



Annual national PPS for HAI infections & AMR in South Africa: An affordable option?

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Global mortality associated with 33 bacterial pathogens in 2019: a systematic analysis for the Global Burden of Disease Study 2019

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GBD 2019 Antimicrobial Resistance Collaborators*

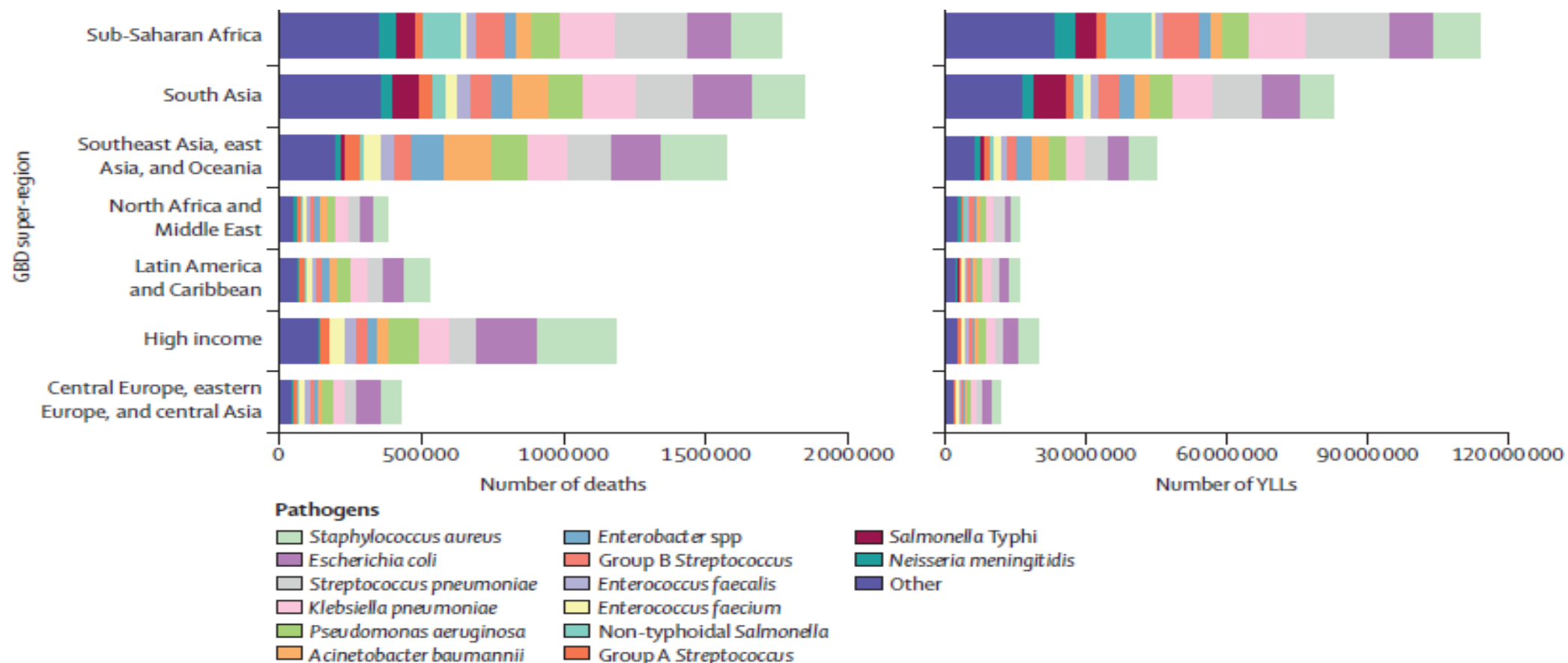
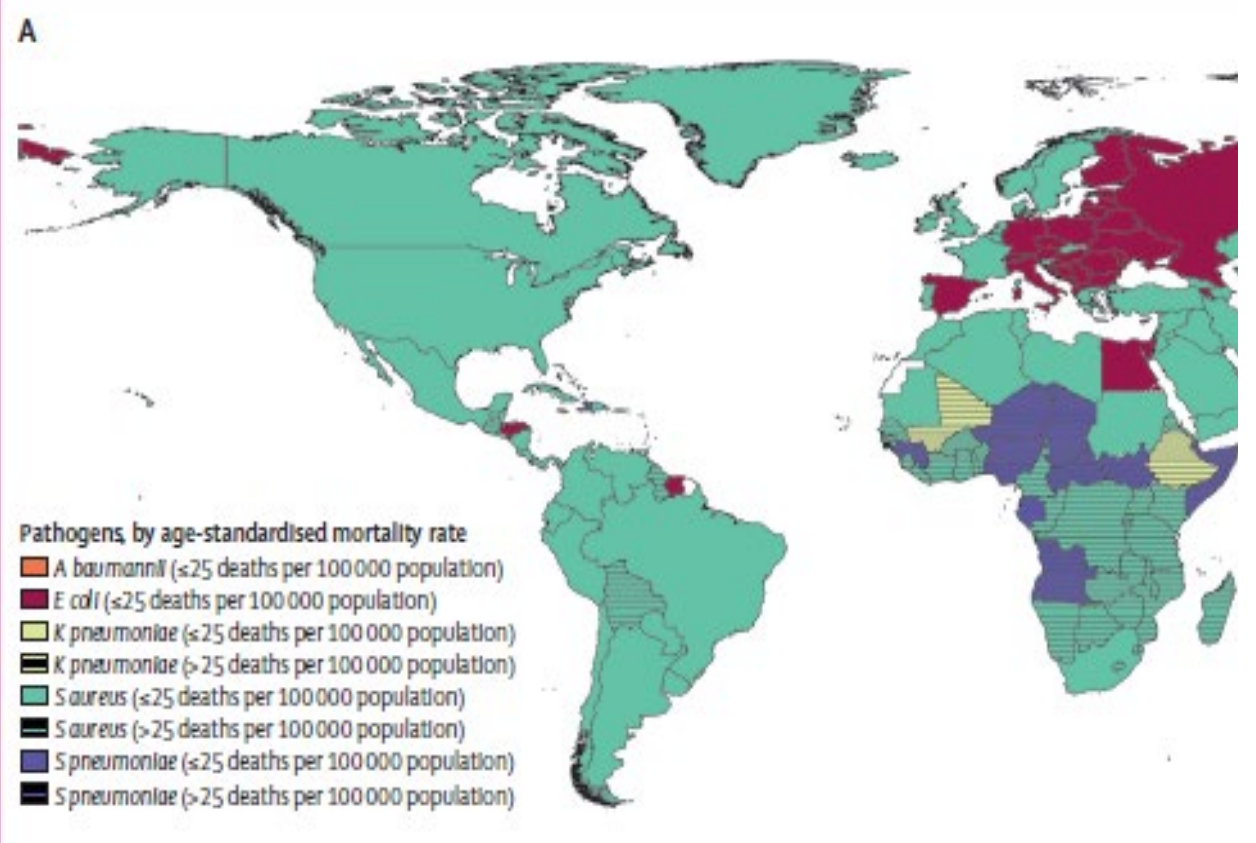
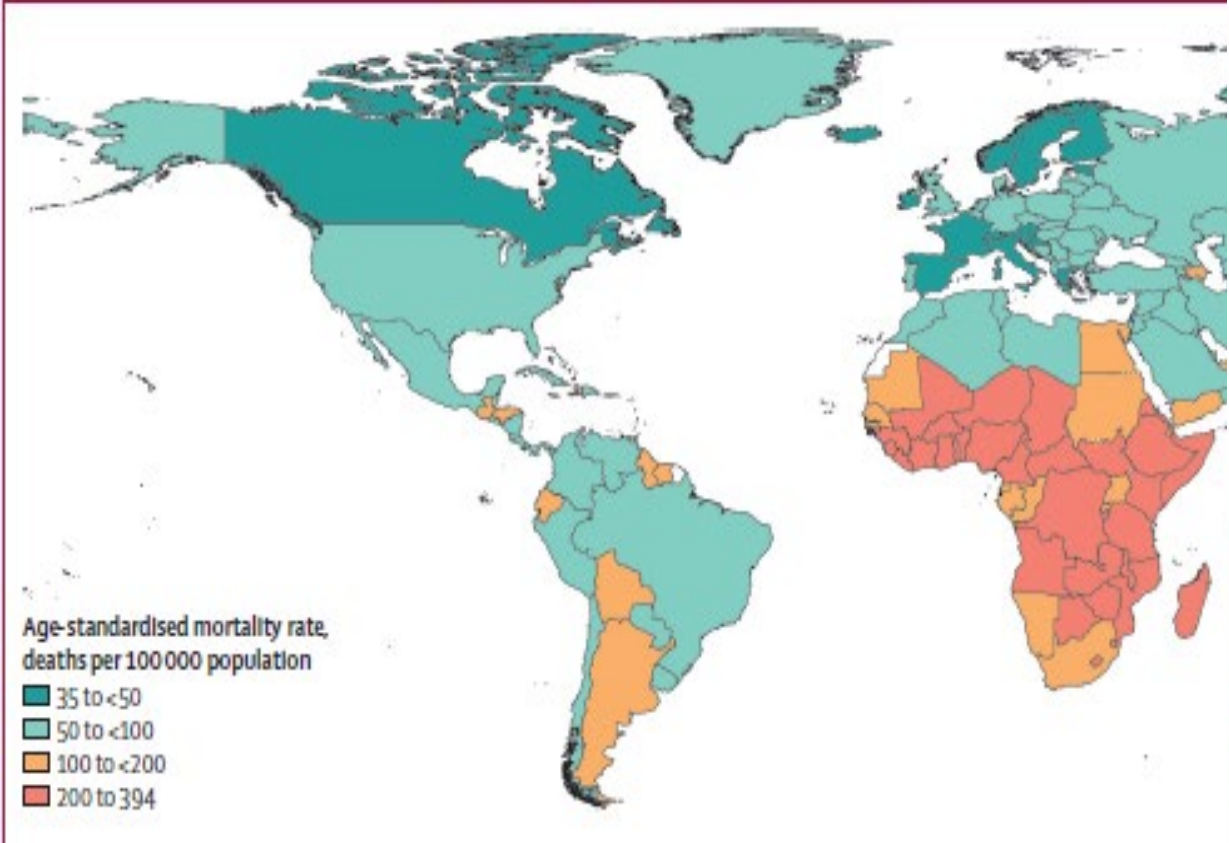


