

Antimicrobial utilisation surveillance

Vicki McNeil

National Antimicrobial Utilisation
Surveillance Program (NAUSP)

Strengthening Antimicrobial Stewardship

Sydney 20-22 May 2015



**Government
of South Australia**

SA Health



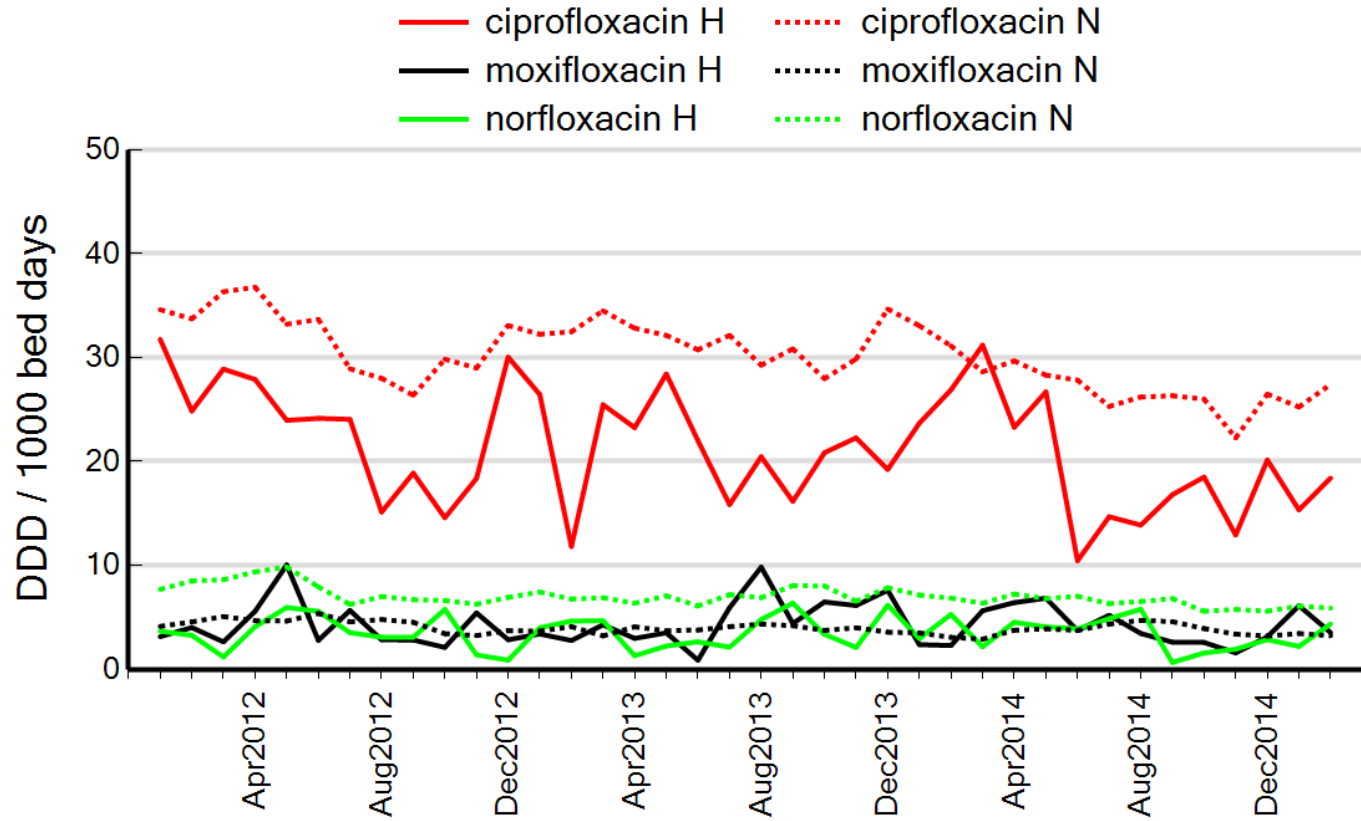
Antimicrobial surveillance

- > **What** – monitoring usage of antimicrobials in a standardised way to facilitate trend mapping and benchmarking
- > **Why** – Antimicrobial stewardship (AMS) – monitoring used to evaluate impact of stewardship & target interventions
- > **How** – methodology
 - internationally accepted standards
 - reproducible
 - applicable in a variety of situations

What is antimicrobial surveillance?

- > Many ways of measuring antimicrobial usage:
 - Number of prescriptions / population
 - Number of days of therapy per admission
 - Grams of antimicrobial given
 - Defined daily doses (DDD) given per (measure of occupancy)
 - etc
- > All these measures are **volume based**
 - Amount of antimicrobial converted to a rate
- > Does not measure whether antimicrobials being used appropriately.

Examples of antimicrobial surveillance - trending data at hospital level





Measuring appropriateness of antimicrobial prescribing – quality-based surveillance

- > Valid method of antimicrobial surveillance
- > Usually involves audit techniques
 - Target particular antibiotic or antibiotic class
 - OR point prevalence survey – ‘snapshot’ looking at all antimicrobials prescribed on one day or other time period
 - Need criteria for assessment of ‘appropriateness’, eg compliance with TG:antibiotic 15 or local guideline
 - Labour intensive collecting audit data and assigning ‘appropriateness’
 - National Antimicrobial Prescribing Survey (NAPS) <http://www.naps.vicniss.org.au/>

Differences between volume-based & quality-based antimicrobial surveillance

	Volume-based	Quality-based
Labour intensive	No	Yes
Can benchmark with similarly peered hospitals	Yes	Yes (via NAPS)
Can assess quality of prescribing	No	Yes
Can show trends in usage	Yes	No (but maybe with annual NAPS)
Useful for meeting Standard 3.14.3	Yes	Yes

National Safety & Quality Health Service Standards

Standard 3.14

> Surveillance is a key component

Draft National Safety and Quality Health Service Standards Guide for use in Hospitals

Criterion: Antimicrobial stewardship

Safe and appropriate antimicrobial prescribing is a strategic goal of the clinical governance system.

C/D	This criterion will be achieved by:	Actions required	Examples of evidence that can be used to demonstrate an action is being met. <i>This is not a checklist. Use only those examples that show that you have met the Standards</i>	Self assessment
C	3.14 Developing, implementing and regularly reviewing the effectiveness of the antimicrobial stewardship system	3.14.1 An antimicrobial stewardship program is in place	<ul style="list-style-type: none"> • Policies, procedures and/or protocols consistent with national guidelines such as <i>Therapeutic Guidelines: Antibiotic</i> • Agenda papers, meeting minutes and/or reports of committees related to antimicrobial stewardship • Reports and recommendations from an antimicrobial management team • Educational programs address antimicrobial usage, development of resistance, and judicious prescribing • Audit of antimicrobial usage, particularly in high antimicrobial usage areas • Restriction, approval or review systems are in place to guide the use of broad spectrum antimicrobials • Referral process to specialist infection disease practitioner and/or microbiologist 	<input type="checkbox"/> MM <input type="checkbox"/> SM <input type="checkbox"/> NM → add to action plan
C		3.14.2 The clinical workforce prescribing antimicrobials have access to current endorsed therapeutic guidelines on antibiotic usage	<ul style="list-style-type: none"> • Access by clinical workforce prescribing antimicrobials to current endorsed therapeutic guidelines on antibiotic usage 	<input type="checkbox"/> MM <input type="checkbox"/> SM <input type="checkbox"/> NM → add to action plan
C		3.14.3 Monitoring of antimicrobial usage and resistance is undertaken	<ul style="list-style-type: none"> • Prescribing guidelines, policies, procedures and/or protocols • Agenda papers, meeting minutes and/or reports of relevant committees include information on monitoring outcomes • Medication audit • Records of antibiotic consumption • Reviews of antibiotic usage and feedback to prescribers • Laboratory based data including analysis of antimicrobial resistance • Documented scope of practice for specialist proceduralists • Observational audit of prescribing behaviour practices • Standing orders for antimicrobial medication and prescribing 	<input type="checkbox"/> MM <input type="checkbox"/> SM <input type="checkbox"/> NM → add to action plan
C		3.14.4 Action is taken to improve the effectiveness of antimicrobial stewardship	<ul style="list-style-type: none"> • Same evidence options as 3.11.3 	<input type="checkbox"/> MM <input type="checkbox"/> SM <input type="checkbox"/> NM → add to action plan



