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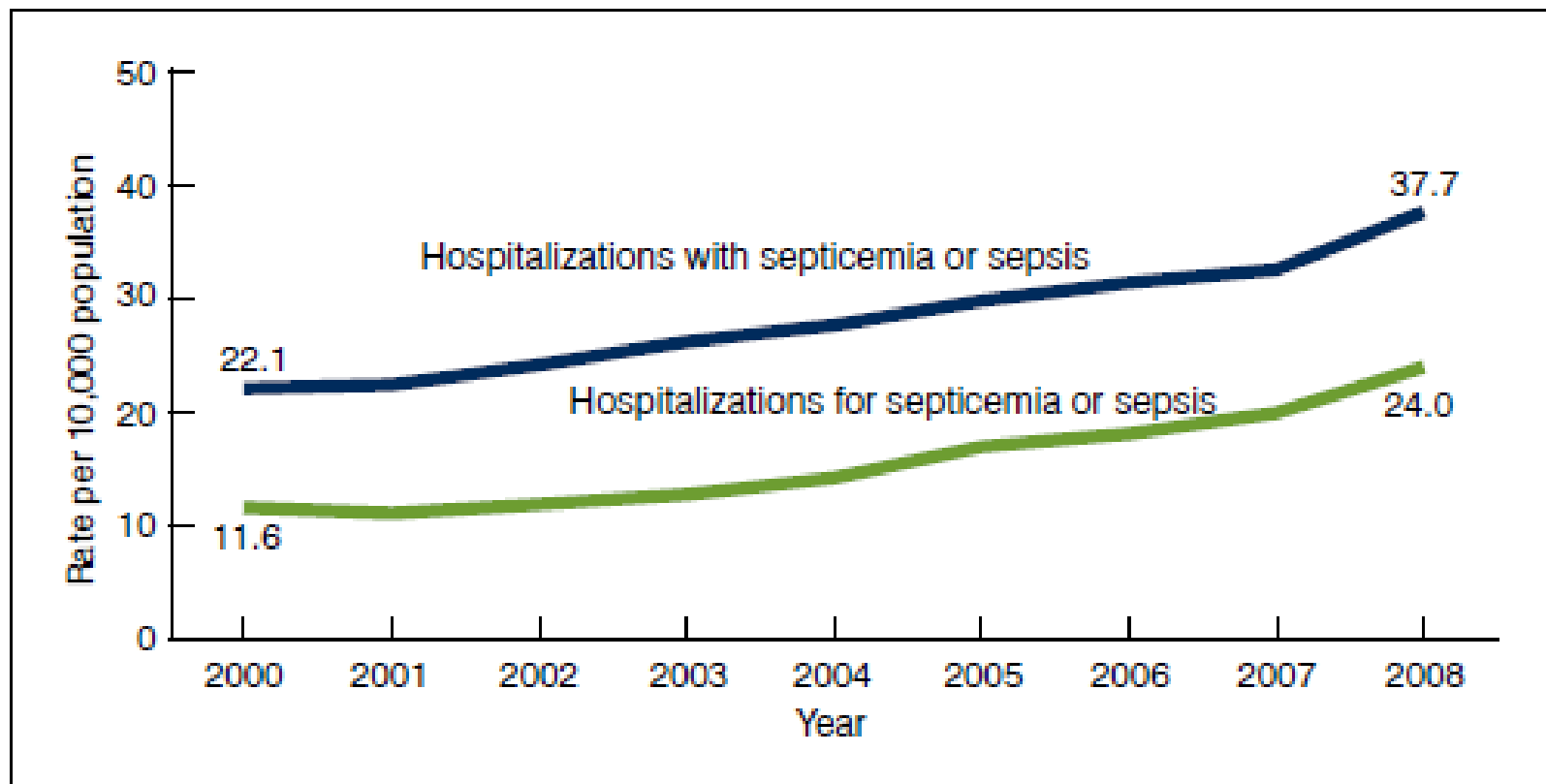
# Quality Use of Antibiotics in ICU

Marghie Murgu  
Tony Burrell



**Hospitalization rates for septicemia or sepsis more than doubled from 2000 through 2008.**

Figure 1. Hospitalizations for and with septicemia or sepsis



NOTE: Significant linear trend from 2000 through 2008 for both categories.  
SOURCE: CDC/NCHS, National Hospital Discharge Survey, 2000–2008.

