Australian Commission on **Safety and Quality** in Health Care

Specification for a Hospital Cumulative Antibiogram

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Introduction

1.1 Purpose

This document provides an update to the *Specification for a Hospital Cumulative Antibiogram 2019.*[1] The revision of the document has been completed to incorporate updates from the fifth edition of the Clinical and Laboratory Standards Institute (CLSI) M39: *Analysis and Presentation of Cumulative Antimicrobial Susceptibility Test Data.*[2] These changes ensure that antibiograms reflect best practice and standards for data analysis and presentation. It includes advice on recording and analysing antimicrobial susceptibility test data through the production of an antibiogram.

Antibiograms tabulate susceptibility patterns of clinically significant microorganisms and the relationship of tested antimicrobials to emerging resistance. Summary antimicrobial susceptibility tables are known as cumulative antibiograms. Timely cumulative antibiograms support health services in achieving compliance with the National Safety and Quality Health Service (NSQHS) Preventing and Controlling Infections Standard, specifically Action 3.19. This action requires hospitals to use surveillance data on antimicrobial resistance (AMR) and antimicrobial use to support appropriate prescribing.

This specification provides a guide for health service organisations to develop local cumulative antibiograms. The use of cumulative antibiograms is intended to aid antimicrobial stewardship (AMS) programs in the development of local antimicrobial prescribing guidelines and formulary management. The detail in the specification is intended for use by clinicians with appropriate support by microbiology, infectious diseases or AMS expertise for its interpretation.

Tabulated cumulative antibiograms should ideally be produced for hospitals each calendar year, or at a frequency that suits each service. They should summarise susceptibilities of the first isolate for a particular organism per patient, per annum for urine, blood, and non-urine/non-blood (for example, other body sites) isolates, where there are sufficient numbers to provide statistically reliable data (e.g., where the number of isolates tested against each antimicrobial is greater than 30).

The cumulative antibiogram may include isolates from inpatient wards, emergency departments and outpatients' clinics. Where the expected organism distributions are likely to be different in terms of frequency or resistance in different settings, separate identification of these patient populations may be possible if threshold volumes are sufficient (for example, haematology patients or patients in the intensive care unit). Subset analyses should still apply the same restrictions to only report percentage susceptibility rates where the total number of isolates tested is greater than 30. In instances where this is not possible, options include: report numbers without percentages, add a cautionary statement, or increase the time period over which the data is presented (e.g., expand to two years).

While this document retains the title of Specification, it is recognised that the guidance provided will be used by local expert teams to produce antibiograms of greatest value to their health service organisations. The first iteration of the specification was developed in consultation with the Commission's AMS Advisory Committee, state and territory representatives, and members of the Australian Passive AMR Surveillance (APAS) User Advisory Group, which includes public and private laboratories.

1.2 Relationship with the CLSI M39 guideline

This specification has been updated to reflect the latest edition of the *Analysis and Presentation of Cumulative Antimicrobial Susceptibility Test Data; Approved Guideline*.[2] The CLSI is an

international, educational organisation based in the United States, which promotes the development and use of standards and guidelines within the healthcare sector.

The CLSI M39 provides:

- guidance for clinical laboratories and their data analysis software providers for the routine generation and storage of susceptibility data and for the compilation of susceptibility statistics
- suggestions to clinical laboratories for effective use of their cumulative susceptibility statistics.

This specification differs from CLSI M39 by recommending:

- primary presentation by specimen site (non-urine/non-blood, urine, blood) rather than as a supplemental mode
- using the terminology of antimicrobials from the *Australian Medicines Handbook*[3]
- compliance with *Australian Guidelines for the Prevention and Control of Infection in Healthcare (2026)*[4] for standard precautions.

This specification also differs from CLSI M39 by permitting the presentation of supplemental AMR data, provided that the number of isolates actually tested against the antimicrobial is included and does not advise presenting overall estimated percentage susceptibility in these circumstances.

Note that for laboratories that apply the European Committee on Antimicrobial Susceptibility Testing (EUCAST) interpretive categories, the number of isolates that test “susceptible (S)” and “susceptible, increase exposure (I or SIE)” should be combined when generating %S results in the antibiogram tables. This is different for laboratories that apply CLSI interpretive categories. In general, the CLSI M39 document advises that laboratories should report the %S but exclude the %I and %SDD in the %S statistic, although for logical consistency, it would be advisable to include %SDD with %S.

