

**Structural implementation profiles of Antimicrobial Stewardship programmes
in German hospitals: Evidence from an explorative cluster-analysis**

Supplementary Material

Sophia-Helen Sass¹, Alina Zimmermann¹, Gesche Först^{2, 3, 4}, Winfried V. Kern², Katja de With¹

1 Institute of Infectious Diseases, University Hospital Carl Gustav Carus, TUD University of Technology Dresden, Dresden, Germany

2 Division of Infectious Diseases, Department of Medicine II, University Hospital and Medical Centre, and Faculty of Medicine, Albert-Ludwigs-University, Freiburg, Germany

3 ADKA-Bundesverband Deutscher Krankenhausapotheker, Berlin, Germany

4 Institute of Pharmaceutical Sciences, Faculty of Chemistry and Pharmacy, Albert-Ludwigs-University, Freiburg, Germany

Corresponding Author: Sophia-Helen Sass (sophia-helen.sass@uniklinikum-dresden.de)

Questionnaire on AMS Structural Quality (English translation)

This is the translated version of the questionnaire that was used to assess the implementation of structural quality indicators (QIs) for antimicrobial stewardship (AMS) in German acute care hospitals. Not all questionnaire items were included in the present analyses. We retained items representing the basic structural QIs of AMS programmes as defined in the German national guideline, while more detailed follow-up questions that were conditional on responses to these basic items were excluded. Items with low variance ($\geq 95\%$ of responses in the same category) were also excluded, as they provided little information for differentiating between hospitals. To further reduce redundancy, highly intercorrelated items (Spearman's $\rho > 0.9$) were removed. This selection resulted in 17 items included in the present analyses, which are marked with an asterisk (*) throughout the questionnaire.

Part A: Information on participants and associated hospitals

1. Which professional group do you belong to?
 - ☐ Pharmacist
 - ☐ Medical specialist (continue with Question 3)
 - ☐ Physician in specialist training (continue with Question 3)
 - ☐ Physician without specialist training (continue with Question 3)
2. Do you have specialist training in infectious diseases for pharmacists?
 - ☐ Yes (continue with Question 8)
 - ☐ No (continue with Question 8)
3. Do you currently work in areas involving direct patient care? (clinical activity, direct patient contact)
 - ☐ Yes
 - ☐ No (continue with Question 5)
4. In which specialties involving direct patient care do you work?
 - ☐ Anaesthesiology (continue with Question 6)
 - ☐ Internal medicine (including subspecialties) (continue with Question 6)
 - ☐ Surgery (including subspecialties) (continue with Question 6)
 - ☐ Other specialty involving direct patient care (German Medical Association specialty training regulations) (continue with Question 6)
5. In which specialties not involving direct patient care do you work?
 - ☐ Microbiology, virology, infection epidemiology
 - ☐ Laboratory medicine
 - ☐ Hygiene and environmental medicine
 - ☐ Public health
 - ☐ Other specialty not involving direct patient care

6. In addition to your qualification as a medical specialist, do you hold an additional qualification in infectious diseases?
- ☐ Yes
- ☐ No
7. Do you hold an additional qualification in hospital hygiene?
- ☐ Yes
- ☐ No
8. Are you employed by a hospital?
- ☐ Yes (continue with Question 10)
- ☐ No
9. Where are you currently employed?
-
10. As part of your current activities (regarding AMS consultation and/or infectious diseases), do you provide services to at least one hospital?
- ☐ Yes, AMS and infectious diseases consultation/support
- ☐ Yes, AMS consultation/support only
- ☐ Yes, infectious diseases consultation/support only
- ☐ No
11. Do you provide AMS consultation to more than one hospital?
- ☐ Yes
- ☐ No (continue with Question 13)
12. How many hospitals do you support as part of your current activities (regarding AMS consultation)?
- ☐ < 5 hospitals
- ☐ ≥ 5 hospitals
13. Is your hospital a university hospital? (not a "university teaching hospital" and not if it is only a hospital with a model degree programme)
- ☐ Yes
- ☐ No
14. Number of beds? (for the individual hospital, not the hospital network)
-

Part B: Core AMS structures and staffing

15. Does your hospital have any form of AMS team?
- ☐ Yes
- ☐ No (continue with Question 22)
16. Does your hospital have an interdisciplinary AMS team for hospital-wide AMS activities consisting of at least two team members?

- ☐ Yes
- ☐ No (continue with Question 19)
- ☐ No response / do not know (continue with Question 19)

17. Has this team been formally mandated by hospital management to conduct hospital-wide AMS activities?

- ☐ Yes
- ☐ No
- ☐ No response / do not know

18. * Does your hospital have an interdisciplinary AMS team in accordance with the German S3 guideline, consisting of at least one infectious diseases specialist, alternatively one physician involved in direct patient care with AMS training, one pharmacist, and one microbiologist working for the hospital and/or the physician responsible for infection prevention and control?

- ☐ Yes
- ☐ No
- ☐ No response / do not know

19. Is an AMS team leader designated at your hospital?

- ☐ Yes
- ☐ No (continue with Question 21)
- ☐ No response / do not know (continue with Question 21)

20. Who leads the AMS team?

- ☐ Clinically active physician with infectious diseases training
- ☐ Clinically active physician without infectious diseases training
- ☐ Microbiologist
- ☐ Hospital hygienist
- ☐ Pharmacist
- ☐ Other physician

21. * Does your hospital have a funded staff allocation or protected time for AMS activities? (for any staff member, not necessarily someone with a specific position within an AMS team)

- ☐ Yes
- ☐ No (continue with Question 23)
- ☐ No response / do not know (continue with Question 23)

22. What is the amount of funded staff allocation or protected time for AMS (full-time equivalents per 500 beds)?

- ☐ 0.1 to < 0.5 FTE/500 beds
- ☐ 0.5–0.99 FTE/500 beds
- ☐ ≥ 1 FTE/500 beds
- ☐ No response / do not know

23. Does your hospital have formal rules of procedure for the AMS programme?
- ☐ Yes
 - ☐ No
 - ☐ No response / do not know
24. In which laboratory are the following microbiological laboratory services provided for your hospital? (This question refers to routine testing, not specialized testing, e.g. in a reference or consultation laboratory.)
- ☐ Internal only (continue with Question 27)
 - ☐ Internal and external
 - ☐ External only
 - ☐ No response / do not know (continue with Question 27)
25. How often are microbiological samples transported to the external laboratory?
- ☐ ≥ 1 time/day
 - ☐ < 1 time/day
 - ☐ Not applicable, as testing is internal only
26. How far is the external laboratory from your hospital?
- ☐ < 10 km
 - ☐ 10–50 km
 - ☐ 51–100 km
 - ☐ > 100 km
 - ☐ Not applicable, as testing is internal only
27. Is your hospital supplied by a hospital pharmacy or a community pharmacy?
- ☐ Hospital pharmacy (own hospital pharmacy or a pharmacy within the hospital network)
 - ☐ Community pharmacy

Part C: AMS training and education

28. In the past 12 months, has your hospital provided hospital-wide training (across all departments) on antibiotics or infections organized or held by the AMS team or infectious diseases specialists?
- ☐ Yes
 - ☐ No (continue with Question 30)
 - ☐ No response / do not know (continue with Question 30)
29. Which topics were covered by these training sessions?
- ☐ Pharmacology of antibiotics
 - ☐ Diagnosis and treatment of specific organ infections
 - ☐ Hospital antibiotic consumption
 - ☐ Results of prescribing analyses (e.g. point prevalence surveys) within the hospital

30. In the past 12 months, has your hospital provided training on antibiotics or infections organized or held by the AMS team or infectious diseases specialists within individual clinical departments ("department-specific")?

- ☐ Yes
- ☐ No
- ☐ No response / do not know

Part D: Digital prescribing and reporting systems

31. Which findings are electronically available to the treating physician at your hospital?

- ☐ Microbiology
- ☐ Radiology
- ☐ Clinical chemistry/"laboratory"
- ☐ Surgical reports
- ☐ Circulatory parameters
- ☐ Ward-round notes
- ☐ No response / do not know

32. Which patient-specific findings can all AMS team members access electronically across the hospital, even if they do not have an explicit treatment or consultation assignment for the patient?

- ☐ Microbiology
- ☐ Radiology
- ☐ Clinical chemistry/"laboratory"
- ☐ Surgical reports
- ☐ Circulatory parameters
- ☐ Ward-round notes
- ☐ No response / do not know

33. Are electronic prescribing systems (medication therapy) used in any area of your hospital?

- ☐ Yes
- ☐ No (continue with Question 37)

34. Are electronic prescribing systems used in the intensive care units at your hospital?

- ☐ Yes
- ☐ No

35. Are electronic prescribing systems used on some/all general wards at your hospital?

- ☐ Yes
- ☐ No (continue with Question 37)

36. * On approximately what percentage of general wards are electronic prescribing systems used?

- ☐ < 50% of general wards
- ☐ 50-90% of general wards
- ☐ > 90% of general wards

37. * Does your hospital have a reporting system (to the pharmacy and/or infectious diseases specialists and/or AMS team) for bloodstream infections caused by specific pathogens (e.g. *S. aureus* bacteremia or candidemia)? (This does NOT refer to reporting systems to hospital hygiene.)

- ☐ Yes
- ☐ No (continue with Question 39)
- ☐ No response / do not know (continue with Question 39)

38. For bloodstream infections (BSI) caused by which pathogens does your hospital have a mandatory reporting system?

- ☐ Detection of BSI with MSSA
- ☐ Detection of BSI with MRSA
- ☐ Detection of BSI with *Candida* spp.
- ☐ Detection of BSI with other pathogens

39. * Does your hospital have an automated reporting system (to the pharmacy and/or infectious diseases service and/or AMS team) when certain antibiotics are prescribed or requested?