NAUSP

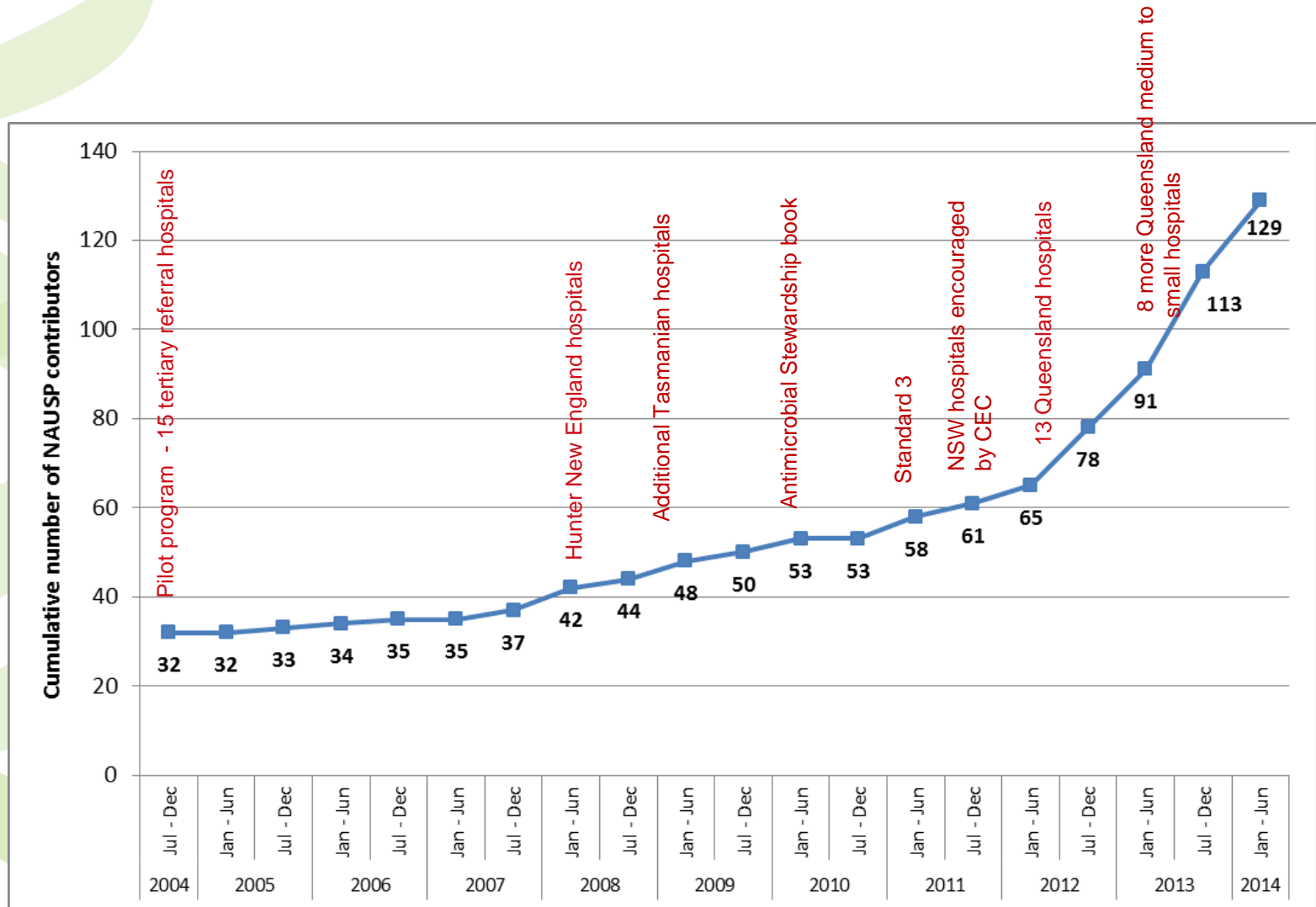
- > National Antimicrobial Utilisation Surveillance Program
- > Funded by Australian government through the Australian Commission on Safety and Quality in HealthCare (ACSQHC)
- > Managed by the Infection Control Service, SA Health
- > Uses custom-built database to convert dispensing data to usage rates
 - Fox-pro database developed 2001
 - Upgraded in 2010 to a web-based version, using SQL server
 - Several enhancements since 2010



NAUSP....history

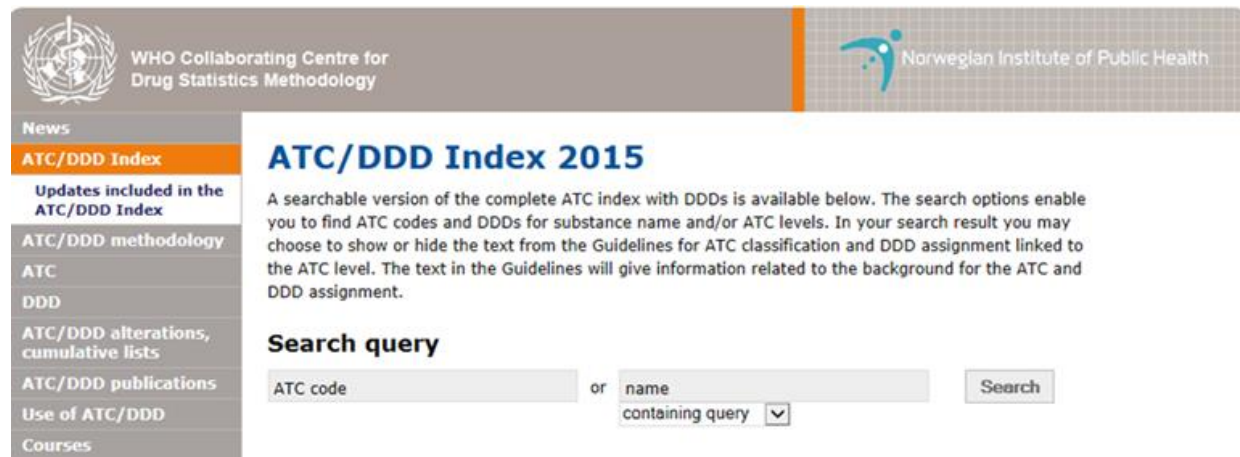
- > Based on a South Australian surveillance program commenced in 2001
- > Dispensing data and OBD data from a range of SA public and private hospitals were submitted
- > In 2004, pilot of 15 non-SA tertiary referral hospitals was commenced
- > Successful and program expanded
- > Initially large hospitals were 'targeted', now a range of medium and small facilities (50 beds or more)
- > In 2015 > 130 hospitals

NAUSP history cont...



NAUSP

- > Volume-based surveillance
- > Measures rates of antimicrobial usage in DDD per 1000 occupied bed days
- > Defined daily dose (DDD) specified by the WHO ATC
 - http://www.whocc.no/atc_ddd_index



The screenshot shows the website for the WHO Collaborating Centre for Drug Statistics Methodology, specifically the ATC/DDD Index 2015 page. The page header includes the WHO logo and the Norwegian Institute of Public Health logo. The main content area features a navigation menu on the left with options like 'News', 'ATC/DDD Index', 'ATC/DDD methodology', 'ATC', 'DDD', 'ATC/DDD alterations, cumulative lists', 'ATC/DDD publications', 'Use of ATC/DDD', and 'Courses'. The 'ATC/DDD Index' option is highlighted. The main content area displays the title 'ATC/DDD Index 2015' and a search query form. The search form includes a text input field for 'ATC code', a radio button for 'or', another text input field for 'name', a dropdown menu for 'containing query', and a 'Search' button. Below the search form, there is a paragraph of text explaining the search options and the availability of the complete ATC index with DDDs.

WHO Collaborating Centre for Drug Statistics Methodology

Norwegian Institute of Public Health

News

ATC/DDD Index

Updates included in the ATC/DDD Index

ATC/DDD methodology

ATC

DDD

ATC/DDD alterations, cumulative lists

ATC/DDD publications

Use of ATC/DDD

Courses

ATC/DDD Index 2015

A searchable version of the complete ATC index with DDDs is available below. The search options enable you to find ATC codes and DDDs for substance name and/or ATC levels. In your search result you may choose to show or hide the text from the Guidelines for ATC classification and DDD assignment linked to the ATC level. The text in the Guidelines will give information related to the background for the ATC and DDD assignment.

