

## National aggregated antibacterial usage rates in Australian hospitals

July 2021 – June 2023

Antibacterial utilisation rates provided in this report are calculated using the number of defined daily doses (DDDs) of the antibacterial class consumed each month per 1,000 occupied bed days using aggregated data from all hospitals currently contributing to NAUSP. Aggregated usage rates of all antibacterials by all contributing hospitals are shown for the total acute use (excluding emergency department and theatre) and for critical care. Rates are also reported for 6 target antibacterial classes, and national critical care and non-critical care rates are shown for individual agents within the 6 target classes.

DDD values for each antimicrobial are assigned by the World Health Organization based on the “assumed average maintenance dose per day for the main indication in adults”. DDDs are reviewed annually by the WHO as dosing recommendations change over time. For more information refer to: [https://www.whocc.no/atc\\_ddd\\_methodology/purpose\\_of\\_the\\_atc\\_ddd\\_system/](https://www.whocc.no/atc_ddd_methodology/purpose_of_the_atc_ddd_system/).

Usage rates for this reporting period include data from 251 hospitals. Critical care rates include data from 137 contributors. Some hospitals were unable to submit data for this reporting period and comparator rates may vary from previous reports.

Enquiries regarding this report should be directed to the Program Manager, NAUSP (email: [Health.NAUSPhelp@sa.gov.au](mailto:Health.NAUSPhelp@sa.gov.au)).

### 1. AGGREGATED NATIONAL ANTIBACTERIAL USAGE IN ACUTE CARE SETTINGS

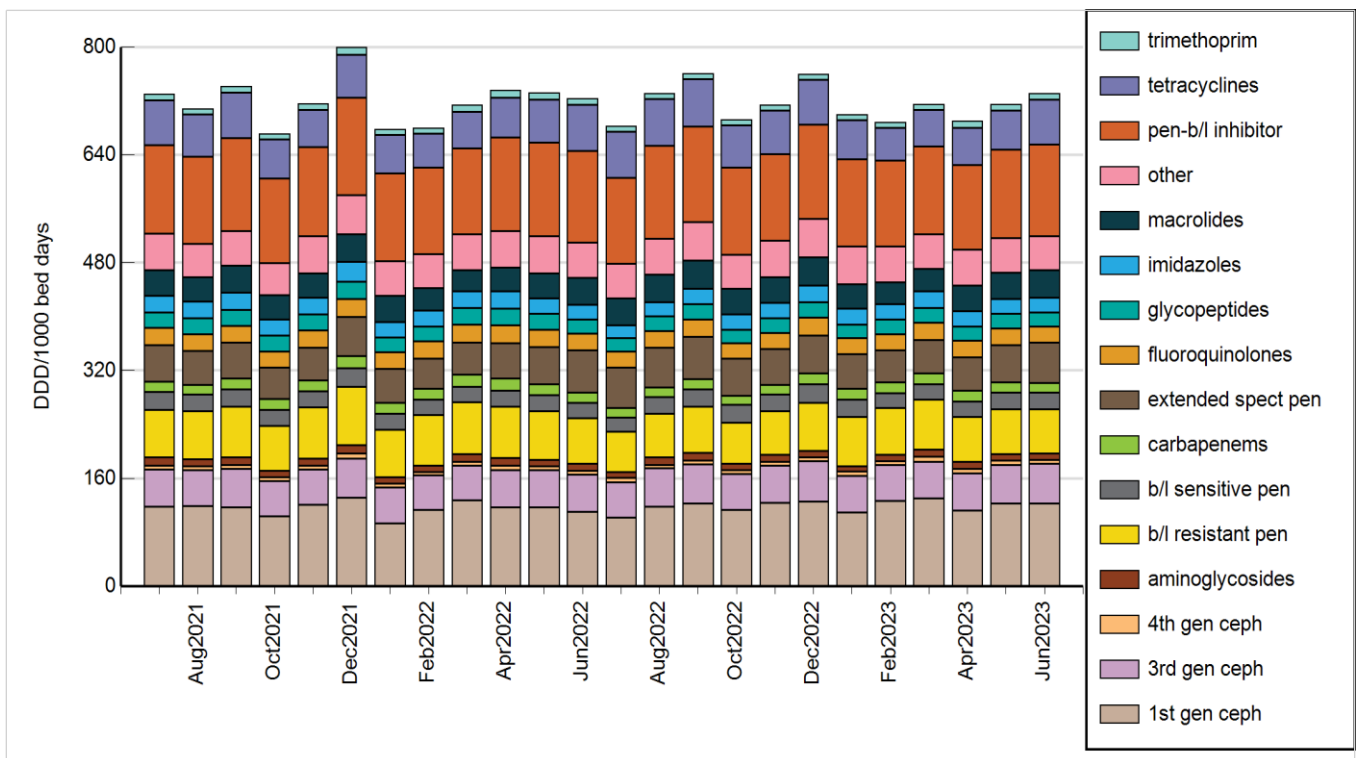


Chart 1: Acute aggregated antibacterial usage rates, NAUSP-contributor hospitals, July 2021 - June 2023 (excludes emergency department and operating theatre)

