AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE

2016 Aged Care National Antimicrobial Prescribing Survey Report

September 2017

AURA Antimicrobial Use and Resistance in Australia

NCAS National Centre for Antimicrobial Stewardship

GUIDANCE

VICNISS HEALTHCARE ASSOCIATED INFECTION SURVEILLANCE

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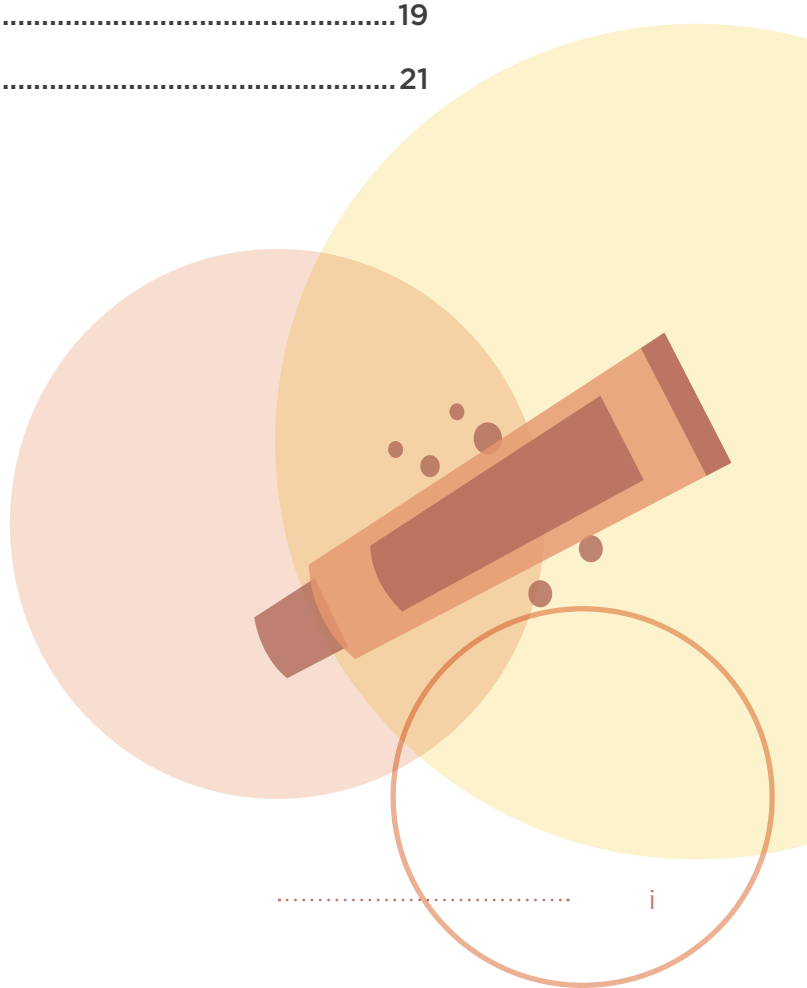
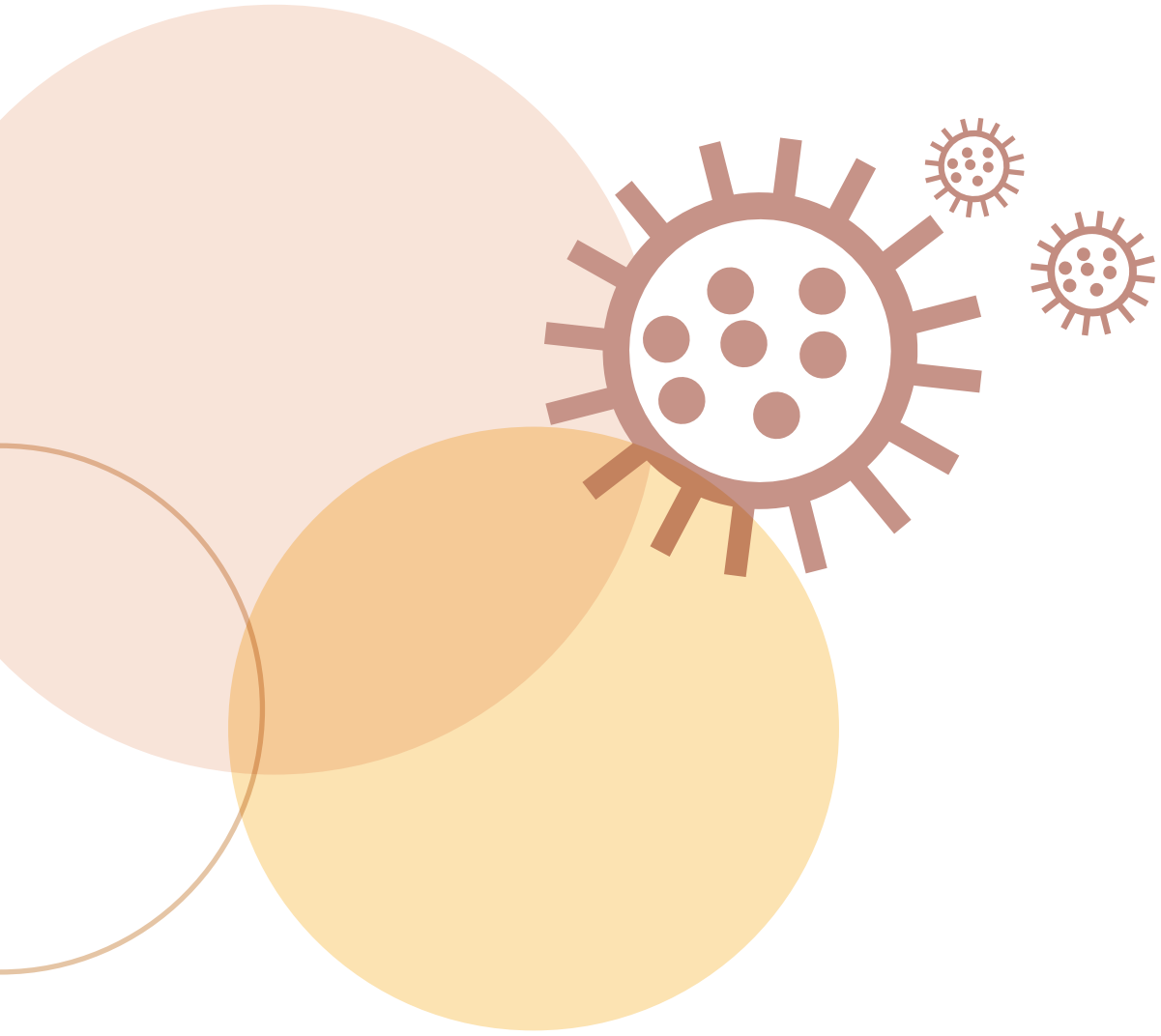


Abbreviations

acNAPS	Aged Care National Antimicrobial Prescribing Survey
AMR	antimicrobial resistance
AMS	antimicrobial stewardship
MPS	multipurpose service
NCAS	National Centre for Antimicrobial Stewardship
RACF	residential aged care facility
RICPRAC	Rural Infection Control Practice Group
VICNISS	Victorian Healthcare Associated Infection Surveillance



Summary

The 2016 Aged Care National Antimicrobial Prescribing Survey (acNAPS) confirmed the results of the 2015 pilot survey, which identified documentation, duration of prescriptions and widespread use of topical antimicrobials as areas for improvement regarding infections and antimicrobial use in Australian aged care homes[1].

The acNAPS is a standardised survey instrument to monitor the prevalence of infections and appropriateness of antimicrobial use in Australian aged care homes. The objective of acNAPS is to support the implementation of antimicrobial stewardship programs in aged care homes. As part of the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System, the Australian Commission on Safety and Quality in Health Care (the Commission) funded the National Centre for Antimicrobial Stewardship to develop and pilot the acNAPS in 2015, and to repeat the survey to which this report relates in 2016.

There was a notable increase in participation by aged care homes in the 2016 acNAPS, from 186 facilities in 2015 to 251 in 2016. Audits of records related to antimicrobial use and infections were completed for 13,447 permanent, respite or transitional care residents in 2016. Almost 10% of residents surveyed were prescribed at least one antimicrobial (including topical antimicrobials). The 2016 acNAPS survey identified a number of issues of particular concern:

- A high rate of use of antimicrobials for unconfirmed infections: almost one-third (32.4%) of antimicrobials were prescribed for residents with no signs or symptoms of infection in the week prior to the antimicrobial start date
- Prescriptions did not meet the criteria for an infection[2,3],: just over two-thirds (67.2%) of prescriptions were for residents who did not have signs or symptoms of infection
- Duration of prescriptions: almost one-quarter (23%) of antimicrobials had been administered for longer than six months
- Widespread use of topical antimicrobials: just over one-quarter (26.9%) of prescriptions; most minor skin infections are self-limiting and resolve without the use of an antibiotic with standard skin hygiene care, and if an antibiotic is required, topical antibiotics are only appropriate for patients with minor, localised areas of impetigo[4]
- Incomplete documentation: the antimicrobial start date was unknown for 3.2% of antimicrobials administered, while the indication for the antimicrobial was not documented for 22.1% of antimicrobials administered, and the review or stop date was not documented for 49.9% of antimicrobials administered.

