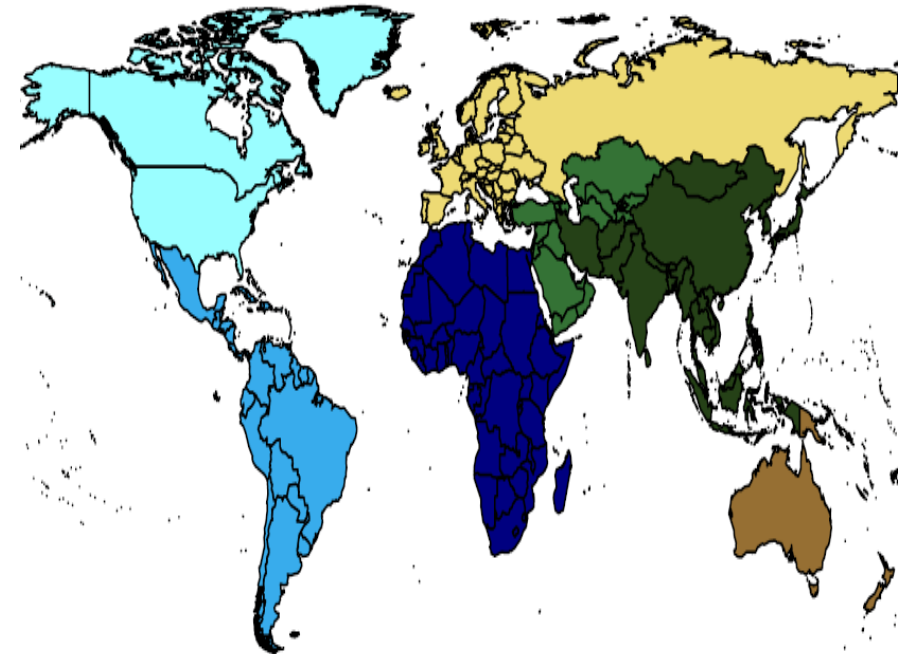


Global Point Prevalence Survey of Antimicrobial Consumption and Resistance



Participation to Global-PPS according to UN macro-geographical regions.

	Number of countries	Number of hospitals
North America	2	22
South America	4	20
Africa	4	7
Europe	25	213
West & Central Asia	8	25
East & South Asia	6	29
Australia & New Zealand	2	9



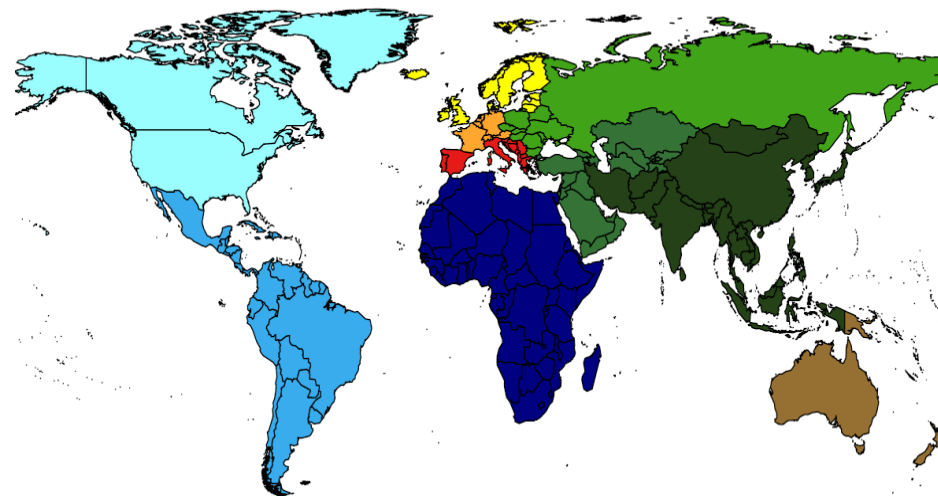
□ North America
□ Latin America
□ Africa

■ West & Central Asia
■ East & South Asia

□ Europe
■ Australia & New Zealand

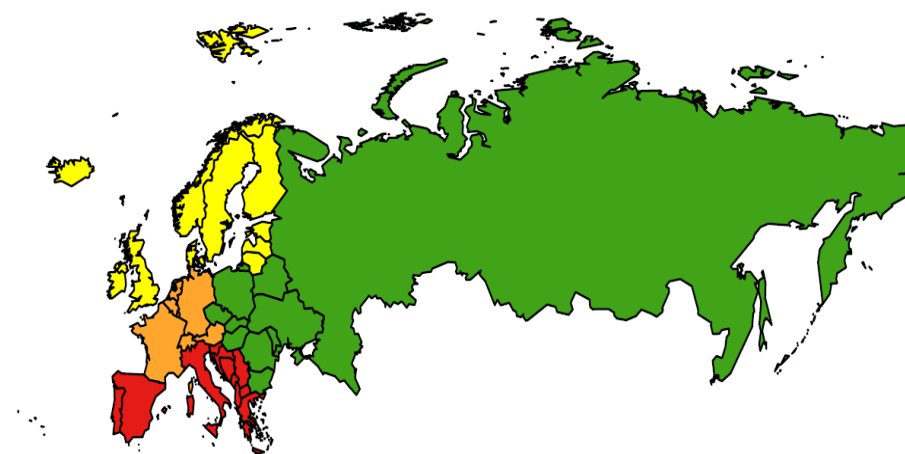
Participation to Global-PPS according to UN macro-geographical subregions.

	Number of countries	Number of hospitals
North America	2	22
South America	4	20
Africa	4	7
North Europe	5	36
West Europe	5	117
South Europe	13	52
East Europe	2	8
West & Central Asia	8	25
East & South Asia	6	29
Australia & New Zealand	2	9



- North America
- Latin America
- Africa
- North Europe
- West Europe

- South Europe
- East Europe
- West & Central Asia
- East & South Asia
- Australia & New Zealand



Overall antimicrobial prevalence by region and type of adult ward.