## 2. TOTAL CRITICAL CARE ANTIBACTERIAL USE (ALL CLASSES)

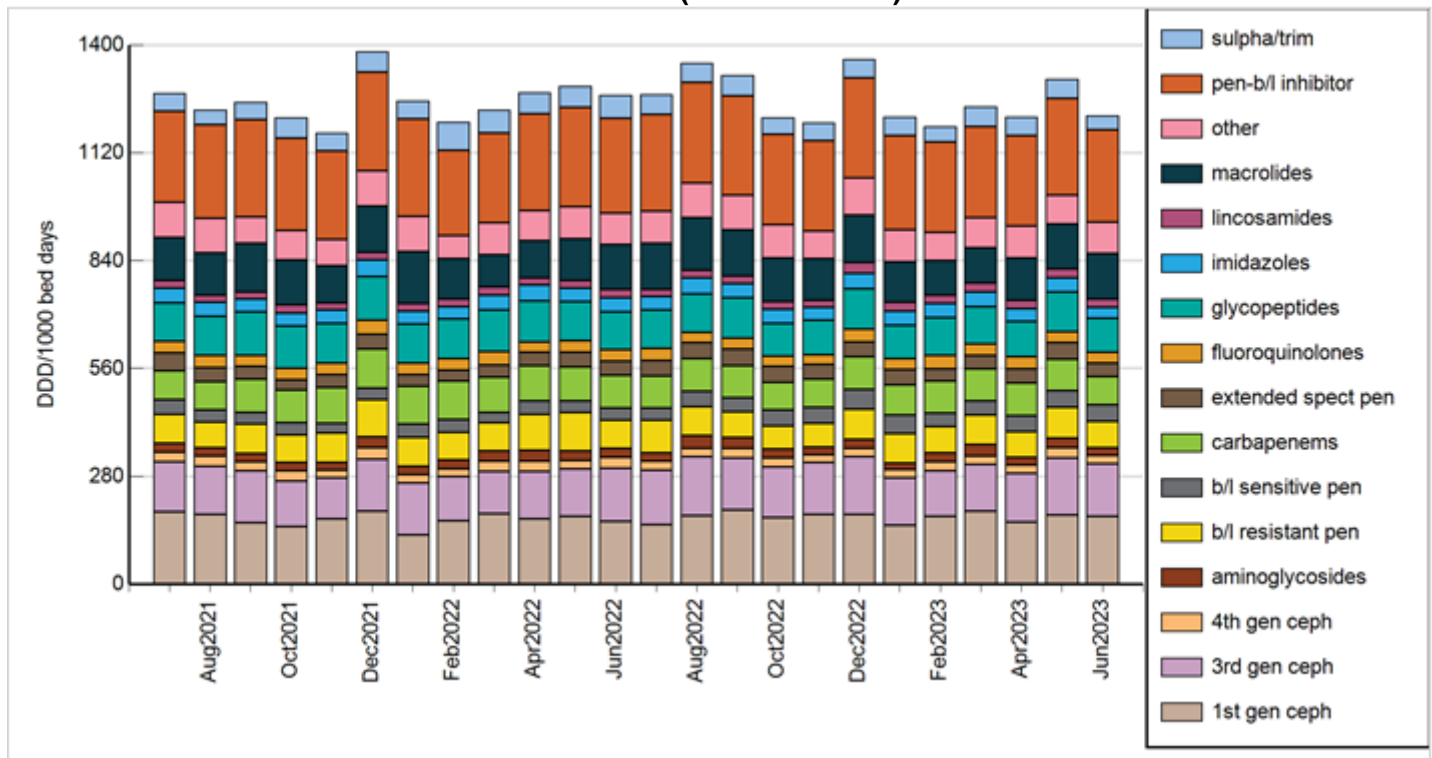


Chart 2: Total Critical Care antibacterial use, NAUSP-contributor hospitals, July 2021 - June 2023

## 3. AGGREGATED NATIONAL USE OF SELECTED CLASSES OF ANTIBACTERIALS

Aggregated acute hospital inpatient usage rates for 3<sup>rd</sup>/4<sup>th</sup> generation cephalosporins, glycopeptides, carbapenems, fluoroquinolones, aminoglycosides and anti-pseudomonal penicillin/β-lactamase inhibitor combinations are displayed for the period July 2021 to June 2023 in charts 3 and 4. Aggregated inpatient usage rates exclude usage in emergency and the operating theatre settings. In the following charts, C denotes aggregate rate for all contributors.

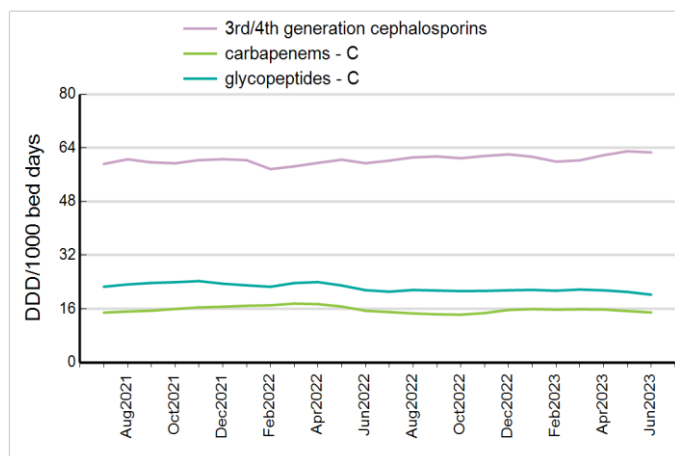


Chart 3: Aggregate usage rate for 3rd/4th generation cephalosporins, glycopeptides and carbapenems

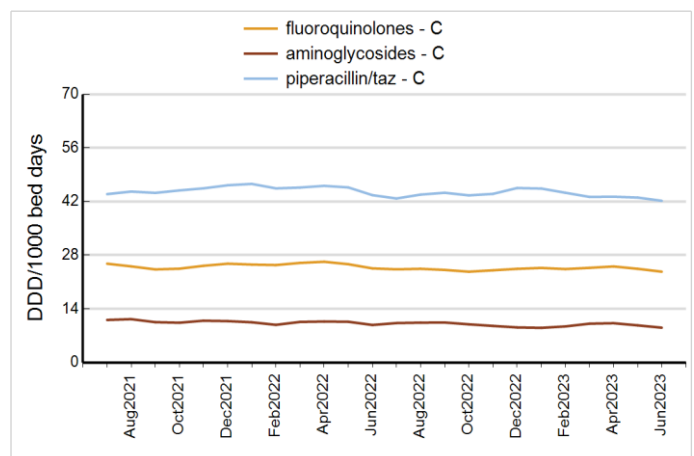


Chart 4: Aggregate usage rate for fluoroquinolones, aminoglycosides and anti-pseudomonal penicillins plus β-lactamase inhibitor

#### 4. CRITICAL CARE COMPARED TO OTHER HOSPITAL USAGE (NON-ICU)

Usage rates for Critical Care compared to non-ICU for each antimicrobial class are shown in charts 5 - 10. Higher usage rates in ICU compared to non-ICU are expected, based on the density of usage in these areas.