In view of these findings, the Commission will work with the Department of Health on strategies to promote implementation of antimicrobial stewardship programs in aged care homes through application of the Commission's Antimicrobial Stewardship Clinical Care Standard[5].

On the survey day in 2016, 3.1% of aged care home residents had signs or symptoms of infections, while 1,590 residents were prescribed a total of 1,867 antimicrobials.

Respiratory tract (34.5% of the total), skin or soft tissue (29.3%) and urinary tract (14.8%) infections were the three most common indications for prescribing antimicrobials. Cefalexin (21.7%) was the most commonly prescribed antimicrobial. The second most commonly prescribed antimicrobial was topical clotrimazole (13.3%).

In addition to the potential for the prescribing practices identified to promote antimicrobial resistance, they may also contribute to higher risks of medication adverse effects.

All Australian aged care homes and multi-purpose services were able to participate in acNAPS in 2016. All states, remoteness areas and provider types were represented; there were no contributors from the Australian Capital Territory or the Northern Territory. The majority of aged care homes that participated were located in Victoria (64.1%), and 62.5% of participating aged care homes were operated by a state government. Forty-one per cent were classified as inner regional[6].

The Commission and the National Centre for Antimicrobial Stewardship will continue to collaborate to support acNAPS and to identify priorities for local, state and territory, and national quality improvement interventions to increase appropriate antimicrobial use in Australian aged care homes.

Introduction

The Aged Care National Antimicrobial Prescribing Survey (acNAPS) is a collaborative project between the National Centre for Antimicrobial Stewardship (NCAS), the Guidance group based at Melbourne Health and Victorian Healthcare-Associated Infection Surveillance System (VICNISS) Co-ordinating Centre.

The acNAPS was piloted in 2015 with funding provided by the Australian Commission on Safety and Quality in Health Care (the Commission). The survey was repeated in 2016 to contribute to the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System. The Commission established AURA with funding from the Australian Government Department of Health.

The acNAPS is a standardised survey instrument to monitor the prevalence of infections and appropriateness of antimicrobial use in Australian aged care homes. The acNAPS was based on a similar survey developed by the VICNISS Coordinating Centre and Rural Infection Control Practice Group that was undertaken annually by most Victorian public aged care homes between 2011 and 2014.

Aged care homes are recognised nationally and internationally as an important community setting for monitoring antimicrobial resistance and antimicrobial use, because of the significant burden of infection and colonisation with resistant organisms. International and Australian data have demonstrated high levels of unnecessary antimicrobial prescribing and inappropriate antimicrobial use in this setting[7].

Surveillance of antimicrobial use and establishing approaches to antimicrobial stewardship that are evidence based and nationally consistent across settings, including aged care homes, are a priority for national action in Australia[8].

The Australian Government requires residential aged care homes that receive government subsidies to meet accreditation quality standards to ensure they provide the best care possible[9]. Within the current Aged Care Accreditation Standards, Standard 2 (Health and personal care) services are required to ensure medication management is safe and accurate.

To comply with this requirement, residential aged care homes must have an effective antimicrobial stewardship program.

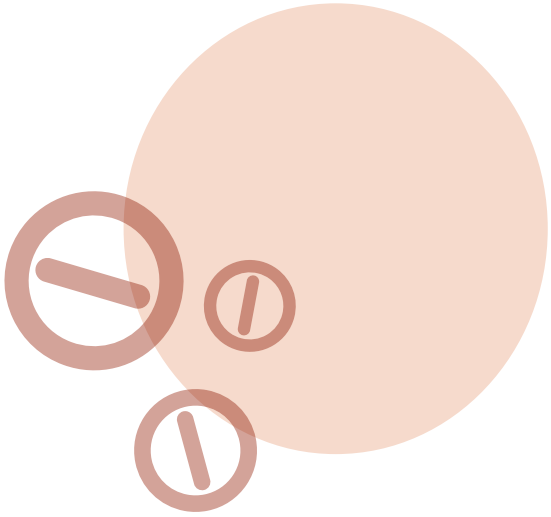
The aim of acNAPS is to promote improved safety and quality of care for residents in Australian aged care homes by monitoring the prevalence of infections and identifying inappropriate antimicrobial use. The long-term objectives of acNAPS are to:

- Describe and compare infection prevalence and antimicrobial prescribing patterns at a local, regional, state and national level
- Help identify priorities for interventions and enable monitoring of their implementation
- Assist aged care providers and clinicians to address the identified priorities
- Assist aged care homes to demonstrate concordance with the Australian Aged Care Accreditation Standards.

Aged care homes contribute voluntarily to acNAPS. After the successful 2015 pilot, feedback from acNAPS participants was reviewed and the methodology and resources were modified accordingly.

This report presents acNAPS data collected between 27 June and 9 September 2016. It builds on the report of the 2015 acNAPS pilot[10].

The acNAPS data collection tool and all resources are available for aged care homes to use at any time to audit their antimicrobial practices. This allows aged care homes to monitor changes in antimicrobial prescribing and assess implementation of antimicrobial stewardship interventions.



Methods

Survey Method

In 2016 aged care homes could choose to use one of the following two survey methods to collect data for acNAPS. Method 2 was recommended for smaller aged care homes that wished to obtain results from a more appropriate sample size to assess their performance.

In 2015 only the single-day point-prevalence survey (Method 1) was used for data collection.

Method 1: A single-day point prevalence survey only

On the survey day, all residents are screened to determine if they:

- Are prescribed antimicrobial therapy and/or
- Have signs and symptoms of a suspected or confirmed infection

Method 2: A single-day point prevalence survey plus an additional one month retrospective survey

On the survey day, all residents are screened to determine if they:

- Are prescribed antimicrobial therapy and/or
- Have signs and symptoms of a suspected or confirmed infection

In addition, all residents present on the survey day are screened to determine if they were prescribed antimicrobial therapy on any day during the previous month (that was ceased prior to the survey day).

Resources to support data collection

The data collection forms and the information technology support provided to contributors to acNAPS in 2016 are described below.

Residential Aged Care Facility form (Appendix 1)

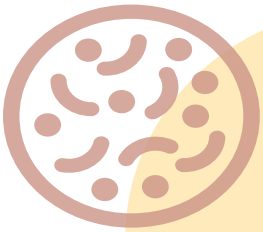
Each participating aged care home was required to complete the Residential Aged Care Facility form.

New data fields for 2016 compared with 2015 included:

- Use of endorsed guidelines for the management of urinary tract infections (Yes, No)
- Availability of alcohol-based hand rubs (Yes, No)
- Delivery of hand hygiene training sessions (Yes, No).

Data fields that were included in 2015 but discontinued in 2016 were:

- Online planning system used (none, Autumn Care, Lee Total Care, I-Care, Management Advantage and Other)
- Access to microbiology reports (hard copy only, electronic only, both, no access)
- Residents with Hospital in the Aged Care Home or in-reach services (number)
- Residents with an intravenous catheter present on audit date (number).



Antimicrobial and Infection forms (Appendices 2 and 3)

An 'Antimicrobials' form was required to be completed for residents who were receiving an antimicrobial on the survey day (Methods 1 and 2), and within the previous month (Method 2 only).

In 2015, if the antimicrobial was prescribed for prophylaxis and the antimicrobial start date was unknown or greater than six months prior to the survey day, data were not collected about microbiology results, urinary investigations and devices and presence of infection signs and/or symptoms. Information was collected in 2016 on antimicrobials prescribed for prophylaxis.

Microbiology data were required to be collected from final microbiology reports about specimens that were taken during the applicable timeframe. If more than one specimen was collected within the timeframe in 2015, only the earliest result was to be reported. In 2016, only the latest result was to be reported.

For the 'Antimicrobials' form, the list of infection signs and symptoms were divided into seven body systems: urinary tract, respiratory tract, skin or soft tissue, gastrointestinal tract, oral, eye and other.

For the 'Infections' form, gastrointestinal tract was excluded for the 2016 survey for the following reasons:

- Limited resources in aged care to collect and submit data
- Gastrointestinal infections have been infrequently reported as part of point-prevalence studies over six years (VICNISS/ Rural Infection Control Practice Group and acNAPS data combined)
- Gastrointestinal outbreaks are reported through communicable diseases channels
- The focus should be on the accurate data collection and follow action for the more common infections – UTIs, respiratory infections and skin /mucosal infections
- Data about gastrointestinal infections are collected for a different timeframe – the antimicrobial start date and six days prior.

For all infection types, explicit constitutional signs and symptoms (fever, leucocytosis, acute change in mental status from baseline and acute functional decline in activities of daily living) were to be considered.

In 2016 the data sources that could be used to report infection signs and symptoms for the 'Antimicrobials' and 'Infections' forms differed. For the 'Antimicrobials' form, the signs and symptoms had to be documented in official documents such as resident histories and hospital discharge summaries. For the 'Infections' form, it was acceptable too to use sources such as interviewing a senior aged care home clinician (for example, a nurse in charge), or documents such as handover notes, incident reports and wound folders.