- ☐ Yes
- ☐ No (continue with Question 41)
- ☐ No response / do not know (continue with Question 41)

40. For which antibiotics is such an automated alert triggered?

- ☐ Aztreonam
- ☐ Cefiderocol
- ☐ Ceftazidime/Avibactam
- ☐ Ceftobiprole
- ☐ Ceftolozane/Tazobactam
- ☐ Colistin i.v.
- ☐ Dalbavancin
- ☐ Daptomycin
- ☐ Ertapenem
- ☐ Fosfomycin i.v.
- ☐ Imipenem/Cilastatin
- ☐ Linezolid
- ☐ Meropenem
- ☐ Rifampicin
- ☐ Tigecycline

Part E: Bedside AMS interventions (infectious diseases consultation service and AMS ward rounds)

41. * Does your hospital have an infectious diseases consultation service (including bedside medical assessment and discussion) provided by colleagues from within or outside the hospital?
- ☐ Yes, consultation service provided only by colleagues from within the hospital
 - ☐ Yes, consultation service provided only by colleagues from outside the hospital
 - ☐ Yes, consultation service provided by colleagues from within and outside the hospital
 - ☐ No, no consultation service (continue with Question 43)
 - ☐ No response / do not know (continue with Question 43)
42. Is a consultation report generally prepared for each consultation at your hospital?
- ☐ Yes
 - ☐ No
 - ☐ No response / do not know
43. Are regular interdisciplinary AMS ward rounds conducted at your hospital together with prescribers?
- ☐ Yes
 - ☐ No (continue with Question 51)
 - ☐ No response / do not know (continue with Question 51)
44. * Are regular AMS ward rounds conducted on general ward(s)?
- ☐ Yes, on at least one general ward
 - ☐ No (continue with Question 47)
 - ☐ No response / do not know (continue with Question 47)
45. Are recommendations made during AMS ward rounds on general wards documented in writing/electronically at your hospital?
- ☐ Yes
 - ☐ No
 - ☐ No response / do not know
46. How frequently are AMS ward rounds conducted on general wards at your hospital?
- ☐ ≥ 1 time/week
 - ☐ 1 time/week to 1 time/month
 - ☐ Less frequently or irregularly
47. * Are regular AMS ward rounds conducted in intensive care unit(s)?
- ☐ Yes, in at least one intensive care unit
 - ☐ No (continue with Question 50)
 - ☐ No response / do not know (continue with Question 50)

48. Are recommendations made during AMS ward rounds in intensive care units documented in writing/electronically at your hospital?

- ☐ Yes
- ☐ No
- ☐ No response / do not know

49. How frequently are AMS ward rounds conducted in intensive care units at your hospital?

- ☐ ≥ 1 time/week
- ☐ 1 time/week to 1 time/month
- ☐ Less frequently or irregularly

50. How are clinically complex infectious diseases cases managed in the context of the ward round?

- ☐ They are generally discussed only during the ward round.
- ☐ They are generally reviewed and discussed after/outside the ward round as part of a consultation.
- ☐ They are discussed after the ward round with an external infectious diseases specialist via telephone consultation.
- ☐ They are discussed in greater detail after the ward round (but not as part of an infectious diseases consultation).

Part F: Personal assessment

51. In your opinion, is the AMS staffing structure at your hospital sufficient for implementing AMS activities?

- ☐ Yes
- ☐ No (continue with Question 53)

52. Which professional groups are lacking, in your opinion, for adequate implementation of AMS activities?

- ☐ Infectious diseases specialists
 - ☐ Additional staffing need unknown
 - ☐ 0 additional FTE required
 - ☐ 0.5 additional FTE required
 - ☐ 1 additional FTE required
 - ☐ 2 additional FTE required
 - ☐ ≥ 2 additional FTE required
- ☐ Pharmacists
 - ☐ Additional staffing need unknown
 - ☐ 0 additional FTE required
 - ☐ 0.5 additional FTE required
 - ☐ 1 additional FTE required
 - ☐ 2 additional FTE required
 - ☐ ≥ 2 additional FTE required
- ☐ Microbiologists/hospital hygienists
 - ☐ Additional staffing need unknown

- ☐ 0 additional FTE required
- ☐ 0.5 additional FTE required
- ☐ 1 additional FTE required
- ☐ 2 additional FTE required
- ☐ ≥ 2 additional FTE required
- ☐ Other medical staff
 - ☐ Additional staffing need unknown
 - ☐ 0 additional FTE required
 - ☐ 0.5 additional FTE required
 - ☐ 1 additional FTE required
 - ☐ 2 additional FTE required
 - ☐ ≥ 2 additional FTE required
- ☐ Other non-medical/non-pharmaceutical staff
 - ☐ Additional staffing need unknown
 - ☐ 0 additional FTE required
 - ☐ 0.5 additional FTE required
 - ☐ 1 additional FTE required
 - ☐ 2 additional FTE required
 - ☐ ≥ 2 additional FTE required

53. In your opinion, are the other structural prerequisites (apart from staffing) at your hospital sufficient for implementing AMS activities?

- ☐ Yes (continue with Question 55)
- ☐ No

54. Which structures are lacking, in your opinion, for adequate implementation of AMS activities?

- ☐ Official mandate from hospital management
- ☐ Greater availability of information on the intranet
- ☐ Electronic prescribing tool
- ☐ Clinical laboratory within the hospital
- ☐ Microbiology laboratory within the hospital
- ☐ Pharmacy within the hospital
- ☐ Participation in a national antimicrobial consumption surveillance system
- ☐ Other

55. Personal assessment of the hospital infrastructure

Part G: Local treatment recommendations

56. Are in-house guidelines for antibiotic treatment of infectious diseases available in paper or digital form?

- ☐ Yes, digital form only
- ☐ Yes, paper form only

☐ Yes, in paper and digital form

☐ No (continue with Question 50)

57. For which infections does your hospital have in-house guidelines that apply hospital-wide?

☐ Community-acquired pneumonia

☐ Sepsis without a focus

☐ Perioperative prophylaxis

☐ Urinary tract infections

☐ Bone/joint infections

58. Do the local guidelines also provide recommendations on switching to oral antibiotic therapy?

☐ Yes

☐ No (continue with Question 60)

59. For which of the listed infections do the local guidelines also provide recommendations on treatment duration?

☐ Community-acquired pneumonia

☐ Hospital-acquired pneumonia

☐ Perioperative prophylaxis

☐ *S. aureus* bacteraemia

☐ Uncomplicated cystitis

☐ Pyelonephritis

☐ Bone/joint infections

☐ Endocarditis

☐ Peritonitis

☐ Erysipelas

60. Do the local guidelines also provide recommendations on dose adjustment in patients with impaired renal function?

☐ Yes

☐ No

61. When were the local treatment recommendations last developed/updated?

☐ Completely within the past two years

☐ Partially within the past two years

☐ More than two years ago

62. Are these local guidelines electronically accessible hospital-wide to all prescribers? (intranet, app, or prescribing tool)

☐ Yes

☐ No (continue with Question 64)

63. In what form are the internal guidelines accessible?

☐ App

☐ Intranet

- ☐ Prescribing tool (e.g. as information in the electronic patient chart)
- ☐ Elsewhere within the hospital IT infrastructure

64. Does your hospital have restrictions/special requirements for (selected) reserve antibiotics?

- ☐ Yes
- ☐ No (continue with Question 66)
- ☐ No response / do not know (continue with Question 66)

65. For which reserve antibiotics have special requirements/restrictions applied currently and during the past three months?

- ☐ Aztreonam
- ☐ Cefiderocol
- ☐ Ceftazidime/avibactam
- ☐ Ceftobiprole
- ☐ Ceftolozane/tazobactam
- ☐ Colistin i.v.
- ☐ Dalbavancin
- ☐ Daptomycin
- ☐ Ertapenem
- ☐ Fosfomycin i.v.
- ☐ Imipenem/cilastatin
- ☐ Linezolid
- ☐ Meropenem
- ☐ Rifampicin
- ☐ Tigecycline

Part H: Surveillance and feedback on antimicrobial consumption

66. In the past 12 months, was antibiotic consumption evaluated at your hospital at least once per year? (at minimum, total consumption and consumption of specific antibiotic classes/groups by specialty and ward type)

- ☐ Yes
- ☐ No (continue with Question 70)
- ☐ No response / do not know (continue with Question 70)

67. * Was consumption density (daily doses/patient-days or daily doses/case numbers) also evaluated?

- ☐ Yes
- ☐ No

68. * Were consumption data for individual clinical departments evaluated and presented separately?

- ☐ Yes, separately for all departments
- ☐ Yes, separately for a selection of departments
- ☐ No, no detailed specialty-specific evaluation

69. In the past 12 months, was antibiotic consumption (at least specialty-specific) made available on your hospital intranet for all physicians to view?

- ☐ Yes
- ☐ No
- ☐ No response / do not know

70. In the past 12 months, did your hospital participate in a non-commercial external antibiotic consumption surveillance system?

- ☐ Yes, ADKA-if-DGI
- ☐ Yes, AVS-RKI
- ☐ Yes, internal cross-hospital surveillance within a hospital group
- ☐ No, commercial system only (Premax/Iqvia)
- ☐ No, no surveillance; evaluation by external software only (AISurv, HyBase)
- ☐ No

71. In the past 12 months, were antibiotic consumption data and an assessment of consumption actively communicated to all participating departments?

- ☐ Yes
- ☐ No
- ☐ No response / do not know

72. * In the past 12 months, was antibiotic consumption presented at least once to the infection prevention and control committee and drug and therapeutics committee?

- ☐ Yes
- ☐ No
- ☐ No response / do not know

73. How often in the past 12 months were resistance data collected, analysed, and communicated to physicians at your hospital?

- ☐ ≥ 2 times / year
- ☐ 1 time / year
- ☐ Only on request
- ☐ Never (continue with Question 77)
- ☐ No response / do not know (continue with Question 77)

74. Does the resistance report distinguish between first and subsequent isolates?

- ☐ Yes
- ☐ No

75. Does the resistance report distinguish between blood, urine, and other specimens (e.g. swabs)?

Please also answer "Yes" if only one pathogen is selectively reported for the respective specimen type.