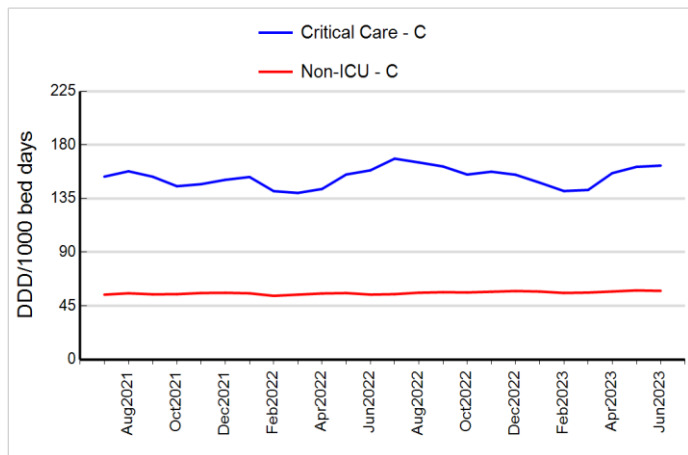


Chart 5: 3rd/4th generation cephalosporins

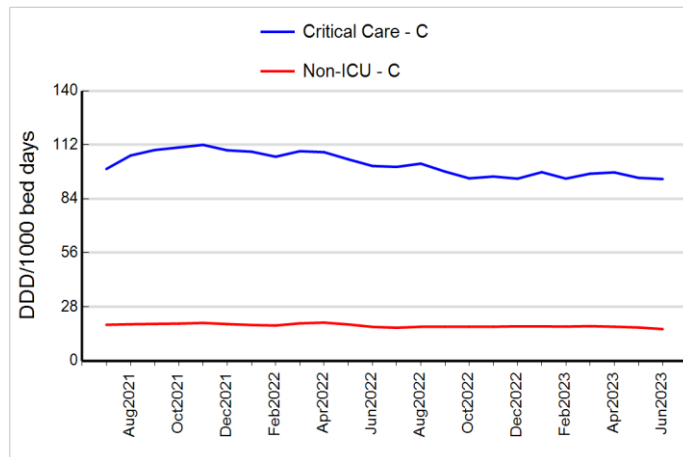


Chart 6: glycopeptides

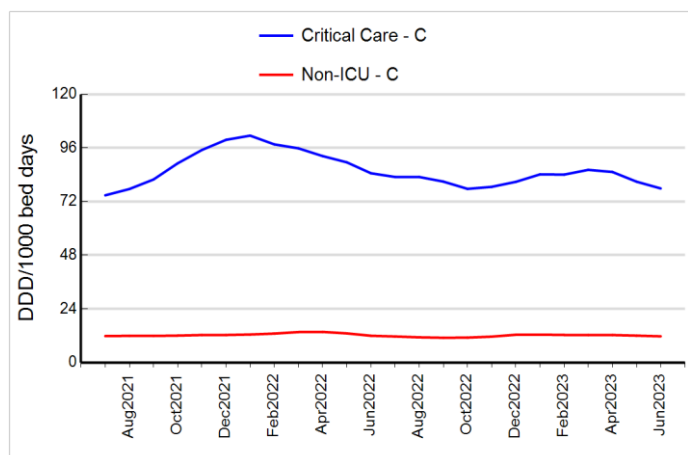


Chart 7: carbapenems

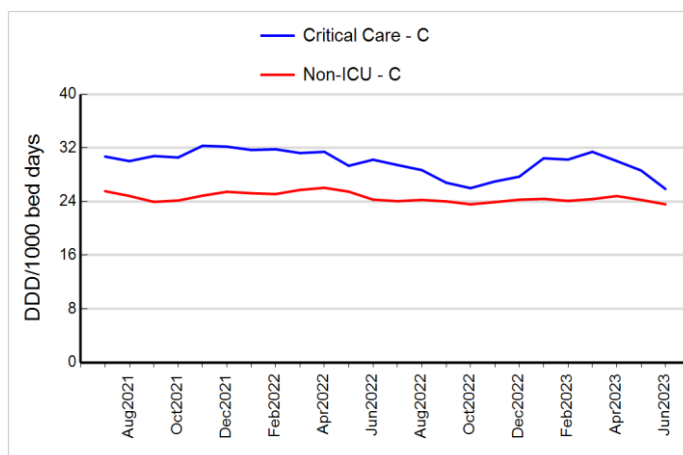


Chart 8: fluoroquinolones

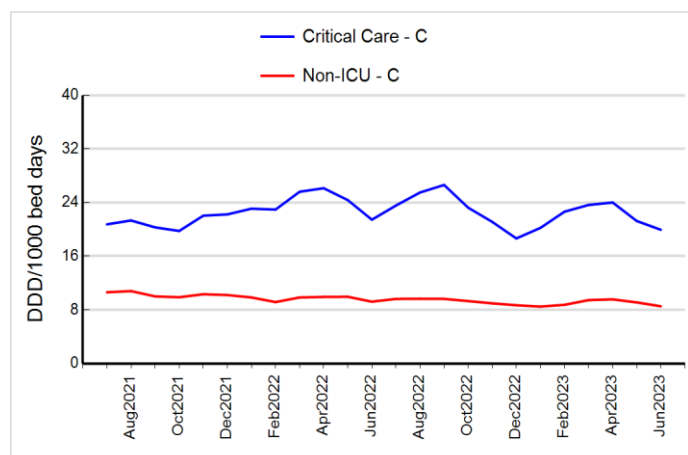


Chart 9: aminoglycosides

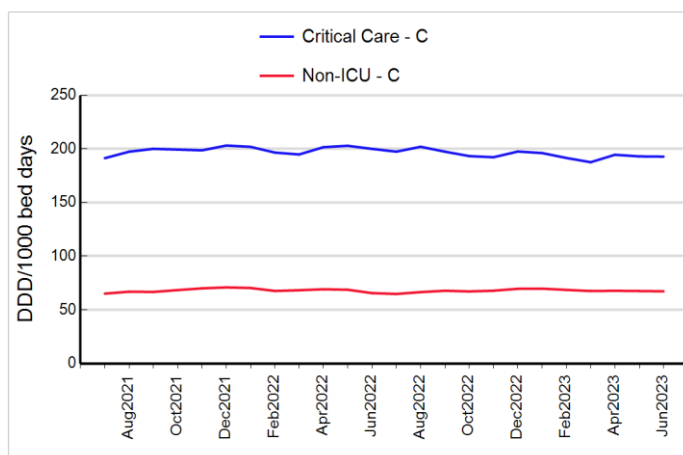
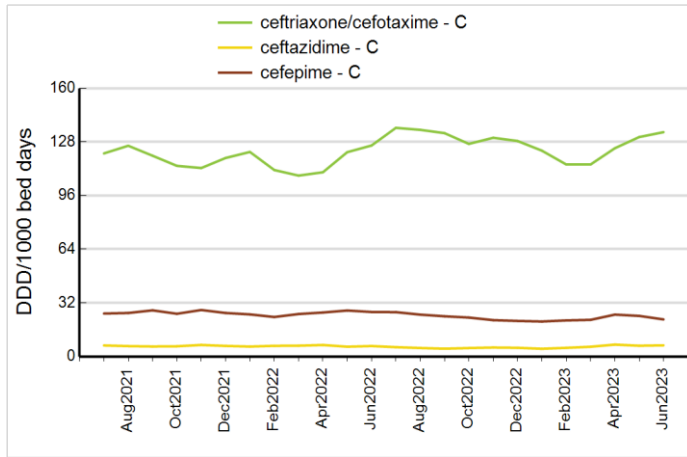