Classification of infections

Infections were classified as aged care home-associated or non-aged care home-associated. The criteria for an infection were based on the internationally recognised 1991 McGeer et al. definitions developed for use in long-term care facilities, and revised by Stone et al. in 2012, taking into account the most recent evidence and the availability of improved diagnostics for surveillance. In the revised version, the majority of definitions were retained with only minor revisions, except for urinary tract infection and respiratory tract infection.

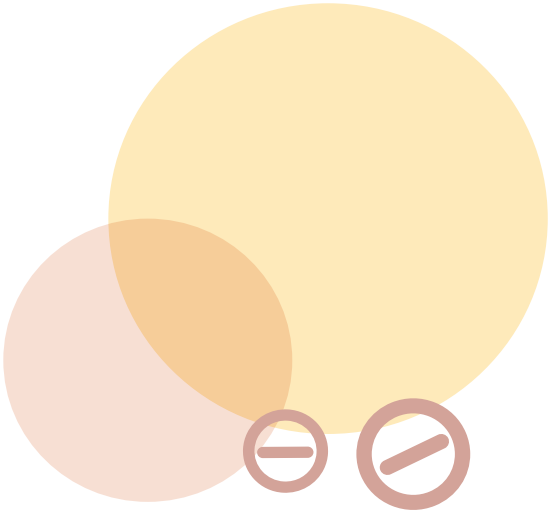
Timeframe

The data submission period for acNAPS was between 27 June 2016 and 9 September 2016.

Recruitment

All Australian aged care homes and multi-purpose services were able to participate in acNAPS.

Numerous strategies were used to notify Australian aged care homes about the 2016 acNAPS and to encourage participation. The objectives were to recapture the aged care homes operated by the Victorian Government that previously participated, and to recruit additional aged care homes in all states and territories.



Participation was promoted from June 2016 onwards through:

- An email to all previous aged care home and multi-purpose service participants
- Newsletters issued by NCAS, the Commission, the then Department of Health and Aged Care, the Australian Aged Care Quality Agency, NPS MedicineWise, the Australasian College for Infection Prevention and Control, AusPharm and the Pharmaceutical Society of Australia
- A letter from the Commission and NCAS, with an enclosed copy of the report of the 2015 acNAPS pilot, to major aged care provider organisations
- A letter to the Australian College of Rural and Remote Medicine
- An email from the Commission to all Australian Multi-Purpose Service Program contacts
- A flyer in most state Aged Care Better Practice Conference satchels
- NCAS and Commission tweets.

Support

NCAS ran 12 optional online training sessions for surveyors – 10 one-hour beginner sessions for new surveyors to provide detailed information on the acNAPS methodology, and two brief refresher sessions for experienced surveyors, mostly focused on changes compared with the 2015 acNAPS. The NAPS coordinating team provided email and telephone assistance on request during the official data submission period.

Limitations

The results of the 2016 acNAPS included in this report should be interpreted in the context of the following limitations.

Sampling and selection bias

The aged care homes included were not a random sample, because participation was voluntary. The majority of participating aged care homes were from Victoria, had participated in similar previous surveys, and were associated with acute healthcare facilities. It is possible that the sample group had relatively high awareness about infections and antimicrobial use. As a result, the results cannot be generalised to all Australian aged care homes.

Infection definitions

The criteria for an infection were based on the internationally recognised surveillance definitions from McGeer et al. as modified by Stone et al. in 2012[2, 3] The criteria were designed to increase the likelihood that events captured are true infections. Signs and symptoms of infection in older residents may be atypical, so failure to meet the definitions may not fully exclude the presence of a true infection. In addition, the McGeer et al. definitions require microbiological confirmation for some infections (for example, urinary tract infection). This means that these infections will not be confirmed unless specimens are taken.

Seasonal variation

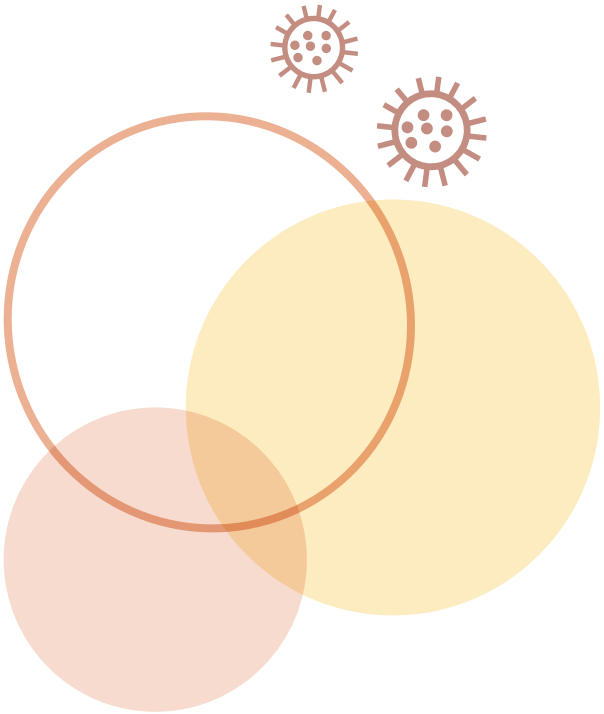
The survey was conducted during winter. The results may have been different in another season.

Validation

The analysis relied on the validity of local assessments.

Comparison with previous surveys

The results of the 2016 acNAPS may not be comparable with the 2015 acNAPS pilot or previous VICNISS surveys because of changes in methodology.



Survey Results

The results of the 2016 acNAPS survey are summarised below.

Surveyors

Surveyors were mostly infection control professionals, nurses and pharmacists.

Participation

In 2016 251 aged care homes submitted data to acNAPS. As shown in Table 1, all states, remoteness areas and organisation types were represented; there were no participants from either the Australian Capital Territory or the Northern Territory.

Audits were completed for 13,447 permanent, respite or transitional care residents in 2016, compared with 7,589 audits in 2015.

Most participants were located in Victoria (64.1%), classified as inner regional (41.4%) and operated by a state government (62.5%). A marginally greater number of residents were audited in not-for-profit aged care homes (6,070) compared with government facilities (5,712).

About one third (30.7%) of participating aged care homes chose to use the single-day point-prevalence survey plus an additional one-month retrospective survey method (Method 2).

Table 1 **Participating aged care homes by state, remoteness area classification and provider type, acNAPS 2016**

Participating aged care homes		2015		2016		2016 residents audited
		No.	%	No.	%	No.
State	NSW	17	9.1	35	13.9	1,619
	Qld	7	3.8	23	9.2	2,007
	SA	8	4.3	7	2.8	587
	Tas	6	3.2	10	4.0	570
	Vic	130	69.9	161	64.1	7,454
	WA	18	9.7	15	6.0	1,210
Remoteness	Major Cities	51	27.4	74	29.5	5,934
	Inner regional	81	43.5	104	41.4	5,085
	Outer regional	45	24.2	61	24.3	2,206
	Remote	8	4.3	9	3.6	154
	Very remote	1	0.5	3	1.2	68
Provider type	Not-for-profit	37	19.9	76	30.3	6,070
	Charitable	9	-	25	-	-
	Religious	20	-	29	-	-
	Community based	8	-	22	-	-
	Government	141	75.8	157	62.5	5,712
	State government	140	-	156		
	Local	1	-	1	-	-
	Private	8	4.3	18	7.2	1,665
Total	**186**	**-**	**251**	**-**	**-**	**13,447**

Aged care home and resident characteristics

In 2016 most aged care homes (97.6%) completed the resources section on the 'Residential Aged Care Facility' form. Of those who completed that section, most reported that hand hygiene training sessions were held for staff (94.7%), and that alcohol-based hand-rubs were available (85.3%).

In 2016, 84.9% of participants reported that they had access to the *Therapeutic Guidelines: Antibiotic*[11], which was similar to 2015 (85.3%).

The National Residential Medication Chart[12] and endorsed guidelines for management of suspected urinary tract infections were used in 44% and 54.3% of participating aged care homes respectively in 2016 (Table 2).

Table 2 Summary of aged care resources, acNAPS contributors, 2016

Question	Response	No.	%
National Residential Medication Chart used	Yes	110	44.0
	No	128	52.2
	Unsure	8	3.3
Availability of *Therapeutic Guidelines: Antibiotic*	Electronic	93	38.0
	Hard copy	41	16.7
	Electronic and hard copy	75	30.6
	No access	37	15.1
Endorsed guidelines routinely used for management of suspected urinary tract infections #	Yes	133	54.3
	No	70	28.6
	Unsuree	42	17.1
Alcohol-based hand rubs available	Yes	209	85.3
Hand hygiene training sessions held for staff	Yes	232	94.7
# Surveyors were not asked to specify which endorsed guidelines were used			

Additional data were collected on all residents present in the aged care home on the survey day (Table 3). For both 2015 and 2016, more than half of the residents were older than 85 years, and about one-third were male (34.4% and 32.9% respectively).

In 2016, 4.7% of residents had been admitted to a hospital in the previous 30 days, and 3.8% had an in-dwelling urinary catheter on the survey day.

