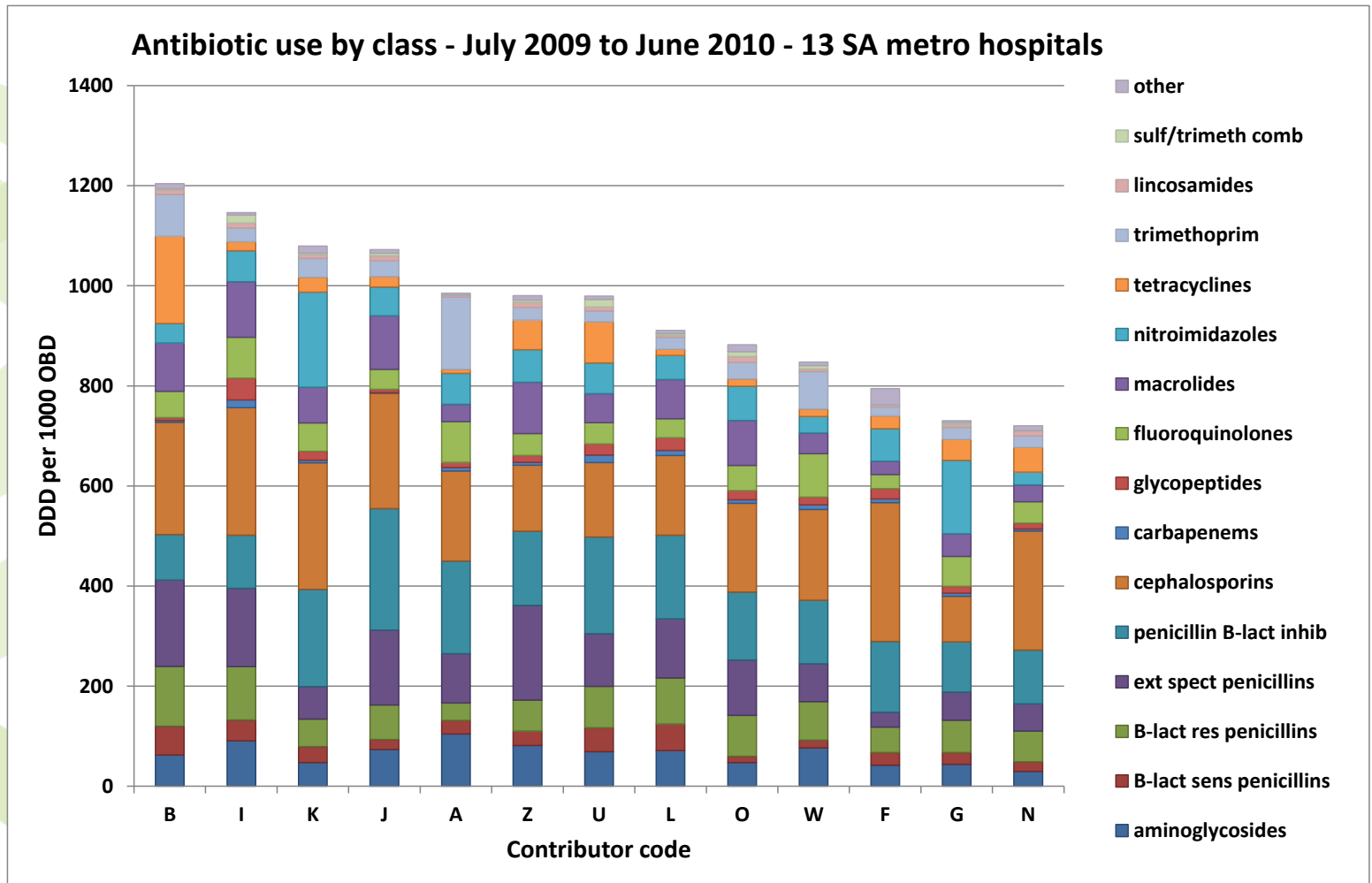
South Australian Antimicrobial Utilisation Surveillance Program – longitudinal data

Hospital H compared to SA metro average (S)



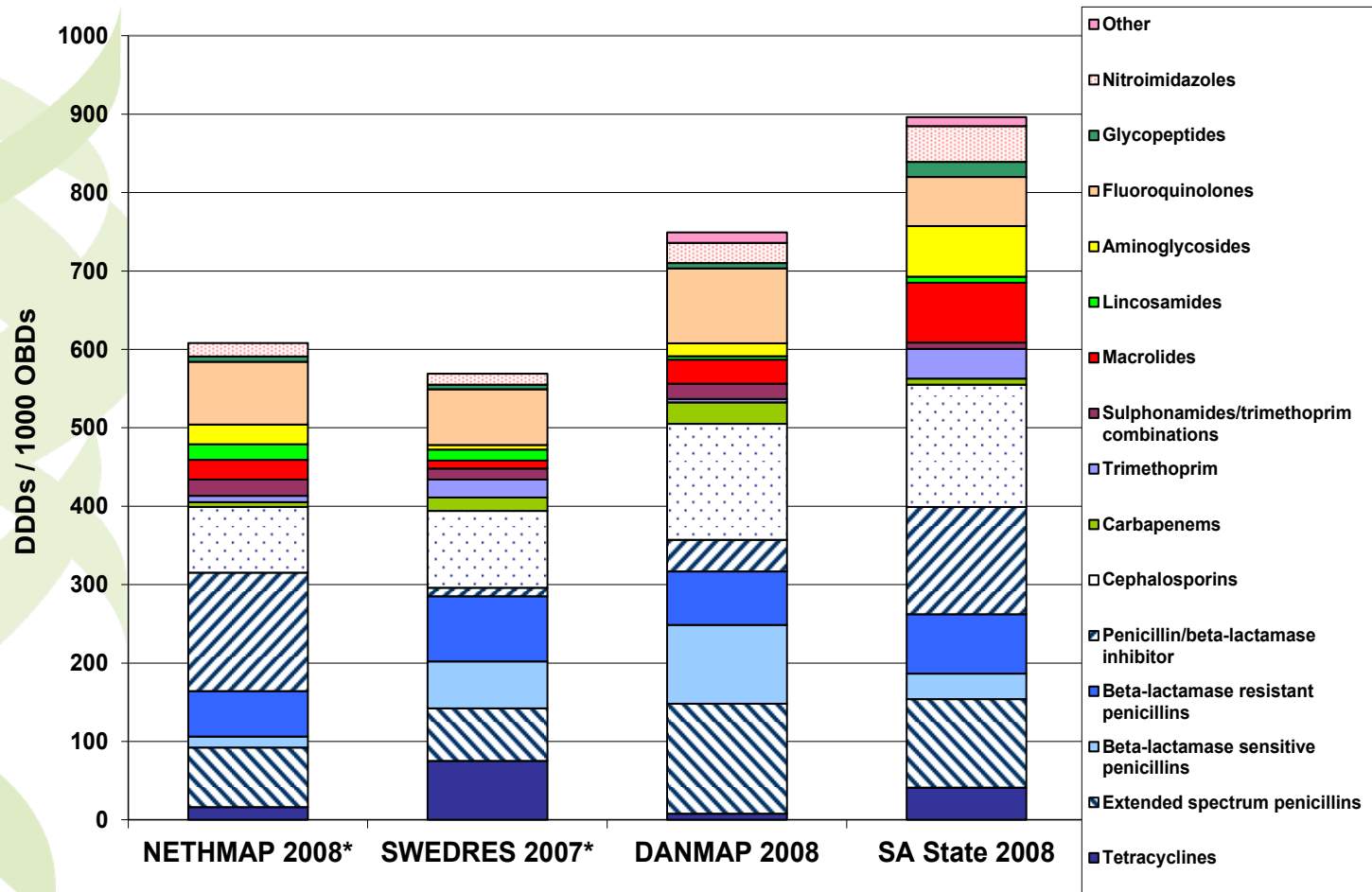
South Australian Antimicrobial Utilisation Surveillance Program – benchmarking

