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Infections and antimicrobial prescribing in Australian residential aged care homes

Results of the 2023 Aged Care National Antimicrobial Prescribing Survey

2023

AGED CARE NAPS National Antimicrobial Prescribing Survey

VICNISS HEALTHCARE ASSOCIATED INFECTION SURVEILLANCE

NCAS National Centre for Antimicrobial Stewardship

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Preface

This report is best interpreted when read in conjunction with the National Antimicrobial Prescribing Survey: technical supplement 2023.[5]

Acknowledgements

Contributing facilities

On behalf of the National Centre for Antimicrobial Stewardship, Royal Melbourne Hospital Guidance Group and Victorian Healthcare Associated Infection Surveillance System (VICNISS) Co-ordinating Centre, we would like to thank all contributing residential aged care homes and auditors for collecting and entering the data for this and the Antimicrobial Use and Resistance in Australia (AURA) surveillance program reports, thereby committing to improving safety and quality across the Australian aged care system.

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Abbreviations

Abbreviation	Term
Aged Care NAPS	Aged Care National Antimicrobial Prescribing Survey
AMS	Antimicrobial stewardship
AURA	Antimicrobial Use and Resistance in Australia
HALT	Healthcare-Associated Infection in Long Term Care Facilities
IPC	Infection prevention and control
NAPS	National Antimicrobial Prescribing Survey
PRN	Pro re nata
RACH	Residential aged care home. For the purposes of NAPS, RACH encompasses all mainstream residential aged care homes as well as Multi-Purpose Services.
VICNISS	Victorian Healthcare Associated Infection Surveillance System

Summary

The Aged Care National Antimicrobial Prescribing Survey (Aged Care NAPS) continues to play a pivotal role in Australian residential aged care homes (RACHs) as part of their infection prevention and control (IPC) and antimicrobial stewardship (AMS) programs. Aged Care NAPS is a standardised tool that can be used to monitor the prevalence of infections and antimicrobial use, provide feedback to key clinicians and administrators and measure the effectiveness of IPC and AMS initiatives.

A total of 852 RACHs participated in 2023 – an increased number from 2022 (n=744). The ongoing large number of Aged Care NAPS contributors indicates that Australian RACHs value the opportunity to participate in this point prevalence survey. All provider states and territories (except Northern Territory), Remoteness Areas and provider groups (government, not for profit and private) were represented.

Key results

- On the survey day, the prevalence of residents who had signs and/or symptoms of at least one suspected infection was 3.6%; the prevalence of residents prescribed at least one antimicrobial (active medication order) was 11.9%.
- On the survey day, suspected skin or soft tissue (47.6%), urinary tract (19.0%) and respiratory tract (17.1%) infections continued to be most commonly reported; only 36.1% met surveillance definitions for confirmed infections.
- Clotrimazole (21.6%) and cefalexin (21.1%) continue to be the most commonly prescribed antimicrobials.
- Documentation of indication for an antimicrobial prescription increased slightly compared with 2022 (83.0% vs 80.3%).
- The most common indication (therapeutic or prophylactic) for prescribing antimicrobials was 'Other - Skin, soft tissue or mucosal' infection (17.8%); that is, all skin, soft tissue or mucosal conditions or infections not available as an option in the NAPS indication list for selection.
- Documentation of review or stop date for an antimicrobial prescription was similar to 2022 (56.6% compared with 56.8%) but still remains well below the expected best-practice target of 95%.
- For those antimicrobials still prescribed on the survey day, over one-third (34.7%) were commenced more than 6 months prior.
- A microbiology specimen was collected for less than one-quarter (20.1%) of antimicrobial prescriptions where the start date was known and less than 6 months prior to the survey date.

Recommendations

The Aged Care NAPS key results again demonstrate that there are significant opportunities for improvement. Recommendations for those working at a local or national level include:

- participation in the Aged Care NAPS
- continuing training and providing support to participating RACH staff, especially to prevent and control common infections and improve antimicrobial use
- sharing Aged Care NAPS results with administrators and clinicians to develop targeted IPC and AMS improvement strategies
- tailoring RACH AMS programs to improve antimicrobial prescribing. This could include, for example, ensuring the documentation of key prescribing elements.

1. Introduction

This report presents analyses of data collected for the 2023 Aged Care National Antimicrobial Prescribing Survey (Aged Care NAPS) and includes comparisons with previous annual (2016 to 2022)1 Aged Care NAPS data. It supersedes all previous Aged Care NAPS reports.

Monitoring of infections and antimicrobial use in residential aged care homes (RACHs) is an important safety and quality activity, as there is longstanding evidence of residents being colonised or infected by multidrug-resistant organisms; and inappropriate antimicrobial use.

Aged Care NAPS, first piloted in 2015, was modelled on the European Centre for Disease Prevention and Control Healthcare-Associated Infection in Long Term Care Homes (HALT) study. Aged Care NAPS has subsequently been conducted annually. Coordination of the Aged Care NAPS is overseen by the National Centre for Antimicrobial Stewardship, Royal Melbourne Hospital Guidance Group and Victorian Healthcare Associated Infection Surveillance System (VICNISS) Co-ordinating Centre. In 2023, funding was provided by the then Australian Government Department of Health and Aged Care. Aged Care NAPS data are included in Antimicrobial Use and Resistance in Australia (AURA) surveillance program reports; AURA is a comprehensive and coordinated national surveillance system of antimicrobial use and antimicrobial resistance in human health.[3]

Aged Care NAPS is a standardised surveillance tool that all Australian mainstream RACHs and Multi- Purpose Services can use to monitor the prevalence of infections and antimicrobial use, provide feedback to key clinicians and administrators, and measure the effectiveness of infection prevention and control (IPC) and antimicrobial stewardships (AMS) programs.[2, 3] It is recommended RACHs participate at least once during the official timeframe. Each year since 2020, the official timeframe has been from June to December. Participation assists RACHs to demonstrate that they meet the action requirements of Aged Care Quality Standards. Standard 3 (3)(g) specifically aims to minimise infection-related risks by implementing standard and transmission-based precautions and practices to promote appropriate antimicrobial use. Standard 8 (3)(e) notes that, where clinical care is provided, a clinical governance framework must include AMS.[2]

For details on the Aged Care NAPS methodology (Methods 1 and 2), 2 data collection forms (facility data collection form and antimicrobial and infection data collection form), analyses and considerations for data interpretation, please refer to the National Antimicrobial Prescribing Survey 2023: technical supplement.[4]

2. Results

2.1 Participation

In 2022, 744 RACHs collected and submitted Aged Care NAPS data at least once during the official timeframe. In 2023, an increased number of RACHs (852 RACHs consisting of 782 mainstream RACHs and 70 Multi-Purpose Services) similarly collected and submitted Aged Care NAPS data. Thirty-one homes participated more than once. Since 2021, 424 RACHs have participated at least once each year during the official data collection period.