Search query

ATC code or name containing query

WHO ATC classification - examples

> J – Anti-infectives

- J01 – Anti-bacterials for systemic use
 - J01C – Beta-lactams – Penicillins
 - J01CA – extended spectrum penicillins
 - J01CA01 – ampicillin
 - J01CA04 - amoxycillin
- J02 – Antimycotics
 - J02A - Antimycotics for systemic use
 - > J02AC – triazole antifungals
 - > J02AC01 – fluconazole
 - > J02AC02 - itraconazole

Antimicrobial usage - numerator

- > NAUSP uses dispensing data as a measure of the antimicrobials which are used in hospitals
 - Assumes all antimicrobials dispensed are given to patients
- > Data loaded by formulation of antimicrobial
 - Name
 - Strength
 - Formulation type (tablet, capsule, vial, mixture)
 - Quantity dispensed
- > NAUSP stores data for systemic antimicrobial use
 - Oral, intravenous, mixtures – not topical preparations e.g. ear drops
 - NAUSP database recognises which medicines are to be loaded and which to ignore



Antimicrobial usage - denominator

- > Occupied bed days (OBD)
 - Need a denominator measure to make usage into a rate
 - Can then compare hospitals of different sizes
 - NAUSP uses overnight OBD (i.e. occupancy at midnight)
- > Alternative denominators
 - Patient days
 - Separations
 - Admissions

Data requirements to contribute to NAUSP

- > Pharmacy dispensing system with ability to retrieve data elements required:
 - Antimicrobials defined through ATC classification (J01 – J05) or SHPA codes (4200000 through 4500000) or agents included in Chapter 5 of AMH
 - Quantity dispensed
 - Wards or specialties to which antimicrobials sent
 - Data by calendar month
- > MS Excel format
- > Occupancy data by ward
 - descriptions matching those for dispensing data



Other requirements

- > Demographic information
 - Hospitals peered according to AIHW categorisation
 - NAUSP requests further information for 'included' beds
 - Acute adult inpatient
 - Paediatrics, psychiatry, outpatients, long-term rehab, day surgery and clinics **excluded**
 - Allows for more precise benchmarking of hospitals with similar activity (particularly private hospitals)
- > Permission from hospital or LHN chief executive



Confidentiality of data

- > Any reports available in public domain are de-identified. Each contributor is assigned an alpha-numeric code.
- > The CEO / General Manager of each contributing hospital signs a Willingness to Participate form and receives letter outlining purpose of NAUSP.
- > Signed WtP's maintained through Record's Management at SA Health

NAUSP website

[Home](#) » [Clinical resources](#) » [Clinical programs](#) » [Antimicrobial stewardship](#)

National Antimicrobial Utilisation Surveillance Program (NAUSP)

National Antimicrobial Utilisation Surveillance Program (NAUSP) is a national antimicrobial surveillance program run by SA Health and funded by the Australian government.

The program provides contributing hospitals with bimonthly and annual reports on their antibiotic usage rates, enabling them to compare their usage to similarly peered hospitals and thus identify areas for improvement.

Background

The NAUSP began in 2004 and is based on the South Australian Antibiotic Utilisation Surveillance program which commenced in 2001. Both programs continue to be run by staff of the SA Health Infection Control Service.

If you are interested in joining, email antibio@health.sa.gov.au.

Antimicrobial surveillance

Surveillance of antimicrobial usage is a fundamental component of antimicrobial stewardship within a health facility in order to target interventions to improve antimicrobial prescribing. It is also a required action for hospitals to comply with the [National Safety and Quality Health Service Standards](#).

From a public health perspective, antimicrobial surveillance enables us to investigate links between antibiotic use and bacterial resistance.




Types of surveillance

Types of antimicrobial surveillance can be classified as being:

- volume-based (observing trends in quantities of antimicrobials used)
- quality-based (observing the appropriateness of antimicrobial prescribing).

NAUSP is an example of volume-based surveillance.

Quality-based surveillance includes point prevalence surveys and clinical audits. Data from these types of surveillance are labour-intensive but can enable assessment of appropriateness of prescribing and can be applied to any patient group or clinical setting.

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Related information

- [Australian Commission on Safety and Quality in Health Care: Antimicrobial Stewardship resource materials](#)
- [Danish antimicrobial usage surveillance reports \(DANMAP\)](#)
- [Swedish antimicrobial usage surveillance reports \(SwedRes\)](#)

Related resources

- [Data principles and definitions \(PDF 393KB\)](#)
- [Demographic survey for contributors \(DOCX 226KB\)](#)
- [Data submission explanatory notes \(PDF 423KB\)](#)
- [Data submission dates \(PDF 116KB\)](#)
- [Confirmation of willingness to participate \(PDF 108KB\)](#)

Information for NAUSP Contributors

National Antimicrobial Utilisation Surveillance Program (NAUSP)

NAUSP Data Principles and Definitions

Reviewed: May 2014

The National Antimicrobial Utilisation Surveillance Program is funded by the Commonwealth Department of Health and Ageing and conducted by the Infection Control Service, Communicable Disease Control Branch, SA Health



NAUSP website

Home » Clinical resources » Clinical programs » Antimicrobial stewardship

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Data Principles

Numerator: Antimicrobial usage data

The quantity of each antimicrobial agent used per month within the included wards or clinical areas.

Key Principles:

- The dataset indicates the monthly usage of each antimicrobial for acute adult inpatient wards (see [Inclusions and Exclusions](#)), expressed as number of [DDO](#).
- 'Antimicrobial' refers to all relevant anti-infective agents for systemic use within the World Health Organization (WHO) Anatomical Therapeutic Chemical (ATC) classification system (J01 antibacterials, J02 antimycotics, J05 antivirals and J04AB02 rtampicon). The only topical anti-infective for which data is currently collected is mupirocin.
- Raw usage datasets contain the number UNITS or PACKS used of each antimicrobial agent during the month. These are obtained by the contributor from their local pharmacy dispensing system (e.g. Pharmacy or Merlin).
- During data processing, NAUSP converts the quantity of UNITS or PACKS used of each agent to a number of [DDO](#) so that a monthly [usage density rate](#) can be calculated for each agent.
- All inpatient supply should be included – both inpatient ward stock usage and individual patient dispensing.

Dataset Rules:

- Usage datasets must be sent in an Excel spreadsheet format with distinct columns for each element – see [Data Elements](#).
- DRUG DESCRIPTION and QUANTITY are the minimum required elements, but other information such as WARD DESCRIPTION and UNIT DESCRIPTION assists with data interpretation so can be included. Please ensure there are no merged, highlighted or blank cells within the spreadsheet, and that there are no embedded tables.
- Data should be presented as quantities of UNITS. If only PACK data is available for all or part of the usage dataset, please inform NAUSP and supply the PACK data separately to the UNIT data as this is processed differently.
- It is preferable if WARD DESCRIPTION is included. If WARD DESCRIPTION is not included in the dataset, NAUSP takes no responsibility for ensuring the necessary exclusions and will accept all data as appropriate inclusion.
- Removal of antimicrobial usage data from excluded wards should be made prior to submission to NAUSP.
- If UNIT DESCRIPTION is not included in the dataset, NAUSP will assume all quantities refer to the appropriate units – see [Accepted Unit Types](#).
- Any agents or dosage forms not required by NAUSP will be discarded automatically during processing (e.g. topical preparations). However, for ease of processing, contributors should only include the relevant drugs within the dataset (i.e. remove drugs that are not antimicrobials).
- The UNITS used for ORAL LIQUID formulations is number of bottles! NOT number of millilitres! Non whole numbers are accepted for part-bottles – see Data Elements table.

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Home » Clinical resources » Clinical programs » Antimicrobial stewardship

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Information for NAUSP Contributors

National Antimicrobial Utilisation Surveillance Program (NAUSP)

Confirmation of Willingness to Participate

To be completed by the Chief Executive Officer or delegate

The National Antimicrobial Utilisation Surveillance Program (NAUSP) is a Commonwealth funded program that provides surveillance of hospital inpatient usage of antimicrobials. It evolved from a pre-existing South Australian program in 2004. The South Australian Infection Control Service, within the SA Communicable Disease Control Branch, continues to run the program.

Participating hospitals voluntarily submit antimicrobial usage and hospital occupancy data on a monthly basis, which is converted to a standardised usage density rate for each agent (using WHO-defined Defined Daily Doses [DDO] per 1000 Occupied Bed Days).

Each hospital is supplied with a bimonthly report detailing antimicrobial usage density rates within their hospital together with a national benchmark for comparison. Aggregated, de-identified data is supplied to the Department of Health and Ageing and the Australian Commission on Safety and Quality in Health Care (ACSQHC). An annual report giving usage rates for all agents in AINW peer group A1 hospitals is also published in October.

An important function of the reports is to provide an indication of exposure to antibiotics in the Australian hospital environment, at a national and local level. The report also serves as a useful antimicrobial monitoring tool as part of an Antimicrobial Stewardship program.

All data submitted to NAUSP is used in confidence, and all participating sites must indicate their willingness to participate in the program. All publicly available reports contain de-identified data, and permission will be sought before any data is published that may be traceable to an individual hospital.

Endorsement of this form acknowledges willingness to participate in NAUSP and indicates your agreement to ensure the necessary data is supplied to NAUSP within scheduled time-frames.

Signed: _____ Date: ___/___/___

Name: _____

Title: _____

Organisation: _____

Please return the completed form to: Email: antibio@health.sa.gov.au

The National Antimicrobial Utilisation Surveillance Program is funded by the Commonwealth Department of Health and Ageing and conducted by the Infection Control Service, Communicable Disease Control Branch, SA Health.

