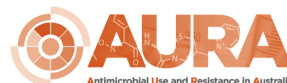


The National Antimicrobial Prescribing Survey (NAPS)

Prof **Karin Thursky**

Director

National Centre for Antimicrobial Stewardship



**AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE**

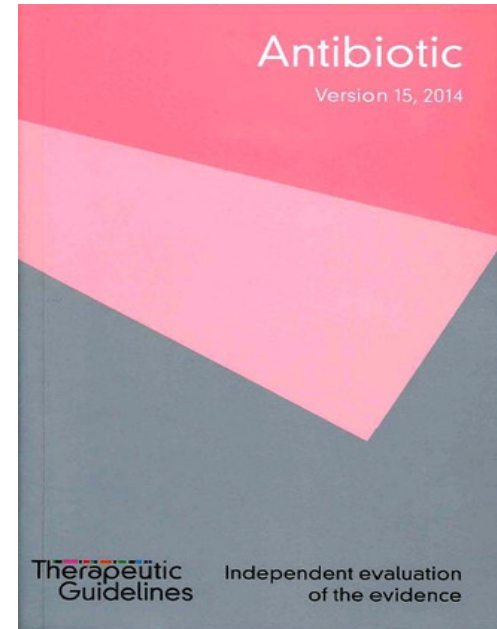
Overview



- Evolution of NAPS
- Tools, support, results and reports
 - Hospital NAPS
 - Quality Assurance NAPS
 - Aged Care NAPS
 - Surgical NAPS
- Participation and feedback
- Future directions

Therapeutic Guidelines

- Australia has had national antibiotic guidelines since 1978
- *Therapeutic Guidelines Antibiotic, Version 15, 2014*



Accreditation standards

For Australian hospitals, an AMS program is an accreditation criterion in the NSQHC Standards

Antimicrobial stewardship

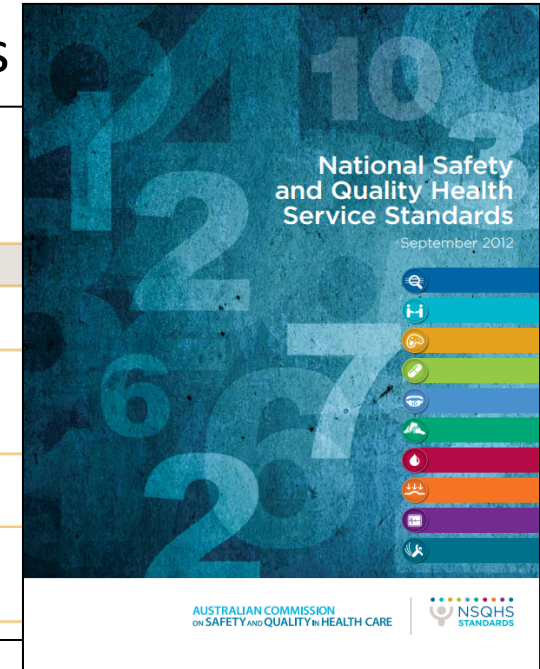
Safe and appropriate antimicrobial prescribing is a strategic goal of the clinical governance system.

This criterion will be achieved by:

3.14 Developing, implementing and regularly reviewing the effectiveness of the antimicrobial stewardship system

Actions required:

- 3.14.1** An antimicrobial stewardship program is in place
- 3.14.2** The clinical workforce prescribing antimicrobials have access to current endorsed therapeutic guidelines on antibiotic usage⁴⁵
- 3.14.3** Monitoring of antimicrobial usage and resistance is undertaken
- 3.14.4** Action is taken to improve the effectiveness of antimicrobial stewardship



Aims



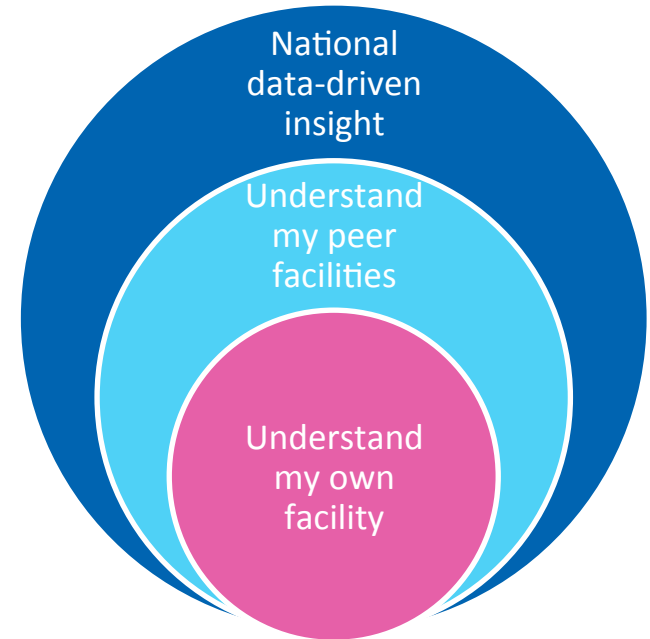
- NAPS began in 2010 – evaluated ESAC methodology initially
 - Continuing development and refinement

Initial Goal:

- To develop a simple and practical snapshot survey
 - Assess key elements of antimicrobial prescribing
 - Quantitative and qualitative
 - Facilitate local quality improvement
 - Education and reports
 - To suit different auditors with various levels of experience

Aims

1. Facilitate local quality improvement
Compare similar facilities
2. National data on antimicrobial prescribing behaviour
3. Identify key areas for improvement
4. Supporting facilities without ID or AMS expertise



Growth of NAPS

More than 100,000 antimicrobial prescriptions in the database

2010

Hospital

5 sites, paper based

2013: online portal

2016: 314 sites



2015

Aged Care

186 sites on debut

2016: 251 sites



2016

Quality Improvement

53 hospitals
- mostly rural sites

2017: phone app

2016

Surgical

2016 pilot: 75 sites

INAPS National Antimicrobial Prescribing Survey

Audit date: / / **Patient identification number:** / / /

Specialty: / / **Word:** / /

Was an indication documented? Yes No
If no, did you consider the finding being investigated?

Specify documented or presumed indication: Yes No
Are there any other documented indications?

Was this review or step done equivalent? Yes No
If no, did you consider the finding being investigated?