	Total	AMW	HO-AMW	T-AMW	P-AMW	ASW	AICU
North America	38.6	32.4	55.4	66.7	58.8	44.2	59.4
South America	36.7	31.8	28.3	65.9	50.0	37.0	55.1
Africa	50.0	49.9	50.0	66.7	100.0	49.0	64.1
North Europe	34.4	29.8	49.6	60.8	53.5	37.7	55.9
West Europe	28.2	23.4	43.1	80.9	49.7	28.0	56.1
South Europe	39.1	32.6	33.6	76.9	60.2	40.0	64.2
East Europe	27.4	11.6	9.1	0.0	30.5	33.2	67.3
West & Central Asia	43.7	42.0	48.1	0.0	100.0	44.6	46.6
East & South Asia	38.7	34.9	54.9	86.9	46.2	35.4	65.6
Australia & New Zealand	37.0	29.8	54.3	0.0	77.8	52.5	69.7
Our hospital	50.1	47.9	72.7	0.0	44.8	46.4	100.0
SG	51.6	50.4	71.0	93.8	57.8	47.4	59.0

Antimicrobial prevalence (%): $100 \times (\text{number of treated patients} / \text{number of registered patients according to UN macro-geographical subregions})$.

Total = Overall antimicrobial prevalence in adult wards; AMW = Adult Medical Ward; HO-AMW = Haematology-Oncology AMW; T-AMW = Transplant (BMT/solid) AMW; P-AMW = Pneumology AMW; ASW = Adult Surgical Ward; AICU = Adult Intensive Care Unit.

Overall antimicrobial prevalence by region and type of child or neonatal ward.

	Total	PMW	HO-PMW	T-PMW	PSW	PICU	NMW	NICU
North America	26.6	41.7	53.1	100.0	71.4	51.9	2.2	20.1
South America	30.8	37.3	23.4	100.0	49.2	54.4	7.8	34.2
Africa	55.4	66.8	46.2	0.0	41.3	100.0	42.1	78.2
North Europe	34.8	33.4	72.7	100.0	33.0	73.7	18.8	30.5
West Europe	22.7	26.8	59.1	100.0	31.2	47.1	4.4	21.5
South Europe	42.0	51.6	73.4	0.0	39.6	64.7	10.8	37.7
East Europe	23.2	12.3	44.1	0.0	23.9	97.9	18.9	88.2
West & Central Asia	47.8	46.0	65.2	0.0	44.7	67.8	20.7	70.7
East & South Asia	36.4	38.8	79.5	31.6	43.8	55.4	19.3	24.4
Australia & New Zealand	28.4	35.2	66.7	0.0	41.4	50.0	6.9	51.8
Our hospital	27.3	0.0	0.0	0.0	0.0	0.0	27.3	0.0
SG	29.8	20.5	80.0	0.0	66.7	50.0	14.0	29.4

Antimicrobial prevalence (%): $100 \times (\text{number of treated patients} / \text{number of registered patients according to UN macro-geographical subregions})$.

Total = Overall antimicrobial prevalence in wards admitting children and neonates; PMW = Paediatric Medical Ward;
 HO-PMW = Haematology-Oncology PMW; T-PMW = Transplant (BMT/solid) PMW; PSW = Paediatric Surgical Ward;
 PICU = Paediatric Intensive Care Unit; NMW = Neonatal Medical Ward; NICU = Neonatal Intensive Care Unit.

Antimicrobial prevalence in adult wards

	Total	AMW	HO-AMW	T-AMW	P-AMW	ASW	AICU
Our hospital							
patients (N)	1228	572	121	0	58	466	11
treated patients (%)	50.1	47.9	72.7	0	44.8	46.4	100
Country							
patients (N)	3180	1556	245	16	90	1151	122
treated patients (%)	51.6	50.4	71	93.8	57.8	47.4	59
Continent							
patients (N)	13844	6286	833	145	409	5470	701
treated patients (%)	38.7	34.9	54.9	86.9	46.2	35.4	65.6
Hospital type							
patients (N)	11059	4794	600	97	372	4584	612
treated patients (%)	38.9	34.5	58	81.4	45.4	35.3	69.6
Europe							
patients (N)	54690	29625	1947	192	1878	18084	2964
treated patients (%)	31.9	26.1	40.6	74.5	52	33.4	59.3

Patients (N) = number of admitted adults.

Treated patients (%) = 100*(number of adults treated with at least one antimicrobial/number of admitted adults).

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Antimicrobial prevalence in paediatric wards.

	Total	PMW	HO-PMW	T-PMW	PSW	PICU
Our hospital						
patients (N)	0	0	0	0	0	0
treated patients (%)	0	0	0	0	0	0
Country						
patients (N)	71	44	15	0	6	6
treated patients (%)	39.4	20.5	80	0	66.7	50
Continent						
patients (N)	977	722	73	19	89	74
treated patients (%)	43.4	38.8	79.5	31.6	43.8	55.4
Hospital type						
patients (N)	437	339	20	0	28	50
treated patients (%)	57.7	55.5	75	0	64.3	62
Europe						
patients (N)	5956	3956	353	7	1345	295
treated patients (%)	36.8	33.8	64	100	31	69.8

Patients (N) = Number of admitted children in the hospital, country, UN macro-geographical region to which the hospital belongs; and the continental results for the hospital type to which the hospital belongs (possible types are primary + secondary level, tertiary level, paediatric and infectious diseases + specialized hospital).

Treated patients (%) = $100 \times (\text{number of children treated with at least one antimicrobial} / \text{number of admitted children})$.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Antimicrobial prevalence in neonatal wards.

	Total	NMW	NICU
Our hospital			
patients (N)	22	22	0
treated patients (%)	27.3	27.3	0
Country			
patients (N)	60	43	17
treated patients (%)	18.3	14	29.4
Continent			
patients (N)	469	223	246
treated patients (%)	22	19.3	24.4
Hospital type			
patients (N)	303	161	142
treated patients (%)	26.4	21.7	31.7
Europe			
patients (N)	2242	1435	807
treated patients (%)	17.9	10	31.8

Patients (N) = Number of admitted neonates in the hospital, country, UN macro-geographical region to which the hospital belongs; and the continental results for the hospital type to which the hospital belongs (possible types are primary + secondary level, tertiary level, paediatric and infectious diseases + specialized hospital).