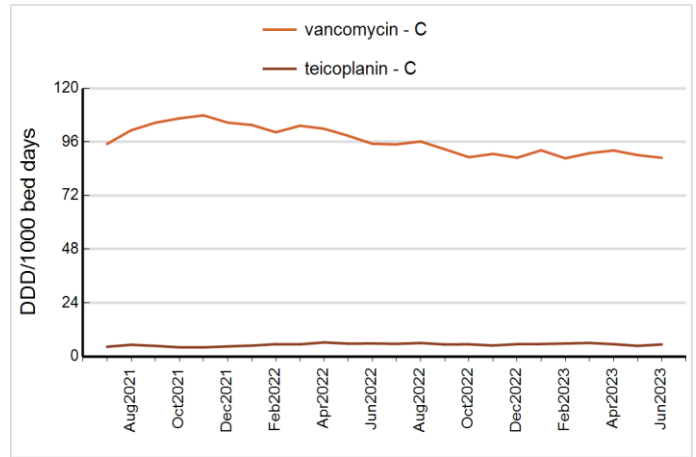
Chart 10: parenteral penicillins / beta-lactamase inhibitors

## 5. CRITICAL CARE USAGE RATES FOR INDIVIDUAL ANTIMICROBIALS

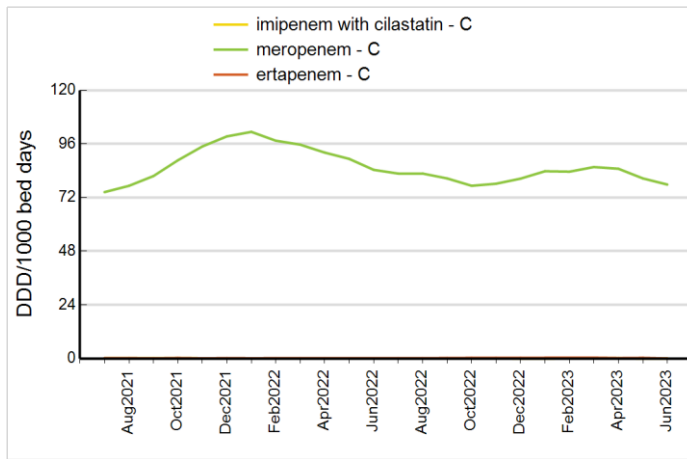
ICU antimicrobial utilisation rates for individual agents within reported classes are shown in the Charts 11 - 16 below.



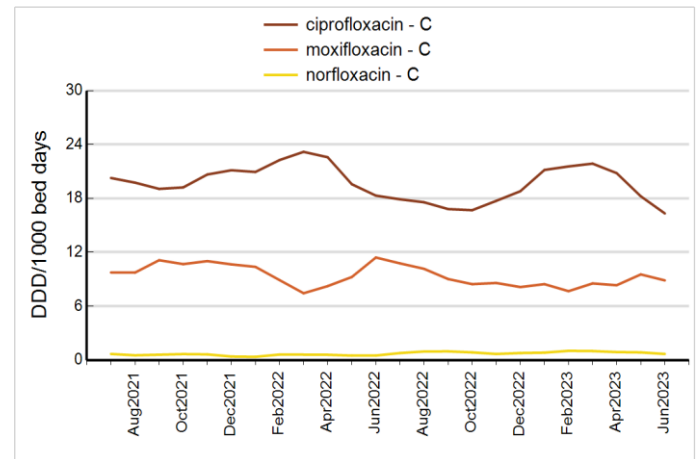
**Chart 11: 3rd/4th generation cephalosporins (ceftriaxone and cefotaxime grouped together)**