Table 3 Number and characteristics of all residents on the survey day, acNAPS contributors, 2016

Indicator	2015		2016	
	No.	%	No.	%
Present on survey day	7,589	-	13,447	-
>85 years	3,968	52.3%	7,307	54.3%
Admitted to hospital in previous 30 days	277	3.7%	632	4.7%
Indwelling urinary catheter present	329	4.3%	514	3.8%

Prevalence of antimicrobial use and infections

On the 2016 survey day, the prevalence of residents prescribed at least one antimicrobial was 9.7%, compared with 11.3% in 2015. If all topical antimicrobials were excluded, the prevalence of antimicrobial use was 7.1%, compared with 7.9% in 2015.

In 2016 the prevalence of residents with infection signs or symptoms was 3.1% (n=417/13,447), compared with4.5% in 2015.

Prevalence results on the survey day, classified by state, remoteness and provider type are shown in Table 4.

Table 4 Prevalence of antimicrobial use and infection, by state, remoteness and provider type on the survey day, acNAPS 2016

Category		Homes	Residents prescribed at least one antimicrobial		Residents with infection signs and/or symptoms	
		No.	No.	%	No.	%
State	NSW	35	209	12.9%	62	3.8%
	Qld	23	248	12.4%	48	2.4%
	SA	7	81	13.8%	21	3.6%
	Tas	10	47	8.2%	8	1.4%
	Vic	166	569	7.6%	223	3.0%
	WA	15	146	12.1%	55	4.5%
Remoteness	Major Cities	74	623	10.5%	184	3.1%
	Inner regional	104	432	8.5%	145	2.9%
	Outer regional	61	213	9.7%	68	3.1%
	Remote	9	26	19.0% a	17	12.4%a
	Very remote	3	6	8.8%	3	4.4%
Organisation type	Not for profit	76	660	10.9%	166	2.7%
	Government	157	531	9.3%	204	3.6%
	Private	18	109	6.5%	47	2.8%
National total		**251**	**1,300**	**9.7%**	**417**	**3.1%**

a The rates of antimicrobial use and infections reported in remote aged care homes should be interpreted with caution as only a small number participated in the 2016 acNAPS (see Table 1)

Antimicrobial use

Antimicrobial data collected using the 'Antimicrobials' form for both Method 1 and Method 2 are combined for the analyses presented in this report. In 2016 1,590 residents were prescribed a total of 1,867 antimicrobials. Just over one-quarter (26.6%) of residents had a documented allergy or adverse drug reaction to an antimicrobial.

Quality indicators

The two key quality indicators against which aged care homes were assessed for acNAPS were 'indication documented in the resident's history and 'review or stop date documented'. In 2016 the results for both indicators were higher than the 2015 results (Table 5).

Table 5 Results of quality indicators for all contributing aged care homes, acNAPS 2016

Quality Indicator	% of total antimicrobial prescriptions	
	2015 (n=975)	2016 (n=1,867)
Indication documented	68.4	77.9
Review or stop date documented	35.0	50.1

There were substantial variations in the two key quality indicators across states, remoteness classifications and organisation types (Table 6). The start date was unknown for 60 (3.2%) prescriptions. For 435 (23.3%) of those prescriptions, the start date was more than six months prior to the survey day.

The 2015 and 2016 acNAPS data is currently being analysed to determine realistic target benchmarks for these measurements.

The European Surveillance of Antimicrobial Consumption point-prevalence survey benchmark of 95%, which was cited in the report of the 2015 pilot acNAPS for documentation of indication, may not be applicable in the Australian context, and there is no published best-practice target for documenting a review or stop date[13]

Table 6 Key results, by state, remoteness and provider type, acNAPS participants, 2016

Category		Number. of prescriptions		Indication documented (%)		Review or stop date documented (%)	
		2015	2016	2015	2016	2015	2016
State	NSW	63	329	63.5	80.9	31.8	55.6
	Qld	30	375	73.3	78.1	50.0	47.5
	SA	109	94	89.0	70.2	32.1	50.0
	Tas	18	58	44.4	74.1	72.2	53.4
	Vic	358	803	76.0	79.1	50.3	50.3
	WA	397	208	57.4	73.1	19.7	44.2
Remoteness	Major Cities	480	619	70.6	79.3	34.2	49.0
	Inner regional	350	827	66.6	74.8	36.0	49.4
	Outer regional	131	365	64.1	78.1	33.6	51.5
	Remote	14	33	78.6	93.9	50.0	42.4
	Very remote	0	23	N/A	87.0	N/A	95.7
Organisation type	Not for profit	524	832	62.0	76.9	24.4	43.9
	Government	408	844	75.2	75.4	46.1	52.7
	Private	43	191	81.4	93.7	58.1	65.4
National total		**975**	**1,867**	**68.4**	**77.9**	**35.0**	**50.1**

Table 7 shows the survey results for mode of prescription with a known start date less than six months prior to the survey day. As for 2015 the majority of these 1,372 antimicrobial prescriptions were written by a prescriber rather than being issued in another form.

For 101 (7.4%) of these, the prescription was given via a telephone or fax order. Of those prescriptions, 45.5% were for residents who were examined by a prescriber within three days of the antimicrobial start date, and 49.5% were for residents who were not examined by a prescriber during that time period.

Table 7 Mode of prescription for prescriptions with a known start date less than six months prior to the survey day, acNAPS contributors, 2016

Mode of prescription	2015		2016	
	Number	%	Number	%
Written by prescriber	531	85%	1244	90.7%
Phone or fax order	51	8.2%	101	7.4%
Unknown	43	6.9%	27	2.0%
Total	**625**	**-**	**1372**	

Most commonly prescribed antimicrobials

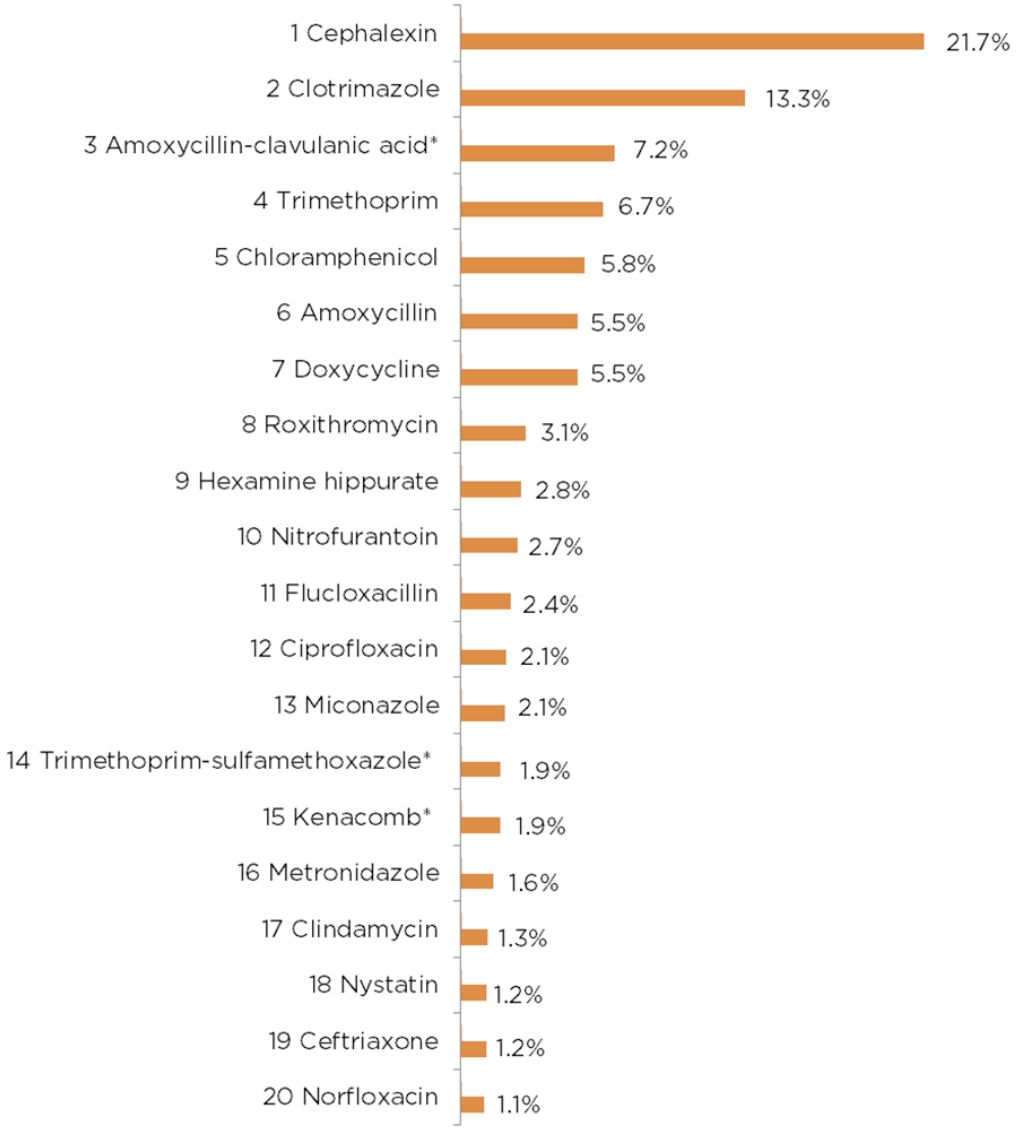
The 20 most commonly prescribed antimicrobials for residents in aged care homes that contributed to acNAPS are shown in Figure 1.