More detailed technical information can be found in the relevant sections of CLSI M39 for the following:

- laboratory information system design
- data verification and validation procedures
- the reason for including only the first isolate from each individual for the year
- the limitations of these types of data and their statistical analysis.

Background

2.1 Antimicrobial Stewardship

AMR is a critical risk to patient safety as it reduces the number of antimicrobials available to treat infections. Patients with infections caused by resistant bacteria may have delayed recovery, treatment failure and an increased risk of mortality.

Approximately 1 in 4 antimicrobial regimens prescribed in Australian hospitals are considered inappropriate.[5] AMS is a systematic approach to optimising the use of antimicrobials, which is an effective strategy for improving patient safety in hospitals.[6]

Hospital AMS programs have been shown to decrease antimicrobial use and improve patient care.[6-8] These programs are essential to local and national efforts to minimise the emergence of AMR and decrease preventable healthcare associated infection. Action 3.19 of the Preventing and Controlling Infections Standard requires health service organisations to use AMR surveillance data to support appropriate prescribing. Cumulative antibiograms can be used to support this action.

The development of a standard approach to antimicrobial susceptibility testing, cumulative analysis and reporting of antibiograms requires the agreement of and implementation by local clinical microbiology services. Depending on the governance structure of the local clinical microbiology service, this may also mean seeking agreement at a local, jurisdictional or national level.

At a local level, regular analyses of AMR should be provided to groups and individuals with responsibility for developing and reviewing local antimicrobial guidelines (such as an AMS committee or drug and therapeutics committee) to inform local empirical therapy recommendations and formulary management. To avoid misinterpretation of antibiograms, clinical requests for access to antibiograms should be supported by concurrent consultation with an infectious diseases specialist or microbiologist to inform response to enquiries.

2.2 Surveillance in Australia

The Antimicrobial Use and Resistance in Australia (AURA) surveillance program was established by the Commission in 2014. It is funded and coordinated by the Australian Centre for Disease Control (CDC), previously the Government Department of Health, Disability and Ageing (the Department), with contributions from states and territories and private pathology services by meeting the costs of testing and data submission processes.

The AURA surveillance program provides a nationally coordinated approach to collection and reporting on AMR and antimicrobial use data from hospital and community settings across Australia. Data and national reporting provide a comprehensive picture of the burden of AMR and antimicrobial use in Australia.

APAS is one of the systems that contributes to AURA. It was established by the Commission in collaboration with Queensland Health and elements of this specification informed the establishment of APAS. APAS uses the OrgTRx system to collect, analyse and report on de-identified patient-level AMR data of participating public and private pathology services.

Participation in APAS provides laboratories with capabilities for comprehensive reporting on local AMR, including production of local cumulative antibiograms via access to the OrgTRx data portal. Where local AMR data are not available, national surveillance data provides a broader picture of AMR in Australia. However, local data may differ due to demographic differences in particular populations and the nature of health service provision.

Antibiogram specifications

3.1 Terminology

Within this specification.

- Generic antimicrobial names should be used, preferably following the terminology of the *Australian Medicines Handbook.*[3]
- The antimicrobial-organism combinations reported should be in accordance with those recommendations for treatments in *Therapeutic Guidelines: Antibiotic.*[9]
- It is recommended that the terminology for bacteria generally follows the terminology of the Royal College of Pathologists of Australasia[10], although this is at the discretion of the AMS participants who will use the data.
- For the purposes of the antibiogram, any organism tested with EUCAST antimicrobial susceptibility method and interpretative criteria should be considered susceptible if it meets the definitions of the susceptibility categorises of either 'susceptible, standard dosing regimen (S)' or 'susceptible, increased exposure (I).[11] Any organisms tested with the CLSI method and interpretative criteria should be considered susceptible if it meets the definitions of the 'susceptible (S)' category.[12]

3.2 Threshold volumes and statistical considerations

The structure of the antibiogram will be determined by local epidemiology and laboratory practices. However, in general.

- Only the first clinical isolate for a particular organism per patient for a specified time period should be included. The use of multiple isolates from the same patient would bias results to reflect the susceptibility data. Isolates performed as part of surveillance programs should not be included. This does not preclude the separate analysis of sequential patient isolates to determine resistance trends.
- Fewer than 30 isolates of any grouping of bacteria do not provide statistically significant information. When data from fewer than 30 isolates are presented, a comment should be included to reflect this, and to provide context. In these cases, it is desirable to provide confidence intervals (as per CLSI M39-Ed5) for the point estimate of percentage susceptibility. This may apply to the total organism group or only specific antimicrobial-organism combinations within the total organism group.
- When there are fewer than 30 isolates, an AMS group may refer to regional or jurisdictional or national data. However, it is essential that each institutional AMS group also reviews its own resistance data in the recommended format, rather than depending on regional or jurisdictional or national data.
- In general, percentages should only be reported where 90% of isolates are tested for each antimicrobial. However, there may be circumstances for certain subsets where a lower value would be acceptable. The total number of isolates tested against each antimicrobial should always be included in the antibiogram notes.