Was this compliant with guidelines? Yes No
Please comment on non-compliance

Comments (e.g. allergies, reasons for non-compliance, microbiology etc.):

SURGICAL INAPS National Antimicrobial Prescribing Survey

Patient identification number: / / / **Date of birth / age:** / / **Gender:** M / F / O **Date of admission:** / / **Date of discharge:** / / **Specialty:** / / **Height cm:** / **Weight kg:** / **eGFR / CrCl (ml/min):** /

Risk factors: none identified

Surgical details

Surgery date: / / **Surgery this admission:** initial subsequent

Procedures documented? emergency elective not assessable

trauma removal/replacement of prosthetic material excessive blood loss

Surgeon code: / **Anaesthetist code:** /

Time of first incision: / / not documented not applicable
If not documented or not applicable, surgery start time (or estimate)

End time (or estimate): / /

Wound classification: clean clean-contaminated contaminated dirty unknown not applicable

ASA score: 1 2 3 4 5 6 unknown

Surgical or clinical notes, microbiology, radiology:

AGED CARE INAPS National Antimicrobial Prescribing Survey

Antimicrobials Form

Has the resident been prescribed an antimicrobial? no yes, complete an **Antimicrobials Form** (separate forms provided 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:** / / **Gender:** M / F / O **Allergies and adverse drug reactions to antimicrobials:** nil known not documented yes, specify drug and nature

Admitted to hospital within 30 days: Yes / No

2. Antimicrobials

Start date: / / **Renal status (MDF):** still prescribed today

Antimicrobial: / **Dose:** /

3. Microbiology: complete for specimens collected on the start date or in the 24 hours prior to the start date. not collected; proceed to section 4. collected, complete below and if multiple types, only include the one immediately prior

Urine: Date collected: / / final report attached Stool: Date collected: / / final report attached Cloacal: Date collected: / / final report attached

Sputum: Date collected: / / final report attached Blood: Date collected: / / final report attached Nore: Date collected: / / final report attached

Swab: Date collected: / / final report attached Respiratory virus test: Date collected: / / final report attached Other: Date collected: / / final report attached

HOSPITAL INAPS National Antimicrobial Prescribing Survey

Audit date: / / **Patient identification number:** / / / **Date of birth / age:** / / **Gender:** M / F / O **Specialty:** / / currently in ICU / NICU **Ward:** / **Weight kg:** / **eGFR / CrCl (ml/min):** /

Antimicrobials

Only record the antimicrobials as prescribed at 08:00 am on the audit day and any surgical prophylaxis or stat doses in the previous 24 hours

Start date	Antimicrobial	Route	Dose	Freq	Indication documented	Specify documented or presumed indication	Review / stop date documented	Guideline compliance (1-6)	Surgical prophylaxis > 24 hrs	Allergy mismatch	Microbiology mismatch	Inappropriate use (1-6)
/ /												
/ /												
/ /												
/ /												

Allergies and adverse drug reactions to antimicrobials: nil known not documented present, record the antimicrobial and the nature of the reaction

Microbiology: not collected / not assessable collected, record the specimen type, organism and susceptibilities if relevant

Guideline compliance:

- Compliant with Therapeutic Guidelines
- Compliant with locally endorsed guidelines*
- Non-compliant with guidelines
- Directed therapy
- No guidelines available
- Not assessable

*Local Therapeutic Guidelines if local guidelines are the same

Clinical notes or comments:

Renal replacement therapy given within the previous 24 hours, eg. dialysis

Surgical procedure if performed:

If prophylaxis given within previous 24 hours, include in audit

Appropriateness:

- Optimal
- Adequate
- Suboptimal
- Inadequate
- Not assessable

Data collection tools

Data fields

KEY INDICATORS



Documentation of indication

HOSPITAL NAPS National Antimicrobial Prescribing Survey

GUIDANCE NCAS

Audit date: / / Patient identification number: Patient identification number Date of birth / age: / / Gender: M / F / O Specialty: currently in ICU / NICU Ward: Weight kg: eGFR / CrCl ml/min:

Antimicrobials
Only record the antimicrobials as prescribed at 08:00 am on the audit day and any surgical prophylaxis or stat doses in the previous 24 hours

For NICU patients
Birth weight kg: Gestational age weeks:

Start date	Antimicrobial	Route	Dose	Freq	Indication documented	Specify documented or presumed indication	Reviewer / date documented	Guideline compliance (1-6)	Surgical prophylaxis > 24 hrs	Allergy / mismatch	Microbiology mismatch	Incorrect route	Incorrect dose / frequency	Incorrect duration	Spectrum too broad	Spectrum too narrow	Indication does not require antimicrobials	If restricted: approval given	Appropriateness (1-5)	
/ /																				
/ /																				
/ /																				

Allergies and adverse drug reactions to antimicrobials
 nil known not documented
 present, record the antimicrobial and the nature of the reaction

Microbiology not collected / not assessable
 collected, record the specimen type, organism and susceptibilities if relevant

Guideline compliance
1. Compliant with Therapeutic Guidelines
2. Compliant with locally endorsed guidelines*
3. Non-compliant with guidelines
4. Directed therapy
5. No guidelines available
6. Not assessable

Clinical notes or comments

Surgical procedure if performed

Renal replacement therapy given within the previous 24 hours; eg. dialysis

If prophylaxis given within previous 24 hours; include in audit

Appropriateness
1. Optimal
2. Adequate
3. Suboptimal
4. Inadequate
5. Not assessable

*Special Therapeutic Guidelines if local guidelines are the same

Doc: HospitalNAPS-GDPV7_20160708

Patient demographics

Antimicrobial information

Allergies & Microbiology

Clinical notes

Surgical prophylaxis >24 hrs

Guideline Compliance

Appropriateness

Appropriate

		If endorsed guidelines are <u>present</u>	If endorsed guidelines are <u>absent</u>
Appropriate	1	Optimal¹ Antimicrobial prescription follows either the Therapeutic Guidelines ² or endorsed local guidelines <i>optimally</i> , including antimicrobial choice, dosage, route and duration ³	The antimicrobial prescription has been reviewed and endorsed by an infectious diseases clinician or a clinical microbiologist OR The prescribed antimicrobial will cover the likely causative or cultured pathogens and there is not a narrower spectrum or more appropriate antimicrobial choice, dosage, route or duration ³ available
	2	Adequate Antimicrobial prescription does not optimally follow the Therapeutic Guidelines ² or endorsed local guidelines, including antimicrobial choice, dosage, route or duration ³ , however, is a reasonable alternative choice for the likely causative or cultured pathogens OR For surgical prophylaxis, as above and duration ³ is less than 24 hours	Antimicrobial prescription including antimicrobial choice, dosage, route and duration ³ is not the most optimal, however, is a reasonable alternative choice for the likely causative or cultured pathogens OR For surgical prophylaxis, as above and duration ³ is less than 24 hours

Inappropriate

Inappropriate	3	Suboptimal There may be a mild or non-life-threatening allergy mismatch OR Antimicrobial prescription including antimicrobial choice, dosage, route and duration ³ , is an unreasonable choice for the likely causative or cultured pathogens, including: <ul style="list-style-type: none"> spectrum excessively broad, unnecessary overlap in spectrum of activity, dosage excessively high or duration excessively long failure to appropriately de-escalate with microbiological results
	4	Inadequate Antimicrobial prescription including antimicrobial choice, dosage, route or duration ³ is unlikely to treat the likely causative or cultured pathogens OR The documented or presumed indication does not require any antimicrobial treatment OR There may be a severe or possibly life-threatening allergy mismatch, or the potential risk of toxicity due to drug interaction OR For surgical prophylaxis, the duration ³ is greater than 24 hours (except where local guidelines endorse this)



Not assessable

5	Not assessable The indication is not documented and unable to be determined from the notes OR The notes are not comprehensive enough to assess appropriateness OR The patient is too complex, due to multiple co-morbidities, allergies or microbiology results, etc.
---	---

Methodology

Study type	Data suitable for		Recommended for:
	Prevalence estimates	Appropriateness of prescribing	
Point prevalence study (gold standard)	✓✓	✓✓	All hospitals if resources sufficient
Repeat point prevalence surveys	✓ (first day only)	✓ (if sufficient data collected, eg >30 prescriptions)	Smaller hospitals
Random sampling point prevalence study	✓ (if sampled appropriately across whole hospital)	✓	Only hospitals with ≥100 beds
Directed survey	X	✓	All hospitals if required

Reports

Royal Melbourne Hospital [Parkville]  

Home Resources My Surveys Patient Data Reports Admin

Dashboard Detailed Reports Benchmarking Time Series Data Export

Dashboard

Only completed 'finalised' patient data are included.