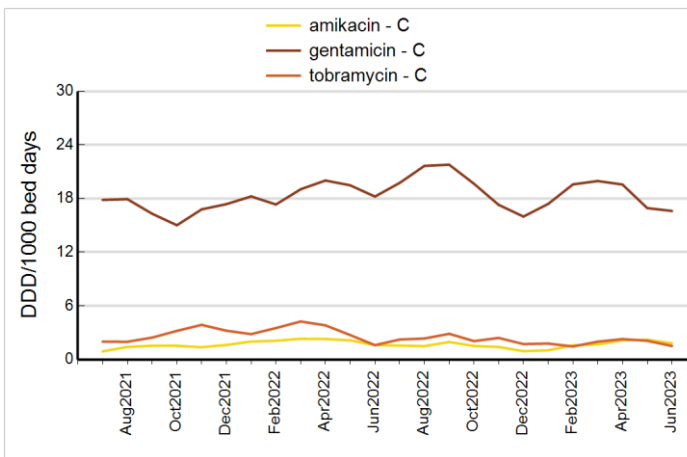
**Chart 12: glycopeptides**



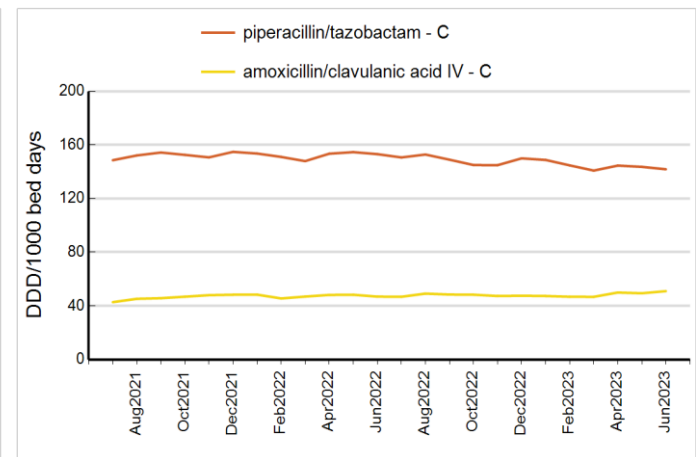
**Chart 13: carbapenems**



**Chart 14: fluoroquinolones**



**Chart 15: aminoglycosides**



**Chart 16: parenteral penicillin /  $\beta$ -lactamase inhibitors**

## 6. NON-ICU ANTIMICROBIAL USAGE RATES FOR INDIVIDUAL ANTIMICROBIALS

Non-ICU antimicrobial utilisation rates for individual agents within reported classes are shown in Charts 17 - 22 below.

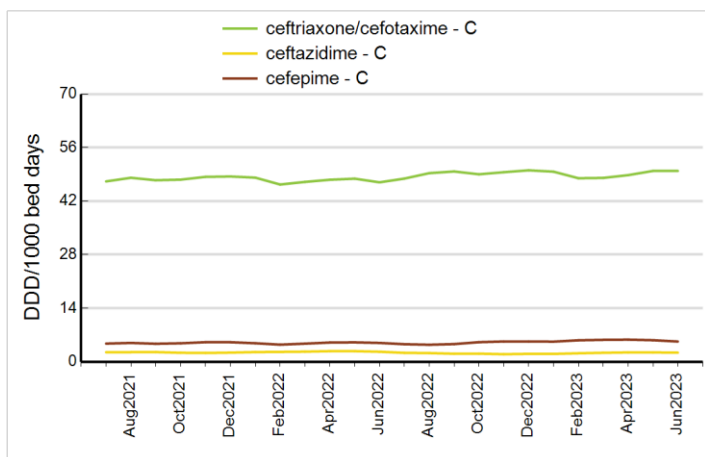


Chart 17: 3rd/4th generation cephalosporins (ceftriaxone and cefotaxime grouped together)