Figure 4: Global number of deaths (A) and YLLs (B), by pathogen and GBD super-region, 2019

Data are presented for the 14 pathogens with the largest number of global deaths; the Other group comprises the additional 19 bacteria estimated in this study. GBD=Global Burden of Diseases, Injuries, and Risk Factors. *Salmonella Typhi*=*Salmonella enterica* serotype Typhi. YLLs=years of life lost.

Global mortality associated with 33 bacterial pathogens in 2019: a systematic analysis for the Global Burden of Disease Study 2019

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Why are surveillance systems needed for South Africa?



OECD-WHO Briefing Paper
on Infection Prevention and Control

ADDRESSING THE
BURDEN OF INFECTIONS
AND ANTIMICROBIAL
RESISTANCE
ASSOCIATED WITH
HEALTH CARE

Focus on G7 countries

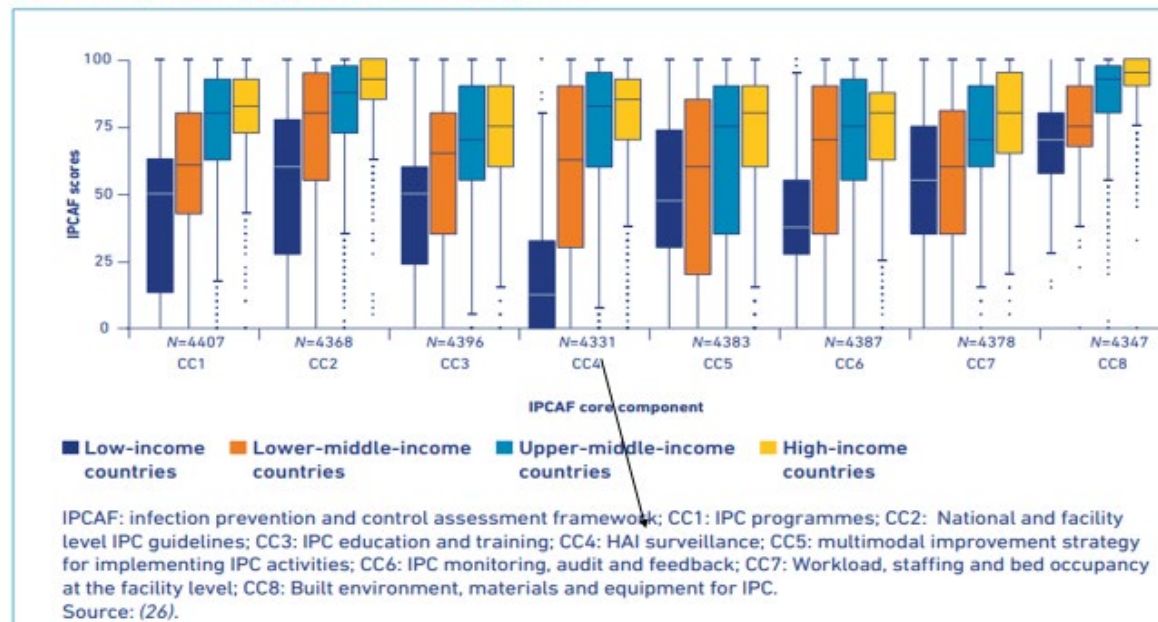
18 October 2022



OECD- 63.5% infections with abt^r were HAI.
Resulted in 72.4% abt^r attributable deaths
IPC interventions can reduce - up to 70% of HAI

IPCAF results 2019.