Choose report filters

Survey Name

- Select/Deselect All
- Royal Melbourne Hospital (Parkville)
- hospital NAPS 2016
- hospital NAPS 2015
- NAPS October 2014
- NAPS August 2014
- NAPS 2014

Antimicrobial *

Specialty *

Currently in ICU/NICU * Both Yes No/Not specified

Ward *

Indication for Antimicrobial *

Choose report type

Able to combine facilities and surveys

Apply filters

- Antimicrobial
- Specialty or ward
- Indication
- Assessment of prescription

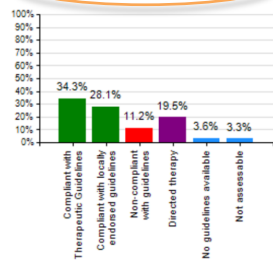
Reports

Surveys included	Methodology	Percentage of patients on antimicrobials
Royal Melbourne Hospital [Parkville]	hospital NAPS 2016	47.7% (184 of 386 patients)

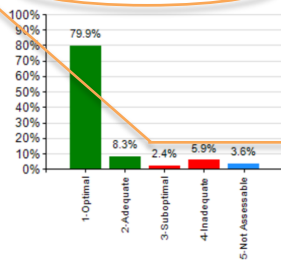
* For repeat point prevalence surveys, this percentage is calculated based on the first audit day only

Prevalence

Compliance with Guidelines



Appropriateness of Antimicrobial



Appropriateness

Compliance with guidelines

Compliant with Guidelines **62.4%**
 Noncompliant with Guidelines **11.2%**
 Directed Therapy **19.5%**
 Other **6.8%**

Appropriate **88.2%**
 Inappropriate **8.3%**
 Not Assessable **3.6%**

Documentation of indication

Therapeutic Guidelines' and 'Local Guidelines' are deemed as being compliant with guidelines (displayed in green). None Available and Not Assessable are grouped as 'Other' (displayed in blue).

'Optimal' and 'Adequate' are deemed as being appropriate (displayed in green). 'Suboptimal' and 'Inadequate' are deemed as being inappropriate (displayed in red).

Documentation of Indication



Review or stop date documented



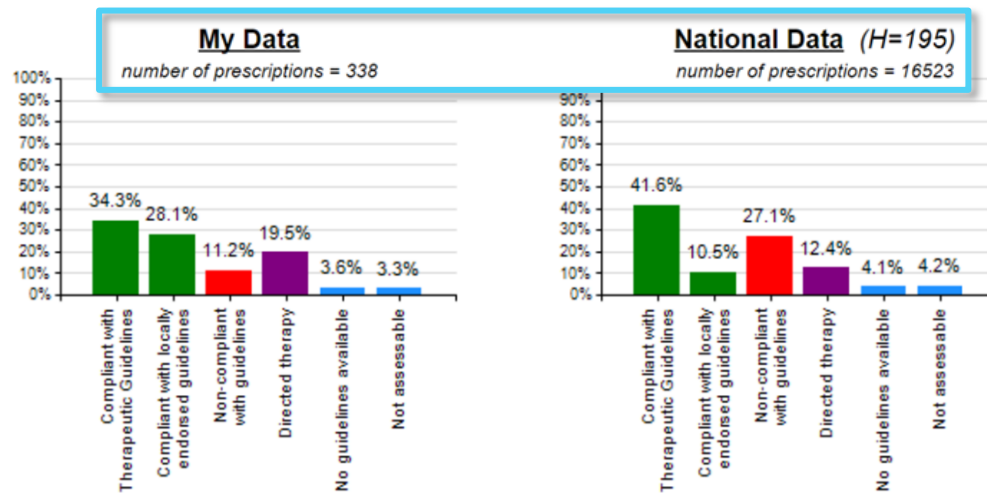
Review or stop date documented

Benchmarking

Apply benchmarking filters

- Public or private
- State or territory
- Remoteness
- Number of beds

Compliance with Guidelines



Compliant with Guidelines	62.4%	Compliant with Guidelines	52.2%
Noncompliant with Guidelines	11.2%	Noncompliant with Guidelines	27.1%
Directed Therapy	19.5%	Directed Therapy	12.4%
Other	6.8%	Other	8.3%

*Therapeutic Guidelines' and 'Local Guidelines' are deemed as being **compliant** with guidelines (displayed in green).*

None Available and Not Assessable are grouped as 'Other' (displayed in blue).

Limitations

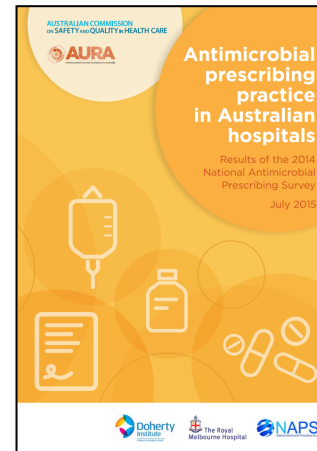
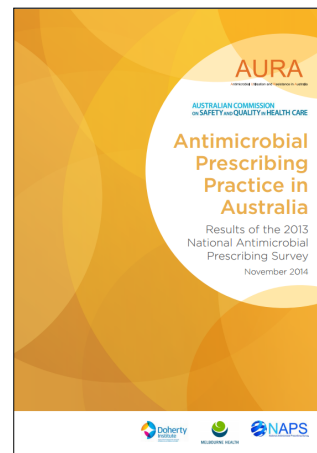
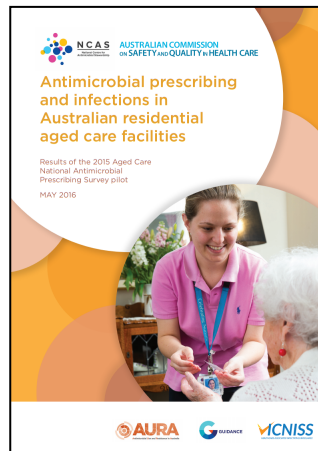
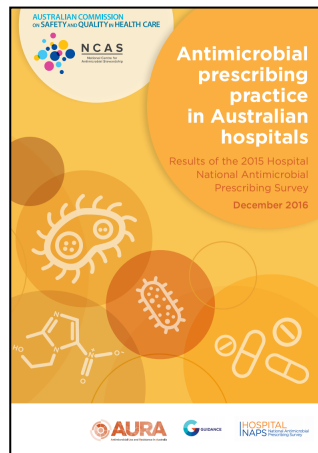
- Voluntary participation
- Subjective nature of ‘appropriateness’ assessment
 - Auditors at each hospital conducted their own assessments
 - Extensive user guide, online videos and live training
 - Multidisciplinary team assessments recommended
 - e-Learning module with mandatory quiz
 - Remote assessments available upon request by NAPS team