In 2016, similar to 2015, the top five antimicrobials prescribed were cefalexin (21.7%), clotrimazole (13.3%), amoxicillin–clavulanate (7.2%), trimethoprim (6.7%) and chloramphenicol (5.8%).

Most antimicrobials were orally (71.0%) or topically (26.9%) administered. The topical antimicrobials most frequently prescribed included:

- Clotrimazole (13.3%)
- Chloramphenicol (5.8%)
- Miconazole (2.1%)
- Gramicidin–neomycin–nystatin (Kenacomb®) (1.9%)
- Nystatin (1.2%).

Figure 1 **Most commonly prescribed antimicrobials, as a percentage of all antimicrobials prescribed in acNAPS contributors, 2016** [a]



a n=1867 antimicrobial prescriptions
* Kenacomb®

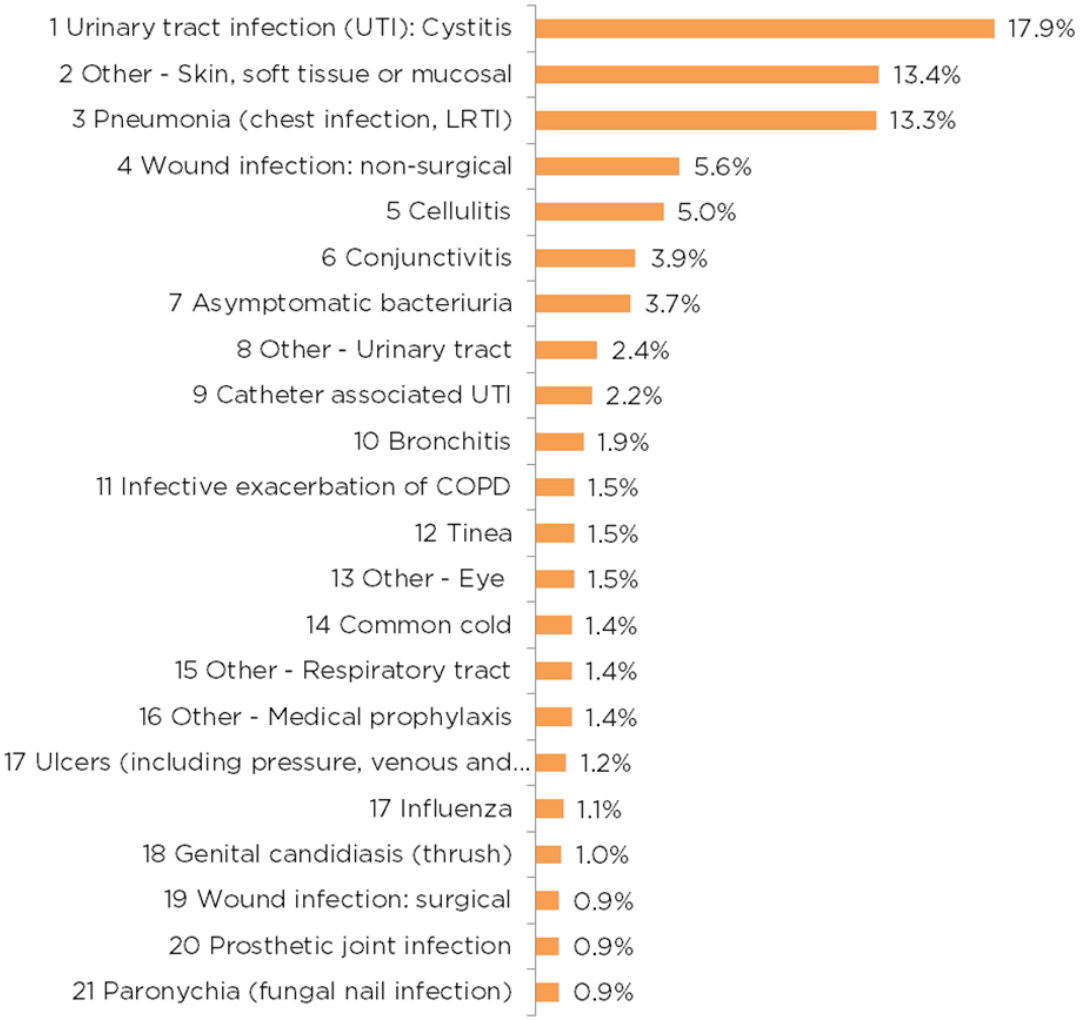
Common indications for prescribing antimicrobials

The 20 most common indications for prescribing antimicrobials in the aged care homes that contributed to acNAPS in 2016 are shown in Figure 2.

In 2016 the top five nominated indications were urinary tract infection: cystitis (17.9%), non-specified skin, soft tissue or mucosal infection (13.4%), pneumonia (chest infection, lower respiratory tract infection), wound infection: non-surgical (5.6%), and cellulitis (5.0%).

The indication was unknown for 5.2% of prescriptions. In 2015 the top five nominated indications were non-specified skin, soft tissue or mucosal infection (17.5%), urinary tract infection: cystitis (16.7%), lower respiratory tract infection (11.8%), tinea (8.4%) and conjunctivitis (5.2%).

Figure 2 **Most commonl indications for antimicrobial prescriptions, as a percentage of all indications,**



NOTES:
COPD = chronic obstructive pulmonory disease
Ulcers = pressure, venous and arterial

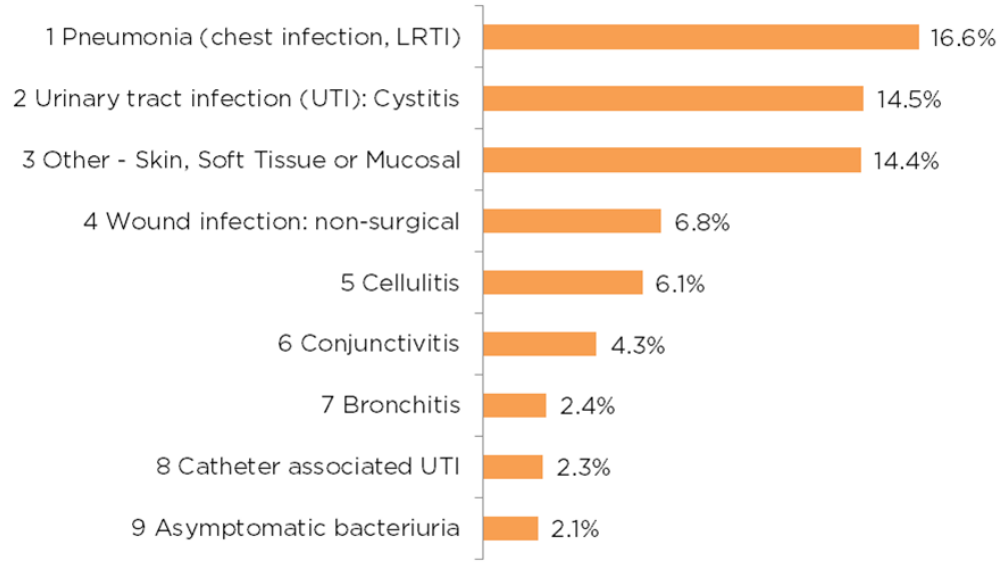
In both 2015 and 2016 antimicrobials were mostly prescribed for therapeutic indications – 77.1% and 78.3% respectively

A breakdown of the most common indications for prescription of antimicrobials for treatment and prophylaxis is shown in Figures 3 and 4. For both 2015 and 2016, urinary tract infections were the most common reason for use of prophylactic antimicrobials (36.3% and 30.4% respectively).

In 2015 unspecified skin, soft tissue or mucosal infections was the most common indication for therapeutic prescriptions (19.4%).

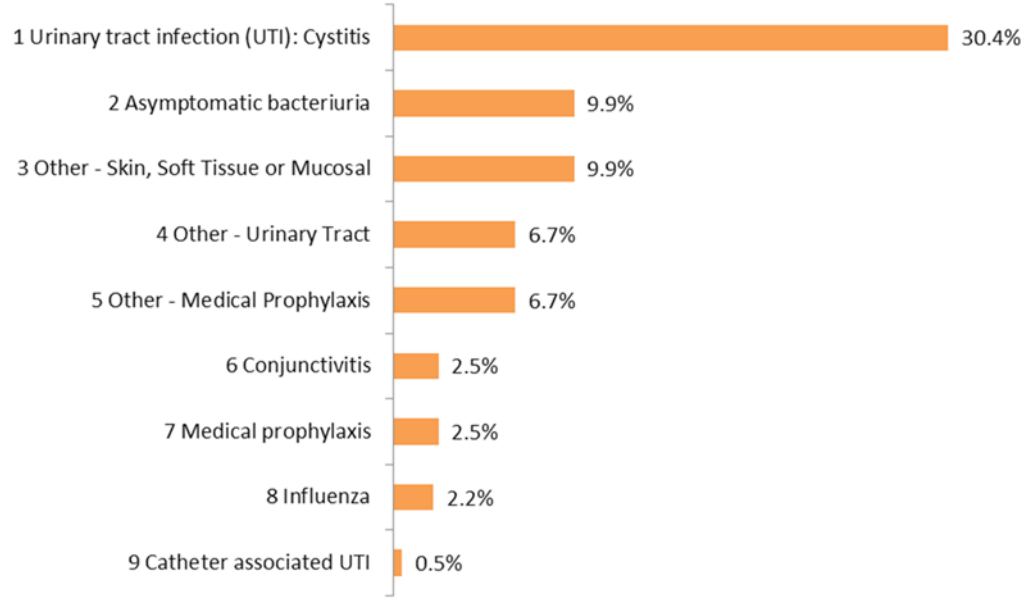
In 2016 pneumonia (chest infection, lower respiratory tract infection) was the most common indication (16.6%). The percentage of unspecified skin, soft tissue or mucosal indications decreased to 14.4% compared with 2015