Treated patients (%) = $100 \times (\text{number of neonates treated with at least one antimicrobial} / \text{number of admitted neonates})$.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Antimicrobial prevalence (%) by activity

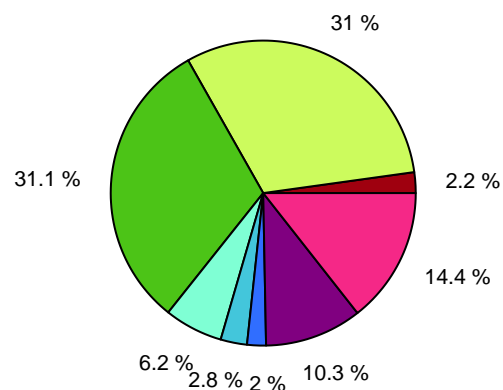
	Hospital	Country	Continent	Hospital type	Europe
Adults					
Medical	49.6	52.1	34.9	33.5	28.7
Surgical	49.3	49.5	41.3	42.7	33.2
ICU	94.1	61.0	68.7	74.1	59.2
Children					
Medical	0.0	34.4	42.0	56.3	36.5
Surgical	0.0	100.0	46.0	66.7	30.5
ICU	0.0	50.0	55.4	62.0	70.5
Neonates					
GNMW	27.3	14.0	19.3	21.7	10.0
NICU	0.0	29.4	24.4	31.7	31.8

Antimicrobial prevalence = 100*(number of treated patients/number of admitted patients)
 Antimicrobial prevalence by activity for adults, children and neonates separately for the hospital, country, continent to which the hospital belongs; and the continental results for the hospital type to which the hospital belongs (possible types are primary + secondary level, tertiary level, paediatric and infectious diseases + specialized hospital).

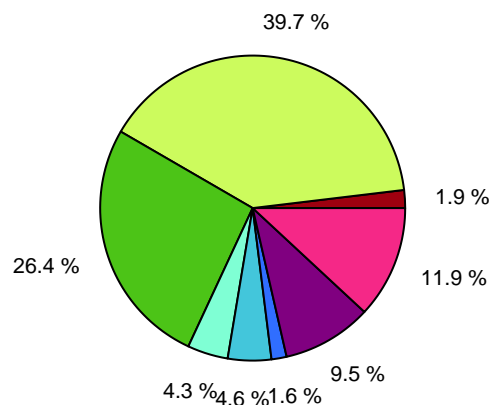
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Overall proportional antimicrobial use.

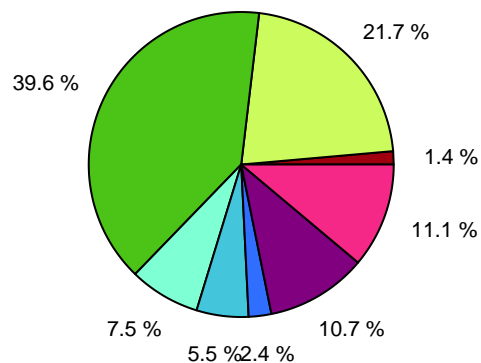
Our hospital (N= 601 treated patients)



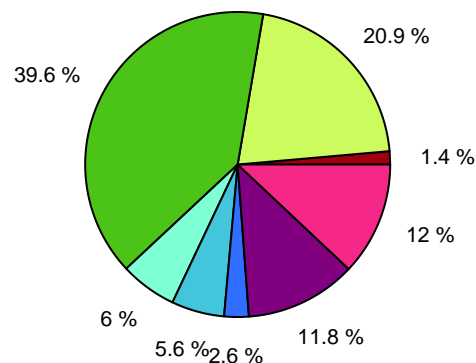
Country (n= 3 hospitals)



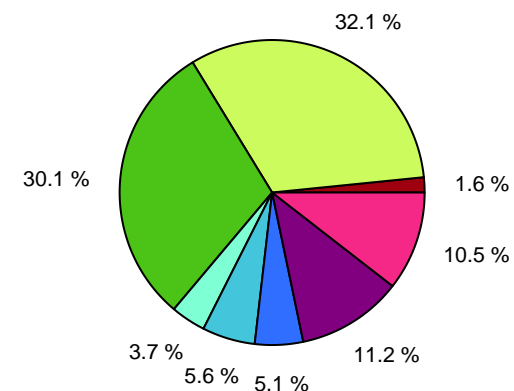
Continent (n= 29 hospitals)



Hospital type (n= 16 hospitals)



Europe (N= 213 hospitals)



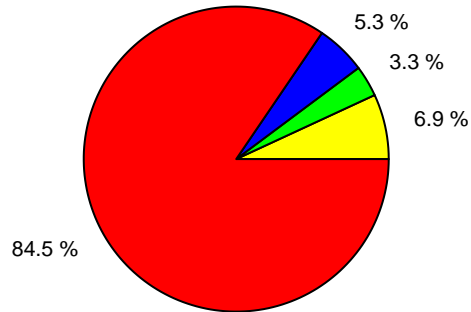
- Tetracyclines
- Penicillins
- Other beta-lactams
- Sulfonamides and Trimethoprim
- Macrolides, Lincosamides and Streptogramins
- Aminoglycosides
- Quinolones
- Other antibacterials

Percentage of antibacterials for systemic use (ATC J01) at ATC3 level (pharmacological subgroup).
Proportional antibiotic use below 0.5% is not reported.

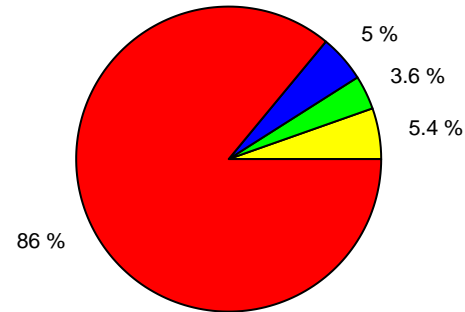
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Proportional use of beta-lactam antibacterials.

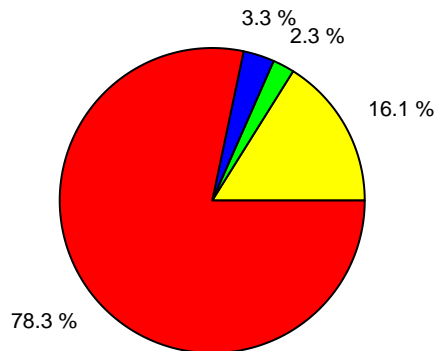
Our hospital (N= 242 treated patients)



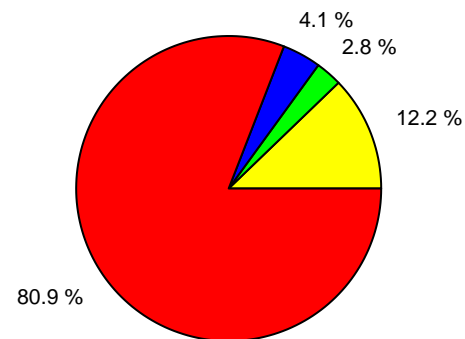
Country (n= 3 hospitals)