3.3 Sentinel resistances

The occurrence of particular AMR in certain species, at any frequency, may be critical for determining stewardship policies. These AR microorganisms are:

- vancomycin-resistant *Enterococcus faecalis or Enterococcus faecium* (VRE)
- methicillin-resistant *Staphylococcus aureus* (MRSA)
- vancomycin-intermediate and vancomycin-resistant *Staphylococcus aureus* (VISA, VRSA); note that the method used for identifying vancomycin non-susceptibility should be reported

- carbapenem-resistant *Enterobacterales*, *Acinetobacter* species and *Pseudomonas aeruginosa*
- *Streptococcus pneumoniae* with beta-lactam resistance should be highlighted by reporting S, I or R separately. For EUCAST, an isolate with a penicillin MIC >0.06 mg/L, or oxacillin 1 µg disk zone diameter <20 mm, are non-wild type strains. Note that penicillin breakpoints for meningitis and endocarditis differ from other infection sites. Therefore, careful handling of this categorical data is required
- *Enterobacterales* resistant to third or later generation cephalosporins; this should be considered as a surrogate marker for possible extended spectrum beta-lactamase (ESBL) or AmpC production and should be reported as listed at Section 4.2.

3.4 Presentation of certain classes of antimicrobials

The following principles should be considered in the preparation and presentation of the hospital antibiogram.

- Inclusion of specific commentary may be appropriate for an antibiogram of a facility that cares for children. This can be emphasised in cumulative antibiograms by means such as a highlighted background colour, different font colour or key. See examples in Section 4, Structure of the Antibiogram.
- It can be indicated that certain antimicrobials should be reserved for specific purposes. For example, the publication of susceptibility data for carbapenems and fluoroquinolones does not imply they are first-line antimicrobials for empiric treatment yet presenting those susceptibility data may trigger prescribing by clinicians.
- Combinations of antimicrobial–microorganisms are routinely included in laboratory test panels that are known to have an expected resistance phenotype or are ineffective for treatment of infections in clinical practice (such as sulfamethoxazole/trimethoprim for *Pseudomonas aeruginosa*) should not be reported in the antibiogram, or specifically left blank, or presented with a dash.[13,14] For example, for EUCAST laboratories, any antimicrobial-species combination that is presented with a “dash” in the breakpoint table, should be considered resistant, or testing and reporting should be avoided. Additional information can be found on their website.

Structure of the antibiogram

The structure of the antibiogram should be a table format, as shown in the example in the Appendix. Colour coding can be used to identify organisms and antimicrobials and distinguish between gram-positive and gram-negative organisms, and associated percentage susceptibility.

4.1 Antibiogram tables within the specification

Tabulated cumulative antibiograms should be produced for blood cultures, urine, skin and if available, soft tissue and respiratory isolates, and only when there are more than 30 isolates of a genus, species or other grouping over one calendar year.

Each cumulative antibiogram table should be annotated with the name of the institution that the isolates reported were derived from, the time period over which the isolates were collected, and the standard used by the laboratory to determine antimicrobial susceptibility. These may include either CLSI[15,16]or EUCAST.[17] Non standardised methods should not be used for interpretation of antimicrobial susceptibility testing.

If the breakpoints for any antimicrobial–organism pair have changed since the last publication of a cumulative antibiogram for a health service organisation, it may be appropriate to indicate the date when the change was implemented in a footnote to the table.

Where the analysis is performed on a subset of isolates (e.g., isolates from urine or blood cultures) ‘first isolate’ would refer to the first isolate in that particular subset (that is the patient's first urine or blood isolate). If the same microorganism is isolated from urine, a non-urine site or blood from an individual, then the susceptibility data from the first isolate from each site should be included in their respective antibiogram.

Only finalised, validated test results are included. Unusual antimicrobial resistances should be verified before inclusion. Refer to CLSI and EUCAST reference guides and the CARAlert Laboratory Handbook where relevant.[2,14,18]

In general, only “percentage susceptible” data should be reported. Exceptions to this are the following antimicrobial–organism combinations for CLSI methods: VISA and percentage penicillin intermediate susceptibility for *Streptococcus pneumoniae* and viridans group *Streptococcus,* if these species are reported.