For more information

National Antimicrobial Utilisation Surveillance Program
Communicable Disease Control Branch
Telephone: 1300 232 272
Email: antibio@health.sa.gov.au
www.sahealth.sa.gov.au/nausp

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Numerator – pharmacy dispensing records example data

Example spread sheet - quantities removed to protect privacy

Please remove columns which are not required by the program. Also any subtotals for wards.

Please provide spreadsheet with NO merged cells, no frozen panes, no field colours in cells, and no hidden cells.

Please **include** both imprint and individual patient supplies

See Data elements tab for further details

Period	Ward description	Product description	Quantity	grams	ValueDes	ValueDes
Oct-11	HDU	AMPICILLIN (Ampicyn) 1g INJECTION 5				
Oct-11	HDU	AMPICILLIN (Austrapen) 1g INJECTION 5 x 1g				
Oct-11	HDU	AZITHROMYCIN (Zithromax) 500mg INJECTION 1				
Oct-11	HDU	BENZYL PENICILLIN SODIUM (BenPen) 1.2g INJECTION 1				
Oct-11	HDU	CEFTRIAZONE (Ceftriaxone ICP) 1g INJECTION 1				
Oct-11	HDU	CEPHAZOLIN (Cefazolin Sandoz) 1g INJECTION 10				
Oct-11	HDU	CHLORAMPHENICOL (Chloromycetin) 1% EYE OINTMENT 4g				
Oct-11	HDU	CIPROFLOXACIN (intravenous) (Aspen) 200mg/100mL INJECTION 10 x 100mL				
Oct-11	HDU	CLOTRIMAZOLE (Clonea) 1% (10mg/g) CREAM 20g				
Oct-11	HDU	FLUCLOXACILLIN (Flucil) 1g INJECTION 5				
Oct-11	HDU	GENTAMICIN (Pfizer) 80mg/2mL INJECTION 50 x 2mL				
Oct-11	HDU	MEROPENEM (intravenous) (Merrem) 1g INJECTION 10 x 1g				
Oct-11	HDU	METRONIDAZOLE (intravenous) (AHB3399) 500mg/100mL INJECTION 10 x 100mL				
Oct-11	HDU	MOXIFLOXACIN (Avelox) 400mg INJECTION 1				
Oct-11	HDU	NYSTATIN (Nystatin Trust) 100,000units/mL ORAL SUSPENSION 24mL				
Oct-11	HDU	NYSTATIN (Omega) 100,000units/mL ORAL SUSPENSION 24mL				
Oct-11	HDU	ROXITHROMYCIN (Roximycin) 150mg TABLETS 10				
Oct-11	HDU	TICARCILLIN-CLAVULANIC ACID (Timentin) 3.1g INJECTION 10				
Oct-11	HDU	VANCOMYCIN (intravenous) (DBL) 1g INJECTION 1				
Oct-11	N1F	AMOXYCILLIN 400mg + CLAVULANATE 57mg/5mL (Augmentin Duo 400) ORAL SUSPENSION 60mL				
Oct-11	N1F	AMOXYCILLIN 875mg + CLAVULANATE 125mg (GenRx) TABLETS 10				
Oct-11	N1F	AMPICILLIN (Ampicyn) 1g INJECTION 5				
Oct-11	N1F	AMPICILLIN (Austrapen) 1g INJECTION 5 x 1g				
Oct-11	N1F	CEFAZOLIN (slow release) (Ceclor CD) 375mg TABLETS 10				
Oct-11	N1F	CEFTRIAZONE (Ceftriaxone ICP) 1g INJECTION 1				
Oct-11	N1F	CEPHALEXIN (GenRx) 500mg CAPSULES 20				
Oct-11	N1F	CEPHAZOLIN (Cefazolin Sandoz) 1g INJECTION 10				
Oct-11	N1F	CHLORAMPHENICOL (Chlorsig) 0.5% EYE DROPS 10mL				
Oct-11	N1F	CLOTRIMAZOLE (Clonea) 1% (10mg/g) CREAM 20g				
Oct-11	N1F	DICLOXACILLIN (Distaph) 500mg CAPSULES 24				
Oct-11	N1F	FLUCLOXACILLIN (Flucil) 1g INJECTION 5				
Oct-11	N1F	GENTAMICIN (Pfizer) 80mg/2mL INJECTION 50 x 2mL				
Oct-11	N1F	METRONIDAZOLE (Flagyl) 400mg TABLETS 21				
Oct-11	N1F	METRONIDAZOLE (intravenous) (AHB3399) 500mg/100mL INJECTION 10 x 100mL				
Oct-11	N1F	NYSTATIN (Nystatin Trust) 100,000units/mL ORAL SUSPENSION 24mL				
Oct-11	N1F	NYSTATIN (Omega) 100,000units/mL ORAL SUSPENSION 24mL				
Oct-11	N1F	ROXITHROMYCIN (Roximycin) 150mg TABLETS 10				

McNeil, Vicki:
Ward description: provides double-check that only acute adult inpatient usage included

McNeil, Vicki:
Product description: all antibiotics, antifungals and antivirals. Include topicals as these can be automatically deleted by database

McNeil, Vicki:
Quantity: in units, not packs

McNeil, Vicki:
Grams: unnecessary as database does this conversion automatically

Denominator – Occupied Bed Days example data

Ward Identifier	Ward Name	Jul-12
N1F	N1F N1F Acute Aged Care	
N1G	N1G N1G Rehabilitation	
N2F	N2F N2F Stroke,Medical	
N3B	N3B MAU, Opera	
N3H	N3H E3H - Surgical Orthopaedics	
N3I	N3I E3I - General Surgery	
N3W	N3W Medical Oncology	
N4B	N4B W4B Surgical	
N4C	N4C W4C Surgical	
N4D	N4D Medical Oncology	
N5A	N5A W5A Medical	
N5B	N5B W5B Medical	
NAI	NAI Intensive Care Unit	
NAM	NAM Antenatal Maternity	
NAP	NAP Ambulatory Procedure Centre	
NCL	NCL Cardiac Cath Lab	
NCW	NCW Childrens Ward	
NDA	NDA Centre for Drug & Alcohol Medicine	
NDS	NDS Delivery Suite	
NED	NED Emergency Observation Ward	
NEM	NEM Emergency Medical Unit	
NEN	NEN Endoscopy	
NFM	NFM Feto Maternal Assessment Unit	
NHU	NHU Inpatient Haemodialysis Unit	
NNB	NNB Newborn Babies	
NNC	NNC Neonatal Intensive Care Unit	
NON	NON Medical Oncology Department	
NPE	NPE Psychiatric Emergency Care Centre	
NPM	NPM Postnatal Maternity	
NPU	NPU Pialla Unit	
NRD	NRD Penrith Community Dialysis Centre	
NRS	NRS	
	Non-ICU	<i>Sum - (yellow + blue)</i>
	ICU	<i>Blue</i>

Numbers left blank for privacy reasons



NAUSP coverage of Australian public hospitals (May 2015)

- > Principal Referral – 29 contributors (100%)
- > Specialist Women – 2 contributors (33%)
- > Large Public Acute – 53 contributors (84%)
- > Medium Public Acute – 33 contributors (76%)
- > Small Public Acute with Surgery / Obstetrics – 12 contributors (32% of small hospitals with > 50 beds)
- > In addition there are 19 Private Hospital contributors.

Data validation processes

- > Caveat – NAUSP assumes that data submitted (numerator and denominator) are accurate and only include ‘included’ wards – “rubbish in, rubbish out”
- > Validation processes:
 - Automated process to check if quantities for each agent are ‘reasonable’ – flags anything outside the range of:
 - > twice the average quantity for the previous year for that hospital
 - < half the average quantity for the previous year for that hospital
 - Oral liquid antimicrobials - > 20 bottles

Examples of NAUSP automated data validation

- > Loading process: quantities outside a usual range:

The following records have warnings

Antibiotic	Quantity	Warning
AMOXICILLIN with CLAVULANIC ACID 4.8g, ORAL LIQUID	45	Oral liquid quantity >20
AMPICILLIN 1g, PARENTERAL	74	Quantity < 50% of average usage (916.833)
ANIDULAFUNGIN 100mg, PARENTERAL	64	Quantity > 200% of average usage (15.750)
BENZYL PENICILLIN 600mg, PARENTERAL	920	Quantity > 200% of average usage (436.417)
CLARITHROMYCIN 250mg, ORAL	710	Quantity < 50% of average usage (1480.167)
FLUCONAZOLE 200mg, PARENTERAL	138	Quantity > 200% of average usage (35.917)
TRIMETHOPRIM with SULFAMETHOXAZOLE 4.8g, ORAL LIQUID	100	Oral liquid quantity >20