Figure 3 **Most common treatment indications, as a percentage of all treatment indications, acNAPS contributors, 2016**



Note LRTI=lower respiratory tract infection

Figure 4 **Most common prophylaxis indications, as a percentage of all prophylaxis indications, acNAPS contributors, 2016**

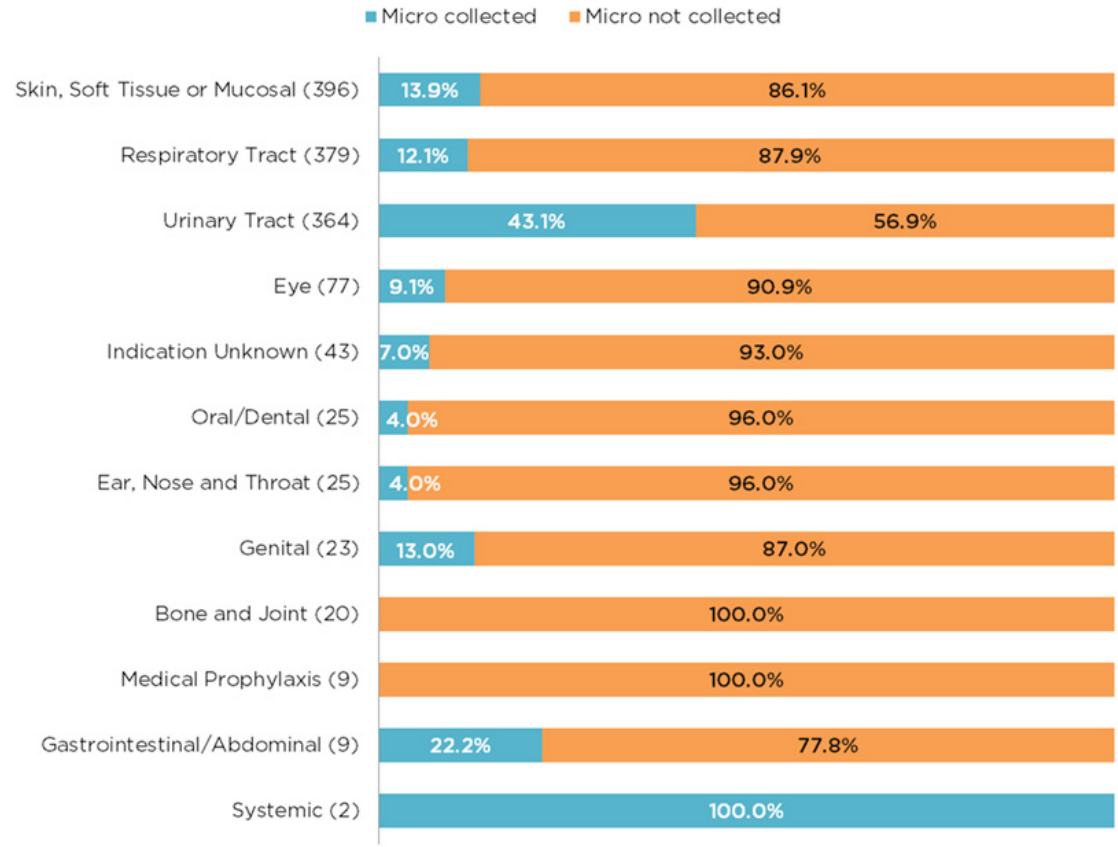


Microbiology, urinary investigations and infections

Additional information regarding microbiology, urinary investigations and signs and symptoms of infection present in the week prior to the antimicrobial start date was collected, using the 'Antimicrobials' form, for a subset of prescriptions for which the known start date was less than six months prior to the survey day.

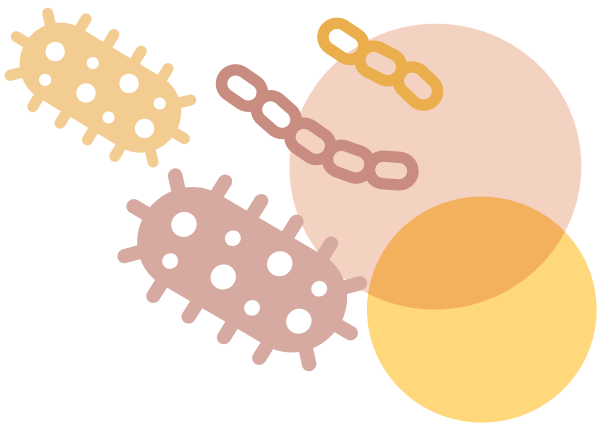
Of the total 1,867 antimicrobial prescriptions, additional information was collected for the 1,372 (73.5%) prescriptions for which start date was known and was less than six months prior to the survey day. A microbiological sample was collected for 20.2% (n=277/1,372) of those prescriptions within the week prior to the antimicrobial start date. Specimens were mostly collected for urinary tract infections (43.1%) as shown in Figure 5.

Figure 5 **Percentage of antimicrobial prescriptions that had microbiological samples taken, by body system, acNAPS contributors, 2016 * #**



* The number of prescriptions is displayed next to the name of each body system

\# Body system as per the indication specified for commencing the antimicrobial



Infection signs and/or symptoms in the week leading up to the survey

Just over two-thirds of prescriptions (67.6%) were for residents with infection signs or symptoms that were present in the week prior to the antimicrobial start date.

Almost 80% of these infections were classified as aged care home-associated and 39.2 % (n=364/928) met the McGeer et al. confirmed infection criteria. Compliance with the McGeer et al confirmed infection criteria was highest for eye (100%) and skin/soft tissue infections (48.2%) as shown in Table 8.

Table 8 Number and percentage of antimicrobial prescriptions where infection signs and/or symptoms were recorded and McGeer et al. criteria were met, by body system, acNAPS participants, 2016

Body system	Number of prescriptions		ACH-associated [a] suspected infections		Infections that met McGeer et al criteria	
	Number	% (n=928)	Number	%	Number	%
Respiratory tract	320	34.5	286	89.4	126	39.4
Skin, soft tissue	272	29.3	245	90.1	131	48.2
Urinary tract	137	14.8	111	81.0	16	11.7
Eye	58	6.3	56	96.6	58	100.0
Other body system	28	3.0	21	75.0	28	100.0
Oral	16	1.7	13	81.3	4	25.0
Gastrointestinal tract	3	0.3	2	66.7	1	33.3
TOTAL	**928**	**-**	**734**	**79.1**	**364**	**39.2**

a ACH = aged care home

Note: some prescriptions may have had infection signs or symptoms from more than one body system

Infections on the survey day itself

On the survey day there were 417 residents who were reported to have signs or symptoms of an infection. For 10.6% of the 443 suspected infections, a microbiological specimen was taken in the 48 hours prior to the survey date. The majority of those (63.8%) were urine specimens.

Overall 36.2% of suspected infections met the McGeer et al. confirmed infection definitions (Table 9).

The zero percentage for urinary tract infections may, in part, be explained by the requirements of the McGeer et al. confirmed infection criteria. In order to meet the definition for a McGeer et al.-confirmed urinary tract infection, a microbiological urine specimen must be taken and an organism must be isolated by culture.

Table 9 Number and percentage of residents with infection signs and/or symptoms by body system[a], acNAPS contributors, 2016

Body system	Number of suspected infections	ACH associated suspected infections		Infections that met McGeer et al criteria	
		Number	%	Number	%
Respiratory tract	155	132	85.2	55	35.5
Skin, soft tissue	145	123	84.8	75	51.7
Urinary tract	79	63	79.8	0	0
Other body system	34	27	79.4	0	0
Eye	20	17	85.0	18	90.0
Oral	10	8	80.0	3	30.0
TOTAL	**443**	**370**	**88.7**	**151**	**36.2**

[a] On the survey day data were not collected on gastrointestinal tract infections

Conclusion and future plans

The 2016 acNAPS has confirmed the 2015 pilot acNAPS results, which identified the need for improvement in practice regarding infections and antimicrobial use in Australian aged care homes. These issues include antimicrobial prescriptions for unconfirmed infections, prolonged duration of antimicrobial prescriptions and the widespread use of topical antimicrobials.