For each genus, species or other grouping, the number of isolates (the denominator) used in determining the percentage can be noted on the antibiogram report (see example antibiograms in the Appendix). Ideally grand totals of all organisms included in the antibiogram should be noted in the antibiogram. Alternatively, include the number of isolates that each species contributes to the antibiogram. This enables quantification of those organisms that do not meet the required thresholds for inclusion in the antibiogram.

The antibiogram should report antimicrobial susceptibilities for the antimicrobials in actual current clinical use, not the susceptibility to any surrogate antimicrobial used in the laboratory. For example, in laboratories using CLSI methods, the antibiogram for *Staphylococcus aureus* should report as percentage susceptible to flucloxacillin, and not percentage susceptible to cefoxitin.

For a cumulative antibiogram, the percentage susceptibility for all clinically relevant antimicrobials tested on an isolate should be reported. It should not be restricted cascade reporting of susceptibilities to the narrow-spectrum, first-line antimicrobials included in routine individual patient reports to clinicians. It is useful to highlight in the antibiogram which antimicrobials are restricted.

Laboratories frequently only test susceptibility to second-line, broader spectrum antimicrobials when an isolate has tested non-susceptible to antimicrobials in a first-line, narrower spectrum panel. This results in a smaller denominator number of isolates tested. Where this occurs, or there is any other systematic cause for a difference in the number of isolates of the same type tested

against different antimicrobials, this should be annotated at each occurrence and explained in the presentation of the cumulative antibiogram.

The inclusion of susceptibility data from isolates that are clearly contaminants or normal flora (such as coagulase-negative *Staphylococcus* species*, Corynebacterium* species and viridans group *Streptococcus*) is discouraged. Ordinarily, these would not be included in a cumulative antibiogram even if there are more than 30 isolates. However, for particular circumstances (such as a hospital having a neonatal intensive care unit with annually 30 or more individual blood isolates of coagulase-negative *Staphylococcus* species that have undergone susceptibility testing), these data may be included at the discretion of the microbiology laboratory and the AMS group. In this circumstance, it is recommended that the data be presented by species (for example *Staphylococcus haemolyticus*, *Staphylococcus epidermidis)* and not grouped together as "coagulase-negative *Staphylococcus* species") and not accumulated at the level of the genus.

With subsequent antibiograms, graphs and charts for trends that are monitored from year to year are useful to highlight significant changes. Such graphs and charts can be used to highlight changes in susceptibility.

Signal resistances that occur at greater than 30 isolates should be included as a separate entry in the main antibiogram. If these occur at a frequency too low to appear in either the urinary, non-urinary or blood culture antibiograms, then the numbers that occur could be reported in a text report or as tabulated data. Although this is not strictly part of a cumulative antibiogram, it is necessary to know the numbers of these organisms in order to guide AMS programs. Zero occurrences of these organisms should also be reported. The ability to detect these resistances is, to a variable degree, dependent on molecular methods, and whether these methods have been applied should be noted in the report.

All antibiograms should be clearly labelled with details of the date of issue, author, details of completed approval processes, document control and/or version numbers.

4.2 Specification for non-urine isolates

In relation to non-urine isolates.

- **Required**: for each calendar year, the antibiogram should report susceptibilities for all isolates where the number tested is greater than 30.
- **Desirable**: if there are less than 30 isolates of any of the five most commonly isolated species, then accumulated antimicrobial susceptibility data should be reported. This can be done first by genus, then by grouping *Enterobacterales* into groups that do or do not usually carry inducible or de-repressed chromosomal β-lactamases. Refer to the latest Manual of Clinical Microbiology.[19]
- Do not combine data from *S. aureus* with data from coagulase-negative *Staphylococcus* species.

4.3 Specification for urine isolates

In relation to urine isolates:

- **Required**: the antibiogram should report all isolates with more than 30 isolated species with their susceptibilities.
- **Desirable:** if there are less than 30 isolates of any of the three most commonly isolated species, then accumulated antimicrobial susceptibility data should be reported. If practical, this can be done first by genus, then by grouping *Enterobacterales* into groups that do or do not usually carry inducible or de-repressed chromosomal β-lactamases. Refer to the latest Manual of Clinical Microbiology.[19]
- Coagulase-negative *Staphylococcus* species other than *Staphylococcus saprophyticus* should not be routinely included. Data from *Staphylococcus aureus* should not be combined with data from *Staphylococcus saprophyticus.*

- Where laboratories do not routinely perform antimicrobial susceptibility testing on specific urinary pathogens (such as *Enterococcus* species or *Staphylococcus saprophyticus*), consider adding a comment that data on these species is not presented in the antibiogram table.