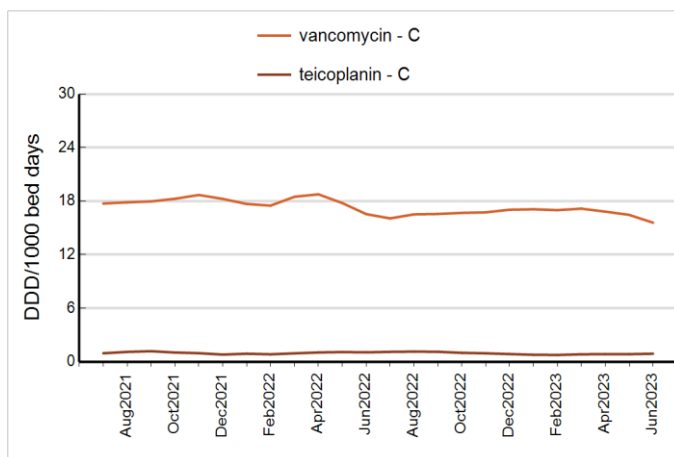


Chart 18: glycopeptides

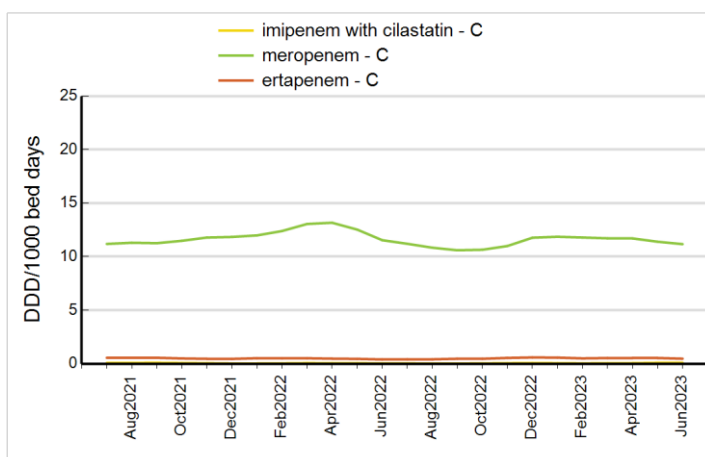


Chart 19: carbapenems

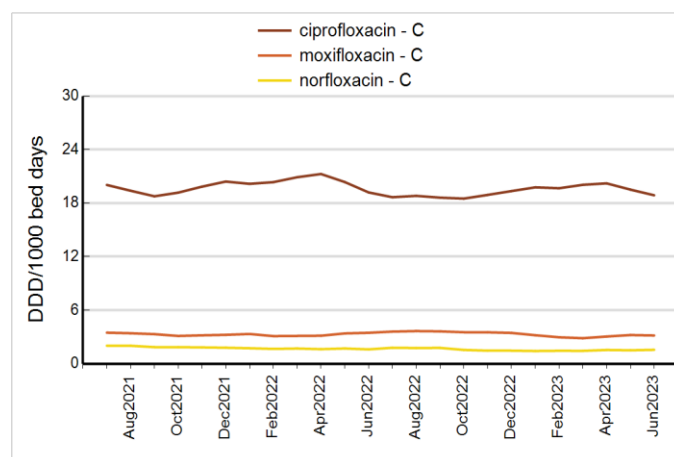


Chart 20: fluoroquinolones

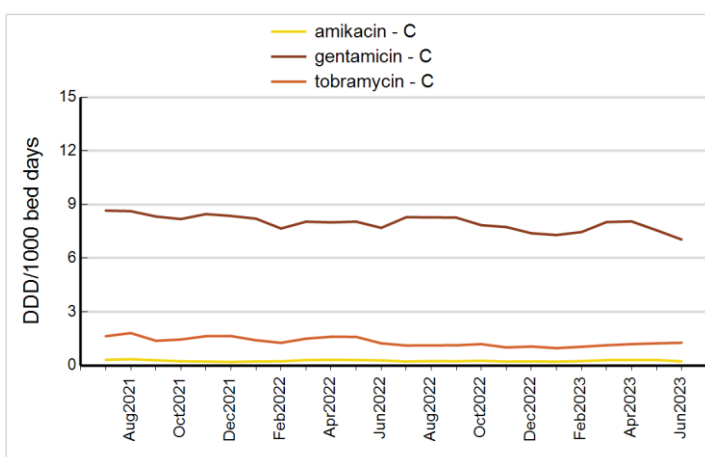


Chart 21: aminoglycosides

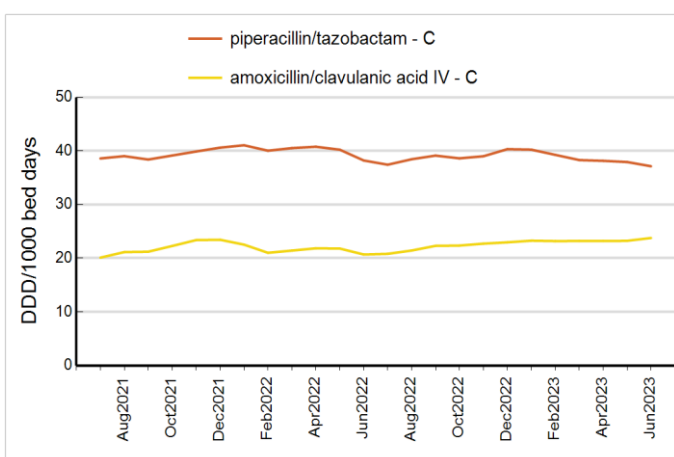


Chart 22: parenteral penicillin / beta-lactamase inhibitors

**This report includes data from the following hospitals:**

**ACT:** CANBERRA HOSPITAL, UNIVERSITY OF CANBERRA HOSPITAL

**NSW:** ARMIDALE HOSPITAL, AUBURN HOSPITAL, BALMAIN HOSPITAL, BANKSTOWN HOSPITAL, BATEMANS BAY DISTRICT HOSPITAL, BATHURST BASE HOSPITAL, BELLINGER RIVER DISTRICT HOSPITAL, BELMONT HOSPITAL, BLUE MOUNTAINS HOSPITAL, BOURKE MULTIPURPOSE SERVICE, BOWRAL HOSPITAL, BRISBANE WATERS PRIVATE HOSPITAL, BROKEN HILL BASE HOSPITAL, CAMPBELL TOWN HOSPITAL, CAMPBELL TOWN PRIVATE HOSPITAL, CANOWINDRA SOLDIERS MEMORIAL HOSPITAL, CANTERBURY HOSPITAL, CESSNOCK DISTRICT HOSPITAL, CHRIS O'BRIEN LIFEHOUSE, COBAR DISTRICT HOSPITAL, COFFS HARBOUR HOSPITAL, CONCORD HOSPITAL, COOMA HOSPITAL, DENILIQUIN HOSPITAL, DUBBO BASE HOSPITAL, FAIRFIELD HOSPITAL, FORSTER PRIVATE HOSPITAL, GILGANDRA MULTIPURPOSE SERVICE, GLEN INNES DISTRICT HOSPITAL, GLOUCESTER SOLDIERS' MEMORIAL HOSPITAL, GOSFORD HOSPITAL, GOSFORD PRIVATE HOSPITAL, GOULBURN BASE HOSPITAL, GRIFFITH BASE HOSPITAL, GUNNEDAH HOSPITAL, HORNSBY KU-RING-GAI HOSPITAL, HUNTER NEW ENGLAND MATER MENTAL HEALTH, HURSTVILLE PRIVATE HOSPITAL, INVERELL DISTRICT HOSPITAL, JOHN HUNTER HOSPITAL, KAREENA PRIVATE HOSPITAL, KEMPSEY DISTRICT HOSPITAL, KURRI KURRI HOSPITAL, LAKE MACQUARIE PRIVATE HOSPITAL, LINGARD PRIVATE HOSPITAL, LITHGOW HOSPITAL, LIVERPOOL HOSPITAL, MACKSVILLE DISTRICT HOSPITAL, MAITLAND HOSPITAL, MAITLAND PRIVATE HOSPITAL, MANNING BASE HOSPITAL, MATER HOSPITAL NORTH SYDNEY, MAYO PRIVATE HOSPITAL, MILTON-ULLADULLA HOSPITAL, MONA VALE HOSPITAL, MOREE HOSPITAL, MORISSET HOSPITAL, MORUYA HOSPITAL, MT DRUITT HOSPITAL, MUDGEE DISTRICT HOSPITAL, MURWILLUMBAH DISTRICT HOSPITAL, MUSWELLBROOK HOSPITAL, NARRABRI HOSPITAL, NARROMINE HEALTH SERVICE, NEPEAN HOSPITAL, NEWCASTLE MATER, NORTHERN BEACHES HOSPITAL, ORANGE HEALTH SERVICE, PORT MACQUARIE BASE HOSPITAL, PRINCE OF WALES HOSPITAL, QUEANBEYAN HOSPITAL, ROYAL NORTH SHORE HOSPITAL, ROYAL PRINCE ALFRED HOSPITAL, ROYAL REHABILITATION HOSPITAL, RYDE HOSPITAL, SCOTT MEMORIAL HOSPITAL, SHELLHARBOUR HOSPITAL, SHOALHAVEN HOSPITAL, SINGLETON DISTRICT HOSPITAL, SOUTH EAST REGIONAL HOSPITAL, ST GEORGE HOSPITAL, ST VINCENT'S HOSPITAL SYDNEY, ST VINCENT'S PRIVATE HOSPITAL SYDNEY, SUTHERLAND HOSPITAL, SYDNEY ADVENTIST HOSPITAL, TAMWORTH HOSPITAL, WAGGA WAGGA BASE HOSPITAL, WARREN MULTIPURPOSE SERVICE, WAUCHOPE DISTRICT MEMORIAL HOSPITAL, WESTMEAD HOSPITAL, WINGHAM COMMUNITY HOSPITAL, WOLLONGONG HOSPITAL, WYONG HOSPITAL, YOUNG HEALTH SERVICE