Usage in SA hospitals compared over a 1 year period



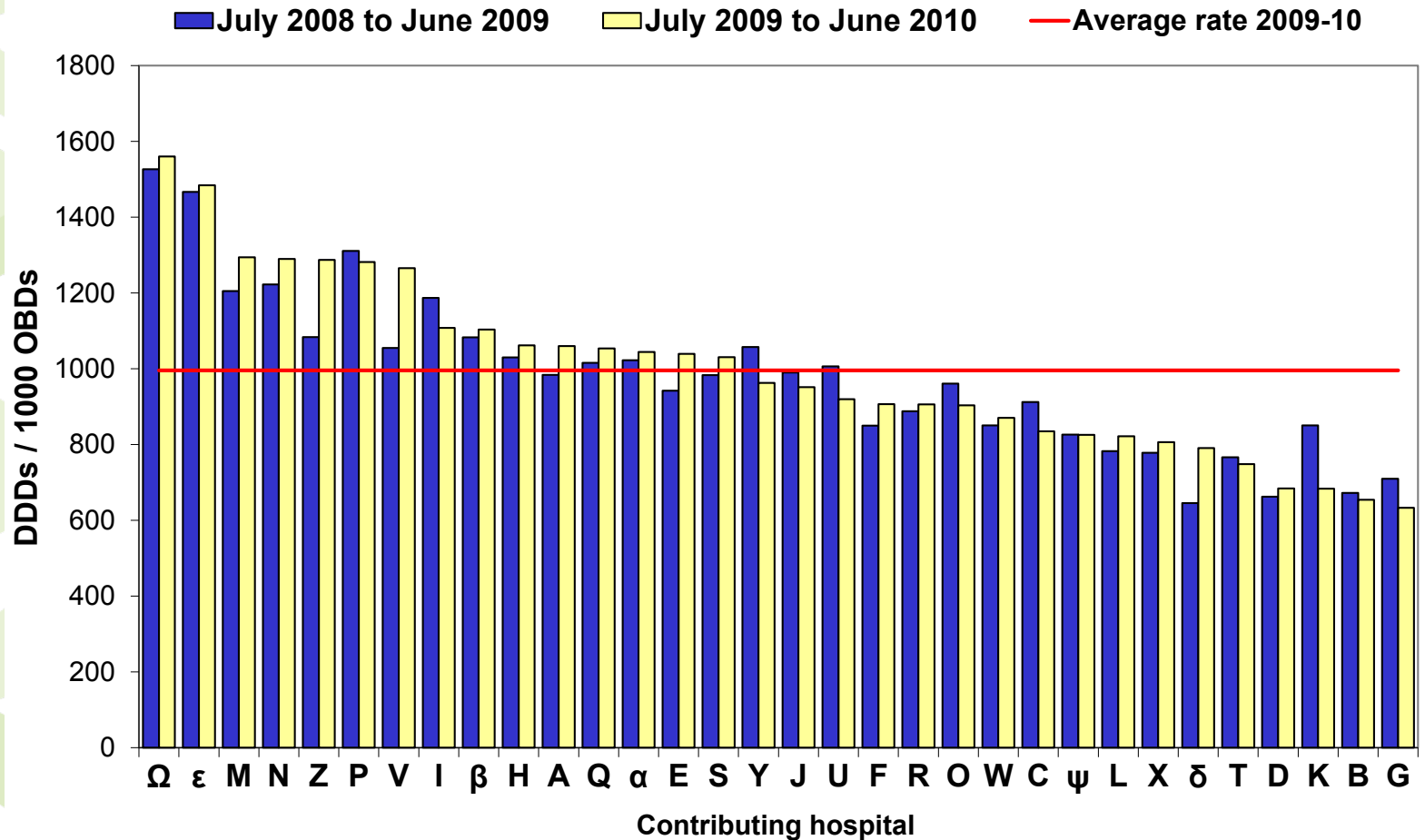
South Australian Antimicrobial Utilisation Surveillance Program – benchmarking

Comparison with international data



National Antimicrobial Utilisation Surveillance Program (NAUSP) - benchmarking

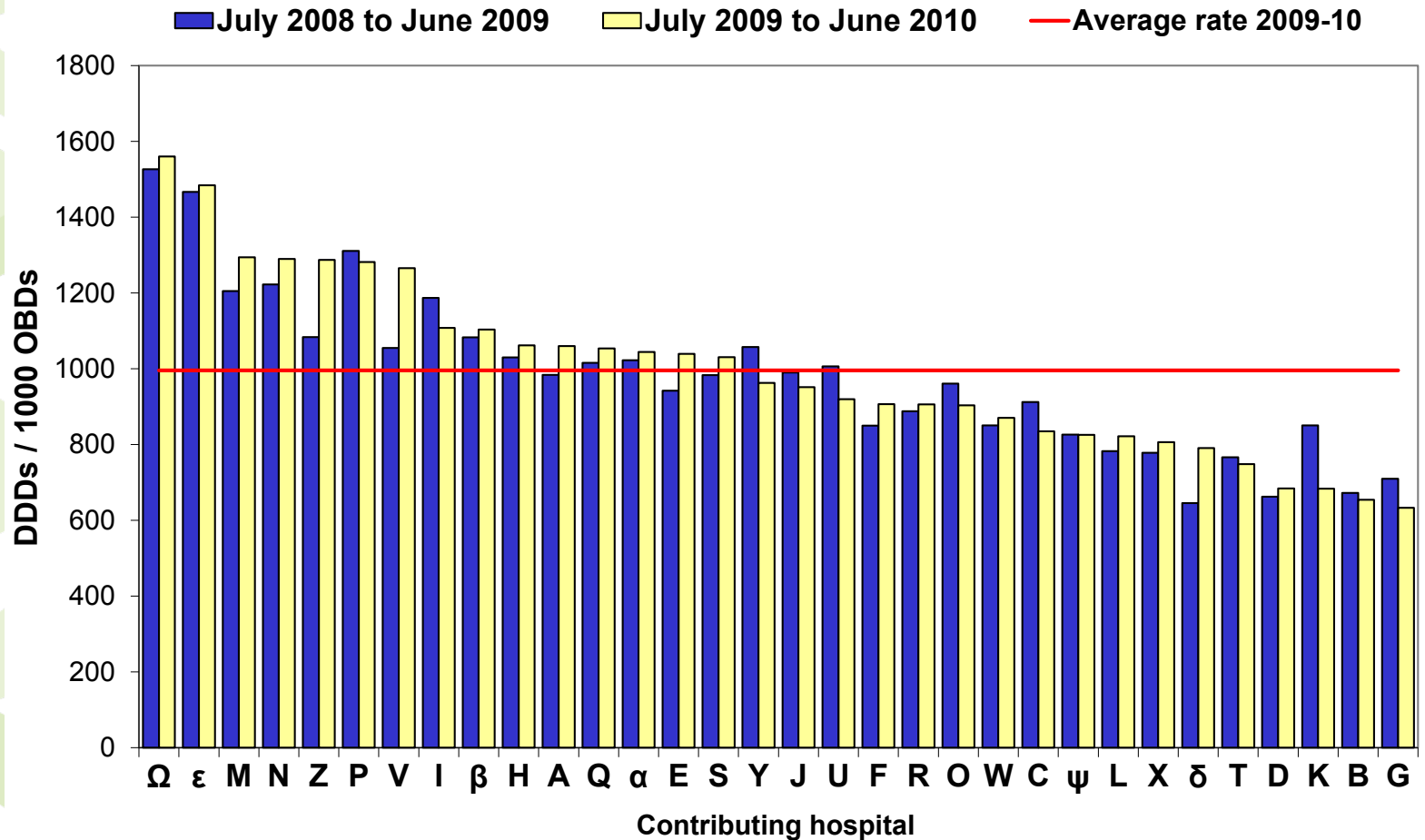
Total usage data from 32 contributors



Note: large inter-hospital variance in annual usage rates

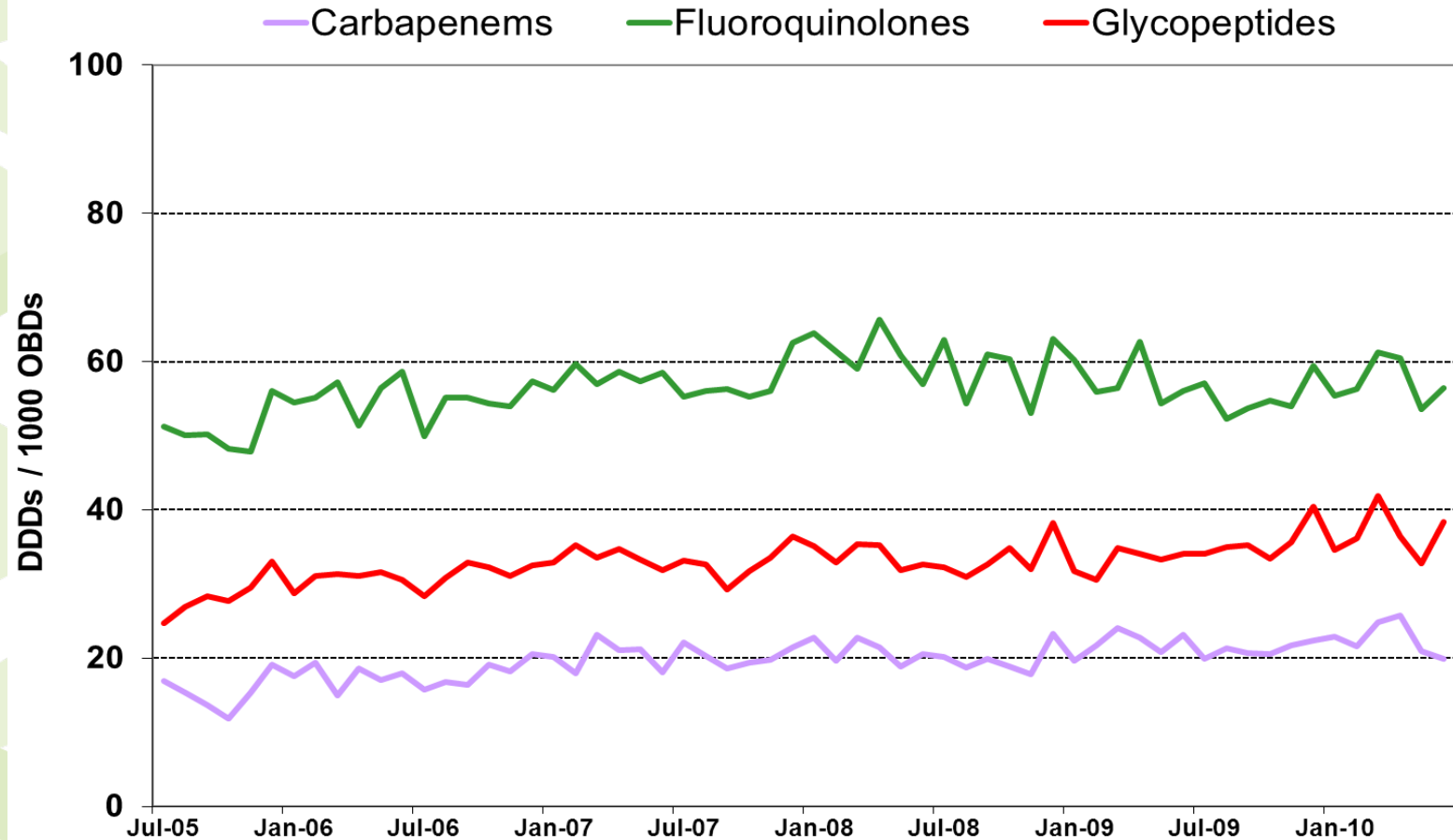
National Antimicrobial Utilisation Surveillance Program (NAUSP) - benchmarking