- > Pharmacist review – decision to proceed with loading or otherwise

Examples of NAUSP semi-automated data validation

- > Database recognises that it has not processed this item before.
 - Pharmacist determines:
 - If can be aliased to an antimicrobial already in the system, OR
 - Add as a 'new' antibiotic, OR
 - Discard (all future occurrences of this antimicrobial will be ignored)

Please resolve the following unknown antibiotics

Unknown Antibiotic	Alias	New	Discard
cephaZOLin (Hospira cefaZOLin) 1g injection Pack: 5	Set Alias	Add New	Discard
Fluconazole (Diflucan) 100mg capsule Pack: 28	Set Alias	Add New	Discard
Fluconazole (Diflucan) 50mg capsule Pack: 28	Set Alias	Add New	Discard
Amphotericin B (SAS) (Fungizone) 50mg infusion Pack: 1	Set Alias	Add New	Discard
Clindamycin 300mg/2mL injection Pack: 10	Set Alias	Add New	Discard
cIPROFLOXAcin (CiloQuin) 0.3% , EYE DROP 5mL	Set Alias	Add New	Discard

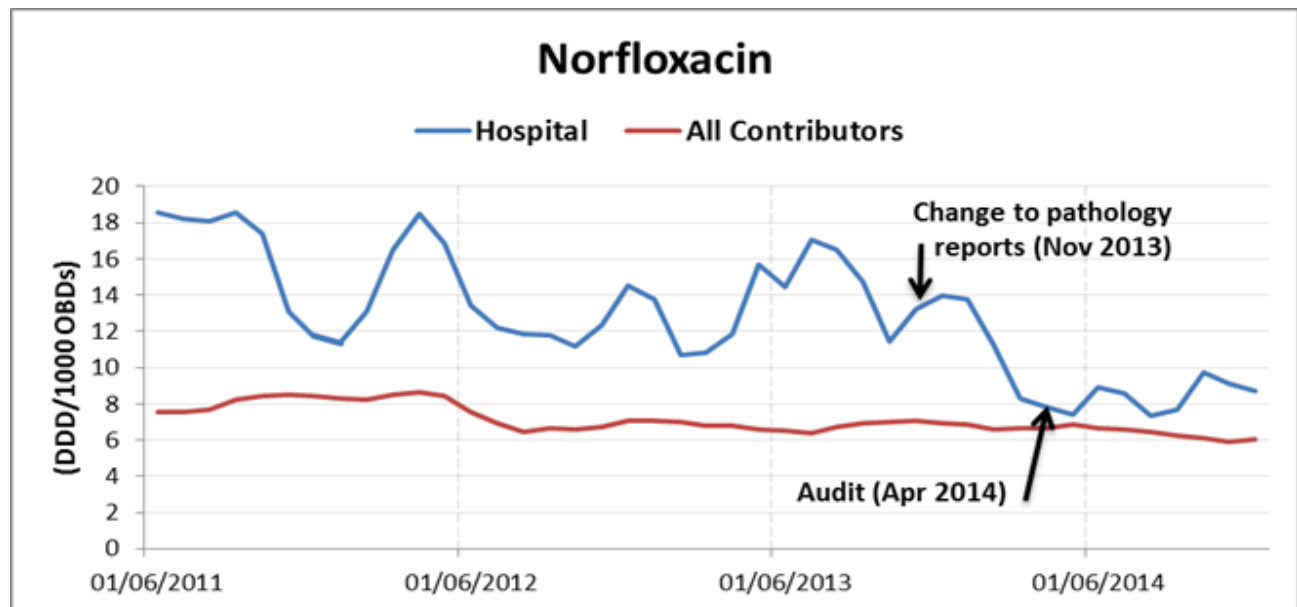
Other quality assurance processes

- > Cyclical basis – each hospital QA'd every 6 months, i.e. one third of hospitals every 2 months
 - Previous 12 months data analysed
 - **Rates** outside a range of average ± 2 SD investigated:
 - Automatically generated report for 'outliers'
 - NAUSP staff manually check data entered to database against data sent from contributor
 - Labour-intensive
- > Half-yearly – check NAUSP has aliased antimicrobials correctly
- > Annually – check WHO defined daily dose for amendments

Using surveillance data – at the hospital level

Example 1

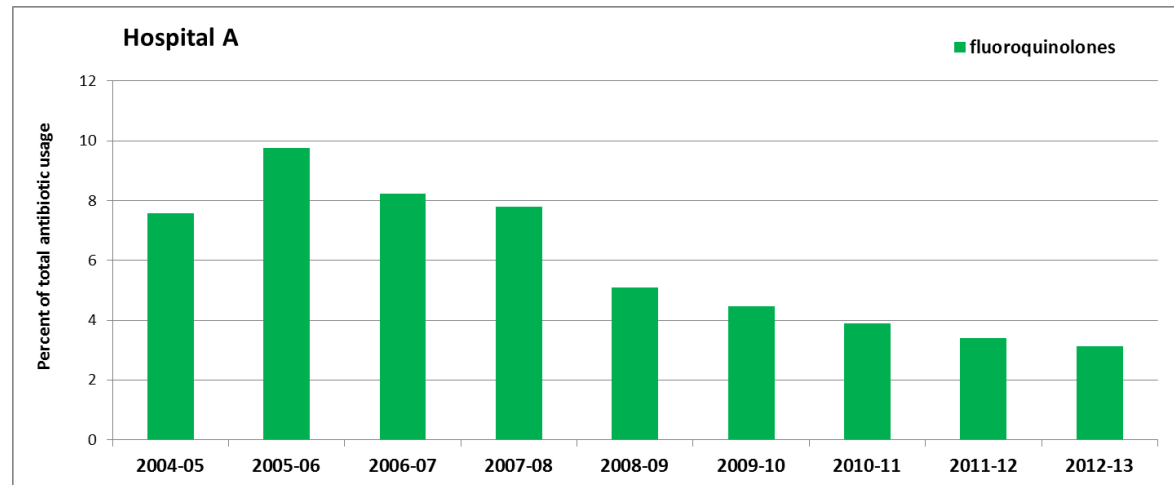
- > NAUSP reports showed norfloxacin use > national comparator
- > In house audits conducted to assess appropriateness of prescribing
- > AMS committee addressed specific prescribers to highlight inappropriate use
- > The reporting of UTI pathology results was altered to offer norfloxacin as a sensitive antibiotic only if the specimen was resistant to other first-line antibiotics



Using surveillance data – at the hospital level

Example 2

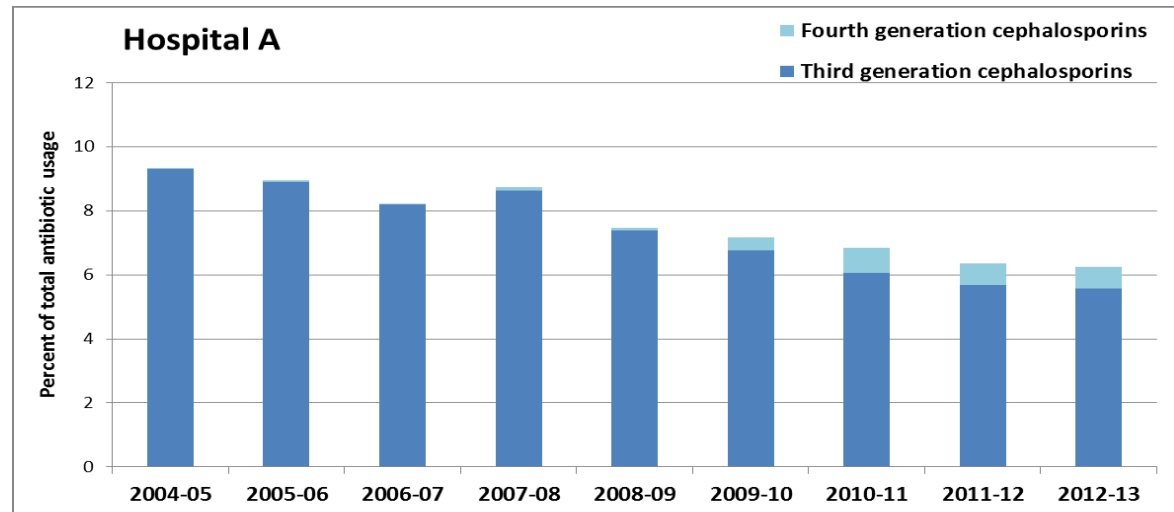
- Showing change in “prescribing culture” – introduction of electronic approval and decision support system
- Annual rates of broad-spectrum antibiotics declined
- Narrow-spectrum ratio increased