Support



- Helpdesk
 - Phone and email
- Live online training sessions for each module
- Remote assessments for sites without infectious diseases expertise
 - Mainly required for regional, remote and private facilities
 - Discuss the audited patients, how to feedback results to medical staff and other local AMS program advice
 - Highly valued by participants
 - Increases surveyors' confidence and credibility of results

Publications



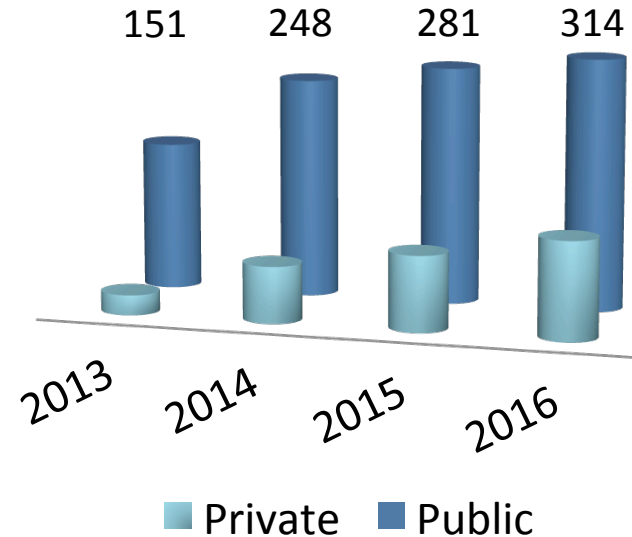
Hospital NAPS



Participation

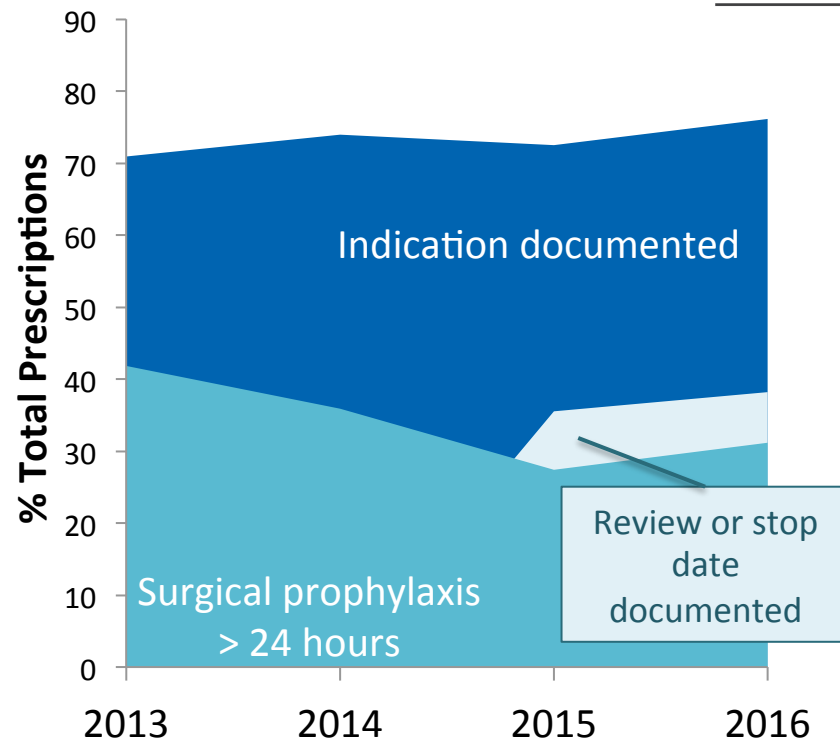
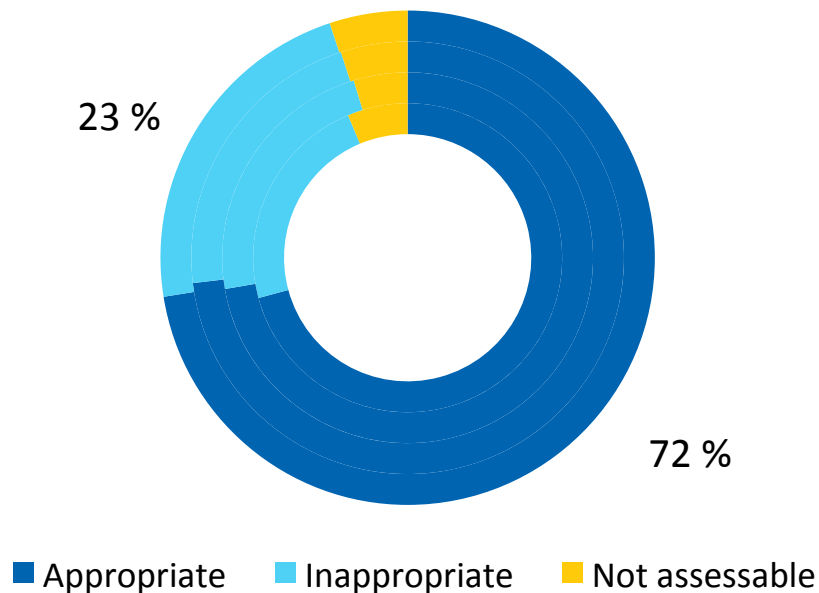
- Point prevalence survey
- All states and territories
- 33% of all public hospitals in Australia
 - 87% of principle referral hospitals
- 14% of all private hospitals in Australia
 - Annual participation is growing

Total Number of Participating Sites



Key indicators

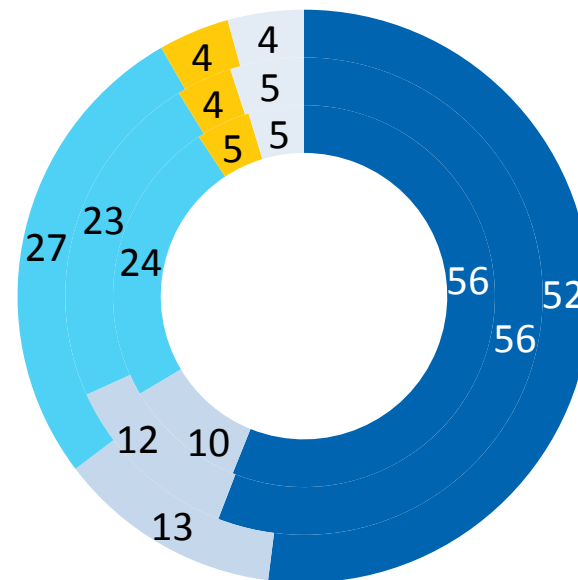
Overall Prescription Appropriateness (%)