Fig. 5. IPC scores, by core component and World Bank income level of countries participating in the 2019 WHO global survey on IPC programmes at the facility level



3 Infection Prevention And Control

Domain 3.2 CLINICAL GOVERNANCE AND CLINICAL CARE

Sub Domain 3.2.1 7 Clinical management

Standard 3.2.1.1 7(1) The health establishment must establish and maintain clinical management systems, structures and procedures that give effect to national policies and guidelines.

Criterion 3.2.1.1.1 7(2)(a) The health establishment must ensure that clinical policies and guidelines for priority health conditions issued by the national department are available and communicated to health care personnel.

3.2.1.1.1.1 National guidelines for strategic priority programmes or health initiatives are available.

AMR and IPC Framework exist

Standard 3.2.1.2 7(2) (b) A health establishment must establish and maintain systems, structures and programmes to manage clinical risk.

Criterion 3.2.1.2.1 7 Infection prevention and control management must be led by trained and experienced health care personnel.

3.2.1.2.2.3 Minutes of the structure reviewing infection prevention and control indicate that analysed infection control surveillance data and control measures are discussed.

IPC Surveillance-

3.2.1.2.3.4 An approved strategy to manage health care-associated infections is in place.

3 IPC (contd) on HAI surveillance



Criterion 3.2.1.2.3 7 The infection prevention and control management structure **must identify and manage risk in relation to health care-associated infections.**

3.2.1.2.3.1 An annual infection prevention and control audit is conducted.

Criterion 3.2.1.2.4 7 The health establishment management structure must implement an effective health care-associated infections surveillance programme.

3.2.1.2.4.1 The incidence of common health care-associated infections is monitored monthly.

Criterion 3.2.1.2.5 7 The health establishment **must report information on health care-associated infections** and notifiable diseases to the appropriate public health agencies.

3.2.1.2.5.1 All diagnosed notifiable diseases have been recorded.

Criterion 3.2.1.2.6 7 Implementation of standard operating procedures must be monitored.

3.2.1.2.6.1 A hand hygiene drive or campaign is held at least annually.

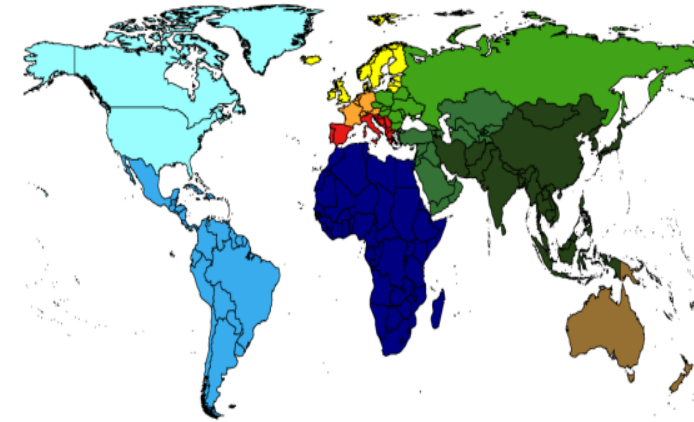
3.2.1.2.6.3 Implementation of procedures to reduce the risk of health care-associated infections are monitored.

Global Point Prevalence Survey on antimicrobial consumption and resistance



Participation to Global-PPS by UN macro-geographical subregion, year 2022

	Number of countries	Number of hospitals
North America	1	2
South America	0	0
Africa	9	31
North Europe	1	1
West Europe	1	4
South Europe	0	0
East Europe	0	0
West & Central Asia	1	2
East & South Asia	4	20
Australia & New Zealand	0	0





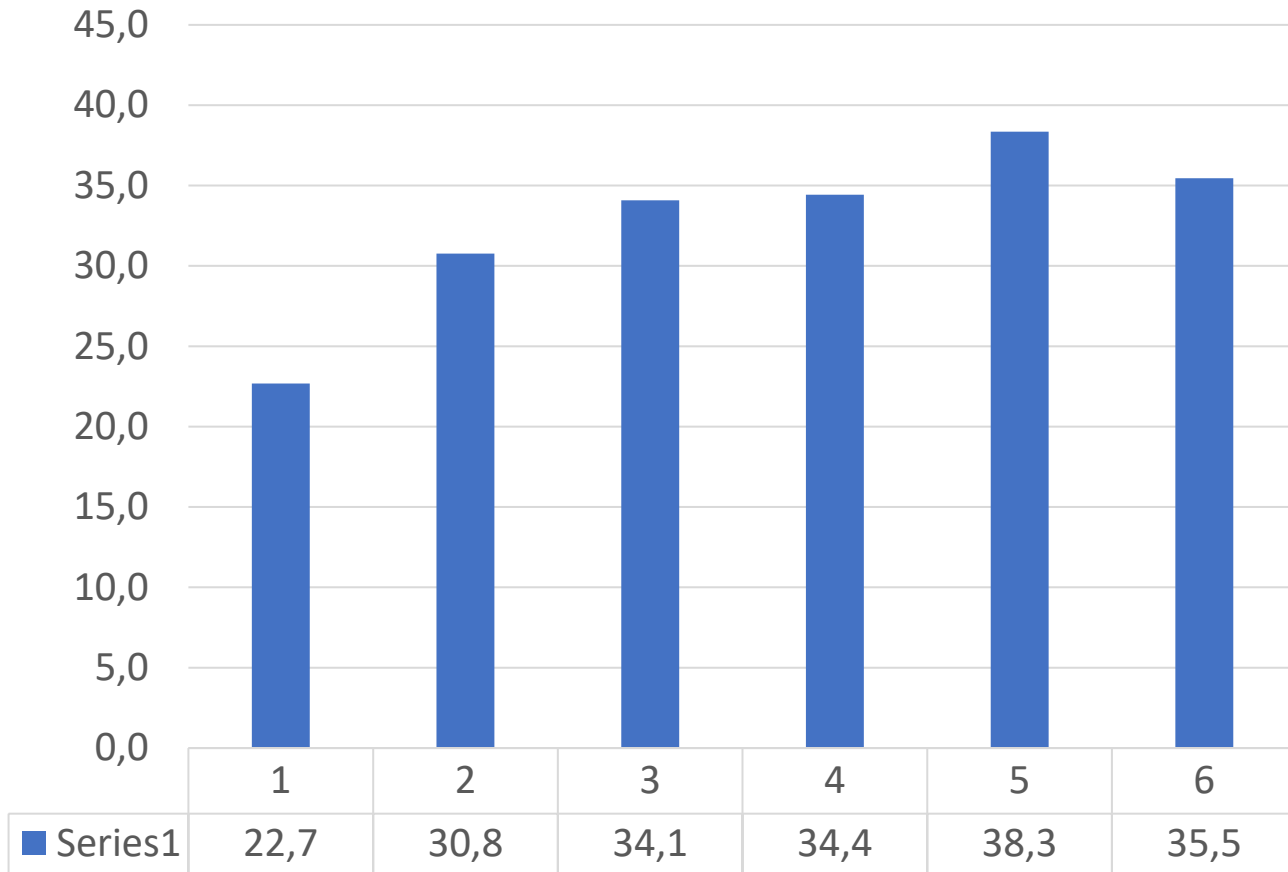
GPPS pilot study 2022

- Training conducted from Oct '21 to April '22- 4 sessions from Uni of Antwerp, Belgium. Ann Versporten and Ines Pauwels
- 8 sites chosen from 4 provinces- National DOH via Prov IPC Committees
- The AMS committees were expected to take the lead in the PPS along with the other members – ID, Pharmacist, IPC and clinical teams
- One site had been previously involved in GPPS
- Pilot conducted May to August '22
- Aggregate from 6/8 hospitals with validated data presented today
- Some individual participating hospital data- anonymous
- Pros and cons of the GPPS study