Using surveillance data – at the hospital level

Example 2

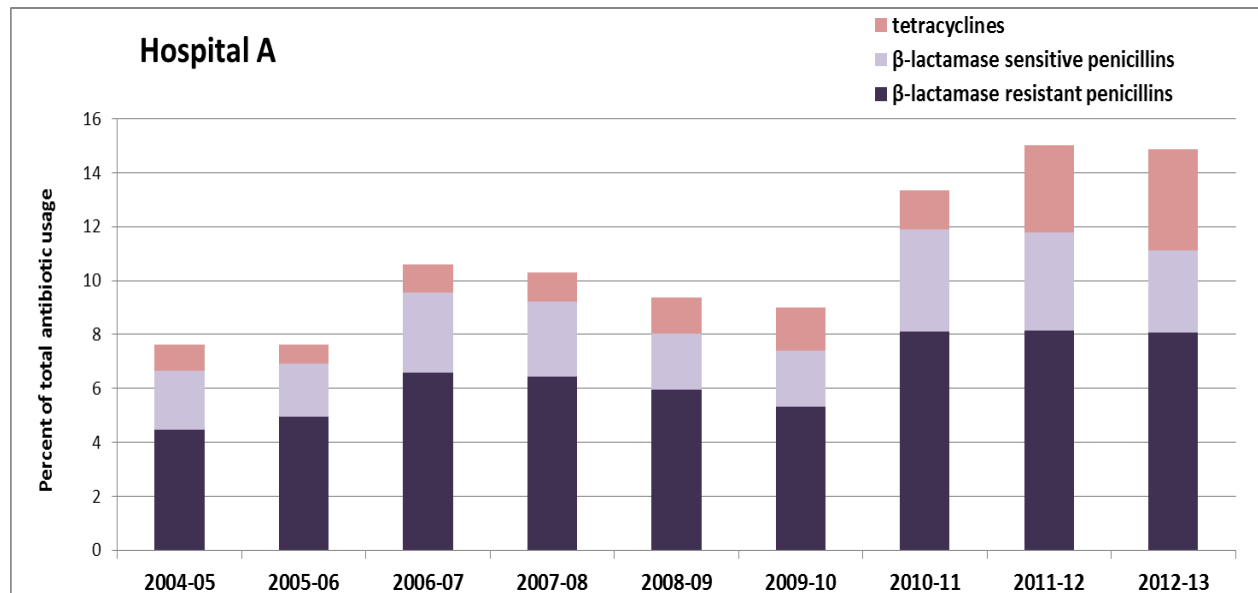
- > Showing change in “prescribing culture” – introduction of electronic approval and decision support system
- > Annual rates of broad-spectrum antibiotics declined
- > Narrow-spectrum ratio increased



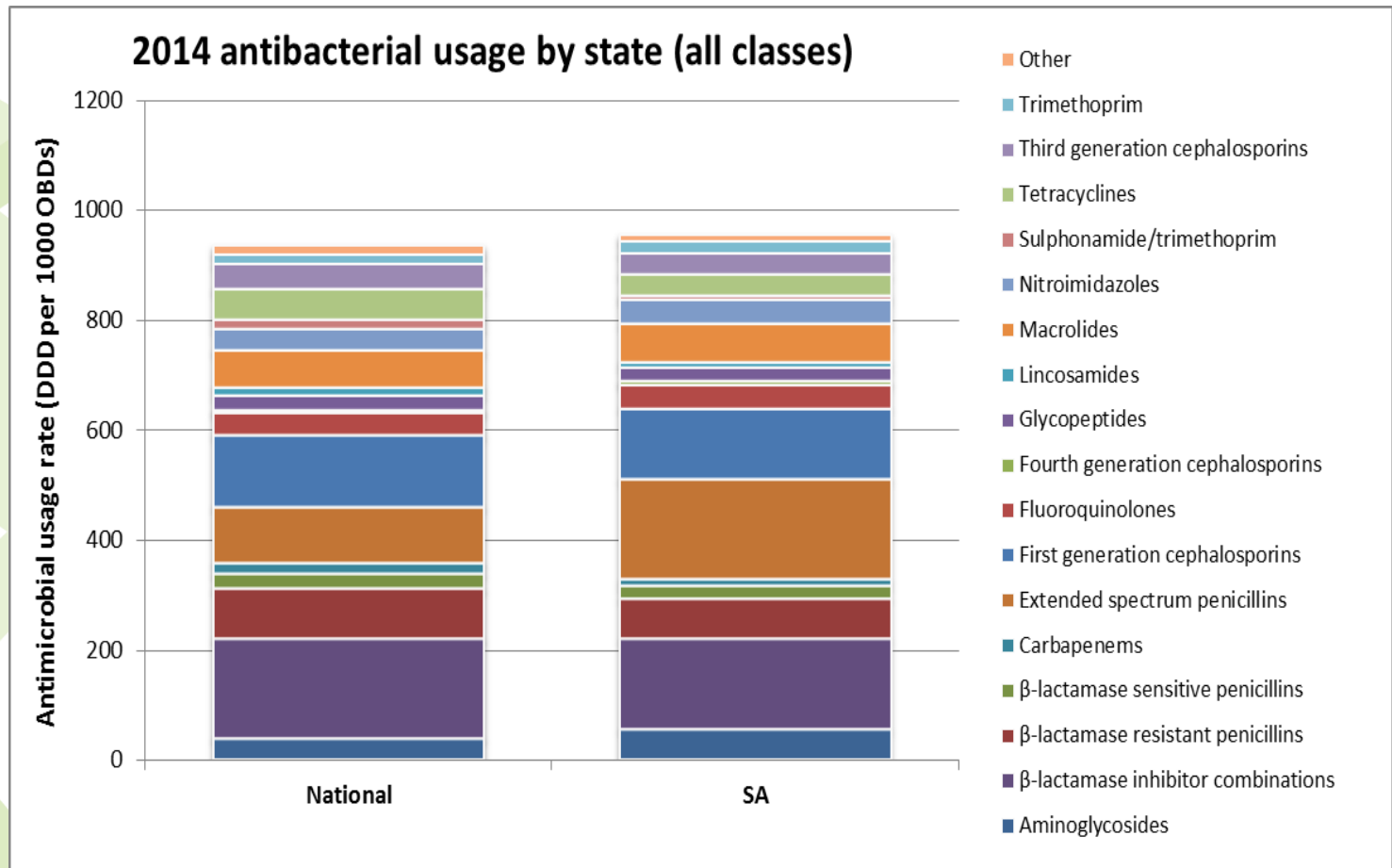
Using surveillance data – at the hospital level

Example 2

- > Showing change in “prescribing culture” – introduction of electronic approval and decision support system
- > Annual rates of broad-spectrum antibiotics declined
- > Narrow-spectrum ratio increased



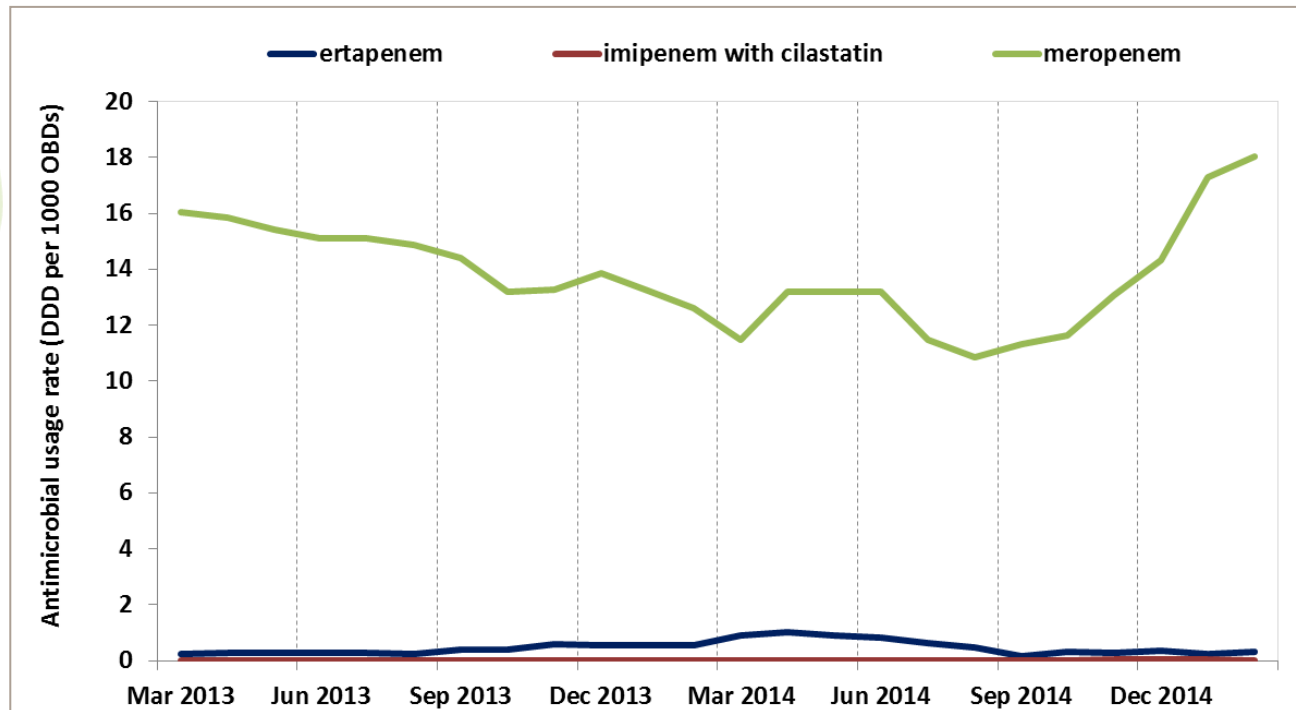
Examples of surveillance data - comparison between state and national averages