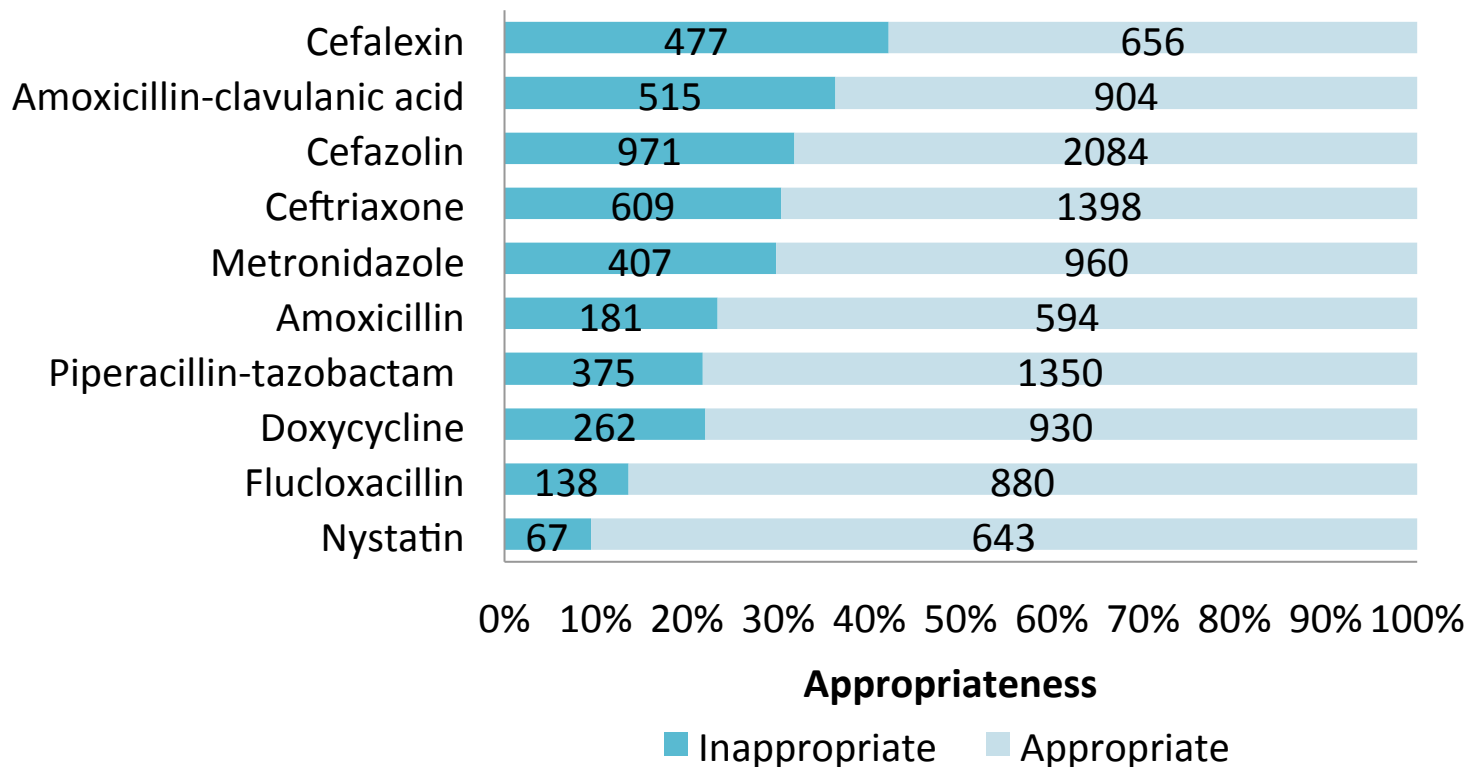
Key indicators

- Compliant with guidelines (TG or local)
- Directed therapy
- Non-compliant
- No guideline available
- Not assessable

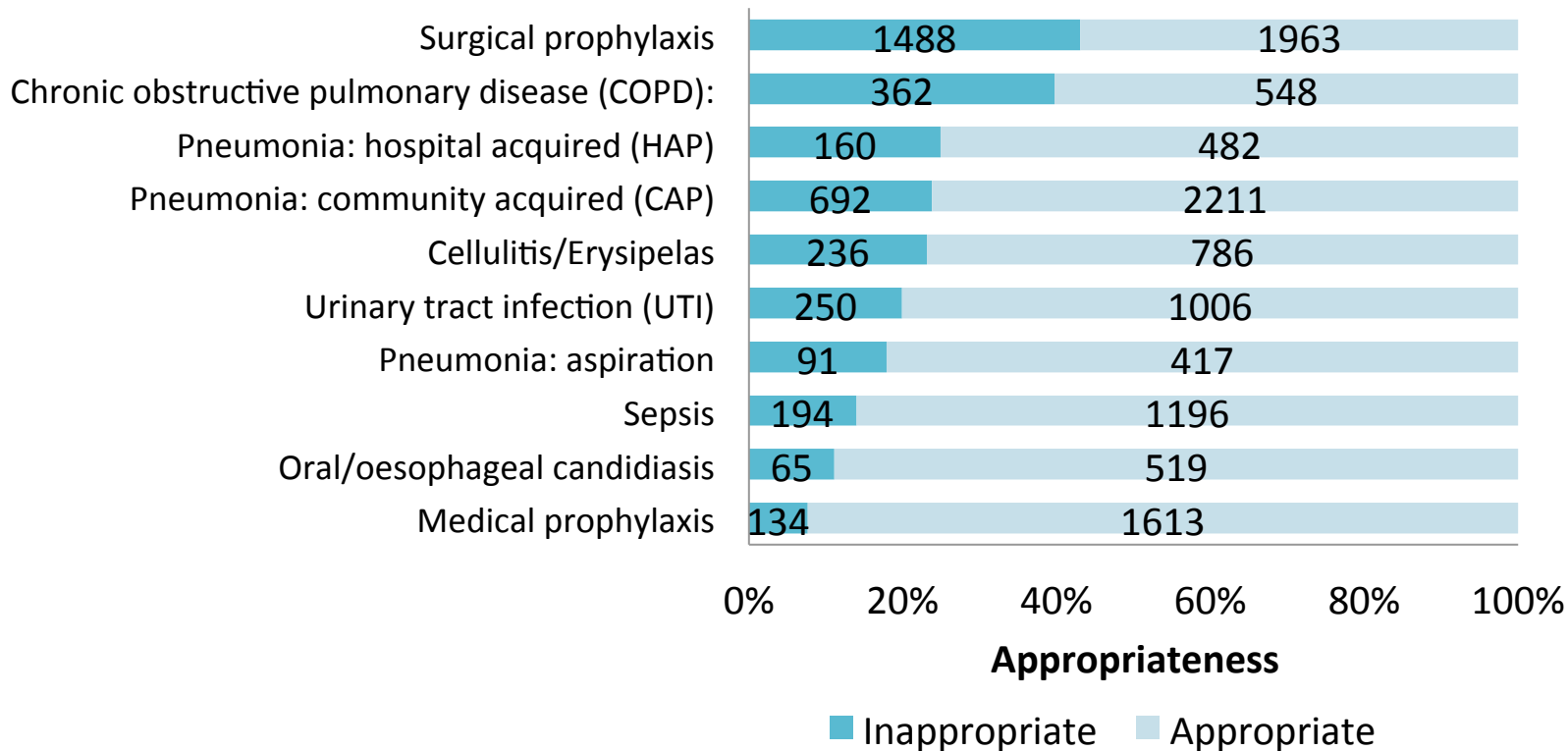
Guideline Compliance (%)



Most common antimicrobials



Most common indications



Hospital NAPS



- NAPS is a core part of many AMS programs
- Increased open dialogue about AMS amongst health care professionals, identified gaps, informed guidelines and educational material
- Larger metro hospitals are self-sufficient
- Hospitals without ID support (regional, remote and private)
 - Motivated and willing but lack confidence and knowledge
 - Need somebody to talk to for advice
 - Less likely to feel confident in their ability to assess appropriateness
 - More likely to require assistance from NAPS or staff at another site
 - ‘Remote assessments’: assessed > 800 prescriptions in 2014