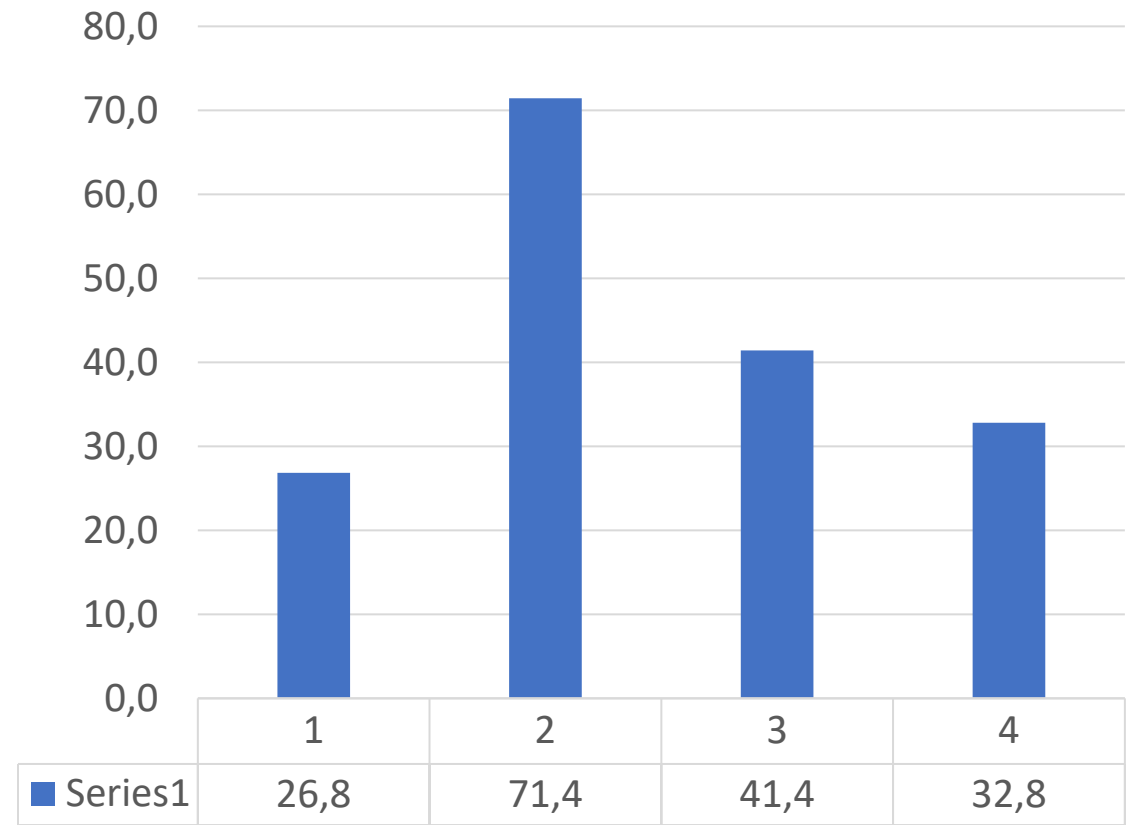
Antimicrobial Prevalence in adult v child/neonatal wards



Prevalence AB use Adult wards



Prevalence AB use Paediatric wards



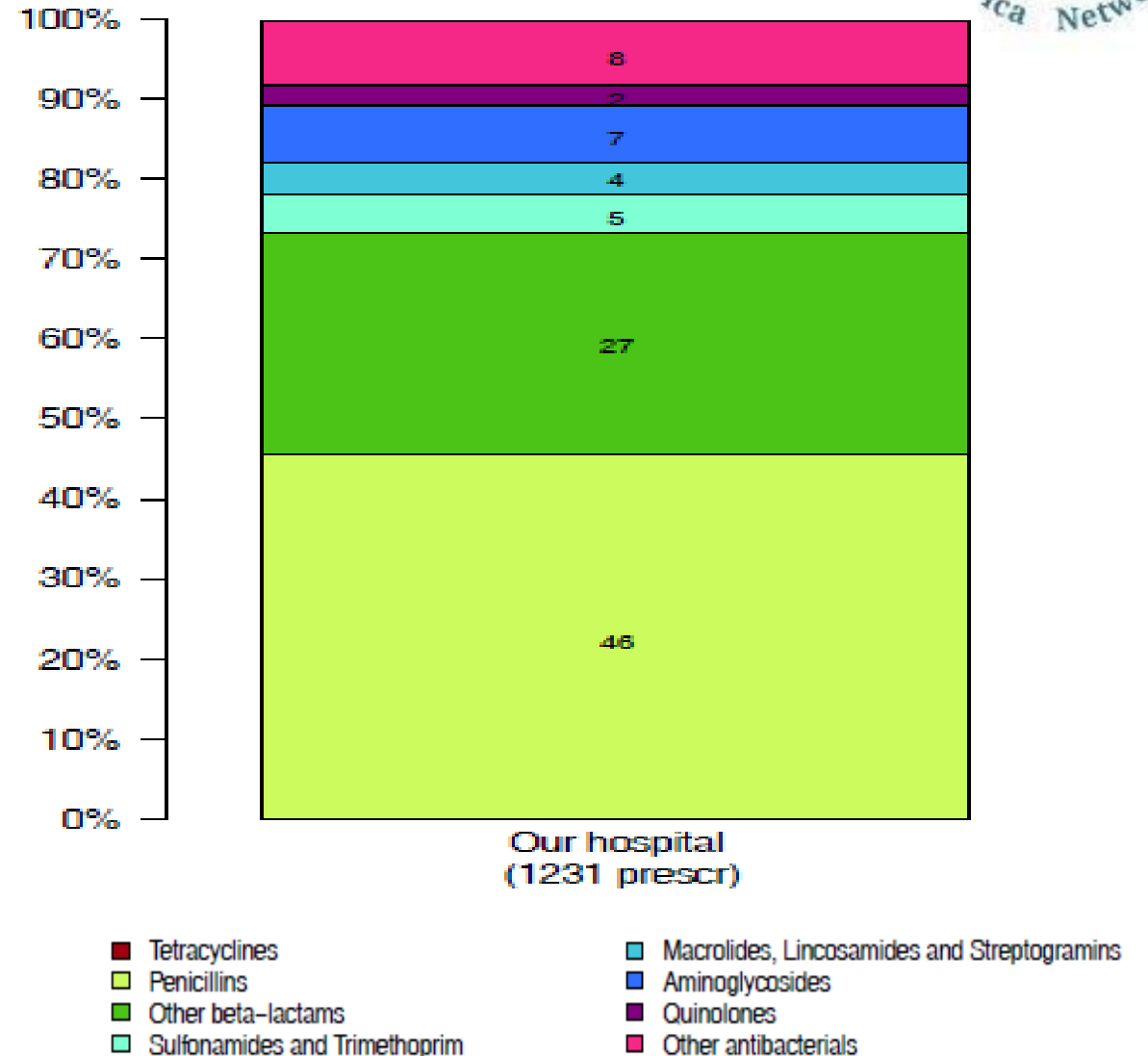
Hosp 5 and 6 did not survey paediatric/neonatal wards