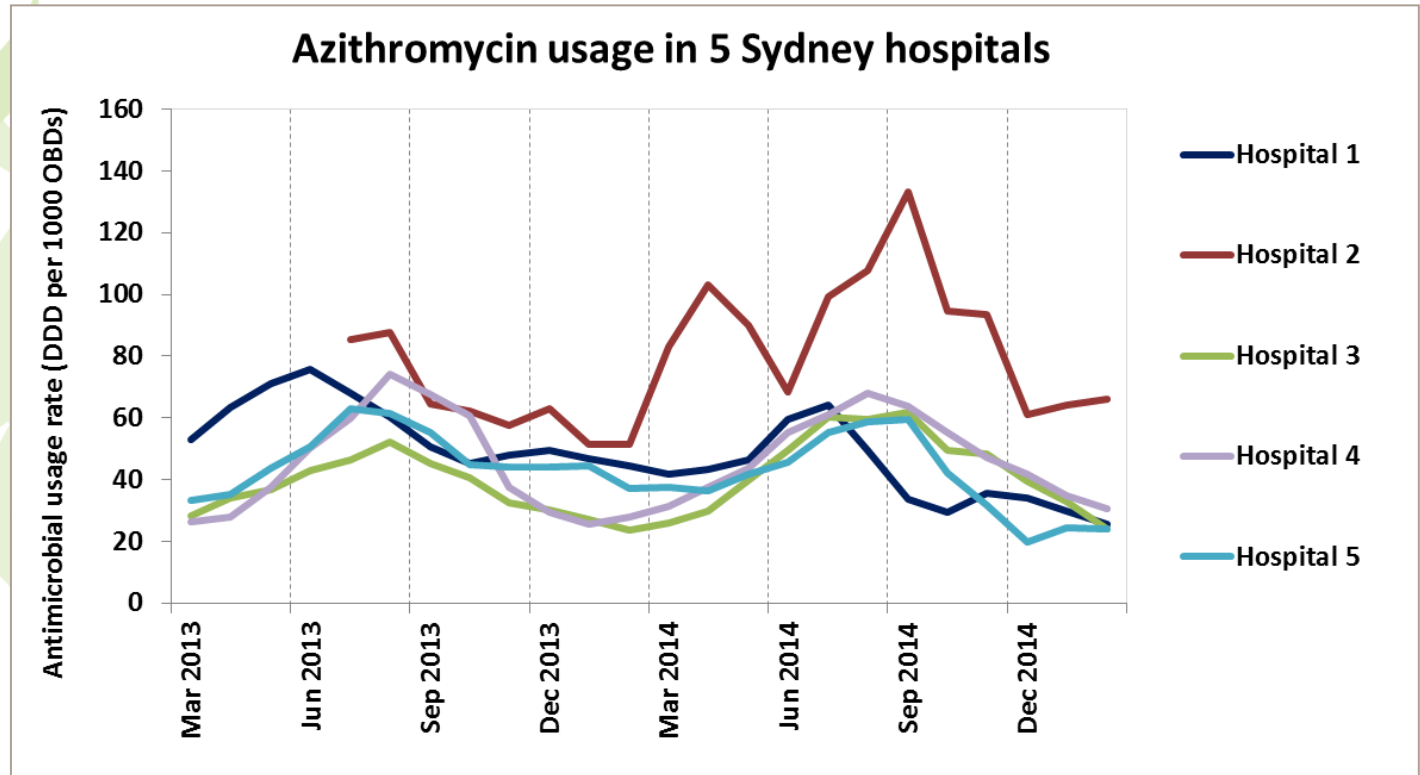
Source: NAUSP data – yet to be published

Using surveillance data – state level

- > Carbapenem usage in SA metropolitan hospitals (n=13) over a three year period