- ☐ Yes
- ☐ No

76. At what hospital level are resistance data collected?

- ☐ Hospital-wide only
- ☐ Also by clinical department
- ☐ Also by ward
- ☐ No response / do not know

77. In the past 12 months, were one or more systematic surveys of antibiotic prescribing (point and/or period prevalence surveys) conducted at your hospital on at least one ward or in one or more areas (e.g. operating theatre)?

- ☐ Yes
- ☐ No (continue with Question 80)
- ☐ No response / do not know (continue with Question 80)

78. * Were point and/or period prevalence surveys conducted in intensive care units at least once per year?

- ☐ Yes
- ☐ No
- ☐ No response / do not know

79. * Were point and/or period prevalence surveys conducted on general wards at least once per year?

- ☐ Yes
- ☐ No
- ☐ No response / do not know

80. In the past three years, were institution-specific AMS quality indicators (QIs) collected at your hospital? (in addition to those required by the external quality assurance procedures of IQTIG)

- ☐ Yes, within the past 12 months
- ☐ Yes, but not within the past 12 months (continue with Question 82)
- ☐ No (continue with Question 82)
- ☐ No response / do not know (continue with Question 82)

81. Which QIs were collected at your hospital in the past 12 months?

- ☐ Proportion of therapies in which two sets of blood cultures were obtained before treatment initiation (at minimum for pneumonia and bacteraemia/fungemia)
- ☐ Proportion of therapies in which a positive urine culture was available
- ☐ Proportion of antibiotic therapies in which the dose was adjusted to renal function (when necessary)
- ☐ Proportion of antibiotics for perioperative prophylaxis that were discontinued within 24 h
- ☐ Proportion of oral therapies for antibiotics with good oral bioavailability (in patients without malabsorption, vomiting, or severe sepsis)
- ☐ Other QIs

Part I: Prescribing policies and documentation requirements

82. * At your hospital, is documentation of infection/suspected infection and/or the indication for antibiotic therapy mandatory in the patient chart when antibiotic therapy is initiated or changed?
- ☐ Yes
 - ☐ No
 - ☐ No response / do not know
83. * At your hospital, is reevaluation of antibiotic therapies after 48–72 h mandatory, with documentation in the patient chart?
- ☐ Yes
 - ☐ No
 - ☐ No response / do not know
84. Are minimum inhibitory concentrations (MICs) for specific pathogens/antibiotics reported in microbiological findings and communicated to prescribers at your hospital?
- ☐ Yes
 - ☐ No
 - ☐ No response / do not know
85. Are selective antibiograms prepared at/for your hospital? (meaning that only selected results of the initial susceptibility testing appear in the report)
- ☐ Yes
 - ☐ No (questionnaire completed)
 - ☐ No response / do not know (questionnaire completed)
86. For which pathogens and specimen types is a selective antibiogram routinely issued?
- ☐ Blood cultures
 - ☐ Urine cultures
 - ☐ Other specimens (all other materials)
 - ☐ *S. aureus*
 - ☐ *E. coli*
 - ☐ Other pathogens

Questionnaire on AMS Structural Quality (Original German version)

Teil A: Informationen über Teilnehmende und zugehörige Krankenhäuser

1. Welcher Berufsgruppe gehören Sie an?
 - ☐ Apotheker*in
 - ☐ Facharzt/-ärztin (weiter ab 3.)
 - ☐ Arzt/Ärztin in Weiterbildung zum FA/FÄ (weiter ab 3.)
 - ☐ Arzt/Ärztin ohne Weiterbildung zum FA/FÄ (weiter ab 3.)
2. Haben Sie eine Fachbereichsweiterbildung Infektiologie? (betrifft Fachbereichsweiterbildung Infektiologie für Apotheker*innen)
 - ☐ ja (weiter ab 8.)
 - ☐ nein (weiter ab 8.)
3. Arbeiten Sie derzeit in Gebieten der unmittelbaren Patient*innenversorgung? (klinische Tätigkeit, direkter Patient*innenkontakt)
 - ☐ ja
 - ☐ nein (weiter ab 5.)
4. In welchen Fachgebieten der unmittelbaren Patient*innenversorgung sind Sie tätig?
 - ☐ Anästhesiologie (weiter ab 6.)
 - ☐ Innere Medizin (incl. Subspezialisierungen) (weiter ab 6.)
 - ☐ Chirurgie (incl. Subspezialisierungen) (weiter ab 6.)
 - ☐ anderes Gebiet der unmittelbaren Patient*innenversorgung (WBO BÄK) (weiter ab 6.)
5. In welchen Fachgebieten der nicht unmittelbaren Patient*innenversorgung sind Sie tätig?
 - ☐ Mikrobiologie, Virologie, Infektionsepidemiologie
 - ☐ Laboratoriumsmedizin
 - ☐ Hygiene und Umweltmedizin
 - ☐ öffentliches Gesundheitswesen
 - ☐ anderes Gebiet der nicht unmittelbaren Patient*innenversorgung
6. Sie sind in Ergänzung zu Ihrer Kompetenz als Facharzt/-ärztin im Besitz der Zusatzweiterbildung Infektiologie?
 - ☐ ja
 - ☐ nein
7. Sie sind im Besitz der Zusatzweiterbildung Krankenhaushygiene?
 - ☐ ja
 - ☐ nein
8. Sind Sie in einem Krankenhaus angestellt?
 - ☐ ja (weiter ab 10.)
 - ☐ nein

9. Wo sind Sie derzeit angestellt?

10. Betreuen Sie im Rahmen Ihrer aktuellen Tätigkeiten (bezüglich ABS-Beratung bzw. Infektiologie) mindestens ein Krankenhaus?

- ☐ ja, ABS- und infektiologische Beratung/Betreuung
- ☐ ja, nur ABS-Beratung/Betreuung
- ☐ ja, nur infektiologische Beratung/Betreuung
- ☐ nein

11. Betreuen Sie bezüglich ABS-Beratung mehr als ein Krankenhaus?

- ☐ ja
- ☐ nein (weiter ab 13.)

12. Wie viele Krankenhäuser betreuen Sie im Rahmen Ihrer aktuellen Tätigkeiten (bezüglich ABS-Beratung)?

- ☐ < 5 Krankenhäuser
- ☐ ≥ 5 Krankenhäuser

13. Handelt es sich bei Ihrem Krankenhaus um ein Universitätsklinikum? (nicht „Lehrkrankenhaus der Universität xy“ und nicht, wenn lediglich "KH mit Modellstudiengang")

- ☐ ja
- ☐ nein

14. Anzahl der Betten? (des einzelnen Krankenhauses, nicht des Verbundes)

Teil B: ABS-Kernstrukturen und Personalausstattung

15. Gibt es an Ihrem Krankenhaus irgendeine Form eines ABS-Teams?

- ☐ ja
- ☐ nein (weiter ab 22.)

16. Gibt es in Ihrem Haus ein für krankenhausweite ABS-Tätigkeiten interdisziplinäres ABS-Team bestehend aus min. zwei Teammitgliedern?

- ☐ ja
- ☐ nein (weiter ab 19.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 19.)

17. Ist dieses Team formal durch die Krankenhausleitung für die klinikweite ABS-Tätigkeit beauftragt?

- ☐ ja
- ☐ nein

☐ keine Angabe, weiß ich nicht

18. Gibt es in Ihrem Haus ein interdisziplinäres ABS-Team analog der S3-Leitlinie bestehend aus min. 1 Infektiolog*in, ersatzweise 1 klinisch-tätigen Arzt/Ärztin mit ABS-Fortbildung und 1 Apotheker*in und 1 am Krankenhaus tätigen Mikrobiolog*in und/oder dem für die Krankenhaushygiene verantwortlichen Arzt/Ärztin?

☐ ja

☐ nein

☐ keine Angabe, weiß ich nicht

19. Gibt es eine an Ihrem Krankenhaus benannte ABS-Teamleitung?

☐ ja

☐ nein (weiter ab 21.)

☐ keine Angabe, weiß ich nicht (weiter ab 21.)

20. Bei wem liegt die Leitung des ABS-Teams?

☐ klinisch tätige/r Arzt/Ärztin mit infektiologischer Weiterbildung

☐ klinisch tätige/r Arzt/Ärztin ohne infektiologischer Weiterbildung

☐ Mikrobiolog*in

☐ Hygieniker*in

☐ Apotheker*in

☐ sonstige ärztliche Person

21. Gibt es an Ihrem Krankenhaus ein finanziertes Stellendeputat oder eine zeitliche Freistellung für ABS-Tätigkeiten? (für irgendeine mitarbeitende Person, nicht unbedingt mit spezifischer Position innerhalb eines ABS-Teams)

☐ ja

☐ nein (weiter ab 23.)

☐ keine Angabe, weiß ich nicht (weiter ab 23.)

22. Wie hoch ist das Stellendeputat bzw. die zeitliche Freistellung (Angabe in Vollzeitkraft/500 Betten) für ABS?

☐ 0,1 bis < 0,5 VK/500 Betten

☐ 0,5 - 0,99 VK/ 500 Betten

☐ ≥ 1 VK/500 Betten

☐ keine Angabe, weiß ich nicht

23. Gibt es an Ihrem Krankenhaus eine ABS-Geschäftsordnung?

☐ ja

☐ nein

☐ keine Angabe, weiß ich nicht

24. In welchem Labor werden für Ihr Krankenhaus die folgenden mikrobiologischen Laborleistungen erbracht? (Frage gilt für Routine-Untersuchungen, nicht für Spezialuntersuchungen z.B. in einem Referenz- oder Konsiliarlabor)

☐ nur intern (weiter ab 27.)

- ☐ intern und extern
- ☐ nur extern
- ☐ keine Angabe, weiß ich nicht (weiter ab 27.)