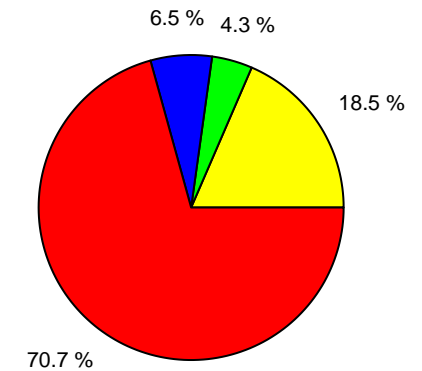
Continent (n= 29 hospitals)



Hospital type (n= 16 hospitals)



Europe (N= 200 hospitals)



■ Penicillins with extended spectrum
■ Beta-lactamase sensitive penicillins

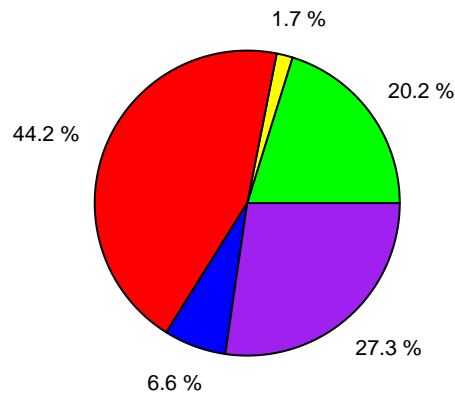
■ Beta-lactamase resistant penicillins
■ Combinations of penicillins, incl. beta-lactamase inhibitors

Percentage of beta-lactam antibacterials (ATC J01C) at ATC4 level (chemical subgroup).
Proportional antibiotic use below 0.5% is not reported.

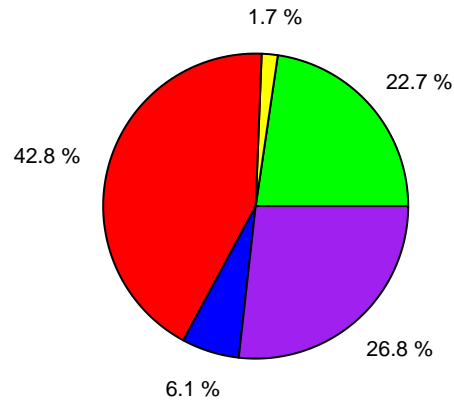
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Proportional use of other beta-lactam antibacterials.

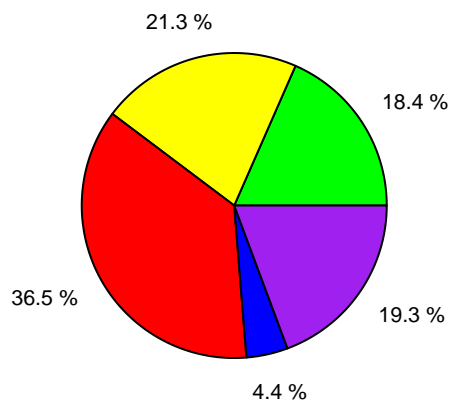
Our hospital (N= 242 treated patients)



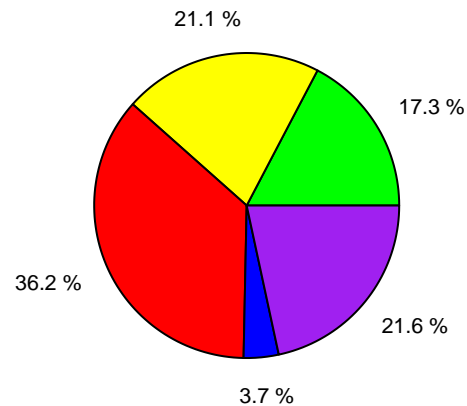
Country (n= 3 hospitals)



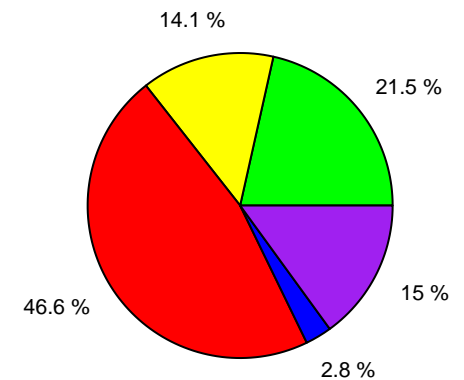
Continent (n= 29 hospitals)



Hospital type (n= 16 hospitals)



Europe (N= 199 hospitals)



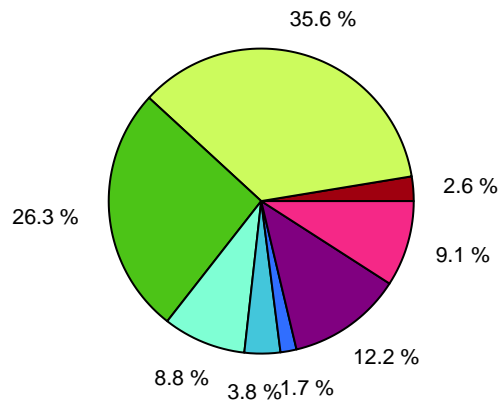
- First-generation cephalosporins
- Second-generation cephalosporins
- Third-generation cephalosporins
- Fourth-generation cephalosporins
- Carbapenems

Proportional use of other beta-lactam antibacterials (ATC J01D) at ATC4 level (chemical subgroup).
Proportional antibiotic use below 0.5% is not reported.

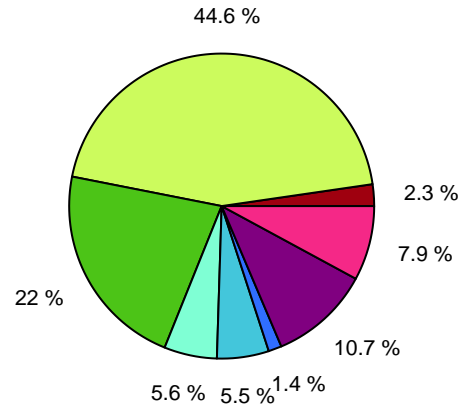
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Overall proportional antibiotic use – medical patients.