Total usage data from 32 contributors



Note: large inter-hospital variance in annual usage rates

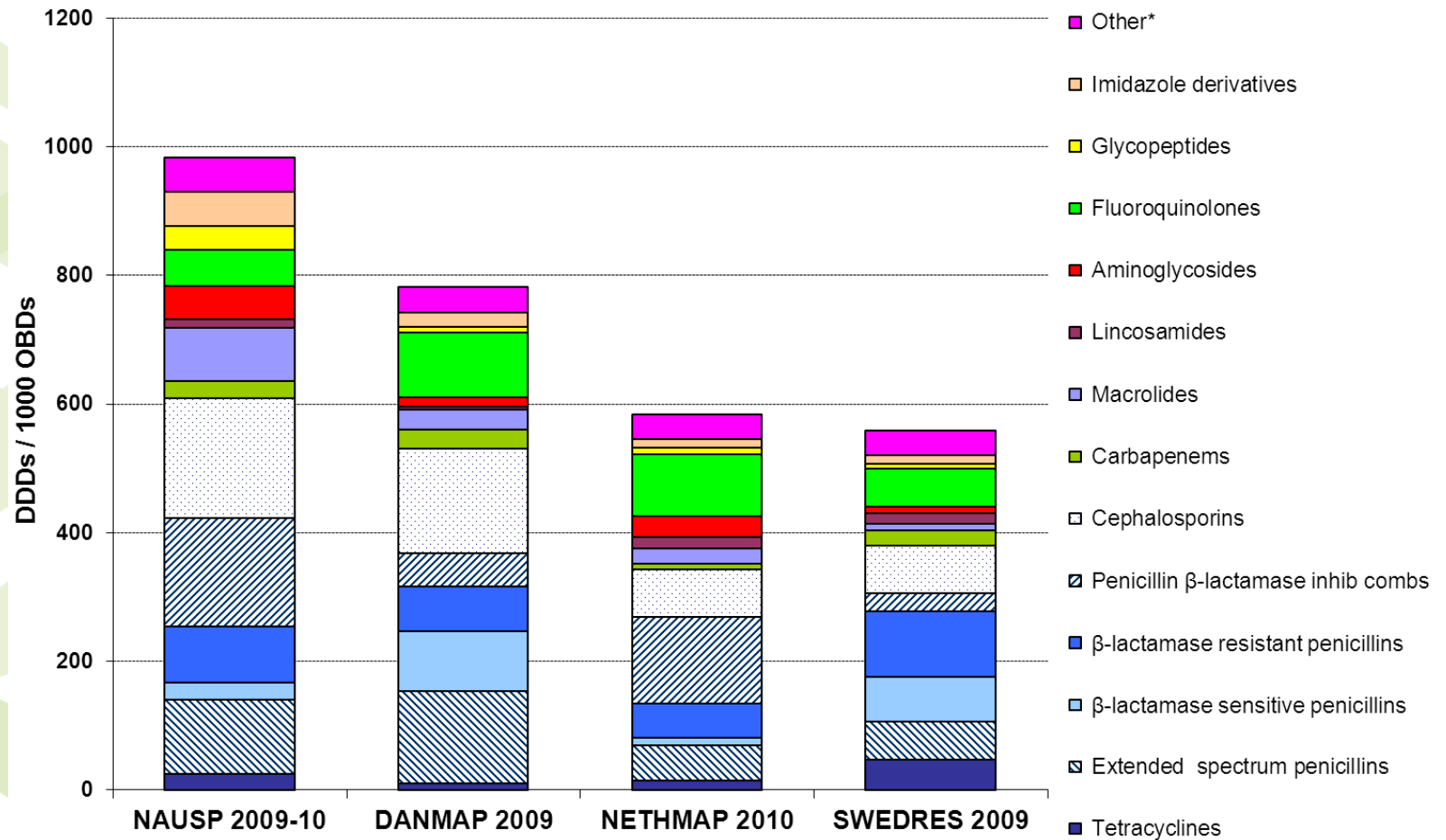
National Antimicrobial Utilisation Surveillance Program (NAUSP) – longitudinal data



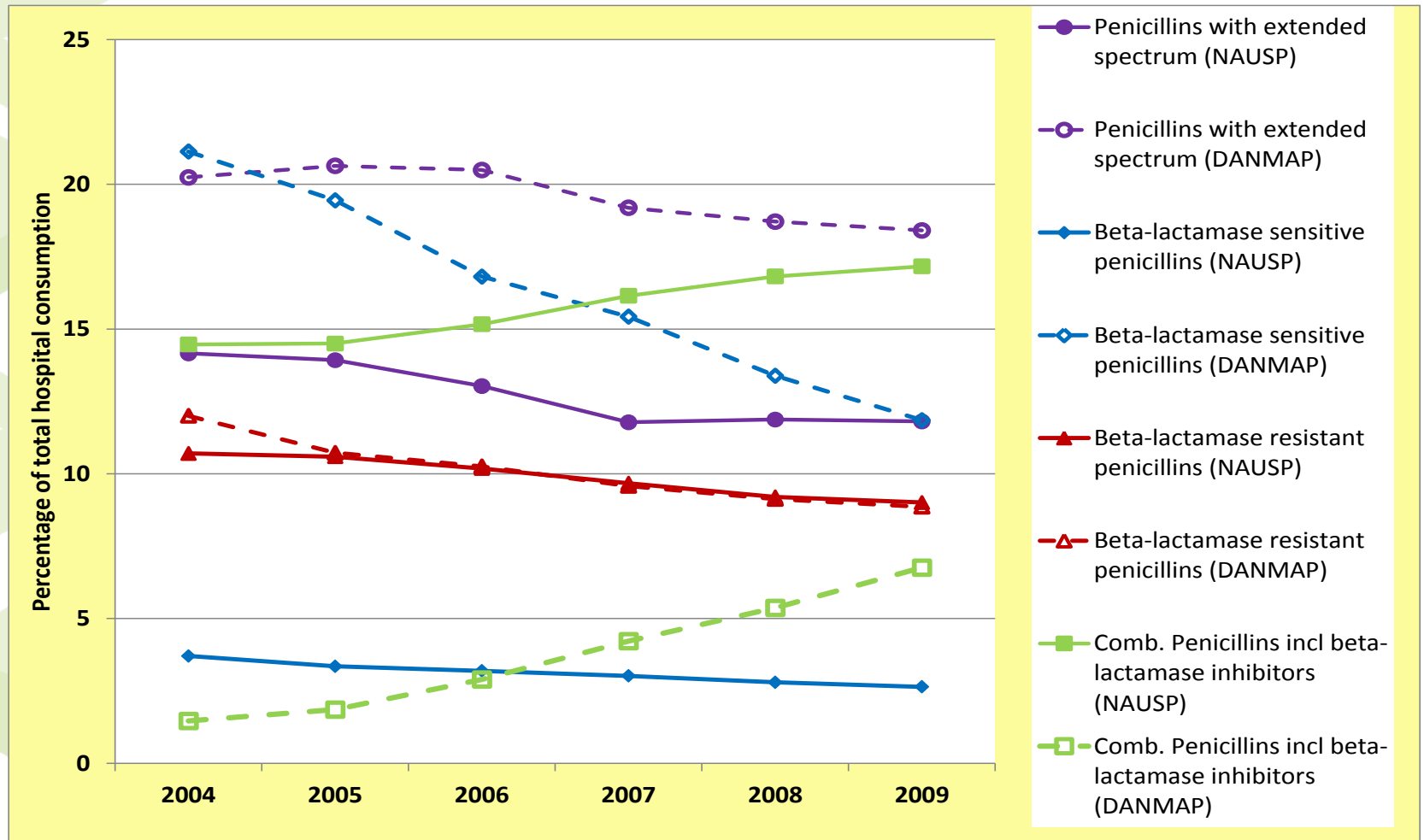
Note: Increased usage of fluoroquinolones followed by plateau after 2008