25. Wie häufig werden die mikrobiologischen Proben zum externen Labor transportiert?

- ☐ ≥ 1 x/Tag
- ☐ < 1 x/Tag
- ☐ trifft nicht zu, da nur intern

26. Wie weit ist das externe Labor von Ihrem Krankenhaus entfernt?

- ☐ < 10 km
- ☐ 10 - 50 km
- ☐ 51 - 100 km
- ☐ > 100 km
- ☐ trifft nicht zu, da nur intern

27. Wird Ihr Krankenhaus durch eine Krankenhausapotheke oder durch eine niedergelassene Apotheke versorgt?

- ☐ durch Krankenhausapotheke (eigene im Krankenhaus oder auch im Verbund)
- ☐ durch niedergelassene Apotheke

Teil C: ABS-Fortbildungen

28. Fanden in den letzten 12 Monaten an Ihrem Krankenhaus vom ABS-Team bzw. der Infektiologie organisierte/durchgeführte klinikweite Fortbildungen (übergreifend für alle Abteilungen) zu Antibiotika/Infektionen statt?

- ☐ ja
- ☐ nein (weiter ab 30.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 30.)

29. Zu welchem Themenbereich wurden diese Fortbildungen durchgeführt?

- ☐ Pharmakologie Antibiotika
- ☐ Diagnostik & Therapie bestimmter Organinfektionen
- ☐ Antibiotika Verbrauch Klinikintern
- ☐ Ergebnisse von Verordnungsanalysen (z.B. PPS) im Klinikum

30. Fanden in den letzten 12 Monaten an Ihrem Krankenhaus vom ABS-Team bzw. der Infektiologie organisierte/durchgeführte Fortbildungen zu Antibiotika/Infektionen in einzelnen klinischen Abteilungen ("abteilungsintern") statt?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

Teil D: Digitale Verschreibungs- und Berichtssysteme

31. Welche Befunde sind für den/die behandelnde/n Arzt/Ärztin an Ihrem Krankenhaus elektronisch verfügbar?
- ☐ Mikrobiologie
 - ☐ Radiologie
 - ☐ klinische Chemie/"Labor"
 - ☐ OP-Berichte
 - ☐ Kreislaufparameter
 - ☐ Visitennotizen
 - ☐ keine Angabe, weiß ich nicht
32. Auf welche patient*innenindividuellen Befunde haben alle ABS-Teammitglieder (krankenhausweit) elektronisch Zugriff, selbst wenn sie für den Patient*innen keinen expliziten Behandlungs-/Konsiliarauftrag haben?
- ☐ Mikrobiologie
 - ☐ Radiologie
 - ☐ klinische Chemie/"Labor"
 - ☐ OP-Berichte
 - ☐ Kreislaufparameter
 - ☐ Visitennotizen
 - ☐ keine Angabe, weiß ich nicht
33. Werden an Ihrem Krankenhaus in irgendeinem Bereich elektronische Verordnungssysteme (Arzneimitteltherapie) genutzt?
- ☐ ja
 - ☐ nein (weiter ab 37.)
34. Werden die elektronischen Verordnungssysteme an Ihrem Krankenhaus auf den Intensivstationen genutzt?
- ☐ ja
 - ☐ nein
35. Werden die elektronischen Verordnungssysteme an Ihrem Krankenhaus auf einigen/allen Normalstationen genutzt?
- ☐ ja
 - ☐ nein (weiter ab 37.)
36. Auf ungefähr wieviel % der Normalstationen werden die elektronischen Verordnungssysteme genutzt?
- ☐ < 50% der Normalstationen
 - ☐ 50-90% der Normalstationen
 - ☐ > 90% der Normalstationen
37. Gibt es an Ihrem Krankenhaus ein Meldesystem (an Apotheke und/oder Infektiologie und/oder ABS-Team) für Blutstrominfektionen mit bestimmten Infektionserregern? (z.B. *S. aureus* Bakteriämie oder Candidämie etc.) (an dieser Stelle NICHT gemeint: Meldesystem an Klinikhygiene)
- ☐ ja

- ☐ nein (weiter ab 39.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 39.)

38. Für Blutstrominfektionen mit welchen Erregern gibt es an Ihrem Krankenhaus ein verpflichtendes Meldesystem?

- ☐ Nachweis von BSI mit MSSA
- ☐ Nachweis von BSI mit MRSA
- ☐ Nachweis von BSI mit Candida spp.
- ☐ Nachweis von BSI mit anderen Erregern

39. Gibt es an Ihrem Krankenhaus ein automatisches Meldesystem (an Apotheke und/oder Infektiologie und/oder ABS-Team) bei Verordnung oder Anforderung bestimmter Antibiotika?

- ☐ ja
- ☐ nein (weiter ab 41.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 41.)

40. Bei welchen Antibiotika wird eine solche automatische Meldung ausgelöst?

- ☐ Aztreonam
- ☐ Cefiderocol
- ☐ Ceftazidim/Avibactam
- ☐ Ceftobiprol
- ☐ Ceftolozan/Tazobactam
- ☐ Colistin i.v.
- ☐ Dalbavancin
- ☐ Daptomycin
- ☐ Ertapenem
- ☐ Fosfomycin iv.
- ☐ Imipenem/Cilastatin
- ☐ Linezolid
- ☐ Meropenem
- ☐ Rifampicin
- ☐ Tigecyclin

Teil E: Bedside ABS-Interventionen (infektiologischer Konsildienst und ABS-Visiten)

41. Gibt es an Ihrem Krankenhaus einen Infektiologischen Konsildienst (mit ärztlicher bedside Untersuchung und Besprechung) durch krankenhausinterne oder -externe Kolleg*innen?

- ☐ ja, Konsildienst nur durch krankenhausinterne Kollegen*innen
- ☐ ja, Konsildienst nur durch krankenhausexterne Kollegen*innen
- ☐ ja, Konsildienst krankenhausinterne und -externe Kollegen*innen
- ☐ nein, kein Konsildienst (weiter ab 43.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 43.)

42. Wird an Ihrem Krankenhaus in der Regel zu jedem Konsil ein Konsilbericht erstellt?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

43. Werden an Ihrem Krankenhaus regelmäßig interdisziplinäre ABS-Visiten gemeinsam mit den Verordnenden durchgeführt?

- ☐ ja
- ☐ nein (weiter ab 51.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 51.)

44. Werden regelmäßig ABS-Visiten auf Normalstation(en) durchgeführt?

- ☐ ja, auf min. einer Normalstation
- ☐ nein (weiter ab 47.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 47.)

45. Werden an Ihrem Krankenhaus die Empfehlungen, die im Rahmen der ABS-Visiten auf Normalstationen ausgesprochen wurden, schriftlich/elektronisch dokumentiert?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

46. Wie häufig werden die ABS-Visiten auf Normalstationen bei Ihnen durchgeführt?

- ☐ $\geq 1x/Woche$
- ☐ 1x/Woche - 1x/Monat
- ☐ seltener oder unregelmäßig

47. Werden regelmäßig ABS-Visiten auf Intensivstation(en) durchgeführt?

- ☐ ja, auf min. einer Intensivstation
- ☐ nein (weiter ab 50.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 50.)

48. Werden an Ihrem Krankenhaus die Empfehlungen, die im Rahmen der ABS-Visiten auf Intensivstationen ausgesprochen wurden, schriftlich/elektronisch dokumentiert?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

49. Wie häufig werden die ABS-Visiten auf Intensivstationen bei Ihnen durchgeführt?

- ☐ $\geq 1x/Woche$
- ☐ 1x/Woche - 1x/Monat
- ☐ seltener oder unregelmäßig

50. Wie ist der Umgang mit infektiologisch komplexen Patient*innenfällen im Rahmen der Visite?

- ☐ Sie werden in der Regel nur während der Visite besprochen.
- ☐ Sie werden in der Regel nach/außerhalb der Visite im Rahmen eines Konsils aufgearbeitet und besprochen.
- ☐ Sie werden nach der Visite mit externem Infektiologen als Telefonkonsil besprochen.
- ☐ Sie werden nach der Visite detaillierter besprochen (allerdings kein infektiologisches Konsil).

Teil F: Persönliche Einschätzung

51. Ist Ihrer Ansicht nach die personelle ABS-Struktur Ihres Krankenhauses ausreichend für Umsetzung der ABS-Tätigkeiten?

- ☐ ja
- ☐ nein (weiter ab 53.)

52. Welche Personengruppen fehlen Ihrer Meinung nach für eine ausreichende Umsetzung von ABS-Tätigkeiten?

- ☐ Infektiolog*innen
 - ☐ zusätzlicher Bedarf unbekannt
 - ☐ 0 zusätzliche VK benötigt
 - ☐ 0,5 zusätzliche VK benötigt
 - ☐ 1 zusätzliche VK benötigt
 - ☐ 2 zusätzliche VK benötigt
 - ☐ ≥ 2 zusätzliche VK benötigt
- ☐ Apotheker*innen
 - ☐ zusätzlicher Bedarf unbekannt
 - ☐ 0 zusätzliche VK benötigt
 - ☐ 0,5 zusätzliche VK benötigt
 - ☐ 1 zusätzliche VK benötigt
 - ☐ 2 zusätzliche VK benötigt
 - ☐ ≥ 2 zusätzliche VK benötigt
- ☐ Mikrobiolog*innen/Hygieniker*innen
 - ☐ zusätzlicher Bedarf unbekannt
 - ☐ 0 zusätzliche VK benötigt
 - ☐ 0,5 zusätzliche VK benötigt
 - ☐ 1 zusätzliche VK benötigt
 - ☐ 2 zusätzliche VK benötigt
 - ☐ ≥ 2 zusätzliche VK benötigt
- ☐ andere ärztliche Mitarbeiter*innen
 - ☐ zusätzlicher Bedarf unbekannt
 - ☐ 0 zusätzliche VK benötigt
 - ☐ 0,5 zusätzliche VK benötigt
 - ☐ 1 zusätzliche VK benötigt

- ☐ 2 zusätzliche VK benötigt
- ☐ ≥ 2 zusätzliche VK benötigt

- ☐ andere nicht ärztliche/pharmazeutische Mitarbeiter*innen
 - ☐ zusätzlicher Bedarf unbekannt
 - ☐ 0 zusätzliche VK benötigt
 - ☐ 0,5 zusätzliche VK benötigt
 - ☐ 1 zusätzliche VK benötigt
 - ☐ 2 zusätzliche VK benötigt
 - ☐ ≥ 2 zusätzliche VK benötigt

53. Sind, Ihrer Ansicht nach, die sonstigen strukturellen Voraussetzungen (neben der Personalstruktur) Ihres Krankenhauses ausreichend für Umsetzung der ABS-Tätigkeiten?