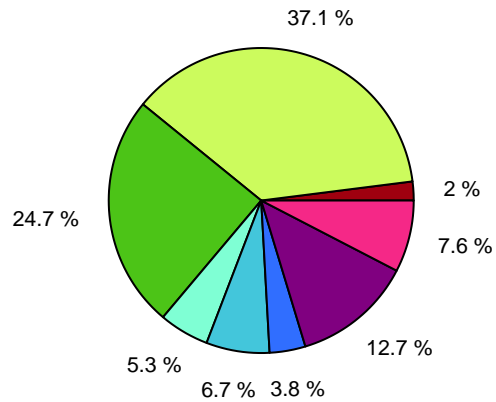
Our hospital (N= 322 treated patients)



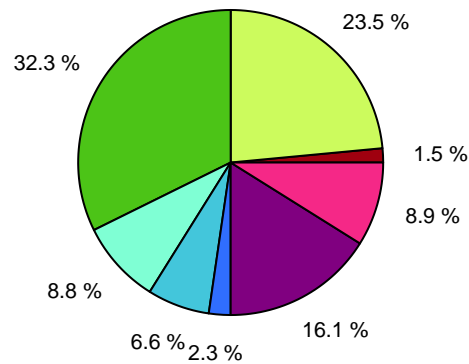
Country (n= 3 hospitals)



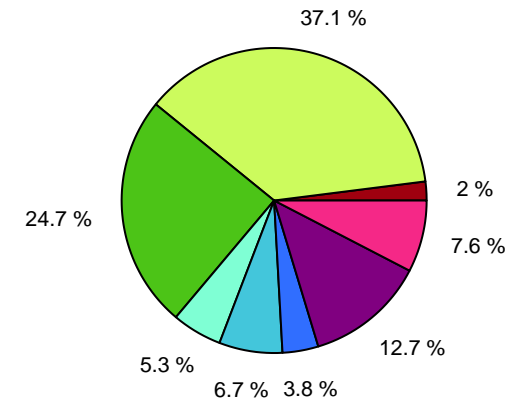
Continent (n= 202 hospitals)



Hospital type (n= 14 hospitals)



Europe (N= 202 hospitals)



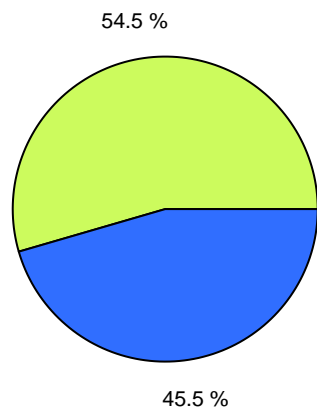
- Tetracyclines
- Penicillins
- Other beta-lactams
- Sulfonamides and Trimethoprim
- Macrolides, Lincosamides and Streptogramins
- Aminoglycosides
- Quinolones
- Other antibacterials

Percentage of antibacterials for systemic use (ATC J01) at ATC3 level (pharmacological subgroup).
Proportional antibiotic use below 0.5% is not reported.

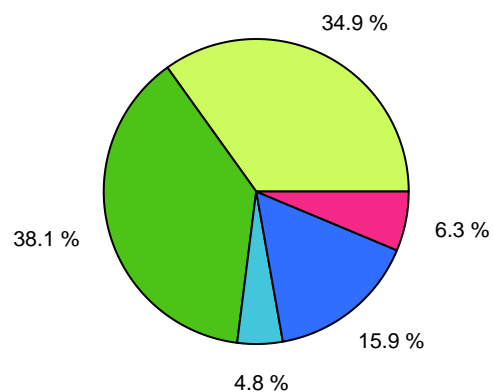
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Overall proportional antibiotic use – medical patients (neonates).

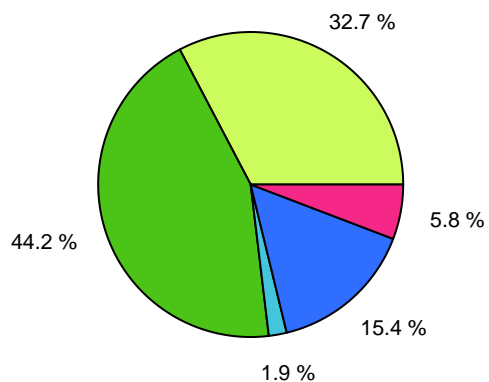
Our hospital (N= 6 treated patients)



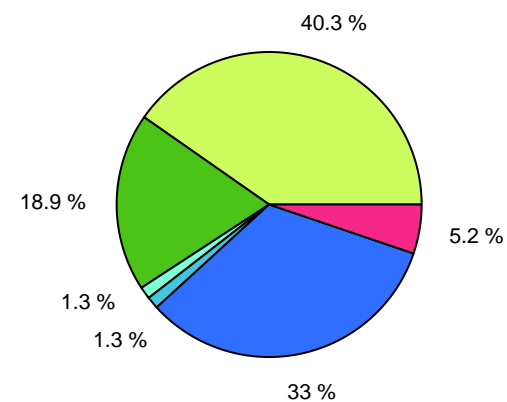
Continent (n= 7 hospitals)



Hospital type (n= 5 hospitals)



Europe (N= 42 hospitals)



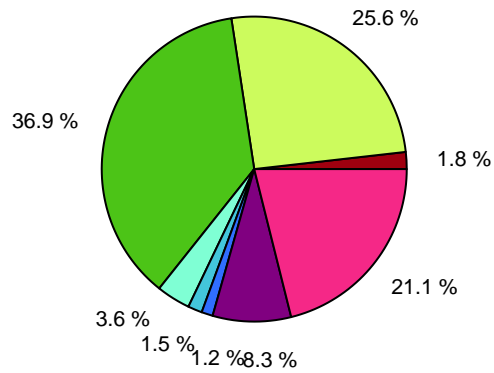
- Penicillins
- Other beta-lactams
- Sulfonamides and Trimethoprim
- Macrolides, Lincosamides and Streptogramins
- Aminoglycosides
- Other antibacterials

Percentage of antibacterials for systemic use (ATC J01) at ATC3 level (pharmacological subgroup).
Proportional antibiotic use below 0.5% is not reported.

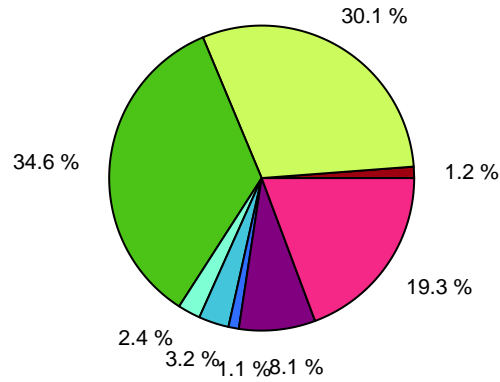
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Overall proportional antibiotic use – surgery patients.