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Appendix

This appendix contains examples of local antibiograms that can be adapted by individual health services. Note that not all antibiograms may be entirely consistent with this Specification due to local circumstances. These antibiograms are included to provide a range of examples of the variety of formats that may best suit local requirements, as part of an effective AMS program. The Commission acknowledges the contribution of the laboratories that provided these de-identified examples.

Figure A1: Example of a cumulative antibiogram and signal resistances for blood culture isolates

This document contains the yearly cumulative blood culture antibiogram for all hospitals combined serviced by *All Pathology Services*.

Notes:

- organisms are listed in descending order of frequency
- organisms are colour coded according to whether they are gram-positive or gram-negative organisms
- only the first isolate of a given species per patient per year per subtype (e.g. urine, non-urine, blood cultures) is included
- screening isolates collected for infection control purposes have been removed
- susceptibility testing to produce these antibiograms is performed using EUCAST microbroth dilution and disc diffusion methods
- expert EUCAST rules in antimicrobial susceptibility testing have been applied
- where the total number of isolates tested is < 30, results are considered statistically invalid in accordance with CLSI M39
- where only a subset (< 95%) of isolates from a particular organism group have been tested, reported susceptibilities are usually not indicative of the true susceptibility because of the selective nature of testing only more resistant isolates. These occasions are marked with an * and susceptibility results should be interpreted with caution.

Signal resistances: signal resistances are summarised even if the organism occurs at a frequency too low (< 30) to appear in either the urinary, blood, or non-urine/blood culture antibiograms. These organisms include:

- *Enterobacterales* resistant to third- or fourth-generation cephalosporins, reflective of a phenotypic surrogate marker for possible presence of extended-spectrum β-lactamases (ESBLs) or plasmid-mediated AmpC production (PAMPs)
- *Enterobacterales* resistant to carbapenems, reflective of a phenotypic surrogate marker for possible plasmid-mediated carbapenemase (CPE)
- Non-*Enterobacterales* (e.g. *Acinetobacter baumannii*; *Pseudomonas aeruginosa*) resistant to carbapenems, reflective of difficult-to-treat (DTR) phenotypes or possible plasmid-mediated carbapenemase (CPNE)
- Vancomycin-resistant enterococci (VRE)
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Vancomycin-heteroresistant, intermediate and resistant *Staphylococcus aureus* (hVISA, VISA, VRSA)
- Non-wild type *Streptococcus pneumoniae* noting that breakpoints differ according to clinical condition (e.g., pneumonia versus meningitis).

Figure A1 (continued)

All Hospitals Antibiogram Jan – Dec 2018

Blood Culture Antibiogram — **All Pathology Service Hospitals, Jan – Dec 2018**

Organism Group	No. Organisms	%Total		Penicillin	Amoxicillin	Flucloxacillin	Amoxicillin-clavulanic acid	Piperacillin-tazobactam	Cefazolin	Ceftriaxone	Ceftazidime	Cefepime	Meropenem	Gentamicin	Amikacin	Sulpha-trimethoprim	Ciprofloxacin	Fusidic Acid	Rifampicin	Gentamicin (High Level)	Erythromycin/Clarithromycin	Clindamycin	Tetracyclines	Quinupristin-dalfopristin	Vancomycin
All isolates	**2142**	**100.0**																							
Escherichia spp.	407	19.0	%		43		79	92	77	90		93	100	91	99	69	86									
			n		407		407	406	407	407		406	407	407	*329	407	407									
Staphylococcus aureus (ALL)	211	9.9	%	26		89	89				R					95	92	95	100		86	87	95		100
			n	211		211	211									211	*185	*186	*186		211	211	211		211
Klebsiella spp.	147	6.9	%		R		94	92	84	93		95	100	99	100	86	93									
			n				147	147	147	147		147	147	147	*119	147	147									
Pseudomonas aeruginosa	100	4.7	%		R		R	89	R	R	92	94	94	96	96	R	94							R		
			n					100			100	100	100	100	*77		100									
Enterococcus spp.	90	4.2	%	77					R	R	R					R		R	43	81	R	R	30	33	87
			n	90															*23	*83			90	*76	90
Enterobacter cloacae complex	56	2.6	%		R		R	66	R	71		86	98	93	100	77	93									
			n					56		56		56	56	56	*43	56	56									
B haemolytic *Streptococci* Group B	30	1.4	%	100						100			100			100			30		70	70			100
			n	30						29			*26			30			*10		30	30	30		*24