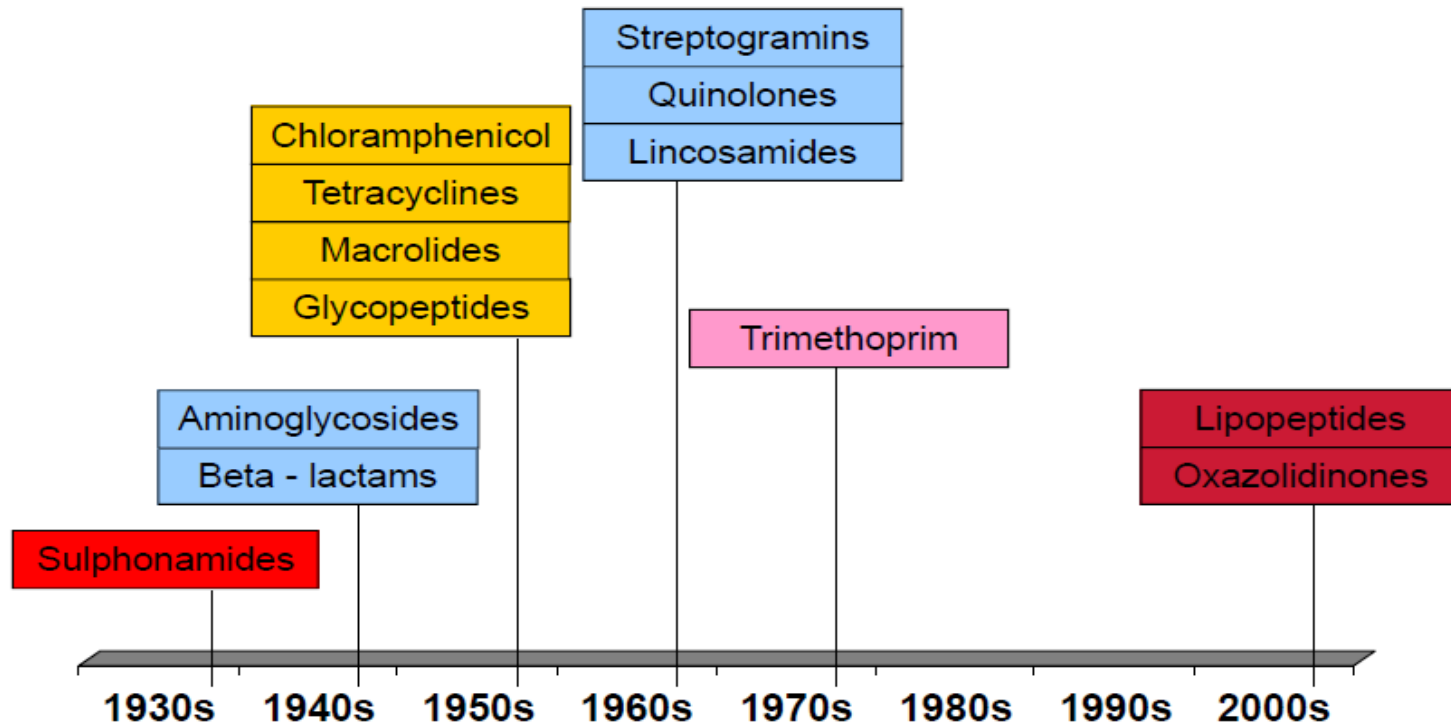


## Antibiotic Resistance – causes Otto Carrs



- “Indiscriminate effects of antibiotics
- Indiscriminate use of antibiotics
- Global spread of resistance facilitated by rapid dynamics of gene transfer between bacteria, travel and trade and by poor sanitation and hygiene
- Alarming decline in drug development”

## ► Discovery of new classes of antibiotics



Levy (2002), Norberg (2004), Singh & Greenstein (2000)



# Antimicrobial Summit

## David Paterson



- Antibiotic resistance is big problem esp in third world
- Indiscriminate use of antibiotics
  - Eg over the counter quinolones in Brazil
- Poor hygiene, sanitation, infection control
  - NB Acinetobacter in Hanoi
- Increasing antimicrobial resistance in patients without recent hospitalisation eg Oceania strain MRSA
  - 10-50% community acquired S aureus and community MRSA