National Antimicrobial Utilisation Surveillance Program (NAUSP) –

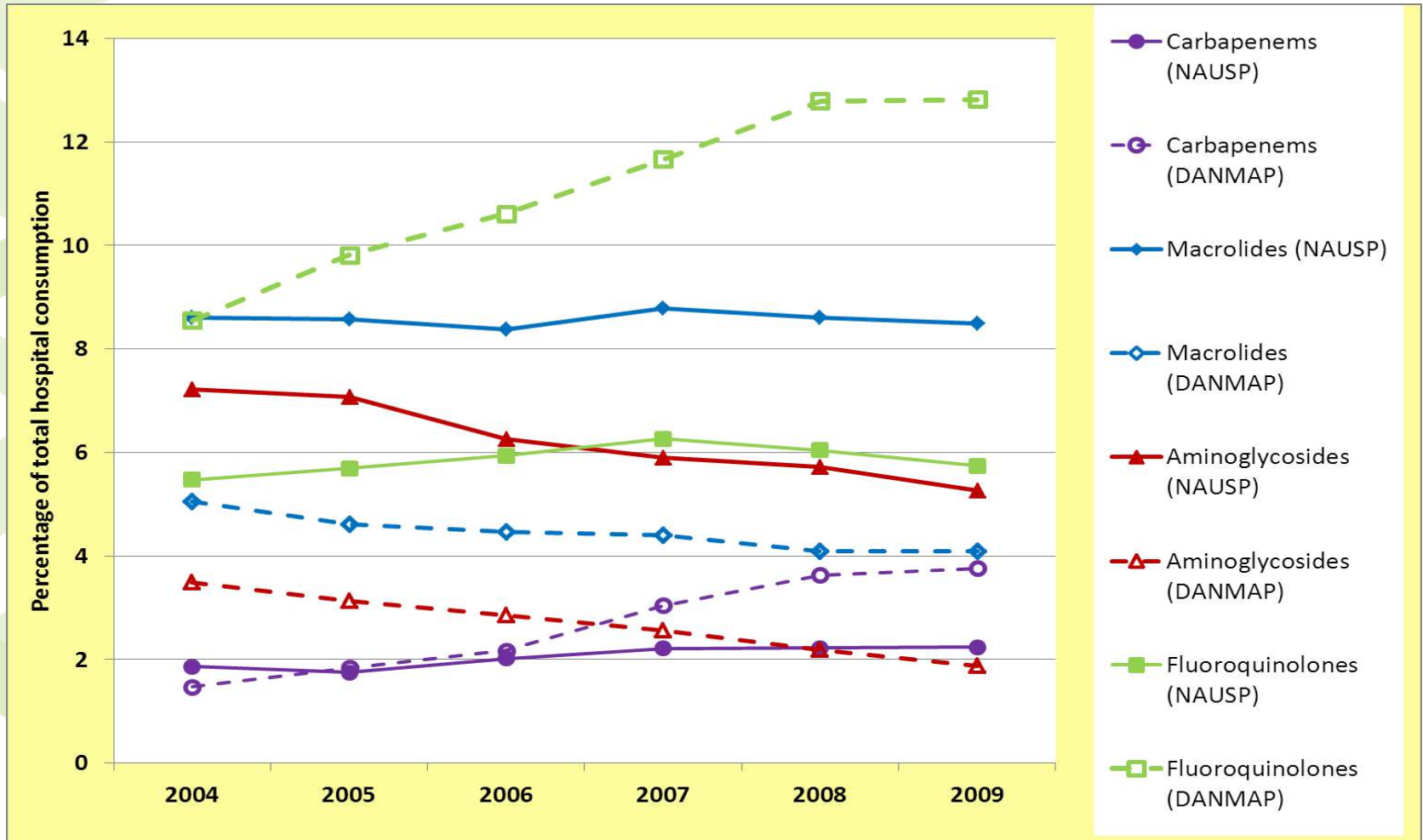
comparison with European antimicrobial surveillance programs



NAUSP vs DANMAP– Usage of penicillins as a percentage of total consumption in hospitals



NAUSP vs DANMAP – Usage of carbapenems, macrolides, aminoglycosides and fluoroquinolones



Further information



- > NAUSP Annual report 2009-10 (published April 2011) at www.health.sa.gov.au/infectioncontrol/
- > Email: antibio@health.sa.gov.au



South Australian Antimicrobial Usage Surveillance Program (SA AUSP)

- Annual reports giving more detailed usage information are also published and distributed to interested parties and the South Australian expert Advisory Group on Antibiotic Resistance (SAAGAR) and SA Health Portfolio Executive.
- These reports also include comparisons with several international surveillance programs where direct comparison is possible.

DANMAP (Danish Integrated Antimicrobial Resistance Monitoring and Research Programme)

Principal Investigator:

Vibeke Frøkjaer Jensen

Other Investigators:

Anette M. Hammerum

Primary Country:

Denmark

Project Description:

- The Danish Integrated Antimicrobial Resistance Monitoring and Research Programme (DANMAP) was established by the Danish Ministry of Food, Agriculture and Fisheries and the Danish Ministry of Health in 1995.

DANMAP (Danish Integrated Antimicrobial Resistance Monitoring and Research Programme)

- **Objectives:**

- Monitor the occurrence of antimicrobial resistance
- Monitor consumption of antimicrobial agents
- Investigate associations between use of antimicrobial agents in animals and humans and occurrence of resistance among bacteria from animals, foods, and humans.
- DANMAP report annually on the occurrence of antimicrobial resistance in zoonotic, indicator, and pathogenic bacteria from animals, foods, and humans in Denmark.

- **Outcome / Result:**

- A comprehensive report on antimicrobial consumption and resistance in health care and food production is produced annually. All reports, including summaries of major findings, are available at DANMAP.org



Educational

Newfoundland Optimal Antibiotic Project

Principal Investigator:

Jim Hutchinson

Primary Country:

St. John's, Newfoundland, Canada

Project Description:

- A physician and public education campaign including an assessment of physician prescribing.
- A public education component included posters circulated to all physicians and pharmacies and use of mass media.
- Family physician prescribing behavior was assessed by a survey conducted by visiting physicians offices prearranged but unannounced and collecting information on all visits pertaining to infection conducted in the prior 2 days.
- The prior year's prescribing patterns for participating physicians was compared with the study period using administrative databases.

Newfoundland Optimal Antibiotic Project

Outcome / Result:

- There were significant reductions in overall prescription rates in the physicians surveyed compared to the previous year. It appeared that the "threat" of surveillance of prescribing habits had a large effect on its own.
- The only difference between physicians that prescribed at high rates and those that prescribed at low rates was in their handling of respiratory infections.
- It appears that authoritative scrutiny has a positive effect on prescribing behavior and that stewardship efforts in primary care should focus on respiratory infection management.