Quality Improvement



Quality Improvement (QI) NAPS



- Supplements the Hospital NAPS
 - Particularly suitable for smaller facilities
- A quick, flexible audit designed to be done often on small numbers of patients
 1. Indication documented?
 2. Review or stop date documented?
 3. Compliant with guidelines?
- Encourages intervention and timely feedback to prescribers

Aged Care NAPS



Context



- 2,700 aged care facilities across Australia
- Prevalence of antibiotic use 5-13%
 - But up to 75% inappropriate
- 50-80% residents receive at least 1 course of antibiotics every year

Challenges



- Gap in AMS-specific accreditation requirements and guidelines
- High workforce turnover and low nurse-resident ratio
- Multiple GPs, operate autonomously and off-site
- Lack of ready access to pathology
- Limited access to ID support and clinical pharmacists
- Atypical illness presentation, accurate clinical diagnosis can be difficult

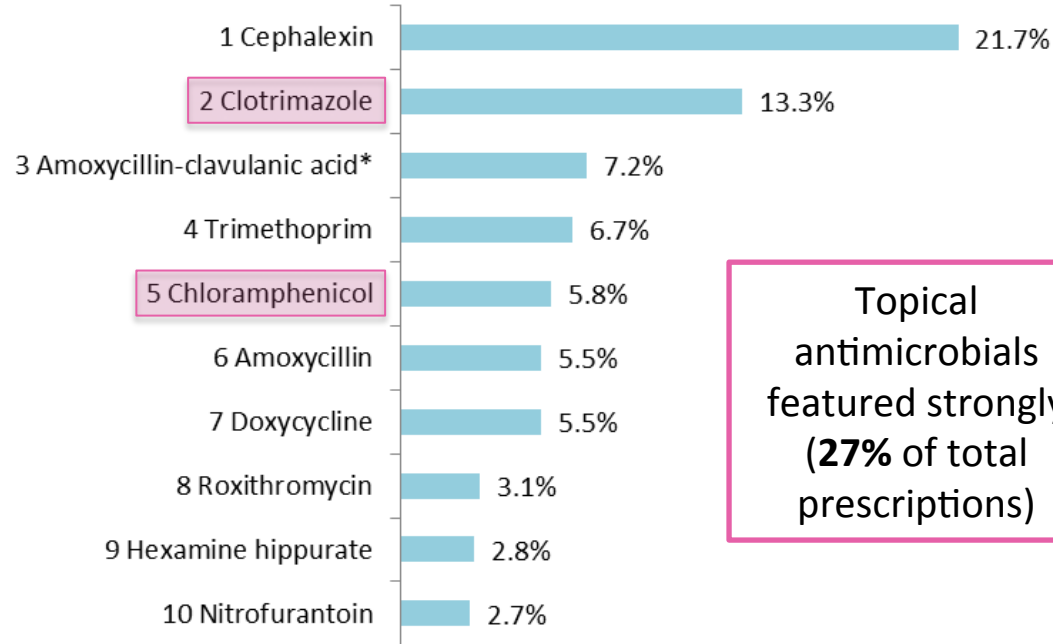
Participation



- Point prevalence survey
- 251 Aged care homes
 - All remoteness areas - metropolitan, regional, rural
 - All funding types - government, private, not-for-profit
- Data obtained on 1,867 prescriptions for 13,447 residents

Commonly prescribed antimicrobials

- 9.7% of residents were receiving at least one antimicrobial on the audit day

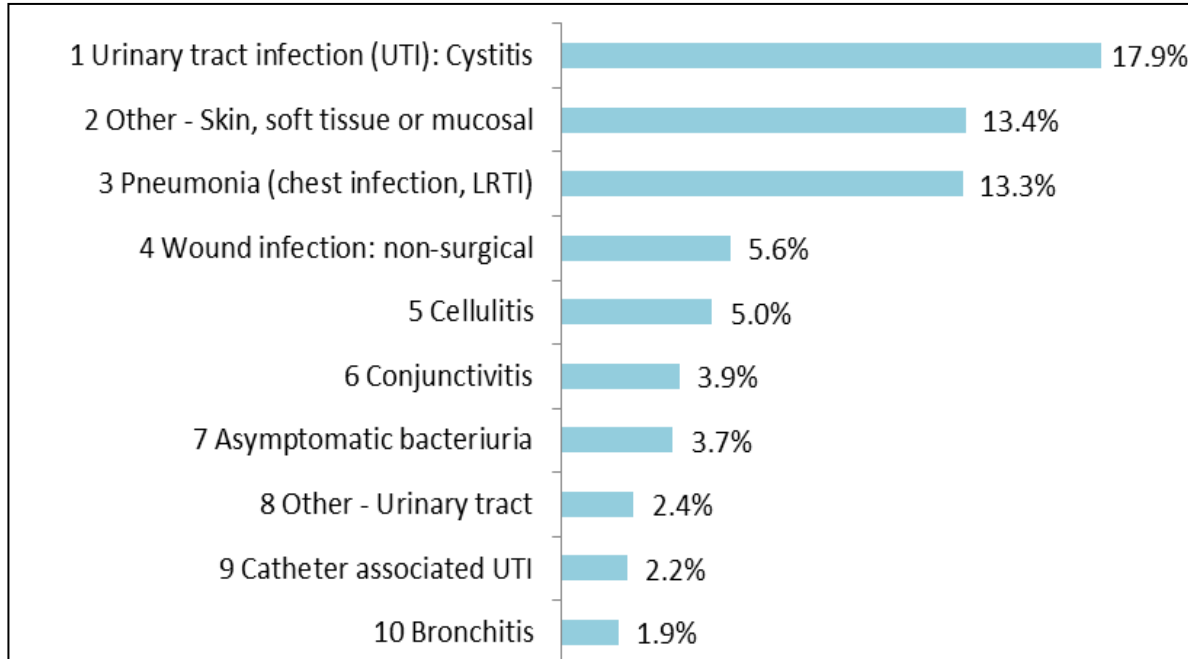


Key results

- 22% of prescriptions did not have an indication documented
- 50% did not have a review or stop date documented
- 27% had an unknown start date or had been administered for > 6 months
- 22% of antimicrobials were prescribed for prophylaxis
 - One third of prophylactic antibiotic use was for UTI prevention
 - And another 10% to prevent asymptomatic bacteriuria

Infections

One third of antibiotics were prescribed for residents that did not have any signs or symptoms of infection in the 1 week before start date