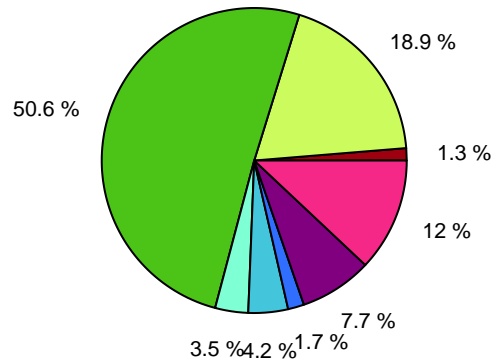
Our hospital (N= 257 treated patients)



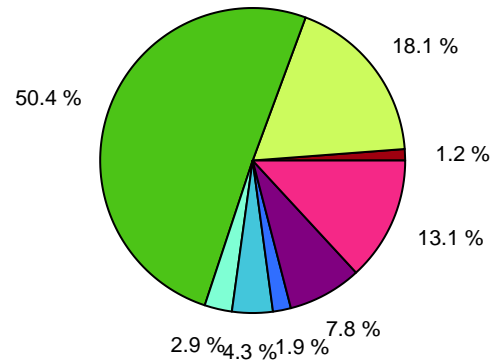
Country (n= 3 hospitals)



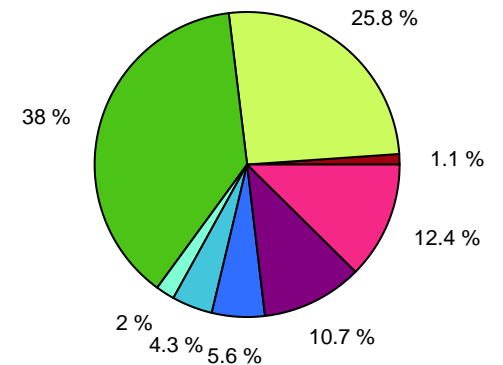
Continent (n= 25 hospitals)



Hospital type (n= 14 hospitals)



Europe (N= 180 hospitals)



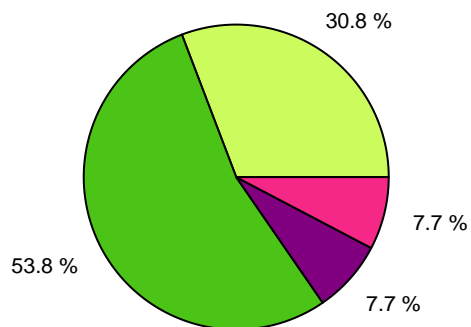
- Tetracyclines
- Macrolides, Lincosamides and Streptogramins
- Penicillins
- Aminoglycosides
- Other beta-lactams
- Quinolones
- Sulfonamides and Trimethoprim
- Other antibacterials

Percentage of antibacterials for systemic use (ATC J01) at ATC3 level (pharmacological subgroup).
Proportional antibiotic use below 0.5% is not reported.

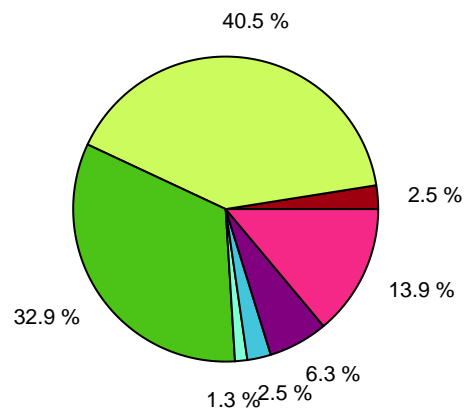
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Overall proportional antibiotic use – adult ICU patients.

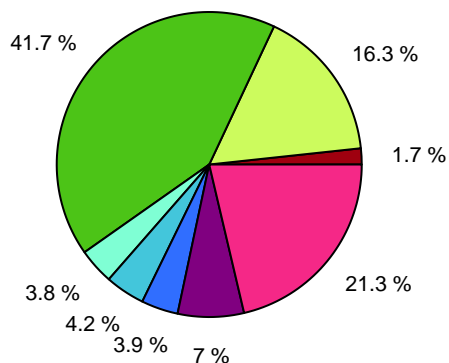
Our hospital (N= 11 treated patients)



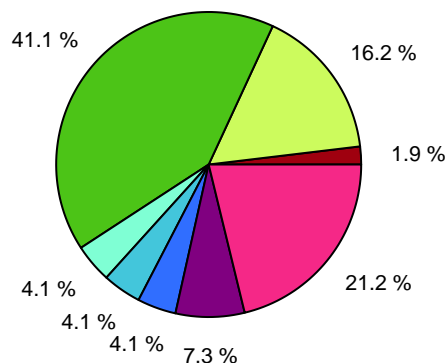
Country (n= 3 hospitals)



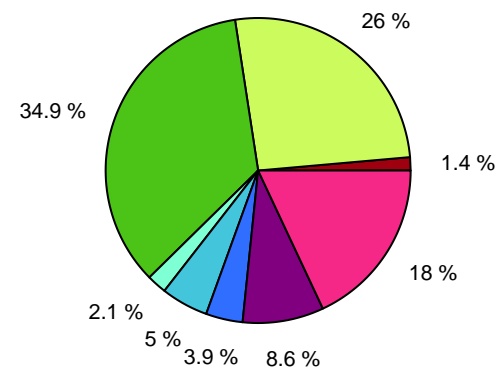
Continent (n= 23 hospitals)



Hospital type (n= 16 hospitals)



Europe (N= 152 hospitals)



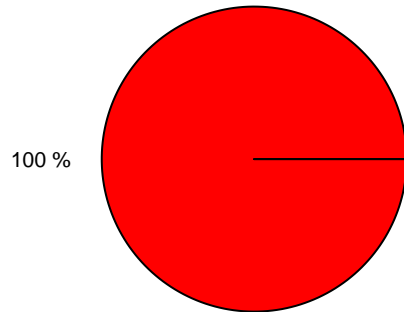
- Tetracyclines
- Macrolides, Lincosamides and Streptogramins
- Penicillins
- Aminoglycosides
- Other beta-lactams
- Quinolones
- Sulfonamides and Trimethoprim
- Other antibacterials

Percentage of antibacterials for systemic use (ATC J01) at ATC3 level (pharmacological subgroup).
Proportional antibiotic use below 0.5% is not reported.

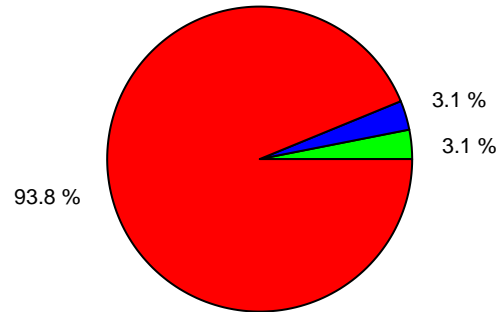
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Proportional use of beta-lactam antibacterials – adult ICU patients.