Combined types of AS initiatives

The 4 C's

Principal Investigator:

Ian Gould

Other Investigators:

D. Nathwani and A. Seaton

Primary Country:

Country wide, Scotland

Project Description:

- In response to a *Clostridium difficile* epidemic a nation-wide campaign was enacted to reduce use of the antibiotics most associated.
- The 4 C's — Cephalosporins, **C**lindamycin, **C**o-amoxiclav and **C**iprofloxacin (fluoroquinolones).
- A similar campaign is running in England and initiatives are now extending into primary care

Educational,
Restrictive,
Organizational,
Structural,
Antimicrobial
Consumption

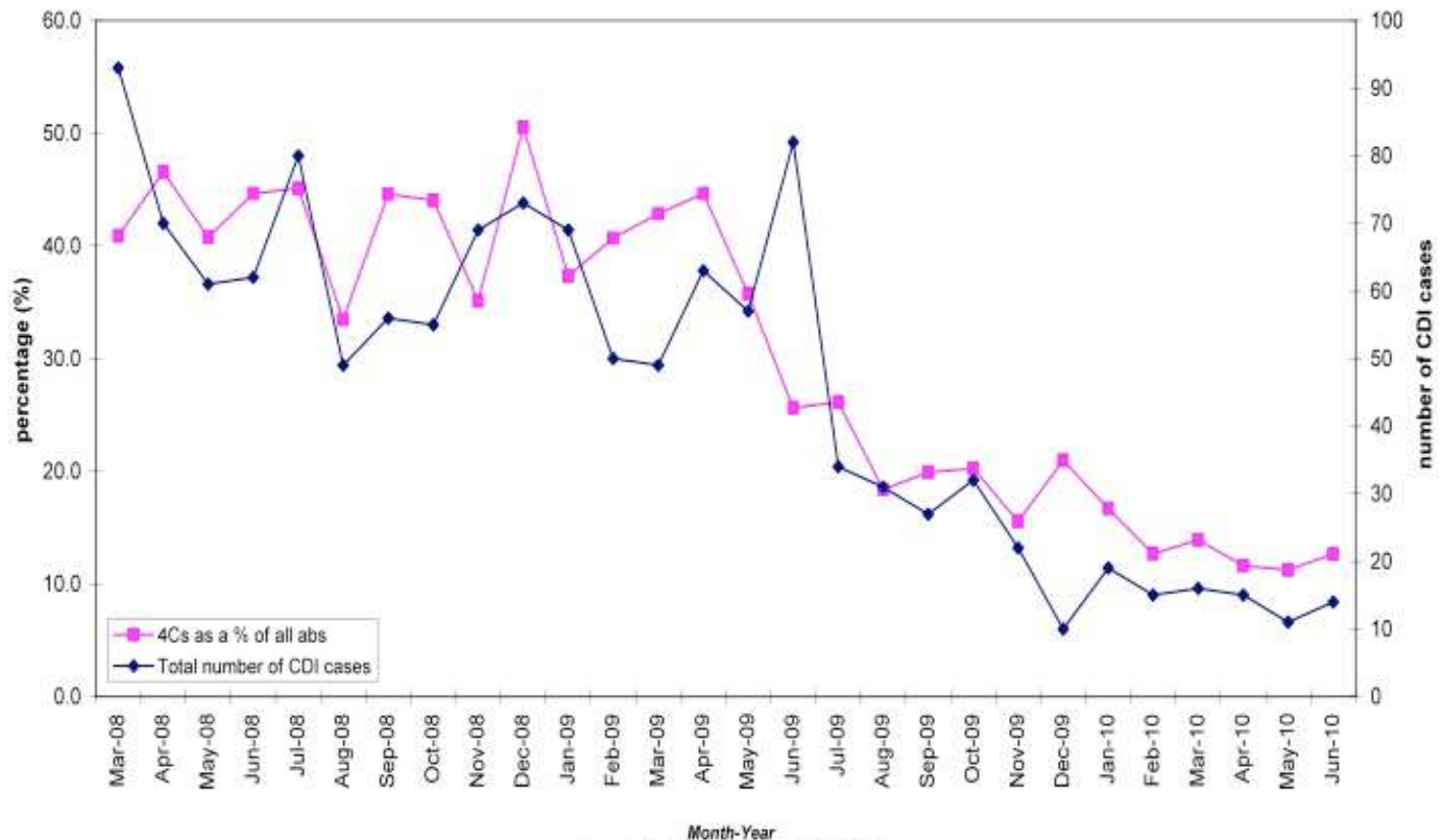
The 4 C's

Outcome / Result:

- reductions in use of these groups of drugs, to be replaced by gentamicin, amoxicillin and tetracyclines.
- Initial analysis suggests major reductions in DDDs per 1000 patient-days, *C. difficile* cases and MRSA, although the data is often confounded by simultaneous infection control interventions.

The 4 C's

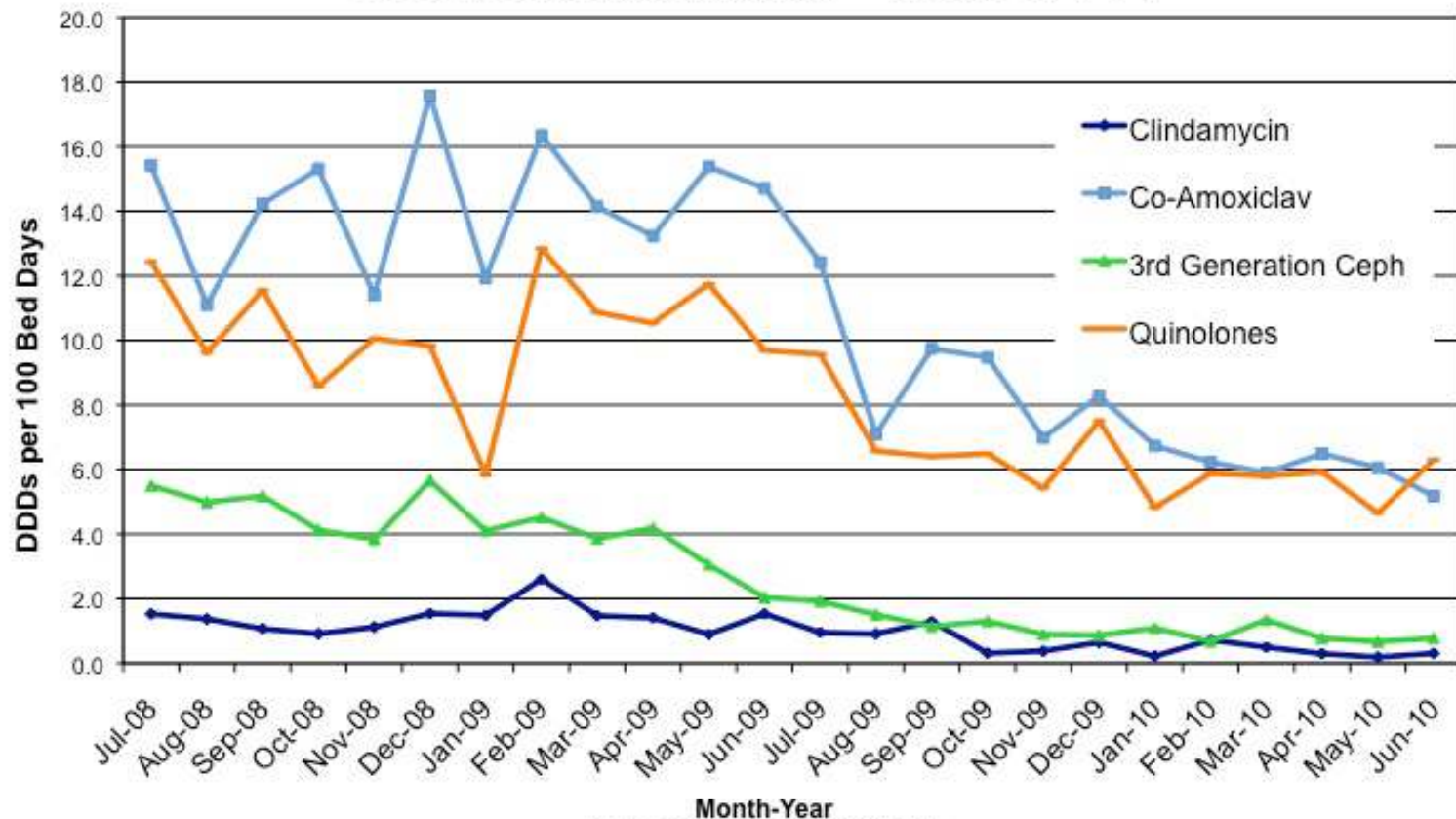
**NHS Grampian Acute Hospitals - 4Cs as a percentage of all antibiotics vs. Total number of CDI cases -
March 2008 - June 2010**



Source: Report Plus, 2010 and PAS, 2010

The 4 C's

Aberdeen Royal Infirmary - Trends in 4 C's



Source: Report Plus, 2010 and PAS, 2010



Antimicrobial Stewardship Program Survey of Knowledge, Perceptions and Beliefs towards antimicrobial use and antimicrobial resistance

Principal Investigator:

Lilian Abbo

Other Investigators:

Thomas Hooton

Primary Country:

United States

Jackson Memorial Hospital /

University of Miami Florida

Project Description:

- 600 physicians (faculty and residents) were surveyed to assess their knowledge, perceptions and beliefs towards the use of antimicrobials in our hospitals, and understand their perceptions of the problem of antimicrobial resistance.



Antimicrobial Stewardship Program Survey of Knowledge, Perceptions and Beliefs towards antimicrobial use and antimicrobial resistance

Educational,
Organizational

- The results of the study are being analyzed for publication and implementation of new interventions ...

Antimicrobial Stewardship Changing Behaviors

“Physicians will not alter their management practices unless they are both aware of and in agreement with the changes that are being proposed”

Cabana MD, et al. *JAMA*.1999;282(15):
1458-1465.