Most participating RACHs were located in Victoria (38.7%) or New South Wales (19.5%) and over half (55.9%) were located in major cities. Approximately 2 in every 5 RACHs (42.0%) were not for profit (Table 1).

Participation of eligible RACHs within different states/territories, Remoteness Areas and provider groups varied; from 0% in the Northern Territory (there are only 11 eligible RACHs in the Northern Territory) to 48.3% in Western Australia; from 18.4% in 'Very Remote' to 35.9% in 'Outer Regional' areas; and from 23.8% not for profit to 64.5% government RACHs (Table 1).

See Figure 1 and Appendix Table A1 for annual participation data from 2016 to 2022.

Table 1. Residential aged care homes by state, Remoteness Area classification and provider type, Aged Care National Antimicrobial Prescribing Survey contributors, 2023

Category		Residents audited	Participating RACHs		RACHs in reporting group^	Participating RACHs in the reporting group^
		n	n	%	n	%
State and territory	ACT	1,147	11	1.3	27	40.7
	NSW	11,816	166	19.5	897	18.5
	NT	0	0	0.0	11	0.0
	Qld	8,518	107	12.6	500	21.4
	SA	5,275	91	10.7	254	35.8
	Tas	513	9	1.1	70	12.9
	Vic	17,834	330	38.7	757	43.6
	WA	8,740	138	16.2	286	48.3
Remoteness Area*	Major Cities	38,547	476	55.9	1,650	28.8
	Inner Regional	10,640	217	25.5	668	32.5
	Outer Regional	4,277	136	16.0	379	35.9

Category		Residents audited	Participating RACHs		RACHs in reporting group^	Participating RACHs in the reporting group^
		n	n	%	n	%
	Remote	249	16	1.9	67	23.9
	Very Remote	130	7	0.8	38	18.4
Provider type	**Government**	6,559	254	29.8	394	64.5
	Not-for-profit	26,601	358	42.0	1,505	23.8
	Private	20,683	240	28.2	903	26.6
Total		53,843	852	100	2,802	30.4

* See the Australian Bureau of Statistics Australian Statistical Geography Standard.[5]

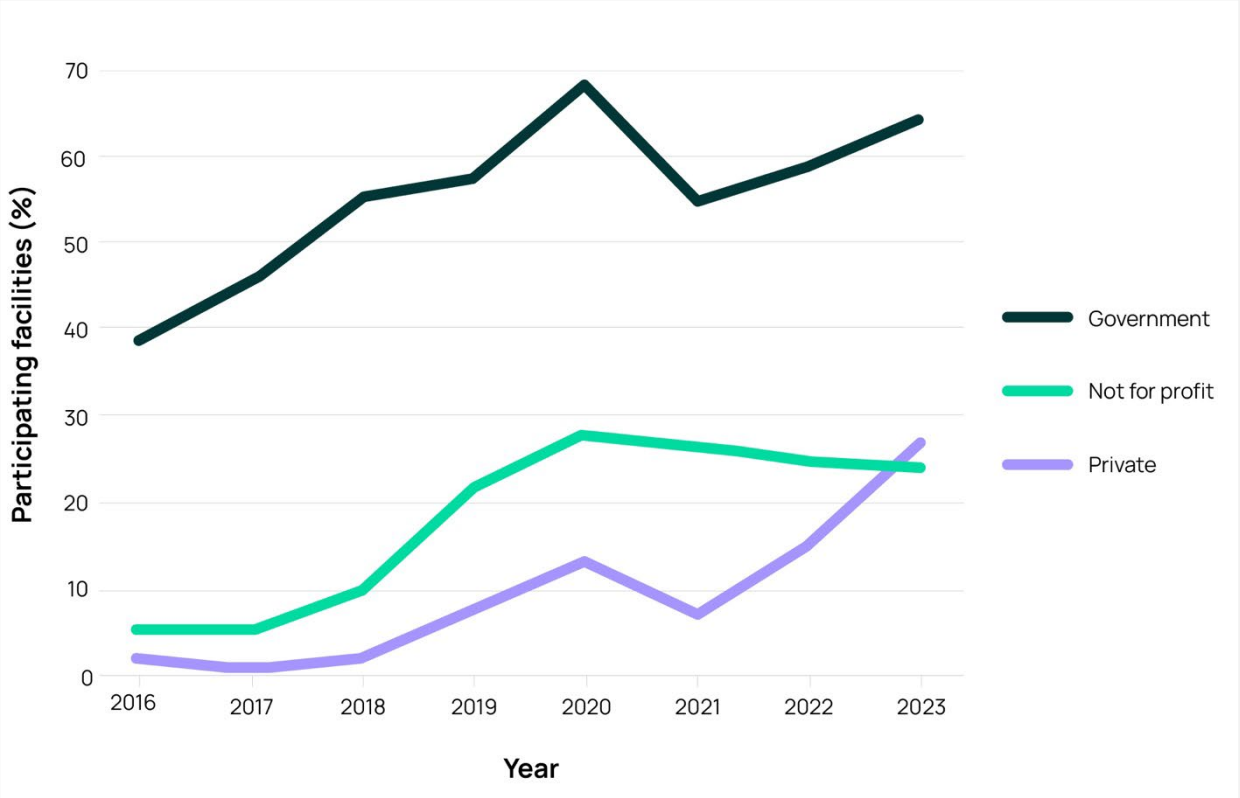
^ 'Reporting group' comprises the actual number of RACHs in each category. Notes:

Sources - Facility data collection form and Aged Care service list: 30 June 2023; AIHW GEN Aged Care.[6] See Figure 1 for graphical presentation.

Transition Care, Innovative Pool, National Aboriginal and Torres Strait Island and Short-term restorative care services are excluded.

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; Qld = Queensland; RACHs = residential aged care homes; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia

Figure 1. Percentage of participating residential aged care homes within different provider types, Aged Care National Antimicrobial Prescribing Survey contributors, 2016-2023



Note: Sources – Facility data collection form and Aged Care service list: 30 June 2016 to 2023; AIHW GEN Aged Care Data.[6]

In 2023, on the survey day over half (58.3%) of the residents were aged >85 years and about one-third (33.9%) were male (Table 2).