- ☐ ja (weiter ab 55.)
- ☐ nein

54. Welche Strukturen fehlen Ihrer Meinung nach für eine ausreichende Umsetzung von ABS-Tätigkeiten?

- ☐ offizielles Mandat durch Klinikleitung
- ☐ mehr Verfügbarkeit von Informationen im Intranet
- ☐ elektronisches Verordnungstool
- ☐ klin. Labor innerhalb der Klinik
- ☐ MiBi Labor innerhalb der Klinik
- ☐ Apotheke innerhalb der Klinik
- ☐ Teilnahme an nationalem Verbrauchssurveillance-System
- ☐ sonstiges

55. Persönliche Einschätzung der Infrastruktur an der Klinik

Teil G: Lokale Therapieempfehlungen

56. Sind hausinterne Leitlinien zur antibiotischen Therapie von Infektionserkrankungen in Papierform oder digital verfügbar?

- ☐ ja, nur digital
- ☐ ja, nur in Papierform
- ☐ ja, in Papierform und digital
- ☐ nein (weiter ab 50.)

57. Zu welchen Infektionen haben Sie hausinterne, krankenhausweit gültige Leitlinien in Ihrem Krankenhaus?

- ☐ ambulant erworbene Pneumonie
- ☐ Sepsis ohne Fokus
- ☐ perioperative Prophylaxe
- ☐ Harnwegsinfektionen
- ☐ Knochen/Gelenk Infektionen

58. Werden in den lokalen Leitlinien auch Empfehlungen zur Umstellung auf orale Antibiotikatherapie gegeben?

- ☐ ja
- ☐ nein (weiter ab 60.)

59. Bei welchen der genannten Infektionen werden in den lokalen Leitlinien auch Empfehlungen zur Therapiedauer angegeben?

- ☐ CAP (ambulant erworbene Pneumonie)
- ☐ NAP (nosokomial erworbene Pneumonie)
- ☐ PAP (perioperative Prophylaxe)
- ☐ S. aureus Bakteriämie
- ☐ unkomplizierte Zystitis
- ☐ Pyelonephritis
- ☐ Knochen/Gelenk Infektionen
- ☐ Endokarditis
- ☐ Peritonitis
- ☐ Erysipel

60. Werden in den lokalen Leitlinien auch Empfehlungen zur Dosisanpassung bei eingeschränkter Nierenfunktion gegeben?

- ☐ ja
- ☐ nein

61. Wann wurden die lokalen Therapieempfehlungen zuletzt erstellt/aktualisiert?

- ☐ innerhalb der letzten zwei Jahre vollständig
- ☐ innerhalb der letzten zwei Jahre teilweise
- ☐ vor mehr als zwei Jahren

62. Sind diese lokalen Leitlinien für alle Verordnenden krankenhausweit elektronisch einsehbar? (Intranet, APP oder Verordnungstool)

- ☐ ja
- ☐ nein (weiter ab 64.)

63. In welcher Form sind die internen Leitlinien einsehbar?

- ☐ App
- ☐ Intranet
- ☐ Verordnungstool (z.B. als Info in elektronischer Kurve)
- ☐ an anderer Stelle in der Klinik IT-Struktur

64. Gibt es an Ihrem Krankenhaus Restriktionen/ Sonderanforderungen für (ausgewählte) Reserve-Antibiotika?

- ☐ ja
- ☐ nein (weiter ab 66.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 66.)

65. Bei welchen Reserve-Antibiotika gelten aktuell und in den letzten drei Monaten die Sonderanforderungen/Restriktionen?

- ☐ Aztreonam
- ☐ Cefiderocol
- ☐ Ceftazidim/Avibactam
- ☐ Ceftobiprol
- ☐ Ceftolozan/Tazobactam
- ☐ Colistin i.v.
- ☐ Dalbavancin
- ☐ Daptomycin
- ☐ Ertapenem
- ☐ Fosfomycin iv.
- ☐ Imipenem/Cilastatin
- ☐ Linezolid
- ☐ Meropenem
- ☐ Rifampicin
- ☐ Tigecyclin

Teil H: Surveillance und Feedback für Antibiotikaverbrauch

66. Wurde in den letzten 12 Monaten an Ihrem Krankenhaus der Antibiotikaverbrauch min. 1x/Jahr ausgewertet? (min. Gesamtverbrauch und Verbrauch spez. Antibiotika-Klassen/-Gruppen nach Fach und Stationsart)

- ☐ ja
- ☐ nein (weiter ab 70.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 70.)

67. Wurde dabei auch die Verbrauchsdichte (Tagesdosen/Pflegetage oder Tagesdosen/Fallzahlen) ausgewertet?

- ☐ ja
- ☐ nein

68. Wurden dabei die Verbrauchsdaten für einzelne klinische Abteilungen gesondert ausgewertet und dargestellt?

- ☐ ja, für alle Abteilungen gesondert
- ☐ ja, für eine Auswahl der Abteilungen gesondert
- ☐ nein, keine detaillierte fachspezifische Auswertung

69. Wurde in den letzten 12 Monaten der (mindestens fachrichtungsspezifische) Antibiotikaverbrauch für alle Ärzte/Ärztinnen einsehbar im Intranet Ihres Krankenhauses eingestellt?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

70. Hat Ihr Krankenhaus in den letzten 12 Monaten an einer nicht kommerziellen, externen Antibiotika-Verbrauchssurveillance teilgenommen?

- ☐ Ja, ADKA-if-DGI
- ☐ Ja, AVS-RKI
- ☐ ja, konzerninterne, klinikübergreifende Surveillance
- ☐ nein, nur kommerzielles System (Premax/Iqvia)
- ☐ nein, keine Surveillance, nur Auswertung durch externe Software (AISurv, HyBase)
- ☐ nein

71. Wurde der Antibiotikaverbrauch und eine Bewertung des Verbrauchs in den letzten 12 Monaten an alle beteiligten Abteilungen aktiv mitgeteilt?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

72. Wurde der Antibiotikaverbrauch in den letzten 12 Monaten in der Hygienekommission, Infektionskommission und/oder Arzneimittelkommission min. 1x vorgestellt?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

73. Wie oft wurden in den letzten 12 Monaten in Ihrem Krankenhaus Resistenzdaten erhoben, analysiert und an die Ärzte/Ärztinnen kommuniziert?

- ☐ $\geq 2x/\text{Jahr}$
- ☐ 1x/Jahr
- ☐ nur auf Nachfrage
- ☐ nie (weiter ab 77.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 77.)

74. Wird bei der Resistenzstatistik zwischen Erst- und Folgeisolaten unterschieden?

- ☐ ja
- ☐ nein

75. Wird bei der Resistenzstatistik zwischen Blut, Urin und Varia (z.B. Abstriche) unterschieden? (bitte auch mit "ja" antworten, wenn beim jeweiligen Material nur ein Erreger selektiv berichtet würde)

- ☐ ja
- ☐ nein

76. Auf welcher Krankenhausebene werden die Resistenzdaten erhoben?

- ☐ nur für Gesamtklinikum

- ☐ auch für Fachabteilungen
- ☐ auch für Stationen
- ☐ keine Angabe, weiß ich nicht

77. Wurden an Ihrem Krankenhaus in den letzten 12 Monaten eine oder mehrere systematische Erhebungen auf mindestens einer oder mehreren Stationen oder in einem oder mehreren Bereichen (z.B. OP) zur Antibiotikaverschreibung (Punkt und/oder Perioden-Prävalenz-Erhebungen) durchgeführt?

- ☐ ja
- ☐ nein (weiter ab 80.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 80.)

78. Wurden min. 1x/Jahr Punkt- und/oder Perioden-Prävalenz-Erhebungen auf Intensivstationen durchgeführt?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

79. Wurden min. 1x/Jahr Punkt- und/oder Perioden-Prävalenz-Erhebungen auf Normalstationen durchgeführt?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

80. Wurden in Ihrer Klinik in den letzten drei Jahren einrichtungsspezifische ABS-Qualitätsindikatoren (QI) erhoben? (zusätzlich zu denen, die durch die externen Qualitätssicherungsverfahren des IQTIG gefordert sind)

- ☐ ja, in den letzten 12 Monaten
- ☐ ja, aber nicht in den letzten 12 Monaten (weiter ab 82.)
- ☐ nein (weiter ab 82.)
- ☐ keine Angabe, weiß ich nicht (weiter ab 82.)