Prevalence of antibiotic usage- aggregate data



Antimicrobial prevalence (%) by activity

	Hospital	Europe
Adults	26	
Medical	30.1	28.6
Surgical	28.1	39.1
ICU	63.9	60.7
Children		
Medical	41.1	31.0
Surgical	18.3	33.6
ICU	73.3	55.1
Neonates		
GNMW	15.1	4.3
NICU	57.1	26.0



Proportional antibiotic use (%age of prescription)



Community Acquired

Antibiotics Subgroup	Our Hospital
Penicillins with extended spectrum	15.5
Beta-lactamase sensitive penicillins	1.3
Beta-lactamase resistant penicillins	3.4
Penicillins incl. beta-lactam. inh.	30.4
First-generation cephalosporins	4.2
Third-generation cephalosporins	16.4
Carbapenems	2.3
Comb. Sulfonamides/trimethoprim	6.4
Macrolides	4.5
Lincosamides	1.8
Other aminoglycosides	4.2
Fluoroquinolones	1.9
Glycopeptide antibacterials	1.3
Imidazole derivatives	3.4

HAI

Antibiotics Subgroup	Our Hospital
Penicillins with extended spectrum	6.2
Beta-lactamase sensitive penicillins	1.3
Beta-lactamase resistant penicillins	2.9
Penicillins incl. beta-lactam. inh.	26.0
First-generation cephalosporins	2.9
Third-generation cephalosporins	7.1
Carbapenems	19.8
Comb. Sulfonamides/trimethoprim	1.6
Lincosamides	0.6
Other aminoglycosides	13.0
Fluoroquinolones	3.2
Glycopeptide antibacterials	6.8
Polymyxins	2.6
Imidazole derivatives	3.2



Type of treatment- empiric or targeted

	CAI Empiric		CAI Targeted		CAI Total	
	N	%	N	%	N	%
Our hospital 26	623	76.3	193	23.7	816	70.3
Country						
Continent	3280	96.4	124	3.6	3404	86.6
Hospital type						

	HAI Empiric		HAI Targeted		HAI Total	
	N	%	N	%	N	%
Our hospital 26	257	74.5	88	25.5	345	29.7
Country						
Continent	489	92.6	39	7.4	528	13.4
Hospital type						

Type antibiotic treatment (Empiric versus Targeted) by activity



> targeted

	2022-P2		2022-P2		2022-P2		2022-P2		2022-P2		Country		Europe	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
All patients														
Empiric	221	86.3	97	86.6	201	87.0	35	83.3	77	71.3	146	81.1	777	83.6
Targeted	35	13.7	15	13.4	30	13.0	7	16.7	31	28.7	34	18.9	152	16.4
Medical														
Empiric	103	92.8	49	87.5	110	90.2	17	85.0	29	55.8	94	85.5	402	85.4
Targeted	8	7.2	7	12.5	12	9.8	3	15.0	23	44.2	16	14.5	69	14.6
Surgical														
Empiric	74	82.2	28	87.5	72	87.8	13	86.7	42	93.3	44	77.2	273	85.0
Targeted	16	17.8	4	12.5	10	12.2	2	13.3	3	6.7	13	22.8	48	15.0
ICU														
Empiric	44	80.0	20	83.3	19	70.4	5	71.4	6	54.5	8	61.5	102	74.5
Targeted	11	20.0	4	16.7	8	29.6	2	28.6	5	45.5	5	38.5	35	25.5

Selection on antibiotic treatments (prophylactic and unknown prescribing are excluded) by activity.

N = number of antibiotics (J01) included per type of treatment and activity (medical, surgical, ICU).

Commonest prescribing of abts by diagnosis



Diagnosis	Our hospital		Europe	
	N	%	N	%
Pneu	178	21.2	1156	25.3
SST	108	12.9	398	8.7
TB	58	6.9	26	0.6
CNS	56	6.7	55	1.2
SEPSIS	48	5.7	193	4.2
HIV	45	5.4	9	0.2
BJ	40	4.8	127	2.8
BAC	37	4.4	67	1.5
GI	37	4.4	138	3.0
IA	36	4.3	389	8.5

The number of diagnoses treated with at least one antimicrobial. Patients with multiple diagnoses can be counted several times. Prophylactic prescribing and patients admitted on NICU or NMW are excluded from this analysis

Quality indicators- summary for abt use



	Our hospital 26		Europe		Adult		Paed/ NNU	
	N	%	N	%				
Medical								
Reason in notes	481	88.4	3133	87.7	339	89.0	142	87.1
Guidelines missing	7	1.3	484	13.5	4	1.0	3	1.8
Guideline compliant	341	82.2	1958	80.5	235	80.2	106	86.9
Stop/review date documented	169	31.1	1748	48.9	146	38.3	23	14.1
Surgical								
Reason in notes	382	74.9	2030	84.6	362	74.0	20	95.2
Guidelines missing	17	3.3	443	18.5	16	3.3	1	4.8
Guideline compliant	258	67.2	1171	78.0	244	66.1	14	93.3
Stop/review date documented	172	33.7	1385	57.7	164	33.5	8	38.1
ICU								
Reason in notes	155	87.6	740	89.6	84	80.0	71	98.6
Guidelines missing	5	2.8	141	17.1	4	3.8	1	1.4
Guideline compliant	102	81.0	418	81.2	65	80.2	37	82.2
Stop/review date	62	35.0	408	49.4	52	49.5	10	13.9