Table 2. Number and characteristics of all residents on the survey day, Aged Care National Antimicrobial Prescribing Survey contributors, 2023

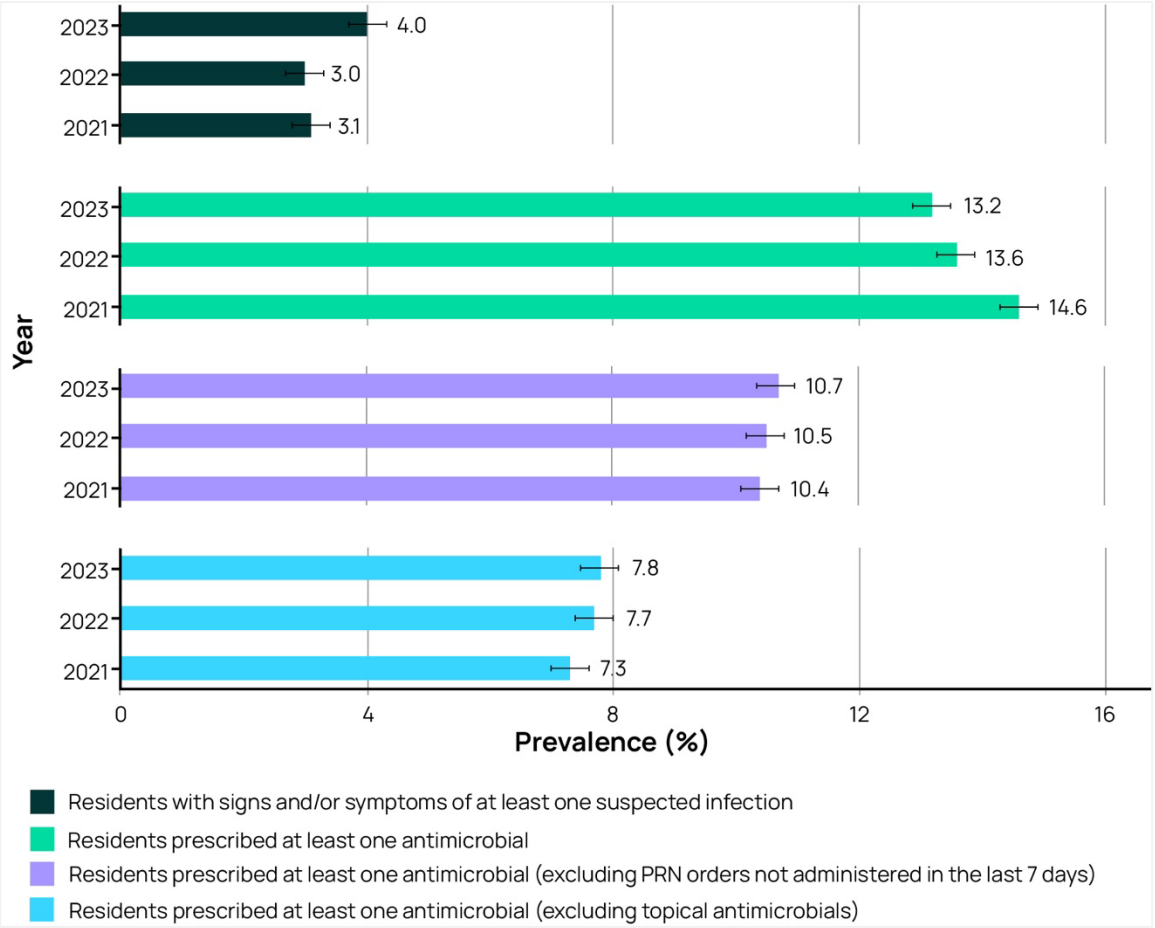
Measurement	2023	
	n	%
Present on survey day	53,843	-
Aged >85 years	31,410	58.3
Male	18,272	33.9
Admitted to hospital in previous 7 days	1,062	2.0
Indwelling urinary catheter present	2,015	3.7

2.2 Prevalence of infections and antimicrobial use

On the survey day in 2023, the prevalence of residents who had signs and/or symptoms of at least one suspected infection was 3.6% (n=1,941). The prevalence of residents prescribed at least one antimicrobial (active medication order) was 11.9% (n=6,429). If all topical antimicrobial orders were excluded, the prevalence of residents prescribed at least one antimicrobial on the survey day was 7.0%. If all pro re nata (PRN) orders not administered in the previous 7 days were excluded, the prevalence of residents prescribed at least one antimicrobial on the survey day was 9.6% (Appendix Table A2).

The same prevalence measurements for those RACHs that have participated each year since 2021 are presented in Figure 2 and Appendix Table A3.

Figure 2. Prevalence of suspected infections and antimicrobial use on the survey day, Aged Care National Antimicrobial Prescribing Survey contributors that have participated each year from 2021 to 2023 (n=424)



Notes:

Sources - Facility data collection form and Antimicrobial and infection data collection form. Refer to Appendix Table A3 for confidence intervals.

PRN = pro re nata.

2.3 Suspected infections on the survey day

Older persons are especially vulnerable to infections and may not have typical signs and symptoms of infection. In 2023, a total of 1,941 residents were reported to have a total of 2,037 suspected infections on the survey day. Suspected skin or soft tissue (47.6%), urinary tract (19.0%) and respiratory tract (17.1%) infections were most commonly reported (Table 3). Only 36.1% met the McGeer et al. infection surveillance definitions7 specifically for use in RACHs; these definitions have been designed to increase the likelihood that events captured are confirmed infections.

Table 3. Number and percentage of suspected infections by body system, Aged Care National Antimicrobial Prescribing Survey contributors, 2023

Body system	Suspected infections		RACH associated suspected infections*	
	n	%	n	%
Skin or soft tissue	970	47.6	934	47.4
Respiratory tract	348	17.1	339	17.2
Urinary tract	387	19.0	373	18.9
Eye	114	5.6	111	5.6
Oral	63	3.1	62	3.1
Other systems	155	7.6	151	7.7
Total	2,037	100	1,970	100

* 'RACH-associated suspected infection' is an infection that developed in the resident 48 hours post (re-) admission.