Figure A1 (*continued*)

Colour coding for antibiogram

	Gram positive organism		>80% of isolates susceptible		>80% of isolates susceptible (where sample size <95% of total isolates tested)
	Gram negative organism		61-80% of isolates susceptible		61-80% of isolates susceptible (where sample size <95% of total isolates tested)
	Antibiotic not recommended to be used in children without specialist advice		<=60% of isolates susceptible		<=60% of isolates susceptible (where sample size <95% of total isolates tested)
	Restricted or second line antibiotics	**R**	Intrinsic resistance is present with this organism–antibiotic combination	*	Sample size <95% of the total isolates tested
	Restricted or second line antibiotics and antibiotic not recommended to be used in children without specialist advice	**%**	Percentage of isolates sensitive to this particular antibiotic	**n**	Number of isolates tested with this antibiotic

Spp. = species; sulfa-triemthoprim = trimethoprim-sulfamethoxazole

Notes:

1. The data presented in this antibiogram is illustrative only and does not reflect real or current antimicrobial susceptibility patterns. It is intended solely as an example to demonstrate the format and interpretation of an antibiogram.
2. Gram-negative and gram-positive organisms are not separated in this example. Some facilities may choose to do so to ensure appropriate antibiotic selection for reporting.

Table A1 Signal Resistances: Where the tables below contain no data no multi-resistant organisms have been detected.

Blood culture: Extended beta-lactamase producing Enterobacterales (ESBL)			
Organism Group	Organism Name	No. identified	% of strains
Citrobacter freundii complex n = 9	*Citrobacter freundii*	1	11.1
Enterobacter cloacae complex n = 56	*Enterobacter cloacae*	3	5.4
Escherichia spp. n = 407	*Escherichia coli*	38	9.3
Klebsiella spp. n = 147	*Klebsiella pneumoniae*	7	4.8
Serratia spp. n = 21	*Serratia marcescens*	1	4.8
Blood culture: Plasmid mediated APMC producing Enterobacterales (PAMP)			
Organism Group	Organism Name	No. identified	% of strains
Escherichia spp. n = 407	*Escherichia coli*	8	2.0
Klebsiella spp. n = 147	*Klebsiella pneumoniae*	1	0.7
Citrobacter freundii complex n = 9	*Citrobacter freundii*	1	11.1
Enterobacter cloacae complex n = 56	*Enterobacter cloacae*	2	3.6
Blood culture: Plasmid mediated Carbapenamase producing *Enterobacterales* (CPE)			
Organism Group	Organism Name	No. identified	% of strains
Citrobacter freundii complex n = 9			
Enterobacter cloacae complex n = 56			

Table A1 (continued)

Blood culture: Vancomycin Resistant *Enterococci* (VRE)			
Organism Group	Organism Name	No. identified	% of strains
Enterococcus spp. n = 90	*Enterococcus faecium* (VRE) VAN A	1	1.1
	Enterococcus faecium (VRE) VAN B	4	1.4
Blood culture: Methicillin Resistant *Staphylococcus aureus* (MRSA)			
Organism Group	Organism Name	No. identified	% of strains
Staphylococcus aureus (ALL) n = 211	*Staphylococcus aureus* (MRSA)	3	1.4
Blood culture: *Streptococcus pneumoniae* Penicillin Susceptibility (indications other than endocarditis and meningitis)			
Organism Group	MIC category	No. identified	% of strains
Streptococcus pneumoniae n = 25	Sensitive ≤ 0.06 mg/L	19	64.0
	Intermediate 0.12 – 1 mg/L	9	36.0
Blood culture: *Streptococcus pneumoniae* Ceftriaxone Susceptibility (indications other than endocarditis and meningitis)			
Organism Group	MIC category	No. Positive	% of strains
Streptococcus pneumoniae n = 25	Sensitive ≤ 0.5 mg/L	23	92.0
	Intermediate 1 – 2 mg/L	2	8.0

Spp=species

Note: The data presented in this table is illustrative only and does not reflect real or current antimicrobial susceptibility patterns. It is intended solely as an example to demonstrate the format of reporting on signal resistances.

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