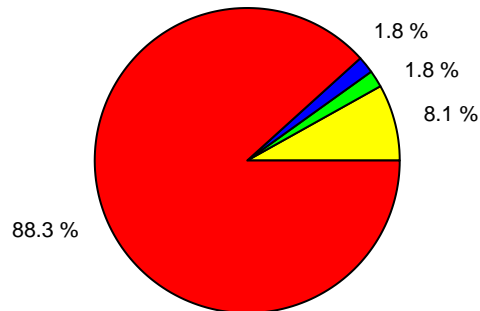
Our hospital (N= 4 treated patients)



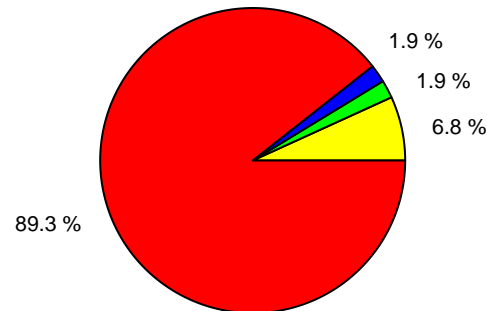
Country (n= 3 hospitals)



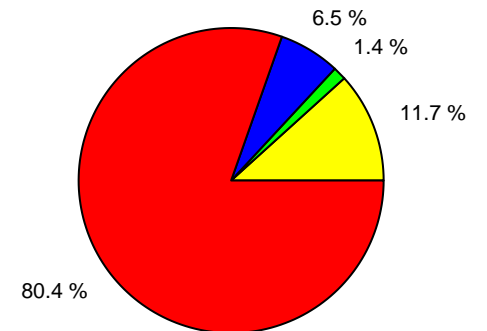
Continent (n= 17 hospitals)



Hospital type (n= 13 hospitals)



Europe (N= 132 hospitals)



■ Penicillins with extended spectrum
■ Beta-lactamase sensitive penicillins

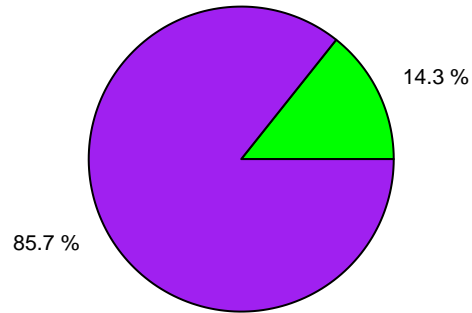
■ Beta-lactamase resistant penicillins
■ Combinations of penicillins, incl. beta-lactamase inhibitors

Percentage of beta-lactam antibacterials (ATC J01C) at ATC4 level (chemical subgroup).
 Proportional antibiotic use below 0.5% is not reported.

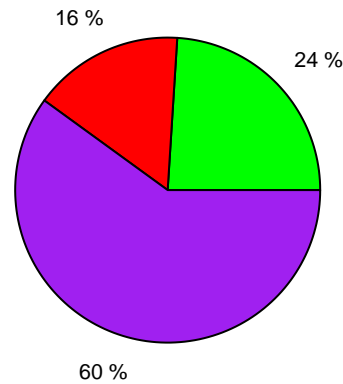
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Proportional use of other beta-lactam antibacterials – adult ICU patients.

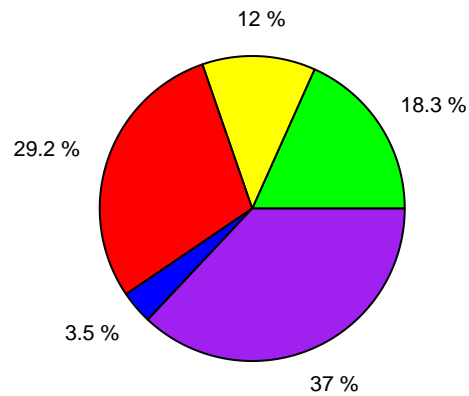
Our hospital (N= 7 treated patients)



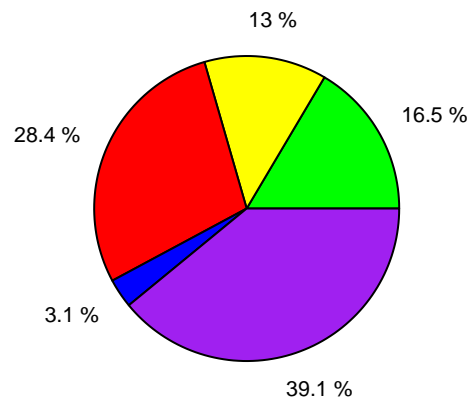
Country (n= 3 hospitals)



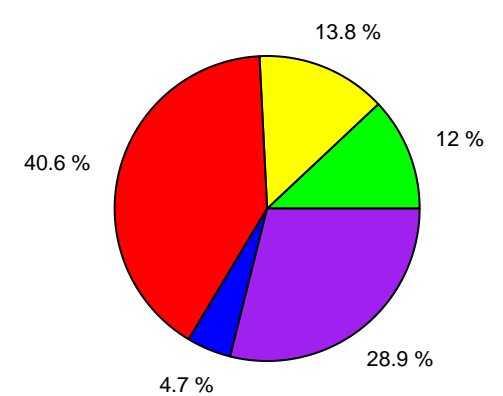
Continent (n= 23 hospitals)



Hospital type (n= 16 hospitals)



Europe (N= 131 hospitals)



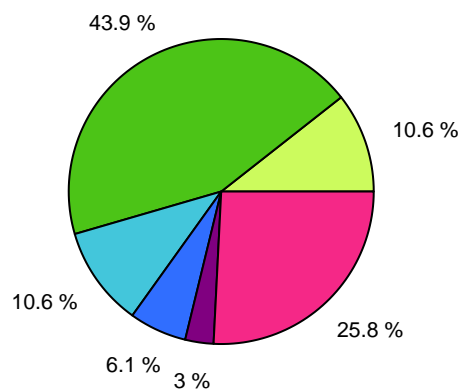
- First-generation cephalosporins
- Second-generation cephalosporins
- Third-generation cephalosporins
- Fourth-generation cephalosporins
- Carbapenems

Proportional use of other beta-lactam antibacterials (ATC J01D) at ATC4 level (chemical subgroup).
 Proportional antibiotic use below 0.5% is not reported.