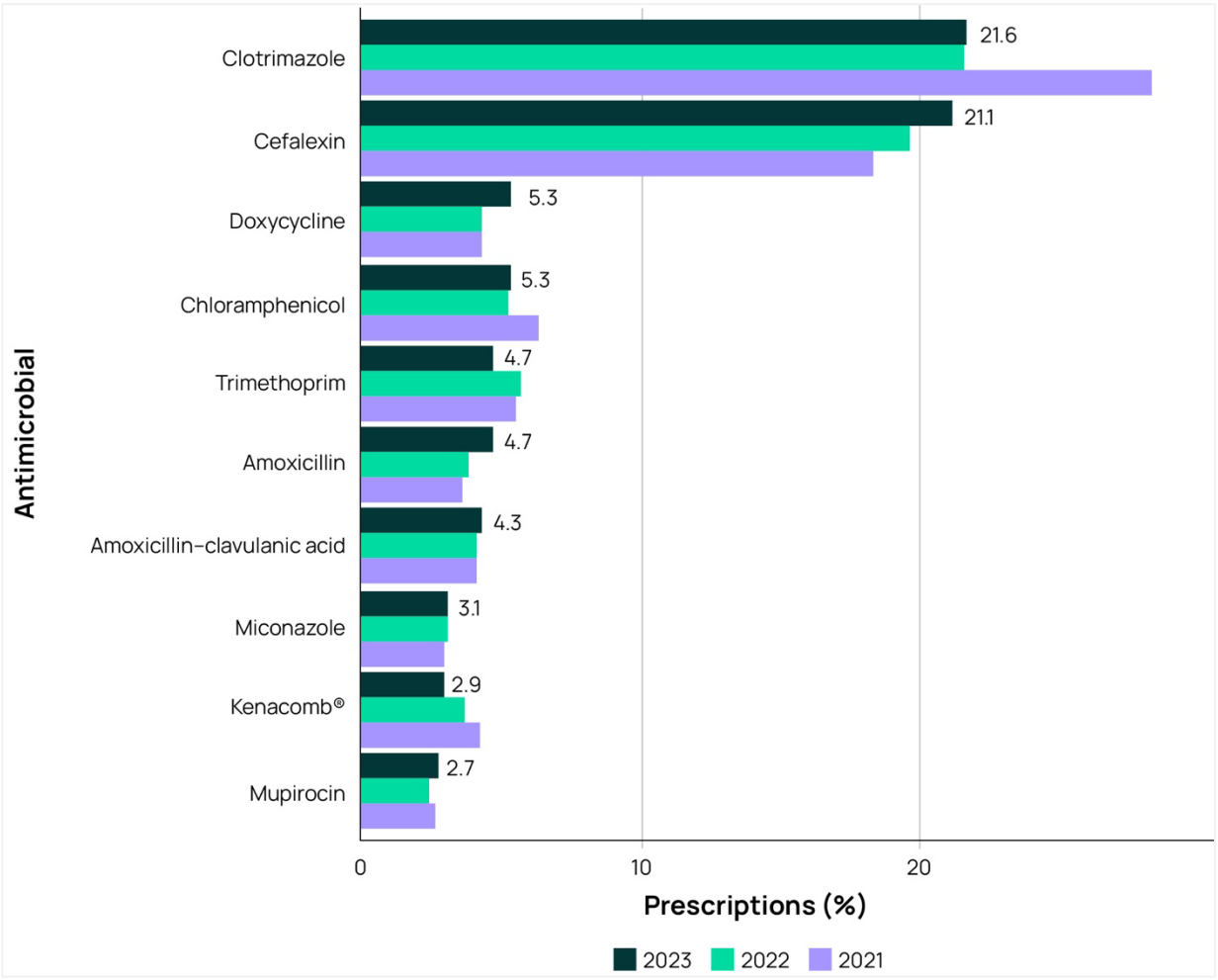
Note: Source – Antimicrobial and infection data collection form, Section 5, Method 1 data.

RACH = residential aged care home.

2.4 Most commonly prescribed antimicrobials

Most antimicrobials were prescribed for oral (58.5%) or topical (40.6%) administration. Just over one- fifth (22.7%) of prescriptions were for prophylactic use. Similar to previous surveys, clotrimazole (21.6%) and cefalexin (21.1%) were the most frequently prescribed antimicrobials (Figure 3, Appendix Table A4).

Figure 3. Most commonly prescribed antimicrobials, Aged Care National Antimicrobial Prescribing Survey contributors, 2021–2023



*Kenacomb® contains triamcinolone, neomycin, nystatin and gramicidin. Notes:

Source – Antimicrobial and infection data collection form, Section 2, Methods 1 and 2 data.

Only the top 10 antimicrobials prescribed are listed (methenamine hippurate, an antibacterial, is excluded).

Clotrimazole (93.0%) and cefalexin (58.7%) were mostly prescribed for therapeutic indications (Table 4).

Table 4. Clotrimazole and cefalexin prescriptions, therapeutic and prophylactic use, Aged Care National Antimicrobial Prescribing Survey contributors, 2023

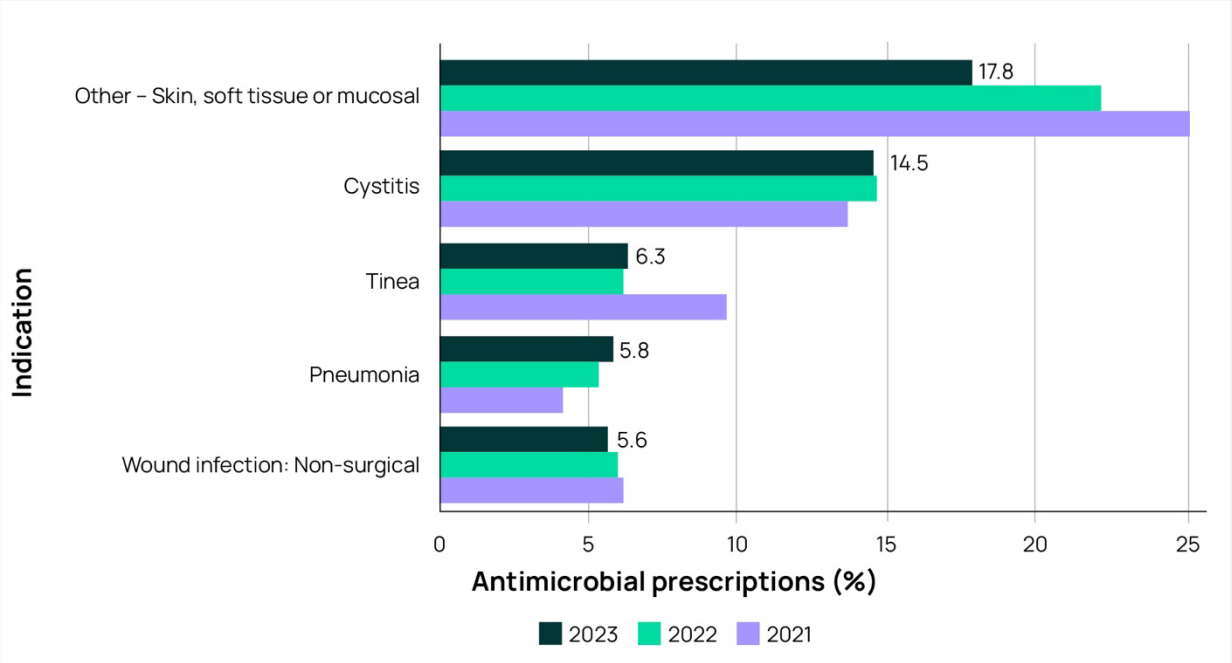
Antimicrobial	Category	n	%	% of total prescriptions (n=8,999)
Clotrimazole (n=1,944)	Therapeutic	1,808	93.0	20.1
	Prophylactic	136	7.0	1.5
Cefalexin (n=1,898)	Therapeutic	1,115	58.7	12.4
	Prophylactic	783	41.3	8.7