Prevalence (% patients) with at least one HAI – by hospital



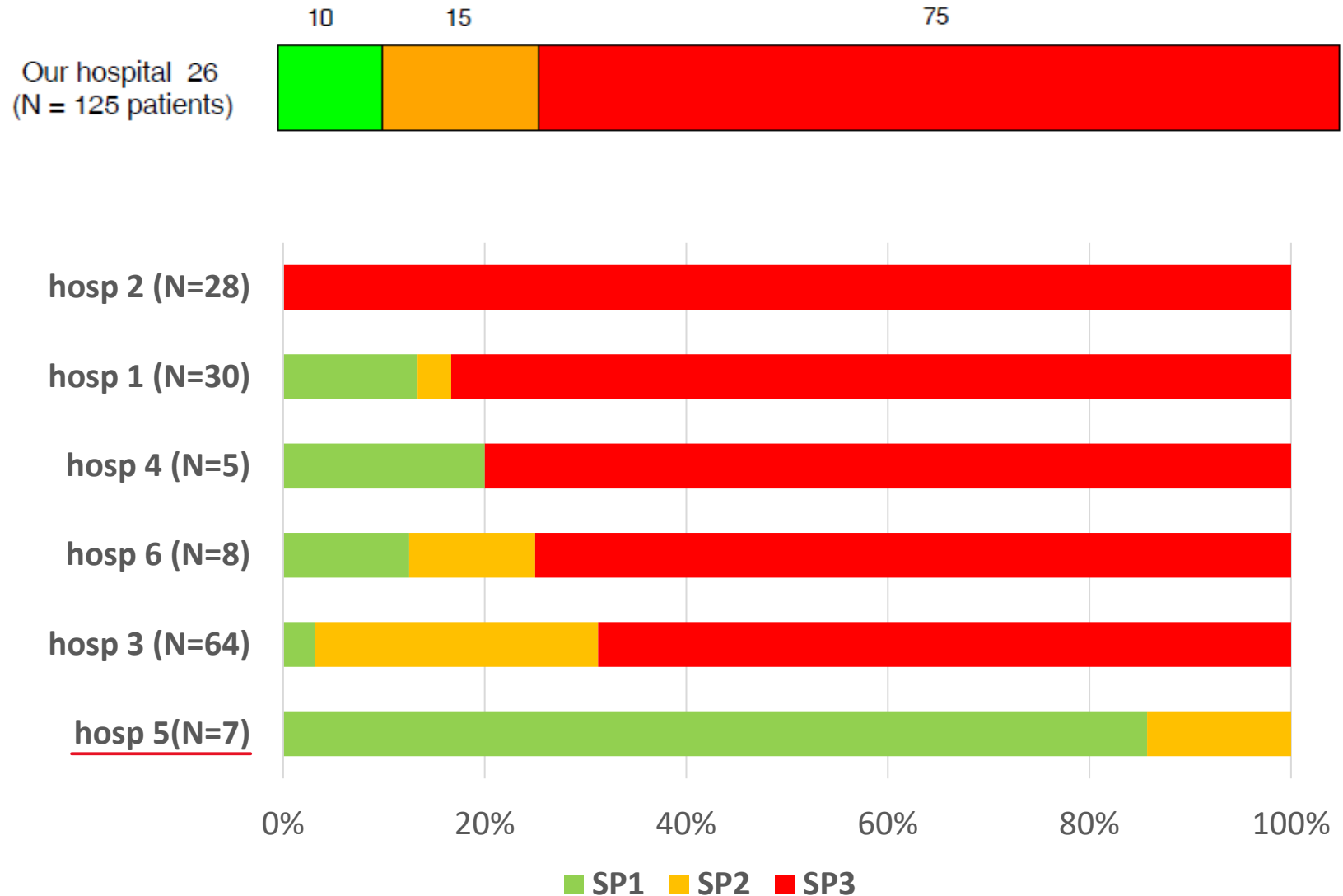
	Hospital 2022–P2	Hospital 2022–P2	Hospital 2022–P2	Hospital 2022–P2	Hospital 2022–P2	Hospital 2022–P2	Country
Numerator (N patients)	84	13	71	25	25	25	243
Denominator (N admitted patients)	1211	269	922	125	339	471	3337
HAI rate (%)	6.9	4.8	7.7	20.0	7.4	5.3	7.3
Post-operative surgical site infection (%)	1.3	0.7	2.8	4.8	0.6	1.5	1.8
Intervention related infection (%)	1.1	3.3	1.4	7.2	3.8	1.1	1.9
CDAD (%)	0.0	0.0	0.0	0.0	0.9	0.2	0.1
Other HAI (%)	4.4	1.1	3.5	7.2	2.4	2.8	3.5
HAI from another hospital (%)	0.2	0.0	0.1	0.8	0.0	0.0	0.1
HAI from LTCF or nursing home (%)	0.1	0.0	0.0	0.0	0.0	0.2	0.1
<u>Intervention-related infections (%)</u>							
Mixed origin	0.3	1.1	1.2	2.4	1.5	0.4	0.8
CVC-BSI	0.2	1.9	0.0	0.8	0.0	0.2	0.3
PVC-BSI	0.0	0.4	0.2	0.0	0.6	0.2	0.2
Ventilator-Associated Pneumonia (VAP)	0.4	0.0	0.0	4.0	0.0	0.0	0.3
CAUTI	0.2	0.7	0.0	0.8	1.8	0.2	0.4
<u>Other Hospital-Associated Infections (%)</u>							
HAI of mixed or undefined origin	3.1	1.1	2.4	3.2	1.2	1.3	2.3
Blood Stream Infection (BSI)	0.3	0.0	0.8	1.6	0.0	0.8	0.5
Hospital-Acquired Pneumonia (not VAP)	0.8	0.0	0.1	2.4	0.9	0.6	0.6
Urinary Tract Infection (UTI)	0.1	0.0	0.4	0.0	0.3	0.0	0.2



Duration of surgical prophylaxis



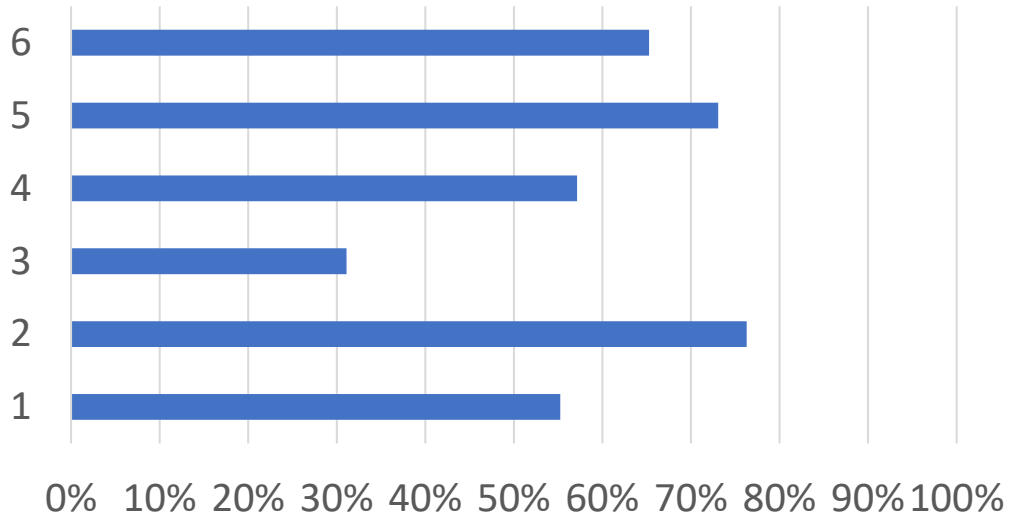
Duration of surgical prophylaxis in adults and children Aggregate