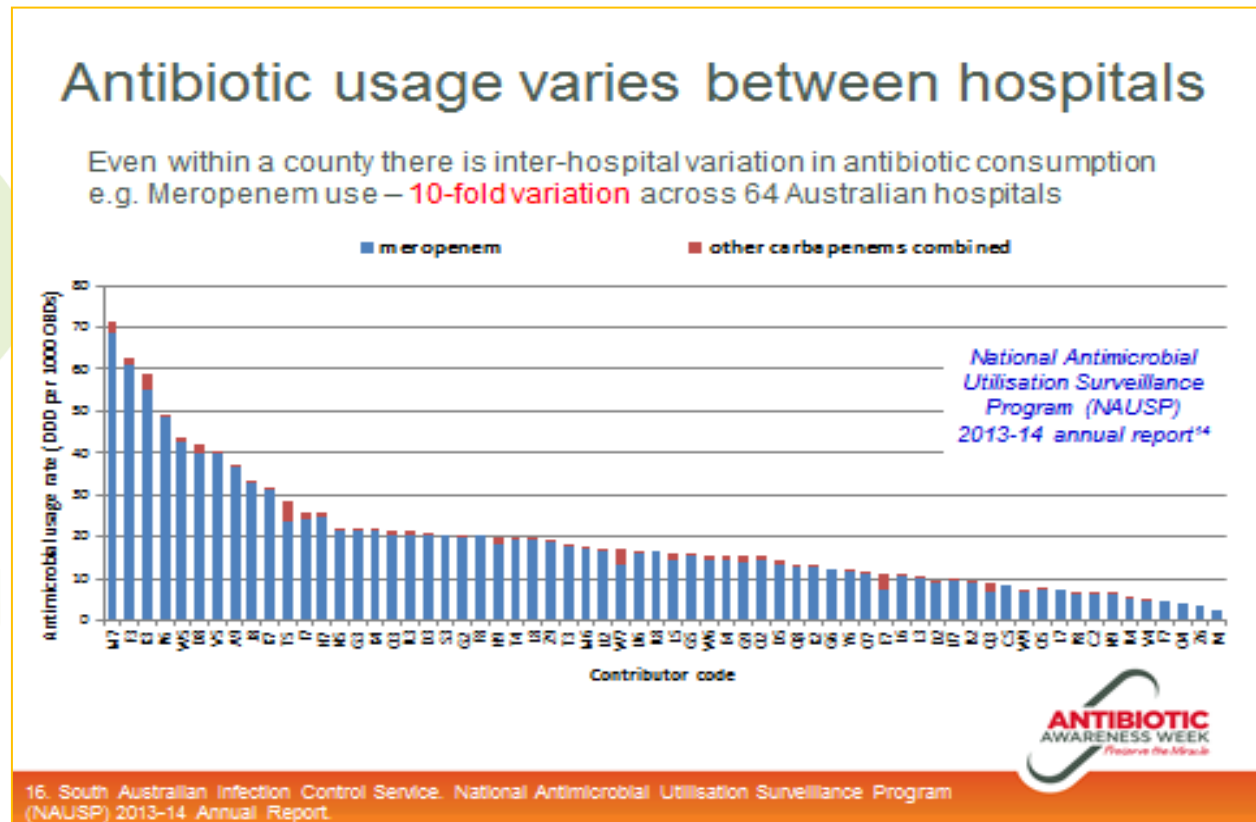


Using surveillance data – local health district level



Using surveillance data – national level

> Antibiotic Awareness Week 2014

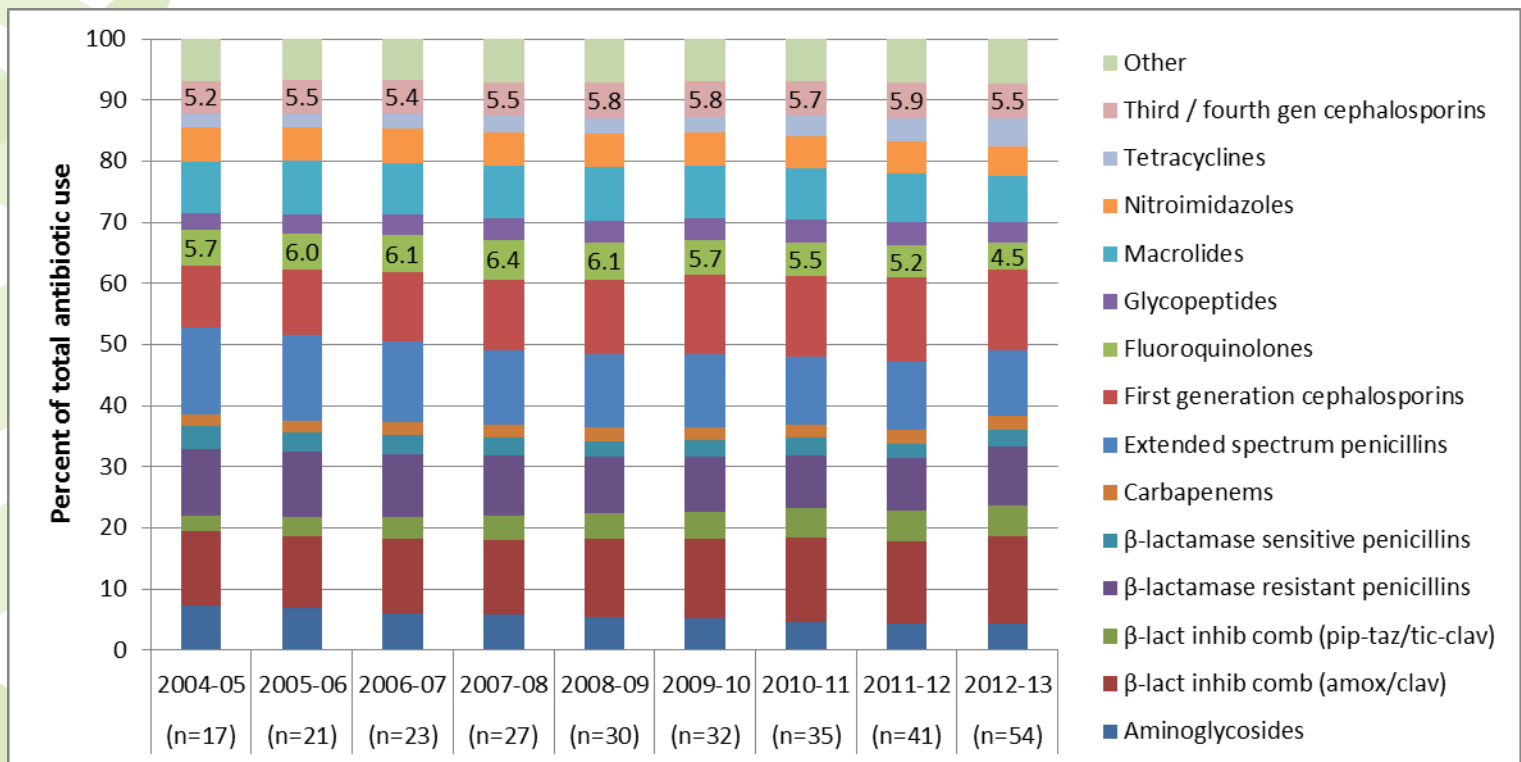


Source: NAUSP Annual Report 2013-14

<http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/health+statistics/healthcare+infection+statistics/antimicrobial+utilisation+surveillance+statistics>

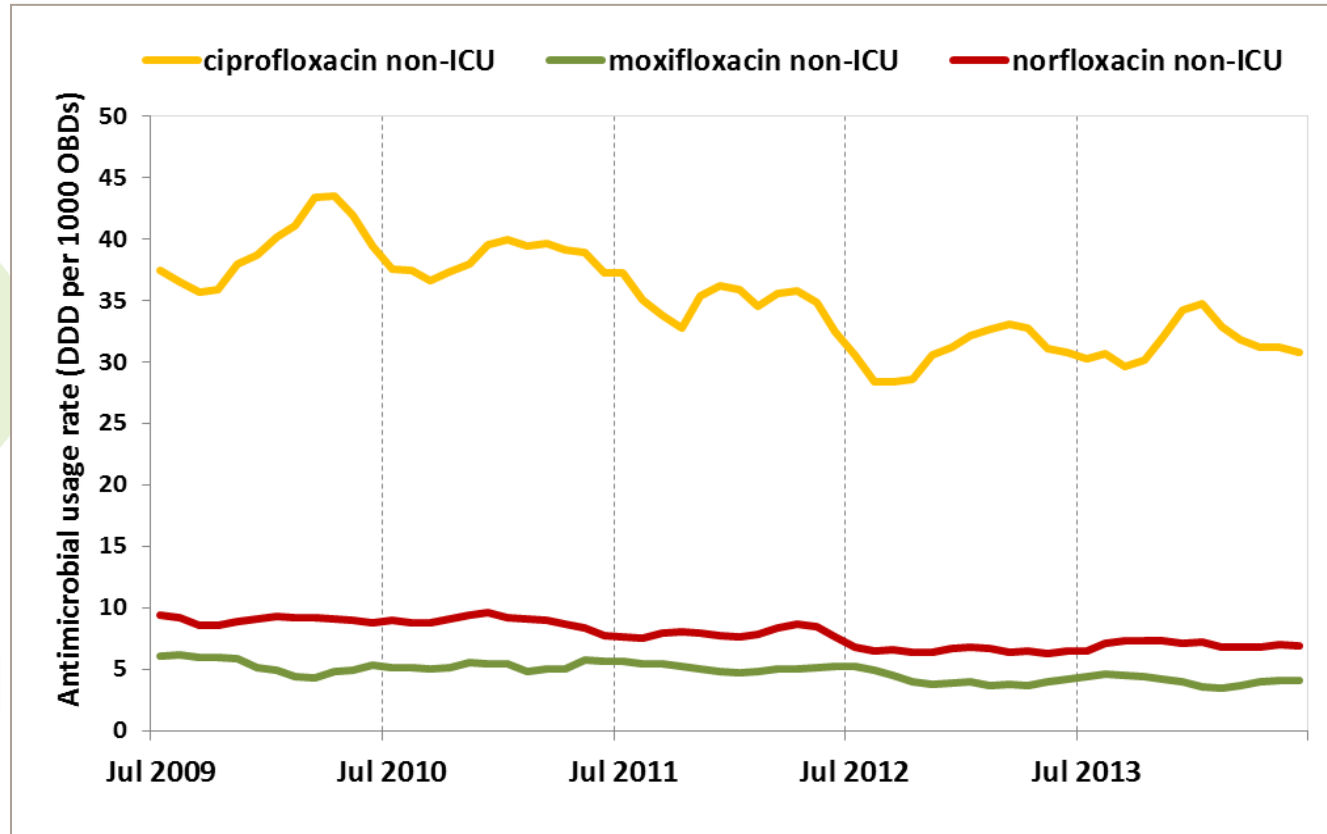
Using surveillance data – national level

- > Monitor change in prescribing practices nationally
- > Fluoroquinolone usage rates have declined at national level



Source: McNeil V, Wilkinson I. Fluoroquinolone and third & fourth generation cephalosporin usage in Australian tertiary hospitals. PO2.16 ASA 2014

Examples of surveillance data - trending data at national level



Source: NAUSP Annual Report 2013-14

<http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/about+us/health+statistics/healthcare+infection+statistics/antimicrobial+utilisation+surveillance+statistics>



Limitations of NAUSP data

- > No patient specific data – volume-based, population data
- > Benchmarking – are apples being compared with apples?
- > Problems with WHO-defined DDDs
 - examples – erythromycin, piperacillin/tazobactam
- > DDD not applicable to paediatric surveillance data
- > Very small hospitals < 50 beds – what is meaningful data?

- > NEVERTHELESS – useful and relatively easy method of commencing antimicrobial surveillance



Conclusion

- > Antimicrobial surveillance integral part of AMS
 - Assists AMS committees with targeting of limited AMS resources to achieve greatest benefit
 - Direct prescriber feedback major strategy in changing prescribing behaviour
 - Provides evidence to hospital governance of success of AMS strategies
 - Fulfils NSQHS Standard 3.14.3
- > NAUSP surveillance
 - Limited to acute inpatient antimicrobial use
 - Volume-based data – does not assess appropriateness of use
 - Relatively easy method of data collection – use as ‘trigger’ for further AMS interventions

Acknowledgements

- > Australian Commission on Safety and Quality in HealthCare (ACSQHC)
- > Colleagues Infection Control Service, CDCB, SA Health
- > AMS pharmacists and others at contributing hospitals for data supply

FOR FURTHER INFORMATION:

NAUSP website: www.sahealth.sa.gov.au/nausp

Email: antibio@health.sa.gov.au



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