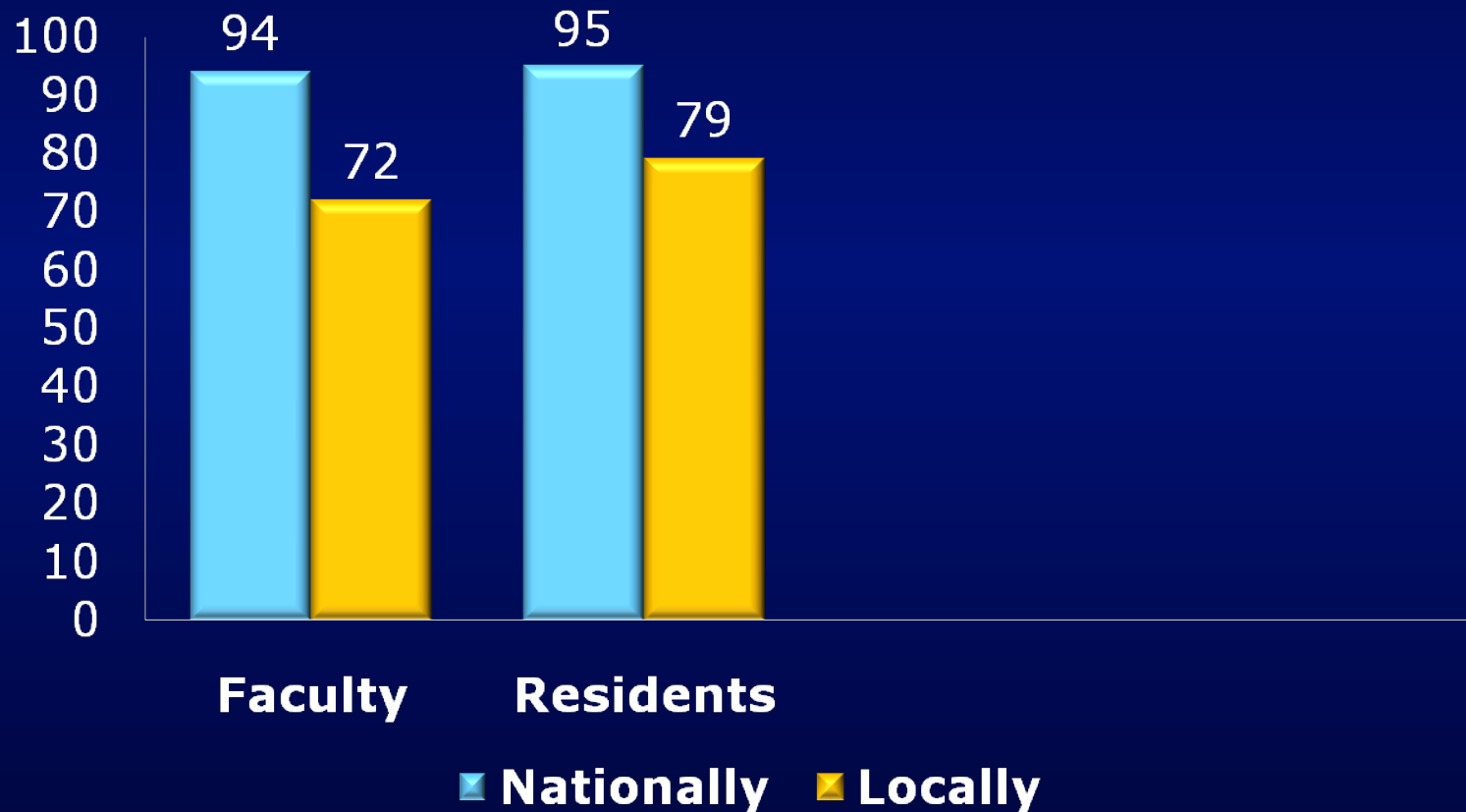
**Evaluation of Faculty and Resident Physicians’
Knowledge Attitudes and Perceptions about
Antimicrobial Use and Resistance**

Abbo L, et al. *ICHE*. 2011 (in Press)

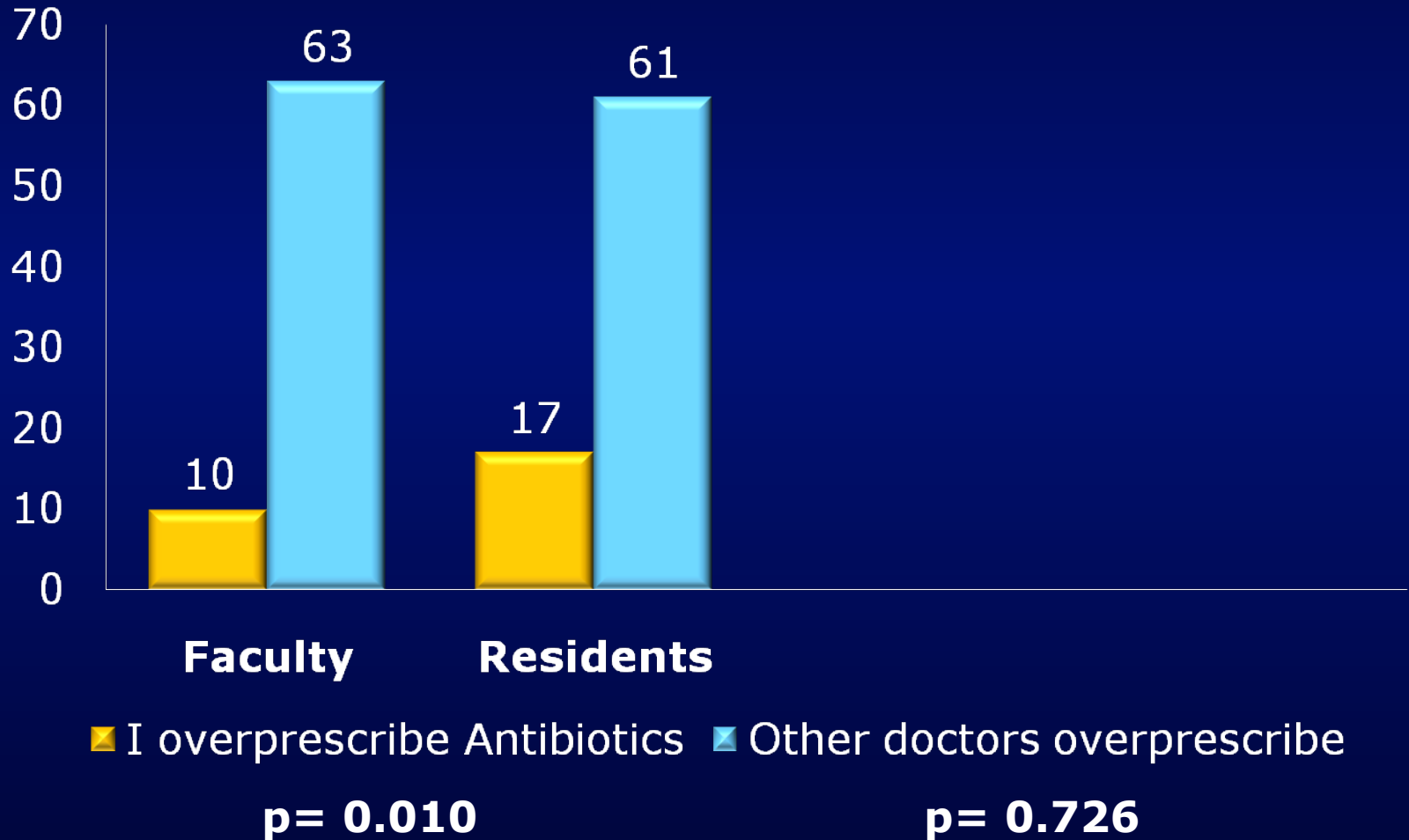
Perceptions

- Concerned about AMR when prescribing antimicrobials: **90%**
- More appropriate use of antimicrobials will decrease AMR: **94%**
- Would like more feedback regarding antimicrobial selections: faculty **72%** vs. residents **79%** ($p=.05$)
- Inappropriate use of antimicrobials is professionally unethical: **62%**

Proportion of Faculty vs. Residents that agreed that Antimicrobials are overused:



Faculty vs. Residents Perceptions Regarding Antimicrobial Prescriptions



Knowledge Scores

- **Faculty vs. Residents 64% vs. 72% (p = 0.001)**

The % of correct responders was lowest for management of anaerobic infections (50.7%), and extended spectrum beta-lactamase (ESBL) positive bacteremia (37.8%)

Restricted Antimicrobials

Principal Investigator:

Lilian Abbo MD

Other Investigators:

Laura Smith PharmD

Primary Country:

United States

Jackson Memorial Hospital,
Miami, Florida

Project Description:

- The antimicrobial stewardship program has a list of antimicrobials selected on the basis of toxicity, induction of resistance and cost that require prior authorization from an ID Clinical Pharmacist or an Infectious Diseases physician.

Educational,
Regulatory,
Antimicrobial
Consumption



Restricted Antimicrobials

Outcome / Result:

- By regulating certain antimicrobials, there is an opportunity to educate prescribers about the appropriate indication of these drugs.
- Investigators are able to track antimicrobial consumption in certain areas and develop benchmark levels.