Cultures sent to lab by hospital– N patients

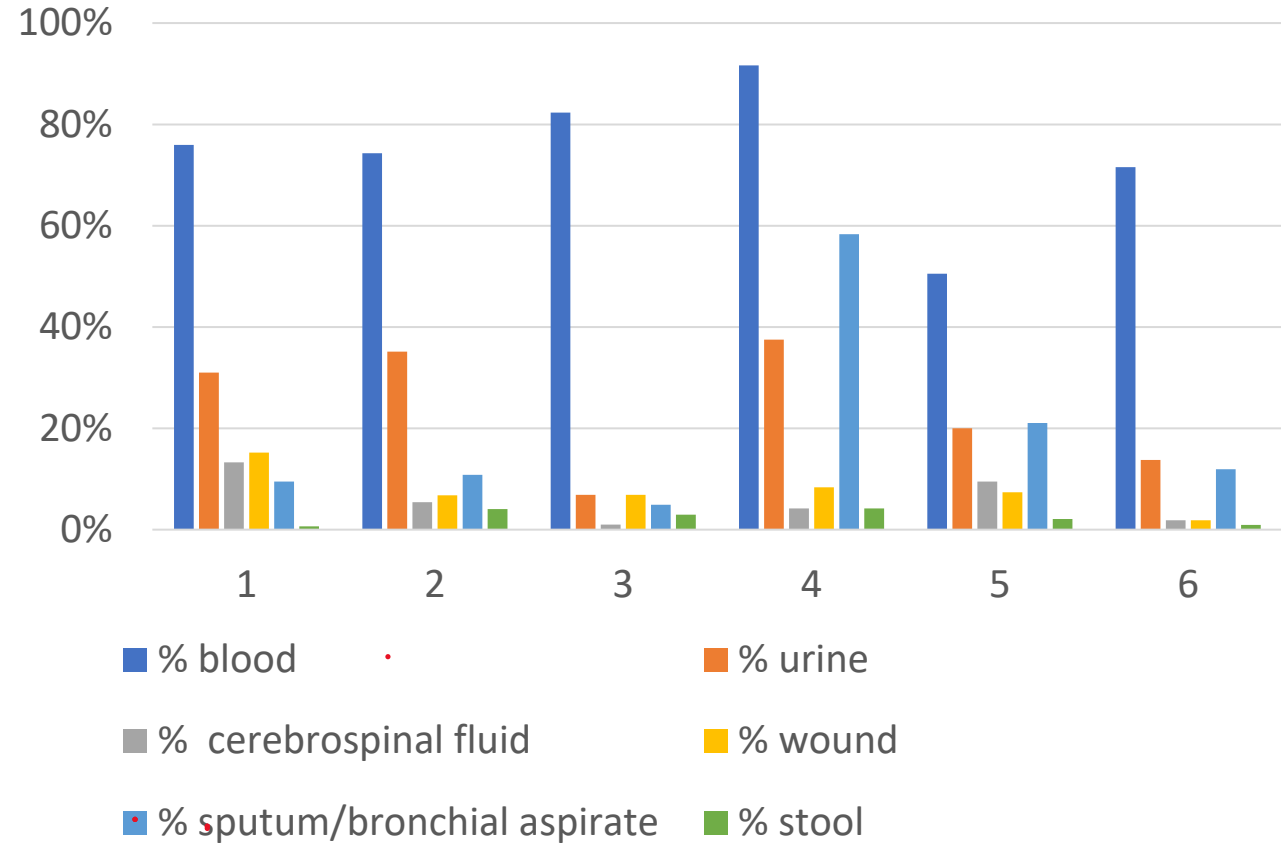
Cultures sent to lab (% patients)



5% of patients (aggregate) treated with an antibiotic had a positive microbiology result!