81. Welche QIs wurden in den letzten 12 Monaten an Ihrem Krankenhaus erfasst?

- ☐ Anteil von Therapien, bei denen vor Therapiebeginn zwei Sets Blutkulturen abgenommen wurden (min. bei Pneumonie und Bakteriämie/Fungämie)
- ☐ Anteil von Therapien, bei denen eine positive Urinkultur vorliegt
- ☐ Anteil von Antibiotika-Therapien, bei denen eine Dosisanpassung an die Nierenfunktion erfolgt ist (wenn notwendig)
- ☐ Anteil von Antibiotika zur perioperativen Prophylaxe, die innerhalb von 24 h abgesetzt wurden
- ☐ Anteil von Therapien per os bei Antibiotika mit guter oraler BV (bei Patient*innen ohne Resorptionsstörungen, Erbrechen und ohne schwere Sepsis)
- ☐ andere QIs

Teil I: Verschreibungsrichtlinien und Dokumentationsanforderungen

82. Gibt es an Ihrem Krankenhaus bei Beginn oder Wechsel einer Antibiotikatherapie eine verpflichtende Dokumentation von Infektion/Infektionsverdacht und/oder Indikation einer Antibiotikatherapie in der Patient*innenkurve?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

83. Gibt es an Ihrem Krankenhaus eine verpflichtende Reevaluation von Antibiotikatherapien nach 48-72 h *mit Dokumentation* in der Kurve?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

84. Wird an Ihrem Krankenhaus in den mikrobiologischen Befunden die MHK bestimmter Erreger/Antibiotika ausgewiesen und an die Verordnenden berichtet?

- ☐ ja
- ☐ nein
- ☐ keine Angabe, weiß ich nicht

85. Werden an Ihrem/für Ihr Krankenhaus selektive Antibiogramme erstellt? (bedeutet, dass nur ausgewählte Ergebnisse der initialen Resistenztestung auf dem Befund erscheinen)

- ☐ ja
- ☐ nein (Fragebogen abgeschlossen)
- ☐ keine Angabe, weiß ich nicht (Fragebogen abgeschlossen)

86. Für welche Erreger und Materialien wird routinemäßig ein selektives Antibiogramm ausgegeben?

- ☐ Blutkulturen
- ☐ Urinkulturen
- ☐ Varia, (alle anderen Materialien)
- ☐ *S. aureus*
- ☐ *E. coli*
- ☐ andere Erreger

Characteristics of study participants (AMS professionals)

Participant characteristic	n (%)
Overall	356 (100.0)
Physicians	274 (77.0)
Specialist physicians	268 (75.3)
Involved in direct patient care	202 (56.7)
Internal medicine	98 (27.5)
<i>with specialized training in infectious diseases</i>	34 (34.7) ^a
<i>with specialized training in infection control</i>	40 (40.8) ^a
Anaesthesiology	69 (19.4)
<i>with specialized training in infectious diseases</i>	5 (7.2) ^b
<i>with specialized training in infection control</i>	40 (58.0) ^b
Surgery	14 (3.9)
Other	21 (5.9)
Not involved in direct patient care	66 (18.5)
Infection prevention and control, environmental medicine	28 (7.9)
Laboratory medicine	2 (0.6)
Microbiology, virology, and infection epidemiology	27 (7.6)
Public health	1 (0.3)
Other	8 (2.2)
Physicians in specialist training	6 (1.7)
Pharmacists	82 (23.0)
<i>with specialized training in infectious diseases</i>	43 (52.4) ^c

Table S 1: Characteristics of study participants (AMS professionals). Percentages are based on the total sample (N = 356), except where otherwise indicated. ^a Percentage calculated among internal medicine physicians (n = 98). ^b Percentage calculated among anaesthesiologists (n = 69). ^c Percentage calculated among pharmacists (n = 82).

Data Plausibility and aggregation

A multistage plausibility and consistency check protocol was applied to all returned questionnaires to assure data quality and to derive a single, hospital level value for each quality indicator used in the subsequent analyses.

Initial screening: test entries (e.g., postcode 12345, bed count 11111) and completely empty questionnaires were identified and removed. Only respondents who were employed by the respective hospital or were at least involved in the hospital's AMS programme were retained.

Verification of hospital specific information: reported bed numbers underwent plausibility checks and were verified based on the German Hospital Directory Classification (www.deutsches-krankenhaus-verzeichnis.de). Classification for University affiliation was based on the official list of German university hospitals (www.uniklinika.de/die-deutschenuniversitaetsklinika)

Logical consistency checks: follow-up questions within each category were checked for internal contradictions.

Categorisation and aggregation: all answers were divided into respondent specific and hospital specific categories and then aggregated at the hospital level, based on previously verified hospital name and location. Of the 253 hospitals included in the analysis, 64 were represented by more than one respondent. When all respondents from a given hospital provided identical answers, that value was adopted directly as the hospital level indicator. If one respondent selected "don't know" or "no answer" while another gave a definitive answer, the definitive answer was retained. If at least two respondents gave the same definitive answer, the majority answer was accepted. If conflicting answers occurred with equal frequency, the discrepancy was addressed by direct contact with hospital staff. Inconsistent responses, which could not be resolved by personal enquiry, were excluded from further analysis.

This systematic approach eliminated erroneous, implausible, or inconsistent entries, resulting in a consistent, hospital level value for each quality indicator that could be employed in the downstream statistical analyses

Hospital names were used exclusively for matching responses and were subsequently removed from the analytical dataset for data protection purposes.

Determining the optimal number of clusters

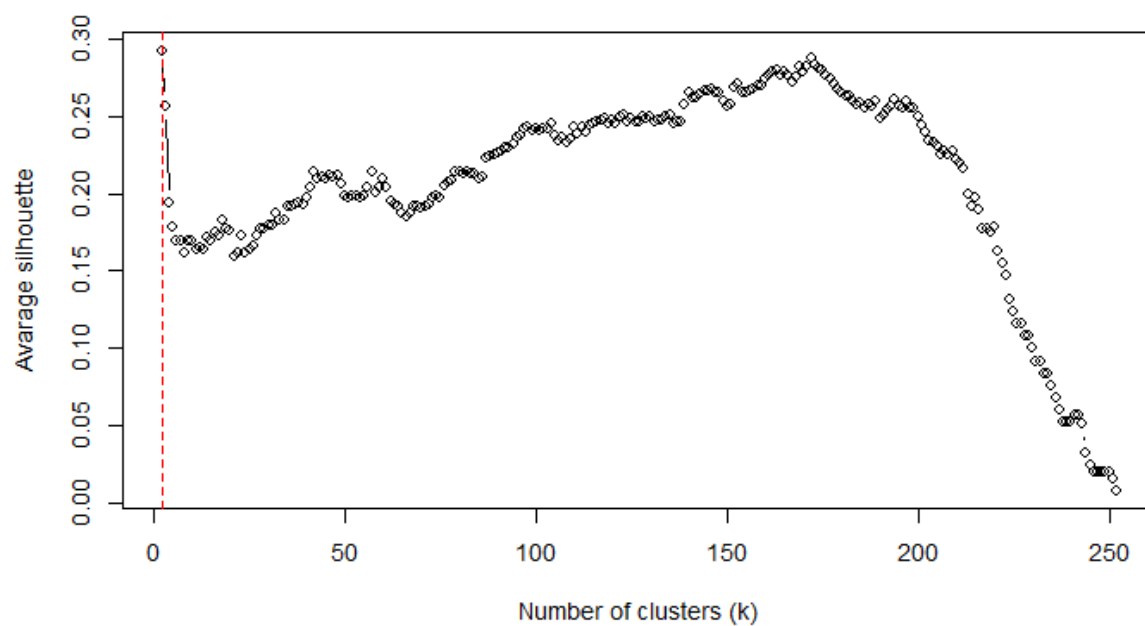


Figure S 1: Silhouette analysis for determining the optimal number of clusters in the PAM cluster analysis. Average silhouette width is shown for solutions ranging from $k = 2$ to $k = n - 1$ (252 clusters for $n = 253$ hospitals), representing the full evaluable range from the minimum cluster solution to the maximum number for which more than one observation remains within a cluster. The highest average silhouette width was observed for $k = 2$, indicating the optimal cluster solution according to the silhouette criterion. The red dashed line indicates the selected two-cluster solution.

Medoid hospitals representing the low- and high-implementation clusters

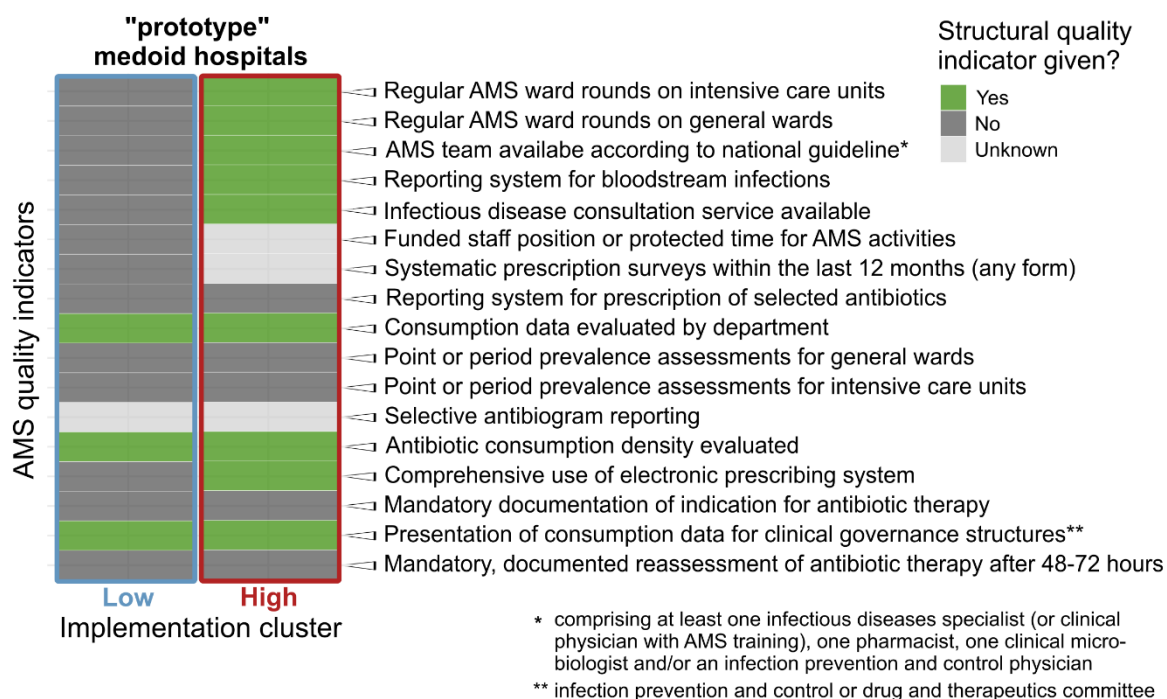


Figure S 2: Medoid hospitals representing the low- and high-implementation clusters identified by PAM clustering. Each column represents the medoid hospital, i.e., the most representative ("prototype") hospital, of the respective implementation cluster. Rows correspond to the 17 structural AMS quality indicators (QI) included in the cluster analysis. Colours indicate whether each QI was fulfilled (green), not fulfilled (dark grey), or unknown (light grey) in the respective medoid hospital. The medoid profiles illustrate the characteristic differences in structural AMS implementation between the low- and high-implementation clusters.