Swiss hospital antibiotic working group

Principal Investigator:
Giorgio Zanetti

Other Investigators:
Stephan Harbarth

Primary Country:
Switzerland

Lausanne and Geneva

Project Description:
Development of a working
group on antibiotic
policies in Switzerland.

Educational,
Organizational,
Antimicrobial
Consumption

Israel ESAC project group

Principal Investigator:

Raul Raz

Other Investigators:

ESAC project group

Primary Country:

Israel

Afula, Northern district

Project Description:

A multifaceted program with several components:

- Community — Guidelines for primary care physicians including treatment protocols for infectious diseases and antimicrobial resistance.

Educational,
Regulatory,
Organizational,
Antimicrobial
Consumption

Israel ESAC project group

Project Description (cont):

- Hospital — Antimicrobial restriction policies, antimicrobial consumption studies, and standard treatment protocols.
- There are few multidisciplinary antimicrobial teams in various parts of the country and in some hospitals, especially the infectious diseases units in larger hospitals.
- Investigators participate in the ESAC project utilizing data from Clalit Health Services, the biggest health insurance institute in Israel covering approximately 55% of the population.

Outcome / Result:

- All efforts are aimed at optimizing use in the face of increasing antimicrobial resistance.

Translating Antibiotic Stewardship into measurable change in clinical practice

○ **Context**

- Best Care Always! (BCA), is an initiative aimed at improving patient safety and spreading improvement methods in all South African hospitals.
- BCA was initiated in August 2009; over 190 hospitals are enrolled.
- Current focus is reduction of healthcare-associated infection through implementation of 4 infection prevention bundles.
- Antibiotic stewardship is clearly synergistic with infection prevention efforts.



| TABLE 1. STEWARDSHIP MEASURES ¹ 3 Hospital Groups – 161 Hospitals | 2009 | 2010 |
|---|-------|-------|
| Microbiology specimens submitted | | |
| All antibiotic events | 30.4% | 31.4% |
| Before initiation of antibiotic | 23.2% | 24.0% |
| After initiation of antibiotic | 7.1% | 7.4% |
| No specimen submitted | 69.6% | 68.6% |
| Therapy > 7 days (>7DDD) | 6.1% | 6.2% |
| Therapy >14 days | 1.6% | 1.5% |
| ≥4 concurrent agents | 0.8% | 1.2% |
| ≥2 concurrent gram – agents | 0.65% | 0.71% |
| ≥2 concurrent gram + agents | 0.07% | 0.10% |
| ≥2 concurrent antifungals | 0.12% | 0.14% |
| Inappropriate surgical prophylaxis agents | 1.7% | 1.7% |

TABLE 2. ANTIBIOTIC UTILISATION¹ - 3 Major Hospital Groups (161 Hospitals)

| | 2009 | 2010 | | 2009 | 2010 |
|--------------------------------------|----------|----------|---|-------|---------|
| Hospital admissions with antibiotics | | | Suspected hospital-acquired infection (based on utilisation pattern) All admissions "Clean" surgical procedures ICU admissions | | |
| DDD≤1 | 51.0% | 53.0% | | | |
| DDD≥2 | 27.3% | 27.6% | | 1.4% | 1.5% |
| Average DDD/event | 20.7% | 22.6% | | 1.5% | 1.7% |
| DDD/100 bed-days ² | 4.5 | 4.9 | | 7.9% | 7.9% |
| | 81.0 | 84.7 | | | |
| Average hospital length of stay | 3.7 days | 3.9 days | "Clean" surgical procedures with antibiotic use | 88.9% | 89.4% |
| ICU admissions with antibiotics | 58.1% | 56.8% | Average antibiotic cost/event | R853* | R1,047* |
| Average ICU antibiotic cost | R5,862* | R7,971* | % of total hospital cost | 4.5% | 4.8% |

Translating Antibiotic Stewardship into measurable change in clinical practice

- **Lessons Learned**
- patterns suggestive of inappropriate antibiotic utilisation are not declining, thus reinforcing the need for a scaled up intervention.
- There are initial reports of reduction in drug-resistant organisms (e.g. *Acinetobacter* spp), improvement in practice patterns and a general increase in awareness of the need to prescribe antimicrobials judiciously.
- Further work is needed to develop more robust and standardised measurement systems to drive the campaign, monitor the intervention impact and sustain improvement.



Antibiotic Stewardship Committee at public sector hospitals

Principal Investigator:

Shaheen Mehtar

Other Investigators:

Committee consists of ID physicians, microbiologists, pharmacist, pharmacologists, Infection Control, hospital managers

Primary Country:

South Africa

Other Location Information:

Tygerberg Academic Hospital and Groote Schuur Hospital and the other district hospitals, Cape Town, Western Cape

Antibiotic Stewardship Committee at public sector hospitals

Project Description:

A multifaceted program with several components:

○ **Educational:**

- ✓ An antibiotic policy exists which shared between two tertiary hospitals and influences district hospitals prescribing.
- ✓ The plan is to monitor antimicrobial prescribing and dosage at Tygerberg Academic Hospital over a six month period and that data used to report back to clinicians to modify behaviour—ultimate goal is to establish ‘prescribing bundles’

○ **Restrictions in use of ATM :**

- ✓ There is an antibiotic restrictive policy but is only partially adhered to. Reinforcement and education is needed.

○ **Study on antimicrobial consumption:**

- ✓ ongoing



Best Care...Always! Campaign: Antibiotic Stewardship initiative

Principal Investigator:

Shaheen Mehtar

Primary Country:

South Africa

Country wide

Project Description:

Governance consists of:

- ✓ task force group made of representatives from hospitals, funders, government,
- ✓ clinical leadership organizations
- ✓ advisory panel of academics and other experts

Best Care...Always! Campaign: Antibiotic Stewardship initiative

○ **Components of the campaign include:**

- ✓ Professional guidelines
- ✓ Peer interactions – antimicrobial ward rounds lead by an “expert”
- ✓ Prescribing forms and checklists
- ✓ Antimicrobial report forms
- ✓ “Campaign” methodology, using “bundles,” horizontal collaboration across organizations, vertical collaborations through existing governance structures in large hospital groups and provincial infection control and quality structures, workshops, newsletter, website, etc.
- ✓ Antibiotic stewardship teams
- ✓ Measurement primarily at hospital level, or hospital group level.
- ✓ Specific indicators of overuse and misuse

Outcome / Result:

- Over 130 hospitals have signed up to the campaign overall, which has four infection prevention interventions (CAUTI, CLABSI, SSI, VAP) as well as antibiotic stewardship.



American University Of Beirut Medical Center Antimicrobial Stewardship Program

Principal Investigator:

Souha Kanj MD and Zeina Kanafani MD

Primary Country:

Lebanon

American University of Beirut Medical Center

Project Description:

A comprehensive, multifaceted effort

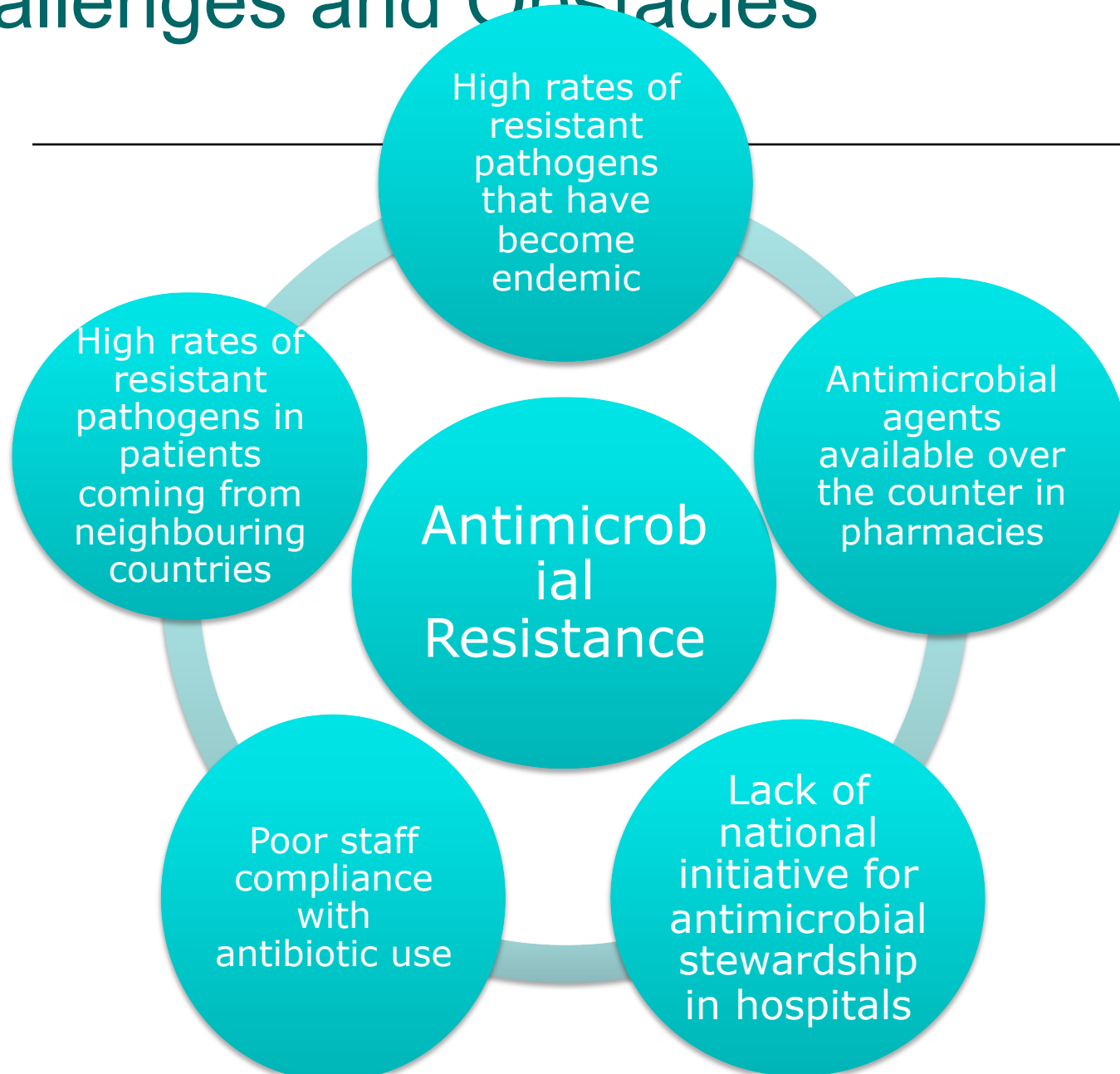
American University Of Beirut Medical Center Activities towards Antimicrobial Stewardship