Note: Source – Antimicrobial and infection data collection form, Methods 1 and 2 data.

2.5 Common indications for prescribing antimicrobials

The most commonly reported indication for antimicrobial prescriptions (therapeutic and prophylactic) was 'Other – Skin, soft tissue or mucosal' (17.8%) (Figure 4, Appendix Table A5). Refer to Appendix Table A6 for comparison of therapeutic and prophylactic antimicrobial prescriptions. The most commonly reported indication for prophylactic antimicrobial prescriptions was 'cystitis' (25.0%) (Figure 5, Appendix Table A7).

Figure 4. Most common indications for all antimicrobial prescriptions, Aged Care National Antimicrobial Prescribing Survey contributors, 2021–2023

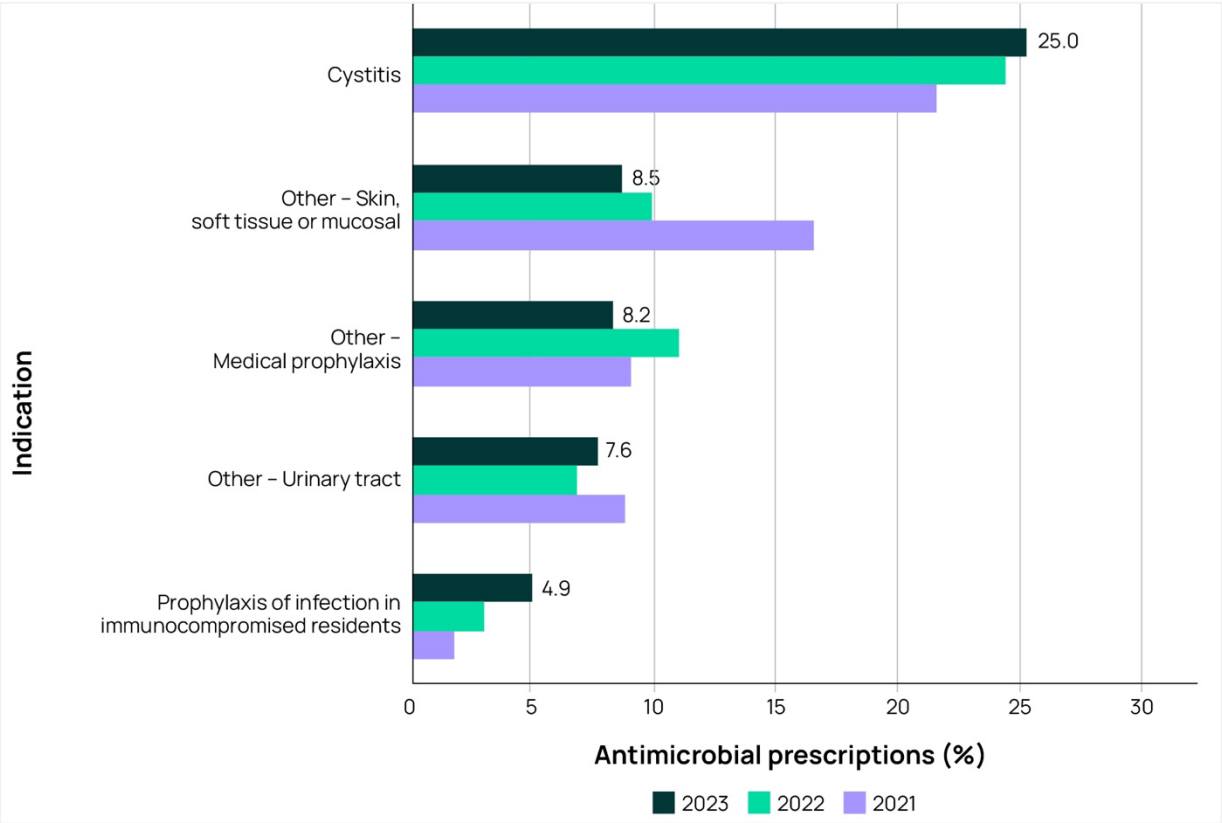


Notes:

Source - Antimicrobial and infection data collection form, Section 2, Methods 1 and 2 data. See Appendix Table A5 for tabular presentation of data.

Only the top 5 indications for antimicrobial prescriptions are listed.

Figure 5. Most common indications for prophylactic antimicrobial prescriptions, Aged Care National Antimicrobial Prescribing Survey contributors, 2021–2023



Notes:

Source - Antimicrobial and infection data collection form, Section 2, Methods 1 and 2 data.

See Appendix Table A7 for tabular presentation of data.

Only the top 5 indications for prophylactic antimicrobial prescriptions are listed.

2.6 Most commonly prescribed antimicrobials for common indications

The most commonly prescribed antimicrobials for cystitis, tinea and pneumonia (the top 3 specific indications) were cefalexin (54.0%), clotrimazole (71.4%) and amoxicillin (25.5%) respectively (Table 5).

Table 5. Commonly prescribed antimicrobials for cystitis, tinea and pneumonia, Aged Care National Antimicrobial Prescribing Survey contributors, 2023

Cystitis (n=1,301)			Tinea (n=567)			Pneumonia (n=526)		
Antimicrobial	n	%	Antimicrobial	n	%	Antimicrobial	n	%
Cefalexin	703	54.0	Clotrimazole	405	71.4	Amoxicillin	134	25.5
Trimethoprim	297	22.8	Miconazole	74	13.1	Amoxicillin–clavulanic acid	123	23.4
Nitrofurantoin	124	9.5	Terbinafine	34	6.0	Doxycycline	114	21.7
Amoxicillin–clavulanic acid	47	3.6	Kenacomb®*	20	3.5	Cefalexin	58	11.0

Cystitis (n=1,301)			Tinea (n=567)			Pneumonia (n=526)		
Antimicrobial	n	%	Antimicrobial	n	%	Antimicrobial	n	%
Amoxicillin	34	2.6	Ketoconazole	12	2.1	Roxithromycin	23	4.4

*Kenacomb® contains triamcinolone, neomycin, nystatin and gramicidin.