**NT :** ALICE SPRINGS HOSPITAL, DARWIN PRIVATE HOSPITAL, PALMERSTON REGIONAL HOSPITAL, ROYAL DARWIN HOSPITAL, TENNANT CREEK HOSPITAL

**QLD:** ATHERTON HOSPITAL, BUDERIM PRIVATE HOSPITAL, BUNDABERG HOSPITAL, GLADSTONE HOSPITAL, GOLD COAST PRIVATE HOSPITAL, GREENSLOPES HOSPITAL, GYMPIE HEALTH SERVICE, HERVEY BAY HOSPITAL, IPSWICH HOSPITAL, JOHN FLYNN PRIVATE HOSPITAL, KILCOY HOSPITAL, KINGAROY HOSPITAL, LOGAN HOSPITAL, MARYBOROUGH HOSPITAL, MATER BUNDABERG, MATER HOSPITAL BRISBANE, MATER MACKAY, MATER MOTHERS' HOSPITAL, MATER PRIVATE HOSPITAL BRISBANE, MATER PRIVATE HOSPITAL SPRINGFIELD, MATER PRIVATE HOSPITAL TOWNSVILLE - PIMLICO, MATER REDLAND PRIVATE, MATER ROCKHAMPTON, MT ISA HOSPITAL, NAMBOUR GENERAL HOSPITAL, PENINSULA PRIVATE HOSPITAL, QUEEN ELIZABETH 2 JUBILEE HOSPITAL, REDCLIFFE HOSPITAL, REDLAND HOSPITAL, ROYAL BRISBANE AND WOMEN'S HOSPITAL, ST ANDREW'S WAR MEMORIAL HOSPITAL, ST STEPHEN'S HOSPITAL HERVEY BAY, ST VINCENT'S PRIVATE HOSPITAL BRISBANE, ST VINCENT'S PRIVATE HOSPITAL NORTHSIDE, ST VINCENT'S PRIVATE HOSPITAL TOOWOOMBA, SUNSHINE COAST UNIVERSITY HOSPITAL, TOOWOOMBA HOSPITAL, TOWNSVILLE HOSPITAL, WARWICK HOSPITAL, WESLEY HOSPITAL

**SA :** ASHFORD HOSPITAL, BARMERA HEALTH SERVICE, BURNSIDE WAR MEMORIAL HOSPITAL, CALVARY ADELAIDE PRIVATE HOSPITAL, CALVARY CENTRAL DISTRICTS HOSPITAL, CALVARY NORTH ADELAIDE HOSPITAL, COOBER PEDY HOSPITAL, FLINDERS MEDICAL CENTRE, FLINDERS PRIVATE HOSPITAL, GAWLER HEALTH SERVICE, HAMPSTEAD REHABILITATION CENTRE, KAROONDA AND DISTRICT SOLDIERS' MEMORIAL HOSPITAL, LAMEROO DISTRICT HEALTH SERVICE, LOXTON HOSPITAL, LYELL MCEWIN HOSPITAL, MANNUM DISTRICT HOSPITAL, MCLAREN VALE & DISTRICTS WAR MEMORIAL HOSPITAL, MEMORIAL HOSPITAL, MENINGIE AND DISTRICTS MEMORIAL HOSPITAL AND HEALTH SERVICES, MODBURY HOSPITAL, MOUNT BARKER DISTRICT SOLDIERS MEMORIAL HOSPITAL, MT GAMBIER HOSPITAL, MURRAY BRIDGE HOSPITAL, NOARLUNGA HOSPITAL, PINNAROO SOLDIERS' MEMORIAL HOSPITAL, PORT AUGUSTA HOSPITAL, QUEEN ELIZABETH HOSPITAL, RENMARK PARINGA DISTRICT HOSPITAL, ROYAL ADELAIDE HOSPITAL, SOUTH COAST DISTRICT HOSPITAL, ST ANDREW'S HOSPITAL, TAILEM BEND DISTRICT HOSPITAL, WAIKERIE HEALTH SERVICE, WHYALLA HOSPITAL, WOMEN'S AND CHILDREN'S HOSPITAL