- Conducting periodic conferences on antimicrobial resistance
- Instituting guidelines for antibiotic prophylaxis before surgical and invasive non-surgical procedures
- Instituting guidelines for treatment of febrile neutropenia
- Reviewing all antimicrobial agents on the formulary on a yearly basis
- Restricting all broad spectrum antibacterial, antiviral, and antifungal agents to approval by ID specialists
- Designing an electronic antimicrobial approval form

Steps taken in the setting of a recent MDR-Acinetobacter outbreak in ICU

- Monthly report on consumption of all antimicrobial agents
- Discouraging the use of carbapenems whenever possible
- Placing all patients on contact precautions
- Performing periodic cultures on all patients
- Performing environmental cultures and cultures from the hands of HCWs
- Periodically flushing the sinks with chlorine lime solution
- Training the housekeeping staff to do meticulous terminal cleaning of all rooms
- Instituting a dress code for ICU staff (short sleeves, no hand jewelry or wrist watches)

Challenges and Obstacles



American University Of Beirut Medical Center Antimicrobial Stewardship Program

- **Regulatory**

- ✓ Review of all antimicrobial agents on the formulary on a yearly basis.

- **Restrictions in use of ATM**

- ✓ All broad spectrum antibacterial, antiviral, and antifungal agents are under restriction to be dispensed after 24 hours of use only when approved by a consultation from Infectious Diseases consultants.
- ✓ Encouraged the use of monotherapy versus combination therapy
- ✓ Daily microbiology rounds to promptly get culture results and adjust treatment recommendations

- **Structural changes**

- ✓ Electronic antimicrobial approval form designed in house in 2009

- **Study on antimicrobial consumption**

- ✓ Monthly report of consumption of all antimicrobial agents
- ✓ Audits of antimicrobial use for surgical prophylaxis

American University Of Beirut Medical Center Antimicrobial Stewardship Program

Outcome / Result:

- ✓ Stewardship program seems to have decreased the cost of antimicrobial agents.
- ✓ It has stabilized the rates of antimicrobial resistance in some cases.
- ✓ There has been improvement in compliance with antibiotic treatment guidelines.
- ✓ Early discharge has been facilitated with home antibiotic therapy.

An ISC Project



we're almost up to 30 projects in 20 countries!

Welcome

Forums

Welcome to the new forums section. Sign up or sign in with Facebook, OpenID or your Google account and have your say.

Discussions Activity Sign In

Stewardship - General Issues

Over the counter antimicrobials
11 comments Most recent by Gabriel Levy Hara March 5 Stewardship - General Issues

Welcome to ISC Antimicrobial Stewardship Forums!

Stewardship - National Issues

If you want to take part in the discussions, sign in or apply for membership below!

Descriptions of National Programs
5 comments Most recent by Gabriel Levy Hara March 3 Stewardship - National Issues



Stewardship - Hospital Issues

experience with Unit or Ward specific antibiogram
2 comments Most recent by Gabriel Levy Hara March 29 Stewardship - Hospital Issues

Categories
All Discussions 8

Changing hospital antibiotic policies - when limited drugs available
6 comments Most recent by Alex Aiken March 15 Stewardship - Hospital Issues

Stewardship
↳ Stewardship - General Issues 1

Antibiotic Pharmacists
3 comments Most recent by Gabriel Levy Hara March 3 Stewardship - Hospital Issues

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experience with Unit or Ward specific antibiogram

Stewardship - Hospital Issues



nadia

March 19

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We are in the process of reviewing our new unit specifica-biogram to help with a more correct emperic therapy for our surgical & Medical ICU, can any one share their experience regarding this, and how reliable is the biogram if you have smaller bed for example our ICU capacity is 18 for both adult and pediatric.

Nadia Ismail

Gabriel Levy Hara

March 29

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Dear Nadia and all

It is an excellent question. I think that irrespective of the low number of samples initially studied, the whole results of resistance patterns you are having in those ICUs always helps in guiding the empirical ATB therapy.

In a 18 bed ICU it is very probable that in aproximately three months you will have a clear panorama regarding what it is happening, at least to know if you have prevalence of MRSA (so the need to begin with vancomycin in some situations), or GNB ESBL producers (not to mention CPK) that will lead to select, depending this prevalence, between PIP/TAZ, carbapenem or colisitin (or tygeciline, but always with another drug to cover the rest of GNB!!!).

Also, as happens in many Argentinean hospitals, will let you evaluate if you need to associate amikacin in some situations (as severe sepsis).

Well, this is a super summarized opinion, but let us wait for others.

Cheers

Gabriel

Start a New Discussion

Categories

[All Discussions](#) 8

Stewardship

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↳ [Stewardship - National Issues](#) 1

↳ [Stewardship - Hospital Issues](#) 5

Antibiotic therapy

↳ [Therapy - Respiratory Tract Infections](#) 1

In this Discussion


[Gabriel Levy Hara](#) March 29

ISC Antimicrobial Stewardship Working Group: the others aims...

- To design and share different initiatives that might include the design, in cooperation with related scientific societies, governmental and non- governmental organizations:
 - International studies of antimicrobial consumption in all five continents
 - Distance learning courses to address specific and locally prevalent problems (e.g., rational management of URI, principles and experiences with antimicrobial stewardship programs, frequent problems regarding antimicrobial use in the elderly, etc).

ISC Antimicrobial Stewardship Working Group: Aims

- To work with pharmacists of the different countries in common aspects (regulation, educational programs) regarding use and misuse of antimicrobials.
- To advocate for the regulation of sales and distribution of antimicrobials worldwide.
- To hold meetings to highlight stewardship issues.



**ISC “Ten commandments”
for the appropriate use of
antibiotics by the practicing
physician in an outpatient
setting**

ISC “Ten commandments”...

1. Does my patient really need antibiotics? Teach the patient how to manage the symptoms of non-bacterial infections.
2. Select the right antibiotic – hitting the target precisely is better than shooting at the whole area....
3. Taking time to determine the best dosing by considering pharmacokinetics and pharmacodynamics (Pk/Pd). Recommend the shortest treatment duration of an antibiotic that is effective, with least side effects and lowest risk for generation of resistance




ISC “Ten commandments”...

4. Patient centered prescribing encourages proper antibiotic use: improve adherence by selecting drugs that are dosed reasonably and conveniently for the patient situation, and carefully explain how to use them.
5. Antibiotic combinations should only be used in rare specific situations
6. Use prescribed, reputable drugs. Avoid low-quality generics
7. Discourage self-prescription of antibiotics

ISC “Ten commandments” ...

8. Use only treatment guidelines with evidence based and developed with an adequate methodology, without conflicts of interest.
9. Try to improve diagnostic support. Rely (rationally) upon the clinical microbiology lab, to determine the pathogen and prevent resistance surprises, as well as to stay aware of local microbial patterns.
10. Take into account the limitations of surveillance data.

- 
-
- **As we can see, a little bit has just been done**
 - **However, is a huge horizon to explore and ugly realities to change...**
 - ***Would you like to join us?***



***Thank you very much for
your attention!!!***

Gabriel Levy Hara glevyhara@fibertel.com.ar

<http://inventory.infectionnet.org>