Where signs and symptoms were recorded, only 39% met McGeer infection criteria

Aged Care NAPS



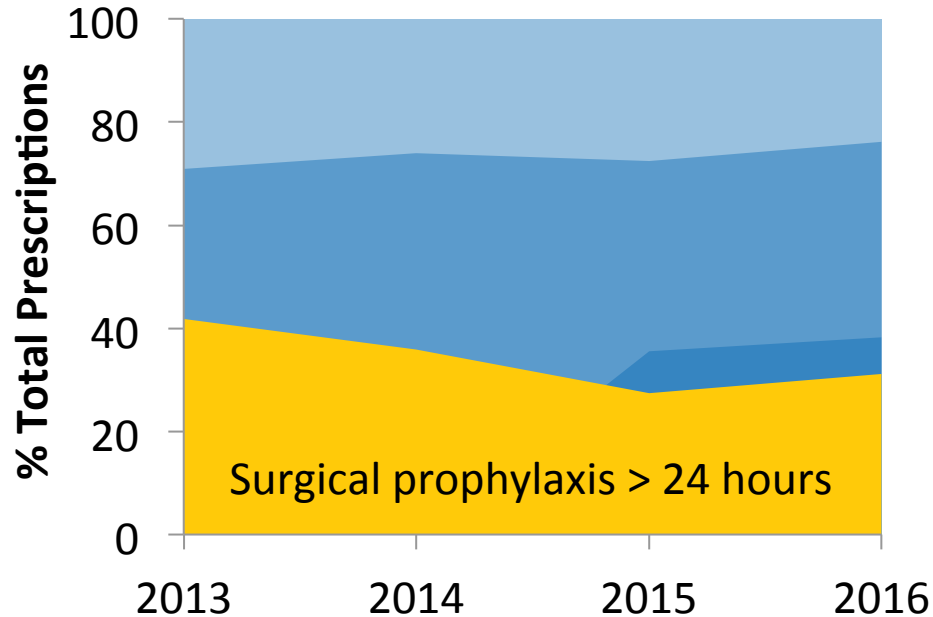
- AMS is a new concept to most aged care home staff
- Poor documentation is the main reason for difficulties obtaining survey data
- Very supportive of this national initiative
- Need help with actioning their own results locally

Surgical NAPS



Context

The Hospital NAPS has consistently shown that SAP prescribing is done poorly



Participation



- Longitudinal methodology
- Optional 30 day outcome data
- 67 hospitals, all states and territories
- Public and private, elective and emergency
- 4,507 surgical episodes captured

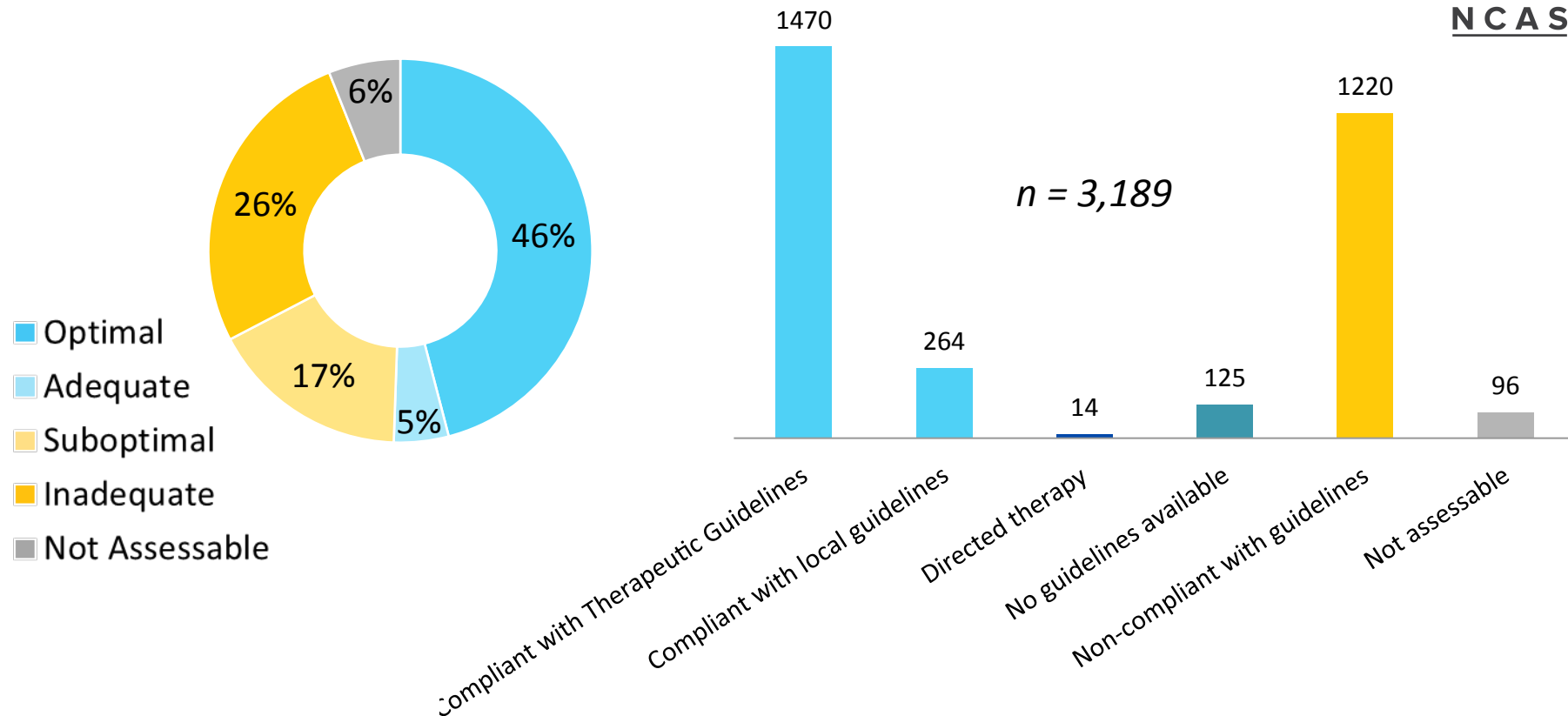
Peri-operative results

- Cephazolin was the most common antimicrobial prescribed (69%)
- 33% of surgical episodes had inappropriate peri-operative prophylaxis