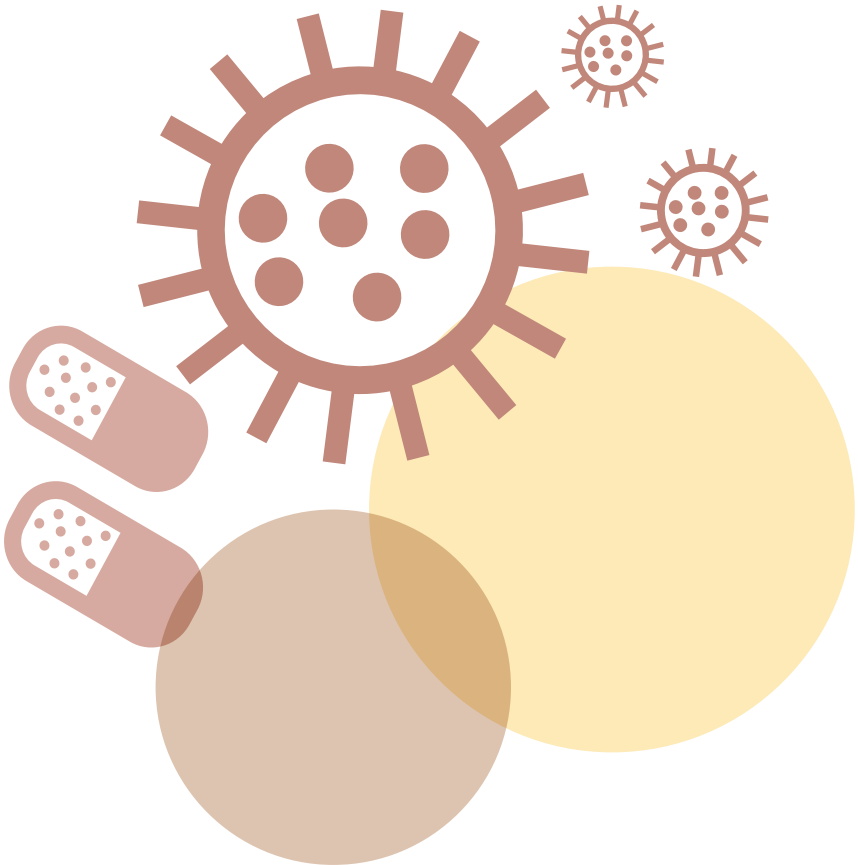
Results of particular concern in 2016 were:

- About one-third (32.4%) of the antimicrobials were prescribed for residents with no infection signs or symptoms in the week prior to the antimicrobial start date
- Antimicrobials had been commenced more than six months before the survey day for 23.3% prescriptions.

Coupled with poor compliance with documentation of prescribing elements – such as clinical indication, dose and intended duration of prescriptions – these issues may contribute to higher risks of medication adverse effects and may promote antimicrobial resistance. The results reinforce the urgent need for antimicrobial stewardship programs to be implemented in Australian aged care homes.

The Commission will work with the Department of Health on strategies to promote implementation of antimicrobial stewardship programs in aged care homes through application of the Commission's Antimicrobial Stewardship Clinical Care Standard.

The Commission and NCAS will continue to collaborate to support acNAPS, and identify priorities for local, state and territory, and national quality improvement interventions to increase appropriate antimicrobial use in Australian aged care homes. The frequency and scope of future acNAPS surveys will be also be reviewed regularly.



Appendix 1 Residential Aged Care Facility Form

AGED CARE NAPS National Antimicrobial Prescribing Survey

RACF Form

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Residential Aged Care Facility name

Survey date / /

1. Facility Data

National Residential Medication Chart used?	❒ yes	❒ no	❒ unsure
Access to Therapeutic Guidelines: Antibiotic	❒ hard copy only ❒ no access	❒ electronic only	❒ both
Endorsed guidelines routinely used for the management of suspected urinary tract infections	❒ yes	❒ no	
Pharmacy services provided *(tick all that apply)*	❒ supply	❒ education	❒ auditing
	❒ medicine review *(chart review or medication management)*		
Alcohol based hand-rubs available (in all rooms and/or staff use portable personal dispensers)	❒ yes	❒ no	
Hand hygiene training sessions are held for staff	❒ yes	❒ no	

2. Resident Data

Enter the total number of residents with the following characteristics **on the survey day**

You may wish to use the **Worksheet** on the following page to help identify these residents

		Total
Number of residents present		
Residents aged > 85 years		
Male residents		
Residents admitted to hospital in previous 30 days		
Residents currently in hospital with a suspected or confirmed infection		
Residents with a urinary catheter present on the survey day		
Residents prescribed an antimicrobial on the survey day	- Complete an **Antimicrobials Form**	
Residents with signs and/or symptoms of infection on the survey day	- Complete an **Infections Form**	

3. Additional Resident Data *(if conducting method 2, see pg.4 of the User Guide)*

Residents prescribed an antimicrobial during the last month (that were ceased prior to the survey day)	- Complete an **Antimicrobials Form**	

acNAPS RACF Form v2 20160624

AGED CARE NAPS National Antimicrobial Prescribing Survey

Antimicrobials Form

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Has the resident been prescribed an antimicrobial? ❒ no ❒ yes; *complete an Antimicrobials Form (separate forms required for antimicrobials that have different start dates)*

Does the resident have signs and/or symptoms of infection **on the survey day**? ❒ no ❒ yes; *complete an Infections Form*

1. Demographics

Identification number	Date of birth/age	Gender
	/ /	M / F / O

Admitted to hospital within 30 days	Urinary catheter present
Yes / No	Yes / No

Allergies and adverse drug reactions to antimicrobials

❒ nil known ❒ not documented ❒ yes; *specify drug and nature*

2. Antimicrobials

Start date*	Started at this RACF	Still prescribed today	Antimicrobial	Dose	Route	Freq	Initial mode of prescription: Unknown or > 6 months	Written by prescriber	Phone or fax order	Resident examined by a prescriber; within 3 days of start date: Yes	No	Not applicable	Indication documented	Specify documented or presumed indication	Was this for prophylaxis?	Review/stop date documented
/ /	❒	❒														
/ /	❒	❒														
/ /	❒	❒														
/ /	❒	❒														

**If the start date is unable to be determined or if > 6 months, document; 'unknown' or '> 6 months' and do not complete Sections 3, 4 and 5*

3. Microbiology; *complete for specimens collected on the start date or in the 6 days prior*

❒ **not collected;** *proceed to section 4* ❒ **collected;** *complete below and if multiple specimens of the same type, only include the one immediately previous to the start date*

❒ Urine Date collected / / ❒ final report attached	❒ Stool Date collected / / ❒ final report attached	❒ *Clostridium difficile* test Date collected / / ❒ final report attached
❒ Sputum Date collected / / ❒ final report attached	❒ Blood Date collected / / ❒ final report attached	❒ Norovirus test Date collected / / ❒ final report attached
❒ Swab Date collected / / ❒ final report attached	❒ Respiratory virus test Date collected / / ❒ final report attached	❒ Other

4. Urinary investigations and devices; *for urinary tract indications only*

Urinary catheter; *present on the start date* or in the 6 days prior*

❒ none ❒ intermittent *(in and out)* ❒ indwelling ❒ suprapubic ❒ external ❒ nephrostomy tube

Urinary dipstick; *performed on the start date or in the 6 days prior*

❒ not performed ❒ performed; *date* / /

Nitrite	❒ negative	❒ positive			❒ not recorded
Leucocyte esterase	❒ negative	❒ 1+	❒ 2+	❒ 3+	❒ not recorded

** Do not include if the catheter was inserted after the antimicrobial was first administered*

Comments

5.Signs and symptoms; *complete for all signs and/or symptoms of suspected or confirmed infections **documented on the start date or in the 6 days prior***

5a. Constitutional criteria

❒ No constitutional criteria identified

Fever
- ❒ Single oral temperature >37.8°C
- ❒ Repeated oral temperature >37.2°C, or rectal temperature >37.5°C
- ❒ Single temperature > 1.1°C over baseline from any site
- ❒ Chills or rigors

Acute change in mental status from baseline
(confusion, forgetfulness, etc.)
- ❒ Acute onset
- ❒ Fluctuating course
- ❒ Inattention
- ❒ Disorganised thinking or altered level of consciousness

Acute functional decline from baseline
Tick all relevant:
- ❒ Bed mobility
- ❒ Transfer
- ❒ Locomotion within facility
- ❒ Dressing
- ❒ Toilet use
- ❒ Personal hygiene
- ❒ Eating

As according to full blood examination results
- ❒ White blood cells elevated (WBC, leucocytes, etc.)
- ❒ Left shift documented

5b. System criteria; *multiple system criteria are possible*

Urinary tract

❒ RACF associated
❒ Non-RACF associated

All urinary tract criteria
- ❒ Acute pain on urination
- ❒ Acute pain, swelling or tenderness of the testes, epididymis or prostate
- ❒ New onset low blood pressure, with no alternate site of infection
- ❒ Either acute change in mental status or acute functional decline with no alternate diagnosis
- ❒ New onset chest wall pain, back pain or tenderness
- ❒ New onset suprapubic pain
- ❒ Pus discharging from around a catheter
- ❒ Blood in urine