**TAS:** HOBART PRIVATE HOSPITAL, LAUNCESTON GENERAL HOSPITAL, MERSEY COMMUNITY HOSPITAL, NORTH WEST REGIONAL HOSPITAL, ROYAL HOBART HOSPITAL

**VIC:** ALBURY WODONGA - ALBURY, ALBURY WODONGA - WODONGA, ALFRED HOSPITAL, ANGLISS HOSPITAL, AUSTIN HOSPITAL, BALLARAT BASE HOSPITAL, BENDIGO HEALTH, BOX HILL HOSPITAL, CABRINI ELSTERNWICK, CABRINI HOSPITAL BRIGHTON, CABRINI HOSPITAL MALVERN, CASEY HOSPITAL, CENTRAL GIPPSLAND HEALTH, DANDENONG HOSPITAL, FRANKSTON HOSPITAL, GEELONG HOSPITAL, GRAMPPIANS HEALTH - HORSHAM, HOLMESGLEN PRIVATE HOSPITAL, KINGSTON CENTRE, MAROONDAH HOSPITAL, MERCY WOMEN'S HOSPITAL, MONASH MEDICAL CENTRE CLAYTON, MONASH MOORABBIN HOSPITAL, PETER JAMES CENTRE, PETER MACCALLUM CANCER CENTRE, PRAHRAN PALLIATIVE & SUPPORTIVE CARE, ROSEBUD HOSPITAL, ROYAL MELBOURNE HOSPITAL, SANDRINGHAM HOSPITAL, SOUTH EASTERN PRIVATE HOSPITAL, ST JOHN OF GOD GEELONG, ST VINCENT'S HOSPITAL MELBOURNE, ST VINCENT'S PRIVATE EAST MELB, ST VINCENT'S PRIVATE FITZROY, ST VINCENT'S PRIVATE HOSPITAL KEW, ST VINCENT'S PRIVATE HOSPITAL WERRIBEE, SWAN HILL DISTRICT HEALTH, THE NORTHERN HOSPITAL, WANTIRNA HEALTH, WARRNAMBOOL BASE HOSPITAL, WERRIBEE MERCY HOSPITAL, WESTERN HEALTH FOOTSCRAY, WESTERN HEALTH SUNSHINE

**WA :** ALBANY HOSPITAL, ARMADALE KALAMUNDA GROUP, BENTLEY HEALTH SERVICE, BROOME HOSPITAL, BUNBURY REGIONAL HOSPITAL, BUSSELTON HEALTH, DERBY HOSPITAL, ESPERANCE HOSPITAL, FIONA STANLEY HOSPITAL, FREMANTLE HOSPITAL, GERALDTON HOSPITAL, HEDLAND HEALTH CAMPUS, JOONDALUP HEALTH CAMPUS, KALGOORLIE HEALTH CAMPUS, KARRATHA HEALTH CAMPUS, KING EDWARD MEMORIAL HOSPITAL, KUNUNURRA HOSPITAL, MOUNT HOSPITAL, NARROGIN HOSPITAL, NORTHAM HOSPITAL, OSBORNE PARK HOSPITAL, ROCKINGHAM HOSPITAL, ROYAL PERTH HOSPITAL, SIR CHARLES GAIRDNER HOSPITAL, ST JOHN OF GOD MIDLAND, ST JOHN OF GOD MURDOCH, ST JOHN OF GOD SUBIACO

<b>ANTIBACTERIAL CLASSES</b>			
<b>Alimentary antibiotics</b>	fidaxomicin	<b>Lincosamides</b>	clindamycin
	paromomycin		lincomycin
	rifaximin		azithromycin
<b>Aminoglycosides</b>	amikacin	<b>Macrolides</b>	clarithromycin
	gentamycin		erythromycin
	neomycin		roxithromycin
	tobramycin		spiramycin
<b><math>\beta</math>-lactamase inhibitor combinations</b>	amoxicillin - clavulanate	<b>Monobactams</b>	aztreonam
	piperacillin - tazobactam	<b>Nitrofurans derivatives</b>	nitrofurantoin
<b><math>\beta</math>-lactamase resistant penicillins</b>	dicloxacillin	<b>Polymyxins</b>	colistin
	flucloxacillin		polymyxin B
<b><math>\beta</math>-lactamase sensitive penicillins</b>	benzathine benzylpenicillin	<b>Second-generation cephalosporins</b>	cefaclor
	benzylpenicillin		cefamandole
	phenoxymethylpenicillin		cefotetan
	procaine benzylpenicillin		cefoxitin
<b>Carbapenems</b>	doripenem	<b>Steroid antibacterials</b>	cefuroxime
	ertapenem		fusidic acid
	imipenem - cilastatin	<b>Streptogramins</b>	pristinamycin
	meropenem	<b>Streptomycins</b>	streptomycin
	meropenem - vaborbactam	<b>Sulfonamide-trimethoprim combinations</b>	sulfamethoxazole - trimethoprim
<b>Extended-spectrum penicillins</b>	amoxicillin	<b>Tetracyclines</b>	doxycycline
	ampicillin		minocycline
	pivmecillinam		tetracycline
	temocillin		tigecycline
<b>First-generation cephalosporins</b>	cefalexin	<b>Third-generation cephalosporins</b>	cefixime
	cefalotin		cefotaxime
	cefazolin		ceftazidime
<b>Fluoroquinolones</b>	ciprofloxacin		ceftazidime - avibactam
	levofloxacin	ceftriaxone	
	moxifloxacin	<b>Trimethoprim</b>	trimethoprim
	norfloxacin	<b>Other (including other cephalosporins and penems)</b>	ceftaroline fosamil
<b>Fourth-generation cephalosporins</b>	cefepime		ceftolozane - tazobactam
	cefpime		daptomycin
<b>Glycopeptides</b>	dalbavancin		faropenem
	oritavancin		fosfomicin
	teicoplanin	linezolid	
	vancomycin	rifampicin	
<b>Imidazole derivatives</b>	metronidazole	tedizolid	
<b>Intermediate-acting sulfonamides</b>	sulfadiazine		