The most common reasons were

- Incorrect timing
- Incorrect dose
- Spectrum too broad

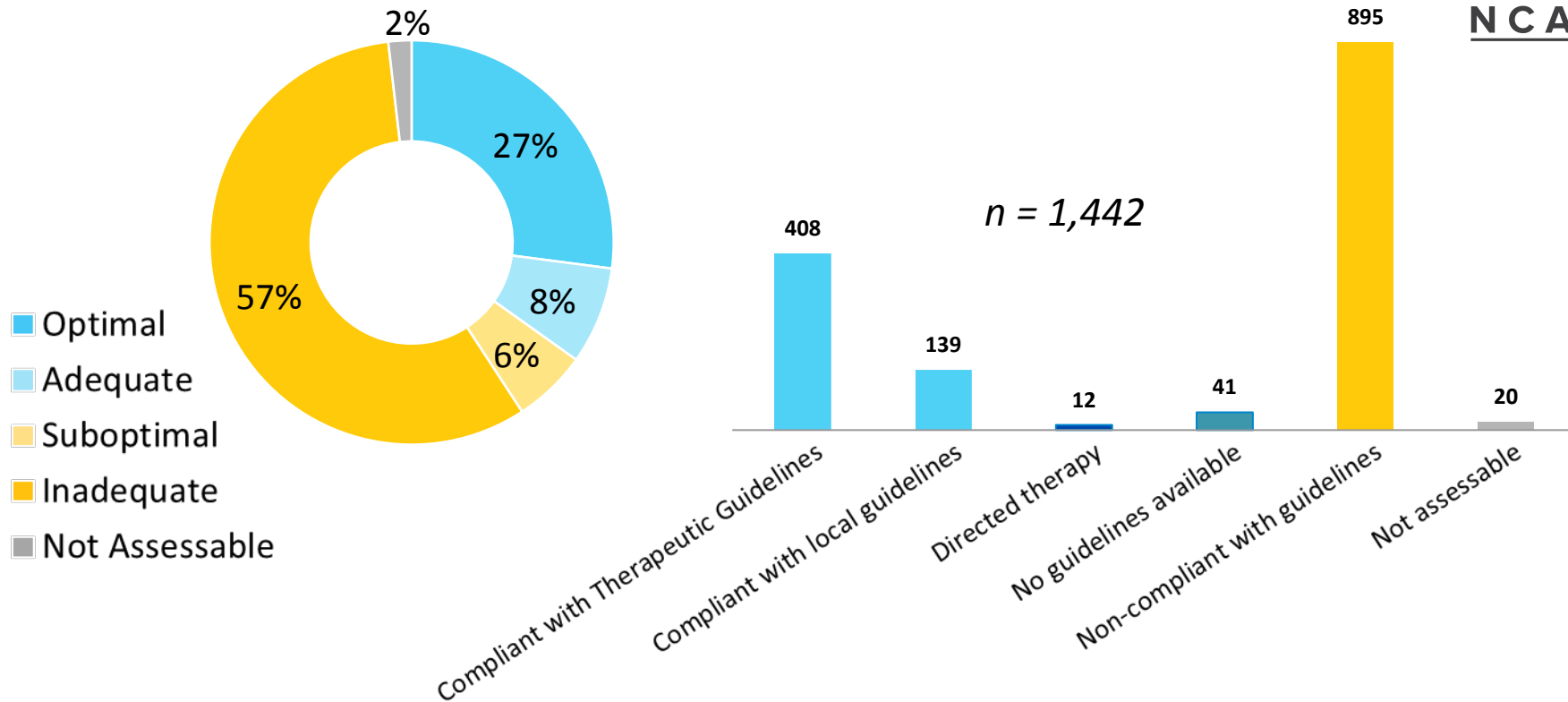
Peri-operative appropriateness and guideline compliance



Post-operative results

- 21% of post-operative surgical episodes had inappropriate prophylaxis
- For episodes where antibiotics *were* prescribed
 - 60% were inappropriate
 - Incorrect duration
 - Incorrect dose or frequency
 - Spectrum too broad
 - 40% did not require any antimicrobial

Peri-operative appropriateness and guideline compliance





Participant Feedback

Participant feedback

- What participants tell us
 - 95%+ would participate again
 - 90%+ happy with the amount of data required
 - Useful at a local level (reports and benchmarking)
- Value being part of something big

“We have seen a dramatic improvement within the health service since we have started using the NAPS.” – Regional pharmacist

Participant feedback

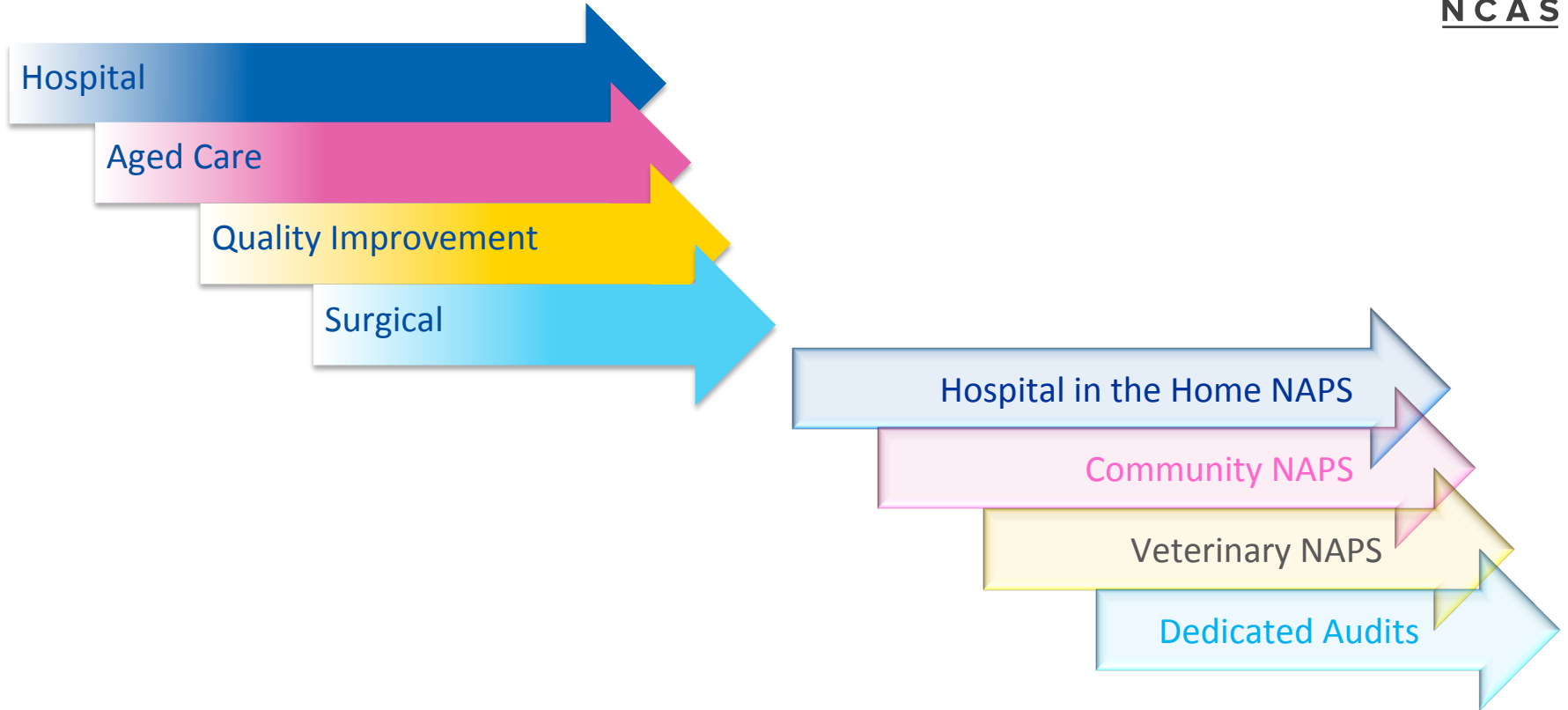


- Increased open dialogue about AMS amongst health care professionals
 - Identified gaps, informed guidelines and educational material
- Participants from hospitals without ID expertise and aged care homes are willing, but lacked confidence and knowledge
 - Remote support is key

"I didn't feel I had enough knowledge or experience to participate ... (but) the NAPS team were so supportive I wouldn't hesitate for next year. I also felt we gained a lot of good information from the survey"

– Regional ICP

Future directions



Acknowledgements



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Ms Renu Padhmanaban

VICNISS

Healthcare Associated Infections Coordinating Centre

A/Prof Leon Worth
Dr Ann Bull
Ms Sandra Johnson
Mr Simon Burrell

The Australian Commission on Safety and Quality in Health Care

Prof John Turnidge
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Marilyn Cruikshank