Associations between structural AMS QIs

QI 1	QI 2	χ^2	df	Cramer's V	p	p_{adj}
Point or period prevalence analyses of prescriptions for general wards	Point or period prevalence analyses of prescriptions for intensive care units	138.763	1	0.770	< 0.001	< 0.001
Point or period prevalence analyses of prescriptions for general wards	Systematic prescription surveys within the last 12 months (any form)	126.633	1	0.800	< 0.001	< 0.001
Regular AMS ward rounds on intensive care units	Regular AMS ward rounds on general wards	118.362	1	0.703	< 0.001	< 0.001
Antibiotic consumption data evaluated by department	Antibiotic consumption density evaluated	118.228	2	0.684	< 0.001	< 0.001
Point or period prevalence analyses of prescriptions for intensive care units	Systematic prescription surveys within the last 12 months (any form)	107.763	1	0.730	< 0.001	< 0.001
Presentation of consumption data for infection prevention and control or drug and therapeutics committee	Antibiotic consumption density evaluated	64.991	1	0.552	< 0.001	< 0.001
Presentation of consumption data for infection prevention and control or drug and therapeutics committee	Antibiotic consumption data evaluated by department	62.361	2	0.518	< 0.001	< 0.001
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Mandatory documentation of indication for antibiotic prescription	51.513	1	0.477	< 0.001	< 0.001
Regular AMS ward rounds on intensive care units	Infectious disease consultation service available	33.619	1	0.378	< 0.001	< 0.001
Regular AMS ward rounds on general wards	Infectious disease consultation service available	28.027	1	0.349	< 0.001	< 0.001
Regular AMS ward rounds on general wards	Funded staff position or protected time for AMS activities	27.387	1	0.360	< 0.001	< 0.001
Mandatory documentation of indication for antibiotic prescription	Point or period prevalence analyses of prescriptions for intensive care units	27.032	1	0.347	< 0.001	< 0.001
Regular AMS ward rounds on intensive care units	AMS team available according to national guideline	24.092	1	0.320	< 0.001	< 0.001
Regular AMS ward rounds on general wards	AMS team available according to national guideline	23.775	1	0.321	< 0.001	< 0.001
Regular AMS ward rounds on intensive care units	Funded staff position or protected time for AMS activities	23.327	1	0.330	< 0.001	< 0.001
Regular AMS ward rounds on intensive care units	Reporting system for bloodstream infections	23.181	1	0.323	< 0.001	< 0.001
Systematic prescription surveys within the last 12 months (any form)	Infectious disease consultation service available	22.706	1	0.339	< 0.001	< 0.001

QI 1	QI 2	χ^2	df	Cramer's V	p	p_{adj}
Infectious disease consultation service available	Reporting system for bloodstream infections	21.764	1	0.314	< 0.001	< 0.001
Systematic prescription surveys within the last 12 months (any form)	Regular AMS ward rounds on general wards	21.660	1	0.329	< 0.001	< 0.001
Reporting system for prescription of selected antibiotics	Reporting system for bloodstream infections	21.394	1	0.321	< 0.001	< 0.001
Mandatory documentation of indication for antibiotic prescription	Systematic prescription surveys within the last 12 months (any form)	21.363	1	0.332	< 0.001	< 0.001
Mandatory documentation of indication for antibiotic prescription	Point or period prevalence analyses of prescriptions for general wards	21.302	1	0.313	< 0.001	< 0.001
Selective antibiogram reporting	Reporting system for bloodstream infections	19.276	1	0.302	< 0.001	< 0.001
Point or period prevalence analyses of prescriptions for general wards	Infectious disease consultation service available	18.897	1	0.291	< 0.001	< 0.001
Point or period prevalence analyses of prescriptions for general wards	Antibiotic consumption data evaluated by department	21.869	2	0.300	< 0.001	< 0.001
Point or period prevalence analyses of prescriptions for general wards	Regular AMS ward rounds on general wards	16.823	1	0.276	< 0.001	< 0.001
Systematic prescription surveys within the last 12 months (any form)	Antibiotic consumption data evaluated by department	20.005	2	0.306	< 0.001	< 0.001
Systematic prescription surveys within the last 12 months (any form)	Presentation of consumption data for infection prevention and control or drug and therapeutics committee	15.506	1	0.291	< 0.001	< 0.001
Systematic prescription surveys within the last 12 months (any form)	Regular AMS ward rounds on intensive care units	15.344	1	0.279	< 0.001	< 0.001
Infectious disease consultation service available	Reporting system for prescription of selected antibiotics	14.884	1	0.266	< 0.001	< 0.001
Regular AMS ward rounds on general wards	Reporting system for bloodstream infections	14.940	1	0.263	< 0.001	< 0.001
Point or period prevalence analyses of prescriptions for intensive care units	Antibiotic consumption data evaluated by department	17.932	2	0.269	< 0.001	< 0.001
Regular AMS ward rounds on general wards	Reporting system for prescription of selected antibiotics	14.230	1	0.261	< 0.001	< 0.001
Antibiotic consumption density evaluated	Infectious disease consultation service available	13.936	1	0.249	< 0.001	< 0.001

QI 1	QI 2	χ^2	df	Cramer's V	p	p_{adj}
Regular AMS ward rounds on intensive care units	Reporting system for prescription of selected antibiotics	13.807	1	0.256	< 0.001	< 0.001
Selective antibiogram reporting	Infectious disease consultation service available	13.470	1	0.249	< 0.001	< 0.001
Antibiotic consumption density evaluated	Regular AMS ward rounds on general wards	12.622	1	0.238	< 0.001	0.001
Antibiotic consumption data evaluated by department	Regular AMS ward rounds on general wards	15.726	2	0.252	< 0.001	0.001
Antibiotic consumption data evaluated by department	Regular AMS ward rounds on intensive care units	15.805	2	0.251	< 0.001	0.001
Infectious disease consultation service available	AMS team available according to national guideline	12.554	1	0.234	< 0.001	0.001
Point or period prevalence analyses of prescriptions for intensive care units	Regular AMS ward rounds on general wards	12.175	1	0.234	< 0.001	0.002
Funded staff position or protected time for AMS activities	AMS team available according to national guideline	11.994	1	0.240	< 0.001	0.002
Antibiotic consumption data evaluated by department	Infectious disease consultation service available	13.879	2	0.237	< 0.001	0.003
Point or period prevalence analyses of prescriptions for intensive care units	AMS team available according to national guideline	9.118	1	0.203	0.003	0.008
Point or period prevalence analyses of prescriptions for intensive care units	Infectious disease consultation service available	8.797	1	0.200	0.003	0.009
Selective antibiogram reporting	Reporting system for prescription of selected antibiotics	8.816	1	0.211	0.003	0.009
Presentation of consumption data for infection prevention and control or drug and therapeutics committee	Regular AMS ward rounds on general wards	8.672	1	0.210	0.003	0.009
Point or period prevalence analyses of prescriptions for intensive care units	Antibiotic consumption density evaluated	8.656	1	0.200	0.003	0.009
Point or period prevalence analyses of prescriptions for intensive care units	Regular AMS ward rounds on intensive care units	8.510	1	0.196	0.004	0.010
Systematic prescription surveys within the last 12 months (any form)	Antibiotic consumption density evaluated	8.384	1	0.213	0.004	0.010
Mandatory documentation of indication for antibiotic prescription	Reporting system for bloodstream infections	8.341	1	0.200	0.004	0.010

QI 1	QI 2	χ^2	df	Cramer's V	p	p _{adj}
Point or period prevalence analyses of prescriptions for intensive care units	Presentation of consumption data for infection prevention and control or drug and therapeutics committee	8.182	1	0.206	0.004	0.011
Presentation of consumption data for infection prevention and control or drug and therapeutics committee	Infectious disease consultation service available	8.056	1	0.202	0.005	0.012
Point or period prevalence analyses of prescriptions for general wards	Reporting system for prescription of selected antibiotics	7.897	1	0.200	0.005	0.012
Antibiotic consumption density evaluated	Regular AMS ward rounds on intensive care units	7.497	1	0.184	0.006	0.015
Reporting system for prescription of selected antibiotics	Funded staff position or protected time for AMS activities	7.422	1	0.199	0.006	0.016
Point or period prevalence analyses of prescriptions for general wards	Antibiotic consumption density evaluated	7.164	1	0.185	0.007	0.018
Point or period prevalence analyses of prescriptions for general wards	Use of electronic prescribing & medicines administration system: % of general wards	6.907	1	0.178	0.009	0.020
Systematic prescription surveys within the last 12 months (any form)	AMS team available according to national guideline	6.874	1	0.190	0.009	0.020
Point or period prevalence analyses of prescriptions for general wards	Presentation of consumption data for infection prevention and control or drug and therapeutics committee	6.828	1	0.191	0.009	0.020
Point or period prevalence analyses of prescriptions for general wards	Regular AMS ward rounds on intensive care units	6.665	1	0.176	0.010	0.022
Selective antibiogram reporting	Mandatory documentation of indication for antibiotic prescription	6.675	1	0.180	0.010	0.022
Antibiotic consumption density evaluated	AMS team available according to national guideline	6.468	1	0.173	0.011	0.024
Point or period prevalence analyses of prescriptions for general wards	Funded staff position or protected time for AMS activities	6.385	1	0.181	0.012	0.024
Infectious disease consultation service available	Use of electronic prescribing & medicines administration system: % of general wards	6.062	1	0.165	0.014	0.029
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Systematic prescription surveys within the last 12 months (any form)	5.935	1	0.184	0.015	0.031