# Antimicrobial Summit

## David Paterson



- VRE
  - 1/3 patients colonised in Pittsburgh
  - In some Australian institutions more bloodstream VRE than MRSA
- Hypervirulent C diff
  - Epidemic strain 027 in N America & Europe
  - 40 colectomies for toxic megacolon in 1 year in Pittsburgh
  - 15% mortality for CDAD
- Carbapenem resistant Acinetobacter outbreaks
- ESBL producers – use of antibiotics as ‘growth promoters’



## **Extended-Spectrum $\beta$ -Lactamase Genes of *Escherichia coli* in Chicken Meat and Humans, the Netherlands**

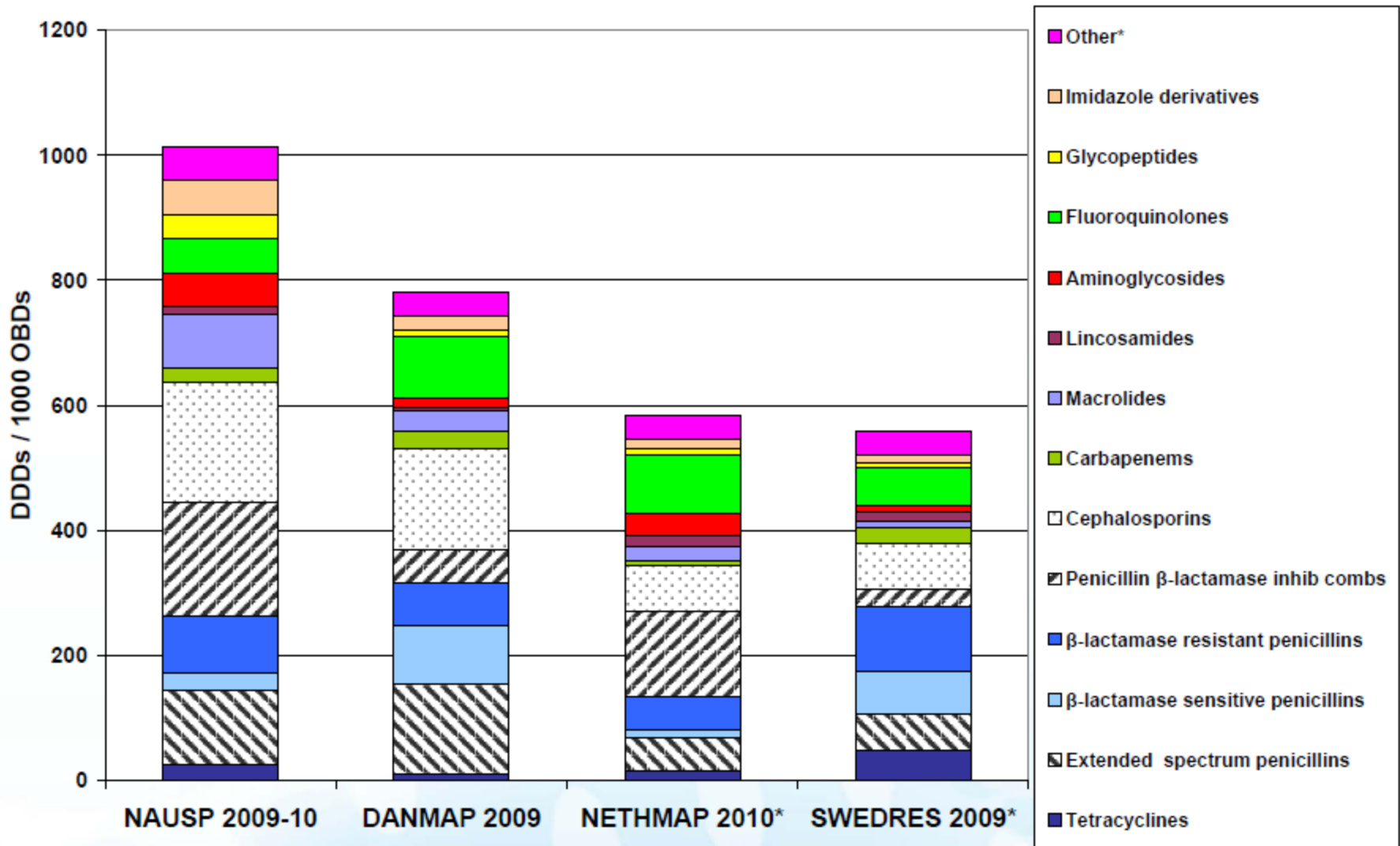
Ilse Overdeest, Ina Willemsen, Martine Rijnsburger, Andrew Eustace, Li Xu, Peter Hawkey, Max Heck, Paul Savelkoul, Christina Vandenbroucke-Grauls, Kim van der Zwaluw, Xander Huijsdens, and Jan Kluytmans