New or marked increase in;
- ❒ incontinence
- ❒ urgency
- ❒ frequency

Respiratory tract

❒ RACF associated
❒ Non-RACF associated

All respiratory tract criteria
- ❒ Runny nose or sneezing
- ❒ Stuffy nose
- ❒ Sore throat
- ❒ Hoarseness
- ❒ Pain on swallowing
- ❒ Swollen or tender neck glands
- ❒ New headache or eye pain
- ❒ Myalgia or muscle pain
- ❒ Malaise
- ❒ Loss of appetite
- ❒ New or increased cough
- ❒ New or increased sputum
- ❒ O_2 saturation < 94% on room air or a reduction of > 3% from baseline
- ❒ New or changed lung abnormalities
- ❒ Chest wall pain
- ❒ Respiratory rate ≥ 25 breaths per minute
- ❒ Chest X-ray showing pneumonia or new infiltrate

Skin or soft tissue

❒ RACF associated
❒ Non-RACF associated

Cellulitis, soft tissue or wound infection
- ❒ Pus present at wound, skin or soft tissue site
- ❒ Heat
- ❒ Redness
- ❒ Swelling
- ❒ Tenderness or pain
- ❒ Serous discharge

Herpes simplex or zoster
- ❒ Vesicular rash
- ❒ Doctor or laboratory confirmation

Fungal skin infection
- ❒ Characteristic rash or lesions
- ❒ Doctor or laboratory confirmation

Scabies
- ❒ Maculopapular rash
- ❒ Itch
- ❒ Doctor or laboratory confirmation
- ❒ Linkage to laboratory confirmed scabies

Gastrointestinal tract

❒ RACF associated
❒ Non-RACF associated

All gastrointestinal tract criteria
- ❒ Nausea
- ❒ Abdominal pain or tenderness

Vomiting
- ❒ 1 episode in 24 hours
- ❒ 2 or more episodes in 24 hours

Diarrhoea
- ❒ 1 or 2 episodes in 24 hours
- ❒ 3 or more liquid or watery stools above what is normal for the resident within 24 hours

- ❒ Pseudomembranous colitis is identified
- ❒ Toxic megacolon is identified

Oral

❒ RACF associated
❒ Non-RACF associated

Oral candidiasis
- ❒ Presence of raised white patches or plaques in mouth
- ❒ Doctor or dental provider confirmation

Eye

❒ RACF associated
❒ Non-RACF associated

Conjunctivitis
- ❒ Pus from one or both eyes present > 24 hours
- ❒ New or increased conjunctival redness
- ❒ Itching or pain > 24 hours

Other infections not listed above
❒ RACF associated
❒ Non-RACF associated

AGED CARE NAPS National Antimicrobial Prescribing Survey

Infections Form

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Has the resident been prescribed an antimicrobial? ❒ no ❒ yes; *complete an Antimicrobials Form (separate forms required for antimicrobials that have different start dates)*

Does the resident have signs and/or symptoms of infection **on the survey day**? ❒ no ❒ yes; *complete an Infections Form*

1. Demographics	Identification number	Date of birth/age	Gender	Admitted to hospital within 30 days	Urinary catheter present
		/ /	M / F / O	Yes / No	Yes / No

2. Constitutional criteria; *completed for all residents with any signs and/or symptoms of a suspected or confirmed infection **on the survey day or in the 2 days prior***

❒ No constitutional criteria identified

Fever
- ❒ Single oral temperature > 37.8°C
- ❒ Repeated oral temperature > 37.2°C, or rectal temperature > 37.5°C
- ❒ Single temperature > 1.1°C over baseline from any site
- ❒ Chills or rigors

Acute change in mental status from baseline
(confusion, forgetfulness, etc.)
- ❒ Acute onset
- ❒ Fluctuating course
- ❒ Inattention
- ❒ Disorganised thinking or altered level of consciousness

Acute functional decline from baseline
Tick all relevant:
- ❒ Bed mobility
- ❒ Transfer
- ❒ Locomotion within facility
- ❒ Dressing
- ❒ Toilet use
- ❒ Personal hygiene
- ❒ Eating

As according to full blood examination results
- ❒ White blood cells elevated (WBC, leucocytes, etc.)
- ❒ Left shift documented

3. System criteria; *completed for all residents with any signs and/or symptoms of a suspected or confirmed infection **on the survey day or in the 2 days prior***

Urinary tract
- ❒ RACF associated
- ❒ Non-RACF associated

All urinary tract criteria
- ❒ Acute pain on urination
- ❒ Acute pain, swelling or tenderness of the testes, epididymis or prostate
- ❒ New onset low blood pressure, with no alternate site of infection
- ❒ Either acute change in mental status or acute functional decline with no alternate diagnosis
- ❒ New onset chest wall or back pain or tenderness
- ❒ New onset suprapubic pain
- ❒ Pus discharging from around a catheter
- ❒ Blood in urine

New or marked increase in;
- ❒ incontinence
- ❒ urgency
- ❒ frequency

Urinary catheter
- ❒ none
- ❒ intermittent *(in and out)*
- ❒ indwelling
- ❒ suprapubic
- ❒ external
- ❒ nephrostomy tube

Urine dipstick
- ❒ not performed
- ❒ performed; *date* / /

Nitrite
❒ negative ❒ positive ❒ not recorded

Leucocyte esterase
❒ negative ❒ 1+ ❒ 2+ ❒ 3+ ❒ not recorded

Urine specimen
- ❒ not collected
- ❒ collected

Date collected / /
- ❒ final report attached

Respiratory tract ❒ RACF associated ❒ Non-RACF associated	**All respiratory tract criteria** ❒ Runny nose or sneezing ❒ Stuffy nose ❒ Sore throat ❒ Hoarseness ❒ Pain on swallowing ❒ Swollen or tender neck glands ❒ New headache or eye pain ❒ Myalgia or muscle pain ❒ Malaise	❒ Loss of appetite ❒ New or increased cough ❒ New or increased sputum ❒ O_2 saturation < 94% on room air or a reduction of > 3% from baseline ❒ New or changed lung abnormalities ❒ Chest wall pain ❒ Respiratory rate ≥ 25 breaths per minute ❒ Chest X-ray showing pneumonia or new infiltrate	**Sputum** ❒ not collected ❒ collected Date collected / / ❒ final report attached **Respiratory virus test** ❒ not collected ❒ collected Date collected / / ❒ final report attached
Skin or soft tissue ❒ RACF associated ❒ Non-RACF associated	**Cellulitis, soft tissue or wound infection** ❒ Pus present at wound, skin or soft tissue site ❒ Heat ❒ Redness ❒ Swelling ❒ Tenderness or pain ❒ Serous discharge **Herpes simplex or zoster** ❒ Vesicular rash ❒ Doctor or laboratory confirmation	**Fungal skin infection** ❒ Characteristic rash or lesions ❒ Doctor or laboratory confirmation **Scabies** ❒ Maculopapular rash ❒ Itch ❒ Doctor or laboratory confirmation ❒ Linkage to laboratory confirmed scabies	**Swab** ❒ not collected ❒ collected Date collected / / ❒ final report attached
Oral ❒ RACF associated ❒ Non-RACF associated	**Oral candidiasis** ❒ Presence of raised white patches or plaques in mouth ❒ Doctor or dental provider confirmation		
Eye ❒ RACF associated ❒ Non-RACF associated	**Conjunctivitis** ❒ Pus from one or both eyes present > 24 hours ❒ New or increased conjunctival redness ❒ Itching or pain > 24 hours		
Other infections not listed above	❒ RACF associated ❒ Non-RACF associated		

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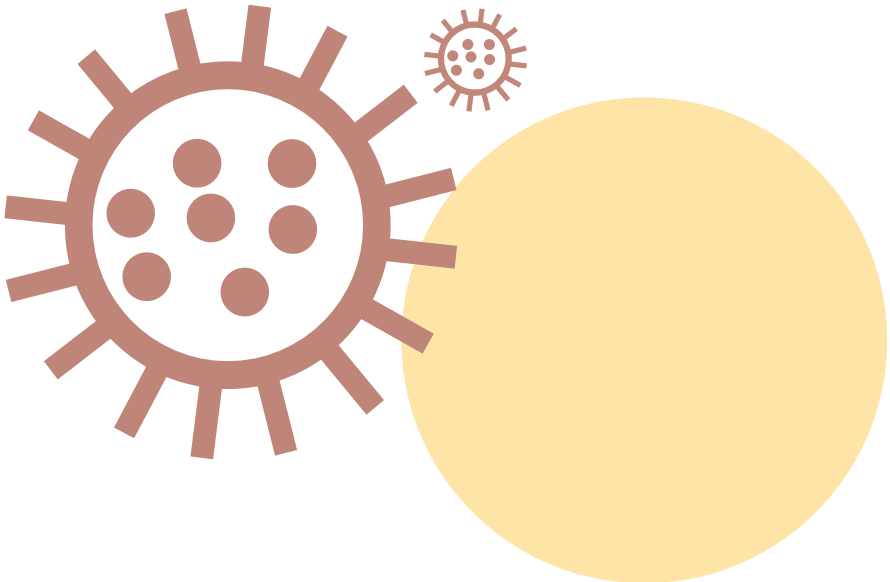

Further information about acNAPS can be obtained by phoning **(03) 9342 9415** or emailing **support@naps.org.au**.

Further information about AURA is available at:
www.safetyandquality.gov.au/antimicrobial-use-and-resistance-in-australia/