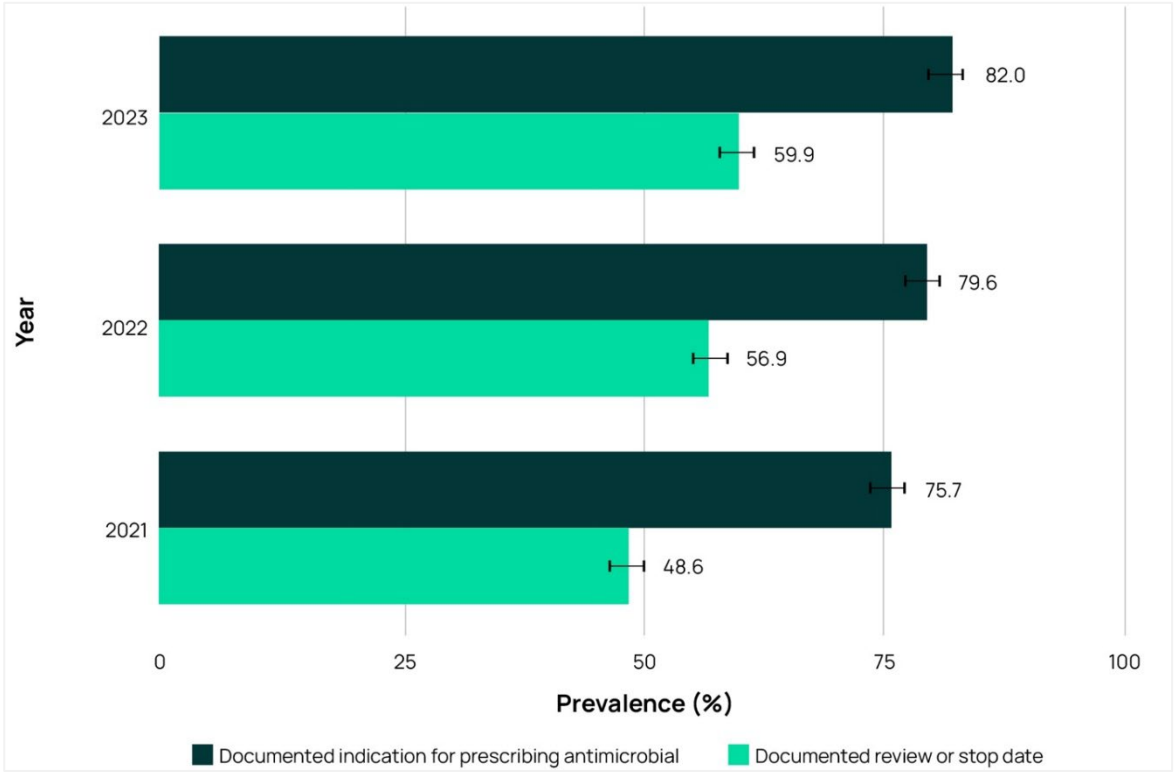
Note: Source – Antimicrobial and infection data collection form, Section 2, Methods 1 and 2 data.

2.7 Quality indicators

Complete and accurate documentation ensures that all those involved in resident care have access to consistent and current information. For example, when a resident is prescribed an antimicrobial, the indication, active ingredient, dose, frequency and route of administration, and the intended duration or review plan should be documented in their healthcare record.8 Where electronic healthcare records are being used, flags and reminders in the record management system can be incorporated to support documentation in all relevant fields.

For RACHs that have participated every year since 2021, there was an increase in the percentage of antimicrobial prescriptions that had a documented indication for prescribing an antimicrobial (82.0%) and documented review or stop date (59.9%) in 2023 (Figure 6, Appendix tables A8 and A9).

Figure 6. Key quality indicators, Aged Care National Antimicrobial Prescribing Survey contributors that have participated each year from 2021 to 2023 (n=424)



Notes:

Source – Antimicrobial and infection data collection form, Section 2, Methods 1 and 2 data. Refer to Appendix Table A9 for confidence intervals.

2.8 Duration

In general, the shortest possible duration of therapy, consistent with the condition being treated and the resident's clinical response, should be used. Prolonged duration of antimicrobial therapy is associated with an increased risk of adverse outcomes, including antimicrobial resistance.[9]

In 2023, for antimicrobials still prescribed on the survey day, the start date was unknown for 2.4% of prescriptions and 34.7% were commenced greater than 6 months prior. For antimicrobials still prescribed on the survey day, with a known start date and prescribed less than 6 months prior to the survey day, 31.7% had been commenced greater than 7 days prior to the survey day.

2.9 Microbiology

For antimicrobials still prescribed on the survey day, with a known start date and prescribed less than 6 months prior to the survey day, a microbiology specimen was collected for less than one-quarter (20.1%) of prescriptions (n=1,807 prescriptions). For one prescription, more than one specimen type could be taken. The types of specimens collected are presented in Table 6.

Table 6. Microbiology specimen collection, Aged Care National Antimicrobial Prescribing Survey contributors, 2023

Specimen type	n	%
Urine	938	51.9
Skin/wound swab	366	20.3
Respiratory swab	334	18.5
Sputum	45	2.5
Other	124	6.9
Total	1,807	100

Note: Source - Antimicrobial and infection data collection form, Section 2, Methods 1 and 2 data.

3. Conclusion

Now in its eighth year, the Aged Care NAPS continues to play a pivotal role in Australian RACHs as part of their IPC and AMS programs. This year's key results again demonstrate that there are significant opportunities for improvement. Updated priorities for those working at a local or national level at least include:

- advocating that all Australian RACHs participate in Aged Care NAPS
- continuing training and helpdesk support to participating RACH staff to ensure accurate Aged Care NAPS data collection and submission
- sharing Aged Care NAPS results with administrators and clinicians such as general practitioners, pharmacists, nurses and aged care IPC leads and using these results to develop targeted IPC and AMS improvement strategies
- enhancing the level of IPC training among RACH staff, focusing on evidence-based strategies that prevent and control common infections such as skin or soft tissue, urinary tract and respiratory tract infections
- tailoring RACH AMS programs to improve antimicrobial use. This could include, for example, ensuring the documentation of key prescribing elements (indication and review or stop included), rationalising antimicrobial prescriptions for prophylactic use and promoting appropriate microbiological sampling.