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We determined the prevalence and characteristics of extended-spectrum  $\beta$ -lactamase (ESBL) genes of *Enterobacteriaceae* in retail chicken meat and humans in the Netherlands. Raw meat samples were obtained, and simultaneous cross-sectional surveys of fecal carriage were performed in 4 hospitals in the same area. Human blood cultures from these hospitals that contained ESBL genes were included. A high prevalence of ESBL genes was found in chicken meat (79.8%). Genetic analysis showed that the predominant ESBL genes in chicken meat and human rectal swab specimens were identical. These genes were also frequently found in human blood culture isolates.

# Benchmarking (international)





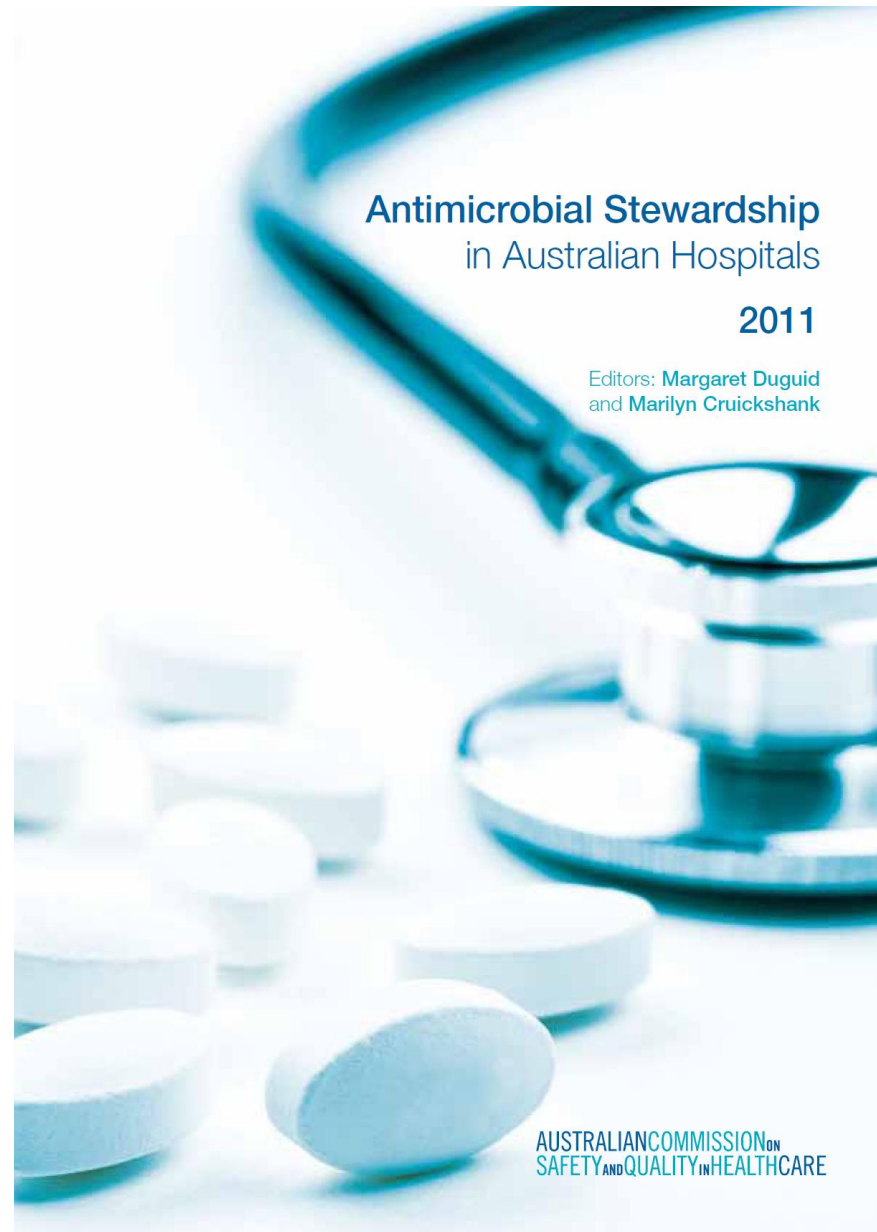
## Following Antimicrobial Resistance Summit 2011