QI 1	QI 2	χ^2	df	Cramer's V	p	p_{adj}
Antibiotic consumption density evaluated	Funded staff position or protected time for AMS activities	5.687	1	0.172	0.017	0.034
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Point or period prevalence analyses of prescriptions for intensive care units	5.687	1	0.169	0.017	0.034
Point or period prevalence analyses of prescriptions for general wards	AMS team available according to national guideline	5.648	1	0.163	0.017	0.034
Presentation of consumption data for infection prevention and control or drug and therapeutics committee	Regular AMS ward rounds on intensive care units	5.509	1	0.169	0.019	0.036
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Reporting system for bloodstream infections	5.527	1	0.168	0.019	0.036
Point or period prevalence analyses of prescriptions for intensive care units	Reporting system for bloodstream infections	5.440	1	0.163	0.020	0.037
Infectious disease consultation service available	Funded staff position or protected time for AMS activities	5.355	1	0.164	0.021	0.039
Regular AMS ward rounds on general wards	Use of electronic prescribing & medicines administration system: % of general wards	5.184	1	0.153	0.023	0.042
Point or period prevalence analyses of prescriptions for intensive care units	Reporting system for prescription of selected antibiotics	5.079	1	0.162	0.024	0.044
Reporting system for bloodstream infections	Use of electronic prescribing & medicines administration system: % of general wards	4.958	1	0.153	0.026	0.045
Antibiotic consumption density evaluated	Reporting system for prescription of selected antibiotics	4.940	1	0.161	0.026	0.045
Systematic prescription surveys within the last 12 months (any form)	Reporting system for prescription of selected antibiotics	4.944	1	0.170	0.026	0.045
Selective antibiogram reporting	Use of electronic prescribing & medicines administration system: % of general wards	4.968	1	0.153	0.026	0.045
Selective antibiogram reporting	Presentation of consumption data for infection prevention and control or drug and therapeutics committee	5.009	1	0.166	0.025	0.045
Selective antibiogram reporting	Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	4.760	1	0.157	0.029	0.049

QI 1	QI 2	χ^2	df	Cramer's V	p	p_{adj}
Antibiotic consumption data evaluated by department	Funded staff position or protected time for AMS activities	6.956	2	0.175	0.031	0.051
Selective antibiogram reporting	Systematic prescription surveys within the last 12 months (any form)	4.625	1	0.161	0.032	0.052
Presentation of consumption data for infection prevention and control or drug and therapeutics committee	Use of electronic prescribing & medicines administration system: % of general wards	4.456	1	0.153	0.035	0.056
Mandatory documentation of indication for antibiotic prescription	Regular AMS ward rounds on intensive care units	4.379	1	0.144	0.036	0.058
Antibiotic consumption data evaluated by department	Reporting system for prescription of selected antibiotics	6.527	2	0.169	0.038	0.061
Reporting system for prescription of selected antibiotics	AMS team available according to national guideline	3.968	1	0.142	0.046	0.073
Point or period prevalence analyses of prescriptions for intensive care units	Use of electronic prescribing & medicines administration system: % of general wards	3.710	1	0.132	0.054	0.083
Mandatory documentation of indication for antibiotic prescription	Regular AMS ward rounds on general wards	3.701	1	0.134	0.054	0.083
Systematic prescription surveys within the last 12 months (any form)	Reporting system for bloodstream infections	3.650	1	0.145	0.056	0.085
Systematic prescription surveys within the last 12 months (any form)	Funded staff position or protected time for AMS activities	3.628	1	0.146	0.057	0.085
Antibiotic consumption data evaluated by department	AMS team available according to national guideline	5.314	2	0.146	0.070	0.103
Point or period prevalence analyses of prescriptions for intensive care units	Funded staff position or protected time for AMS activities	3.281	1	0.132	0.070	0.103
Mandatory documentation of indication for antibiotic prescription	Use of electronic prescribing & medicines administration system: % of general wards	3.250	1	0.125	0.071	0.103
Selective antibiogram reporting	Point or period prevalence analyses of prescriptions for intensive care units	3.194	1	0.127	0.074	0.106
Presentation of consumption data for infection prevention and control or drug and therapeutics committee	AMS team available according to national guideline	3.120	1	0.131	0.077	0.110

QI 1	QI 2	χ^2	df	Cramer's V	p	p_{adj}
Presentation of consumption data for infection prevention and control or drug and therapeutics committee	Reporting system for prescription of selected antibiotics	2.765	1	0.130	0.096	0.135
Reporting system for bloodstream infections	Funded staff position or protected time for AMS activities	2.709	1	0.123	0.100	0.139
Mandatory documentation of indication for antibiotic prescription	Presentation of consumption data for infection prevention and control or drug and therapeutics committee	2.589	1	0.123	0.108	0.148
Systematic prescription surveys within the last 12 months (any form)	Use of electronic prescribing & medicines administration system: % of general wards	2.453	1	0.117	0.117	0.159
Reporting system for bloodstream infections	AMS team available according to national guideline	2.364	1	0.109	0.124	0.167
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Funded staff position or protected time for AMS activities	2.219	1	0.114	0.136	0.182
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Point or period prevalence analyses of prescriptions for general wards	2.045	1	0.108	0.153	0.202
Selective antibiogram reporting	Antibiotic consumption density evaluated	1.971	1	0.103	0.160	0.210
Regular AMS ward rounds on intensive care units	Use of electronic prescribing & medicines administration system: % of general wards	1.924	1	0.096	0.165	0.214
Mandatory documentation of indication for antibiotic prescription	Reporting system for prescription of selected antibiotics	1.869	1	0.103	0.172	0.220
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Regular AMS ward rounds on intensive care units	1.806	1	0.099	0.179	0.228
Antibiotic consumption density evaluated	Use of electronic prescribing & medicines administration system: % of general wards	1.743	1	0.094	0.187	0.235
Selective antibiogram reporting	Point or period prevalence analyses of prescriptions for general wards	1.712	1	0.097	0.191	0.238
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Use of electronic prescribing & medicines administration system: % of general wards	1.695	1	0.096	0.193	0.239
Selective antibiogram reporting	Regular AMS ward rounds on intensive care units	1.626	1	0.092	0.202	0.248
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Antibiotic consumption data evaluated by department	3.168	2	0.114	0.205	0.249

QI 1	QI 2	χ^2	df	Cramer's V	p	p_{adj}
Presentation of consumption data for infection prevention and control or drug and therapeutics committee	Reporting system for bloodstream infections	1.483	1	0.097	0.223	0.269
Presentation of consumption data for infection prevention and control or drug and therapeutics committee	Funded staff position or protected time for AMS activities	1.447	1	0.098	0.229	0.273
Reporting system for prescription of selected antibiotics	Use of electronic prescribing & medicines administration system: % of general wards	1.365	1	0.087	0.243	0.287
Selective antibiogram reporting	Regular AMS ward rounds on general wards	1.309	1	0.084	0.253	0.296
Mandatory documentation of indication for antibiotic prescription	Infectious disease consultation service available	1.238	1	0.081	0.266	0.307
Selective antibiogram reporting	AMS team available according to national guideline	1.237	1	0.081	0.266	0.307
Point or period prevalence analyses of prescriptions for general wards	Reporting system for bloodstream infections	1.211	1	0.083	0.271	0.310
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Infectious disease consultation service available	1.052	1	0.079	0.305	0.346
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Regular AMS ward rounds on general wards	0.973	1	0.077	0.324	0.364
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	AMS team available according to national guideline	0.658	1	0.065	0.417	0.465
Antibiotic consumption density evaluated	Reporting system for bloodstream infections	0.648	1	0.065	0.421	0.465
Mandatory documentation of indication for antibiotic prescription	Antibiotic consumption data evaluated by department	1.654	2	0.082	0.437	0.480
Mandatory documentation of indication for antibiotic prescription	AMS team available according to national guideline	0.410	1	0.051	0.522	0.568
Use of electronic prescribing & medicines administration system: % of general wards	Funded staff position or protected time for AMS activities	0.378	1	0.050	0.539	0.581
Mandatory documentation of indication for antibiotic prescription	Funded staff position or protected time for AMS activities	0.258	1	0.044	0.612	0.655
Selective antibiogram reporting	Antibiotic consumption data evaluated by department	0.864	2	0.060	0.649	0.690
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Antibiotic consumption density evaluated	0.167	1	0.045	0.683	0.720

QI 1	QI 2	χ^2	df	Cramer's V	<i>p</i>	<i>p_{adj}</i>
Mandatory documentation of indication for antibiotic prescription	Antibiotic consumption density evaluated	0.148	1	0.038	0.700	0.727
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Presentation of consumption data for infection prevention and control or drug and therapeutics committee	0.148	1	0.047	0.701	0.727
Selective antibiogram reporting	Funded staff position or protected time for AMS activities	0.125	1	0.034	0.723	0.745
Mandatory, documented reassessment of antibiotic therapy after 48-72 hours	Reporting system for prescription of selected antibiotics	0.095	1	0.037	0.759	0.776
Use of electronic prescribing & medicines administration system: % of general wards	AMS team available according to national guideline	0.064	1	0.024	0.800	0.812
Antibiotic consumption data evaluated by department	Reporting system for bloodstream infections	0.377	2	0.040	0.828	0.834
Antibiotic consumption data evaluated by department	Use of electronic prescribing & medicines administration system: % of general wards	0.308	2	0.035	0.857	0.857