Appendix

Table A1. Participation of eligible residential aged care homes within state and territory and provider groups, Aged Care National Antimicrobial Prescribing Survey contributors, 2016-2022

Category		2016			2017			2018		
		No of PF	No of facilities in RG	% of PF in the RG	No of PF	No of facilities in RG	% of PF in the RG	No of PF	No of facilities in RG	% of PF in the RG
State and territory	**ACT**	0	26	0.0	0	26	0.0	4	26	15.4
	NSW	31	928	3.3	37	937	3.9	63	940	6.7
	NT	0	11	0.0	0	11	0.0	2	11	18.2
	Qld	26	469	5.5	19	473	4.0	49	478	10.3
	SA	7	275	2.5	8	268	3.0	36	268	13.4
	Tas	10	73	13.7	5	73	6.8	6	72	8.3
	Vic	168	761	22.1	185	766	24.2	200	770	26.0
	WA	14	276	5.1	22	271	8.1	36	278	12.9
Provider type	**Government**	163	422	38.6	192	418	45.9	229	415	55.2
	Not for profit	78	1,535	5.1	75	1,529	4.9	148	1,524	9.7
	Private	15	862	1.7	9	878	1.0	19	904	2.1
Total		**256**	**2,819**	**9.1**	**276**	**2,825**	**9.8**	**396**	**2,843**	**13.9**

Category		2019			2020			2021			2022		
		No of PF	No of facilities in RG	% of PF in the RG	No of PF	No of facilities in RG	% of PF in the RG	No of PF	No of facilities in RG	% of PF in the RG	No of PF	No of facilities in RG	% of PF in the RG
State and territory	**ACT**	6	25	24.0	6	25	24.0	8	26	30.8	9	27	33.3
	NSW	136	937	14.5	171	940	18.2	136	928	14.7	157	912	17.2
	NT	1	11	9.1	1	11	9.1	0	11	0.0	0	11	0.0
	Qld	82	492	16.7	97	499	19.4	96	504	19.0	94	498	18.9
	SA	66	271	24.4	89	267	33.3	88	263	33.5	64	259	24.7
	Tas	28	71	39.4	31	71	43.7	25	69	36.2	14	69	20.3
	Vic	227	778	29.2	295	776	38.0	239	767	31.2	271	764	35.5
	WA	90	283	31.8	134	284	47.2	95	287	33.1	135	283	47.7
Provider type	**Government**	238	413	57.6	279	410	68.0	224	408	54.9	236	401	58.9
	Not for profit	330	1,535	21.5	422	1,530	27.6	400	1,516	26.4	366	1,493	24.5
	Private	68	920	7.4	123	933	13.2	63	931	6.8	142	929	15.3
Total		**636**	**2,868**	**22.2**	**824**	**2,873**	**28.7**	**687**	**2,855**	**24.1**	**744**	**2,823**	**26.4**

Notes:

Sources - Facility data collection form and Aged Care service list: 30 June 2016 to 2023; AIHW GEN Aged Care Data.[6] See Table 1 for 2023 data.

ACT = Australian Capital Territory; NSW = New South Wales; NT = Northern Territory; PF = participating facilities; Qld = Queensland; RG = reporting group; SA = South Australia; Tas = Tasmania; Vic = Victoria; WA = Western Australia.

Table A2. Prevalence of suspected infections and antimicrobial use on the survey day, Aged Care National Antimicrobial Prescribing Survey contributors, 2016-2023

On survey day	2016		2017		2018		2019		2020		2021		2022		2023	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Residents with signs and/or symptoms of at least one suspected infection	384	3.2	343	2.9	561	2.9	983	2.8	1,377	2.9	1,241	3.1	1,311	3.0	1,941	3.6
Residents with signs and/or symptoms of at least one RACH-associated suspected infection	n/a	-	n/a	-	n/a	-	n/a	-	n/a	-	1,215	3.0	1,294	3.0	1,879	3.5
Residents prescribed at least one antimicrobial	1,211	10.0	1,060	9.1	1,909	9.9	3,491	9.9	5,610	11.9	5,543	13.8	5,456	12.5	6,429	11.9
Residents prescribed at least one antimicrobial (excluding PRN orders not administered in the last 7	1,211	10.0	1,058	9.0	1,621	8.4	2,920	8.3	4,133	8.8	3,911	9.8	4,227	9.7	5,173	9.6

On survey day	2016		2017		2018		2019		2020		2021		2022		2023	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
days)																
Residents prescribed at least one antimicrobial (excluding topical antimicrobials)	867	7.2	730	6.2	1,261	6.5	2,197	6.2	3,052	6.5	2,724	6.8	3,025	6.9	3,744	7.0
Number of residents present	12,055	-	11,696	-	19,312	-	35,190	-	46,995	-	40,075	-	43,655	-	53,843	-

Note: Sources – Facility data collection form and Antimicrobial and infection data collection form. See National Antimicrobial Prescribing Survey 2023: technical supplement for definition of 'RACH-associated suspected infection'. n/a = not available – new data field introduced in 2021; PRN = pro re nata; RACH = residential aged care home.

Table A3. Prevalence of suspected infections and antimicrobial use, Aged Care National Antimicrobial Prescribing Survey contributors that have participated each year from 2021 to 2023 (n=424)

On survey day	2021			2022			2023		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
Residents with signs and/or symptoms of at least one suspected infection	734	3.1	2.9 – 3.3	714	3.0	2.8-3.2	952	4.0	3.7-4.2
Residents prescribed at least one antimicrobial	3,468	14.6	14.1-15.0	3,202	13.6	13.1-14.0	3,178	13.2	12.8-13.7
Residents prescribed at least one antimicrobial (excluding PRN orders not administered in the last 7 days)	2,478	10.4	10.0-10.8	2,486	10.5	10.1-10.9	2,573	10.7	10.3-11.1
Residents prescribed at least one antimicrobial (excluding topical antimicrobials)	1,726	7.3	6.9-7.6	1,819	7.7	7.4-8.0	1,867	7.8	7.4-8.1
Number of residents present	23,797	-	-	23,627	-	-	24,022	-	-

Notes:

Sources – Facility data collection form and Antimicrobial and infection data collection form.
See Figure 2 for graphical presentation.

CI = confidence interval; PRN = pro re nata.