- Aggressive campaigns in Europe eg Sweden
- WHO European Strategy
- In Aus 'A national interdisciplinary body is urgently needed to manage the looming antimicrobial resistance crisis'
  - Gottleib & Nimmo MJA 2011
- ACSQHC in conjunction with NH&MRC now developing MRO strategy which will require Antimicrobial Stewardship

## AMS

‘...involves a systematic approach to optimising the use of antimicrobials used by healthcare institutions to reduce inappropriate antimicrobial use, improve patient outcomes and reduce adverse consequences of antimicrobial use (including antimicrobial resistance, toxicity and unnecessary costs)’





# QUAIC Project

- CEC and ICCMU project

Aim is to:

- Analyse existing structures and processes to support quality use of antimicrobials in ICU (QUAIC)
- Define structures and process that should be in place to support QUAIC
- Develop /obtain tools and resources for use in ICU to implement supportive structures and processes



# ICU Survey



- 66% responded:
  - 73% tertiary, 75% metropolitan, 50% rural, 100% paediatric
- 19%: don't access empiric guidelines
- 57%: no antibiogram data
  
- 53%: micro results are timely or very timely
- Positive attitude towards principles of quality use of antimicrobials
  
- Not all had supportive internal processes available to support project including:
  - Variable access to: ID specialists, micro, lab and pharmacy services.
  
- 62%: volunteered to participate in pilot



# ICCMU Position statement

[http://intensivecare.hsnet.nsw.gov.au/attachments/218\\_Draft%20ICCMU%20CEC%20Position%20Statement%20on%20QUAIC.pdf](http://intensivecare.hsnet.nsw.gov.au/attachments/218_Draft%20ICCMU%20CEC%20Position%20Statement%20on%20QUAIC.pdf)



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1. Appropriate policies for first line treatment of sepsis, including policies for empiric antimicrobial management of suspected infection
  - Intensive Care Unit Empirical Antimicrobial Treatment Guidelines November 2010 completed by the Expert Advisory group and based on the therapeutic guidelines
  - Available at [http://www.cec.health.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0006/136977/empiric-guideline.pdf](http://www.cec.health.nsw.gov.au/__data/assets/pdf_file/0006/136977/empiric-guideline.pdf)



# ICCMU Position statement

2. Prevalence data of microorganisms and their susceptibility assessed local guidelines accordingly
  3. Laboratory to guide antimicrobial therapy available in a timely fashion
- Labs engaged and encouraged to extract data and utilise freeware from the World Health Organisation (WHONET) available at:  
<http://www.whonet.org/DNN/>



# ICCMU Position statement

## 4. Monthly antimicrobial usage data available

- Crystal reports available to extract data and provide it to the National Antimicrobial Utilisation Surveillance Program
- NSW contributors currently include 2 of the pilot sites
- Email: [antibio@health.sa.gov.au](mailto:antibio@health.sa.gov.au) or enquires to Vicki McNeil ([vicki.mcneil@health.sa.gov.au](mailto:vicki.mcneil@health.sa.gov.au))



# ICCMU Position statement

## 5. Standard materials for training medical officers available

- Written learning package in final draft
- Will be tested and made available on the QUAIC pages when complete



# ICCMU Position statement

## 6. Mechanisms to audit and feedback to individual prescribers

- 2 audit tools developed available at <http://www.cec.health.nsw.gov.au/programs/quaic>
- Reports to be constructed



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# ICCMU Position statement

7. Local expertise utilised to provide patient focussed ward rounds reviewing all positive microbiology and antimicrobial prescriptions
  - ICUs encouraged to form teams which include representation from ID/micro, ICP's, pharmacy where available (and appropriate)



# Project progress

- 3 Pilot sites
- Toolkit:
  - Position statement
  - Empiric guideline
  - Learning package
  - Audit tools
  - Reports
  - Sites encouraged to submit to NAUSP and utilise WHONET

All finalised tools available @ QUAIC project webpage:

<http://www.cec.health.nsw.gov.au/programs/quaic.html>



# Difficulties

‘Important but...’

Requires involvement of ID, micro etc

Successful implementation needs active support of managers...