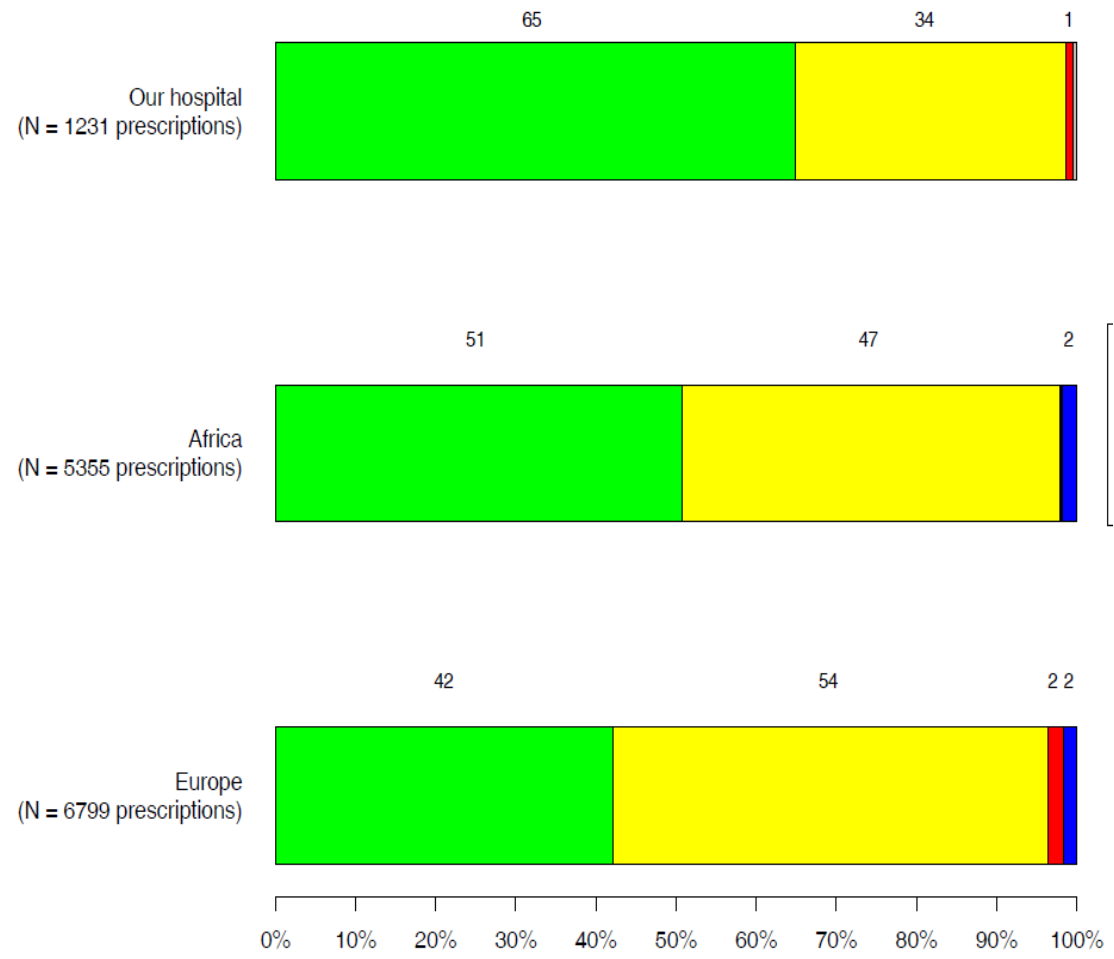
% patients cultures sent to lab



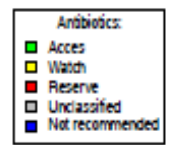
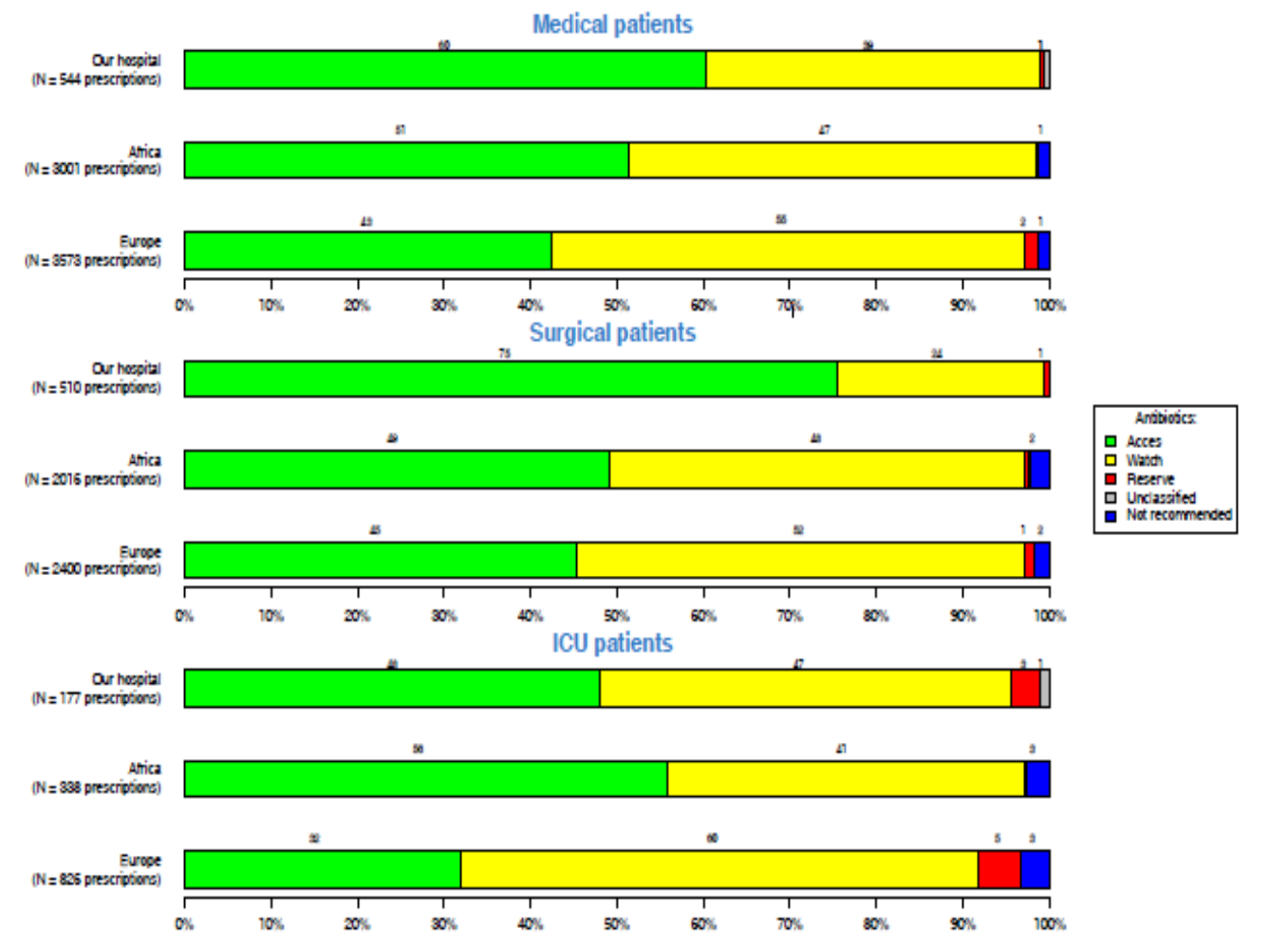
Overall abt use: WHO AWaRe classification



Overall antibiotic use (ATC J01) according to the WHO AWaRe classification



Antibiotic use (ATC J01) by activity according to the WHO AWaRe classification



Evaluation of GPPS Pilot study- Summary



Pro

- Fulfils criteria for IPC standards – OHSA.
- Can collect PPS data 1 day/ ward/ period of time.
- Fixed annual PPS- allows for preparation
- Gives the AMS Committee useful information to implement AMS Framework
- Real time data returned to relevant health facilities- improve AMS & reduce HAI
- GPPS Belgium team supportive and committed
- Feedback to change the form accepted for modification in 2023.
- Good HAI data which can be expanded
- Can be adapted for Vet Health hospitals
- National support within the GPPS working group exists

Con

Mainly logistics

- Ownership- IPC? AMS?
- Research or routine surveillance ?- some clinician resistance
- HCFs not prepared. Structures not established- no focal person to understand and enter the data
- Confusion over terminology, codes and entering the correct information
- Tablets or paper forms for collecting data
- HF teams changed at every training meeting- information not understood or passed on.
- Ideally clinical persons should be involved, such as the AMS Committee
- In house validation a challenge.- incorrect data entered particularly dosage, name of antibiotics and codes



What can GPPS do for South Africa?

• Interim

- Collect baseline data on antibiotic utilization by diagnosis
- HAI and CAI prevalence rates
- Use of antimicrobials for HAI and CAI
- No immediate outlay of expenses
 - Data collected once a year or fixed time annually
 - Collected as part of the AMS team activities
 - Can provide quick feedback with each hospital analysis

• Long term

- Impact of IPC and AMS programmes by comparing year to year outcomes
- Cost analysis of HAI and abt usage
- Move over to DOH as part of WHO CC4- HAI surveillance (JEE evaluation)
- Bench marking
- Move to a home grown system (adapt from N Shellack's publication)

HOSPITAL PRACTICE
2021, VOL. 49, NO. 3, 184-193
<https://doi.org/10.1080/21548331.2021.1889213>

CLINICAL FEATURE
ORIGINAL RESEARCH

Development of a web-based application to improve data collection of antimicrobial utilization in the public health care system in South Africa

D Kruger^{a,b}, NN Dlamini^a, JC Meyer ^a, B Godman^{a,c,d}, A Kurdi ^{c,e}, M Lennon^f, M. Bennie ^c and N Shellack ^a



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