Table A4. Most commonly prescribed antimicrobials, Aged Care National Antimicrobial Prescribing Survey contributors, 2021-2023

Antimicrobial	2021 (n=7,622)		2022 (n=8,401)		2023 (n=8,999)	
	n	%	n	%	n	%
Clotrimazole	2,159	28.3	1,818	21.6	1,944	21.6
Cefalexin	1,396	18.3	1,650	19.6	1,898	21.1
Doxycycline	329	4.3	364	4.3	479	5.3
Chloramphenicol	478	6.3	437	5.2	476	5.3
Trimethoprim	419	5.5	476	5.7	424	4.7
Amoxicillin	278	3.6	319	3.8	423	4.7
Amoxicillin–clavulanic acid	310	4.1	346	4.1	389	4.3
Miconazole	220	2.9	257	3.1	276	3.1
***Kenacomb®**	321	4.2	312	3.7	265	2.9
Mupirocin	200	2.6	204	2.4	244	2.7

*Kenacomb® contains triamcinolone, neomycin, nystatin and gramicidin. Notes:

Source – Antimicrobial and infection form, Methods 1 and 2 data. See Figure 3 for graphical presentation.

Only the top 10 antimicrobials prescribed are listed (methenamine [24]ippurate, an antibacterial, is excluded).

Table A5. Most common indications for all antimicrobial prescriptions (therapeutic and prophylactic), Aged Care National Antimicrobial Prescribing Survey contributors, 2021-2023

Indication	2021 (n=7,622)		2022 (n=8,401)		2023 (n=8,999)	
	n	%	n	%	n	%
Other – Skin, soft tissue or mucosal	1,914	25.1	1,853	22.1	1,605	17.8
Cystitis	1,039	13.6	1,229	14.6	1,301	14.5
Tinea	735	9.6	516	6.1	567	6.3
Pneumonia	312	4.1	443	5.3	526	5.8
Wound infection: Non-surgical	476	6.2	507	6.0	505	5.6

Notes:

Source – Antimicrobial and infection data collection form, Methods 1 and 2 data.

See Figure 4 for graphical presentation.

Only the top 5 indications for antimicrobial prescriptions are listed.

Table A6. Comparison of therapeutic and prophylactic antimicrobial prescriptions for common indications, Aged Care National Antimicrobial Prescribing Survey contributors, 2023

Indication	Therapeutic		Prophylactic		Total
	n	%	n	%	
Other – Skin, soft tissue or mucosal	1,432	89.2	173	10.8	1,605
Cystitis	791	60.8	510	39.2	1,301
Tinea	539	95.1	28	4.9	567
Pneumonia	485	92.2	41	7.8	526
Wound infection: Non-surgical	464	91.9	41	8.1	505
Cellulitis	340	95.5	16	4.5	356
Conjunctivitis	298	93.1	22	6.9	320
Other – Respiratory tract	292	91.2	28	8.8	320
Cutaneous candidiasis	299	96.5	11	3.5	310
Other – Urinary tract	84	35.1	155	64.9	239

Notes:

Source – Antimicrobial and Infection data collection form, Section 2, Methods 1 and 2 data. Only the top 10 indications for antimicrobial prescription are listed.

Unknown and medical prophylaxis indications for commencing an antimicrobial are excluded.

Table A7. Most common indications for prophylactic antimicrobial prescriptions, Aged Care National Antimicrobial Prescribing Survey contributors, 2021-2023

Indication	2021 (n=1,699)		2022 (n=1,585)		2023 (n=2,039)	
	n	%	n	%	n	%
Cystitis	364	21.4	383	24.2	510	25.0
Other – Skin, soft tissue or mucosal	277	16.3	156	9.8	173	8.5
Other – Medical prophylaxis	151	8.9	173	10.9	168	8.2
Other – Urinary tract	148	8.7	106	6.7	155	7.6
Prophylaxis of infection in immunocompromised residents	31	1.8	48	3.0	100	4.9

Notes:

Source – Antimicrobial and infection form, Section 2, Methods 1 and 2 data.

See Figure 5 for graphical presentation.

Only the top 5 indications for prophylactic antimicrobial prescriptions are listed.

Table A8. Key quality indicators, Aged Care National Antimicrobial Prescribing Survey contributors, 2016-2023

Indicator	2016		2017		2018		2019	
	n	%	n	%	n	%	n	%
Indication for prescribing an antimicrobial								
Documented	1,377	78.7	1,191	79.3	1,906	77.0	3,376	73.2
Not documented	372	21.3	311	20.7	568	23.0	1,237	26.8
Review or stop date								
Documented	895	51.2	785	52.3	1,165	47.1	2,508	54.4
Not documented	854	48.8	717	47.7	1,309	52.9	2,105	45.6
Total	**1,749**	**-**	**1,502**	**-**	**2,474**	**-**	**4,613**	**-**

Indicator	2020		2021		2022		2023	
	n	%	n	%	n	%	n	%
Indication for prescribing an antimicrobial								
Documented	5,799	76.5	5,610	73.6	6,747	80.3	7,472	83.0
Not documented	1,784	23.5	2,012	26.4	1,654	19.7	1,527	17.0
Review or stop date								
Documented	3,468	45.7	3,407	44.7	4,769	56.8	5,097	56.6

Indicator	2020		2021		2022		2023	
	n	%	n	%	n	%	n	%
Not documented	4,115	54.3	4,215	55.3	3,632	43.2	3,902	43.4
Total	**7,583**	**-**	**7,622**	**-**	**8,401**	**-**	**8,999**	**-**

Note: Source – Antimicrobial and infection data collection form, Section 2, Methods 1 and 2 data.

Table A9. Key quality indicators, Aged Care National Antimicrobial Prescribing Survey contributors that have participated each year from 2021 to 2023 (n=424)

Indicator	2021			2022			2023		
	n	%	95% CI	n	%	95% CI	n	%	95% CI
Indication for prescribing an antimicrobial									
Documented	3,767	75.7	74.5 - 76.9	3,749	79.6	78.4-80.7	4,004	82.0	80.9 - 83.1
Not documented	1,210	24.3	23.1 - 25.5	961	20.4	19.3-21.6	879	18.0	16.9 - 19.1
Review or stop date									
Documented	2,419	48.6	47.2 - 50.0	2,680	56.9	55.5 - 58.3	2,925	59.9	58.5 - 61.3
Not documented	2,558	51.4	50.0 - 52.8	2,030	43.1	41.7 - 44.5	1,958	40.1	38.7 - 41.5
Total	**4,977**	**-**	**-**	**4,710**	**-**	**-**	**4,883**	**-**	**-**

Notes:

Source – Antimicrobial and infection data collection form, Section 2, Methods 1 and 2 data. See Figure 6 for graphical presentation.

CI = confidence interval.

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