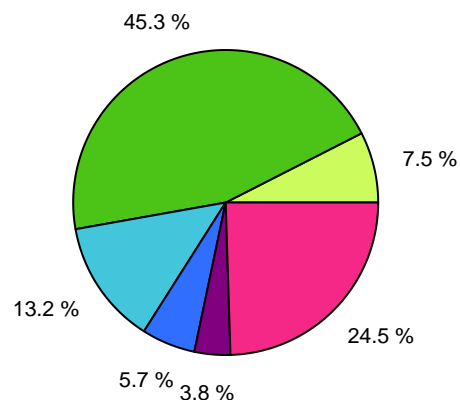
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Overall proportional antibiotic use – paediatric ICU patients.

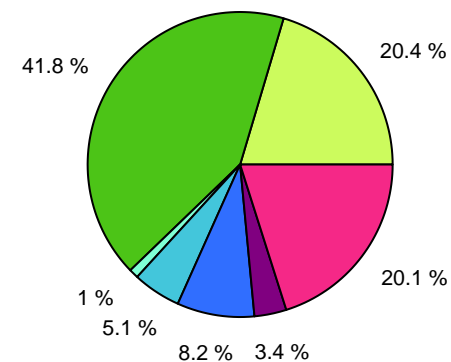
Continent (n= 6 hospitals)



Hospital type (n= 4 hospitals)



Europe (N= 33 hospitals)



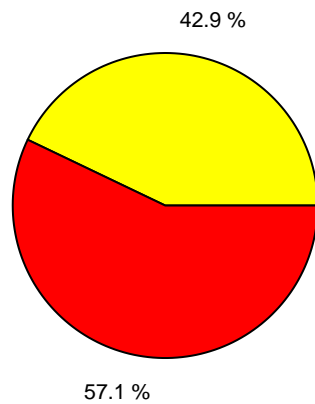
- Penicillins
- Other beta-lactams
- Sulfonamides and Trimethoprim
- Macrolides, Lincosamides and Streptogramins
- Aminoglycosides
- Quinolones
- Other antibacterials

Percentage of antibacterials for systemic use (ATC J01) at ATC3 level (pharmacological subgroup).
Proportional antibiotic use below 0.5% is not reported.

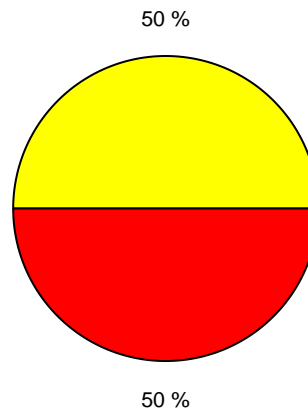
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Proportional use of beta-lactam antibacterials – paediatric ICU patients.

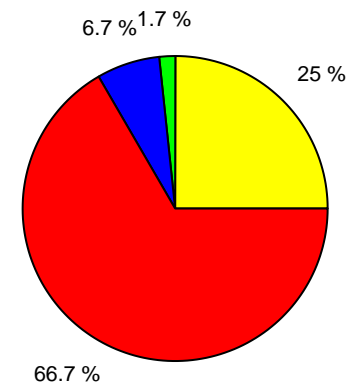
Continent (n= 5 hospitals)



Hospital type (n= 3 hospitals)



Europe (N= 22 hospitals)



■ Penicillins with extended spectrum
■ Beta-lactamase sensitive penicillins

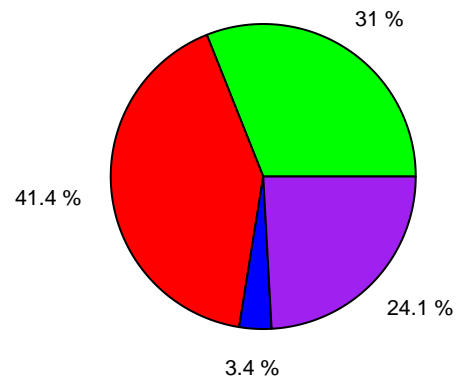
■ Beta-lactamase resistant penicillins
■ Combinations of penicillins, incl. beta-lactamase inhibitors

Percentage of beta-lactam antibacterials (ATC J01C) at ATC4 level (chemical subgroup).
Proportional antibiotic use below 0.5% is not reported.

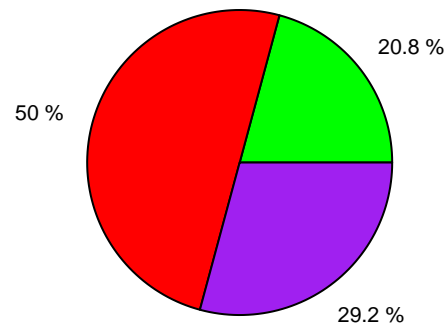
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Proportional use of other beta-lactam antibacterials – paediatric ICU patients.

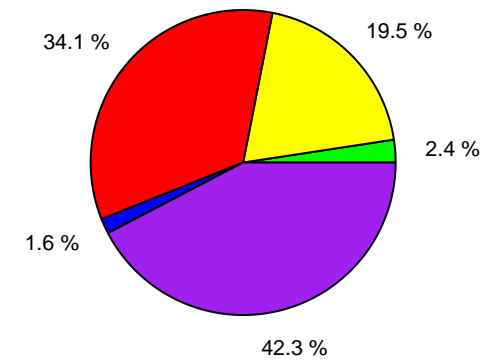
Continent (n= 5 hospitals)



Hospital type (n= 4 hospitals)



Europe (N= 29 hospitals)



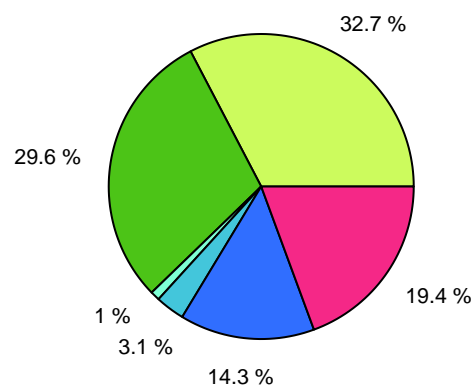
- First-generation cephalosporins
- Second-generation cephalosporins
- Third-generation cephalosporins
- Fourth-generation cephalosporins
- Carbapenems

Proportional use of other beta-lactam antibacterials (ATC J01D) at ATC4 level (chemical subgroup).
Proportional antibiotic use below 0.5% is not reported.

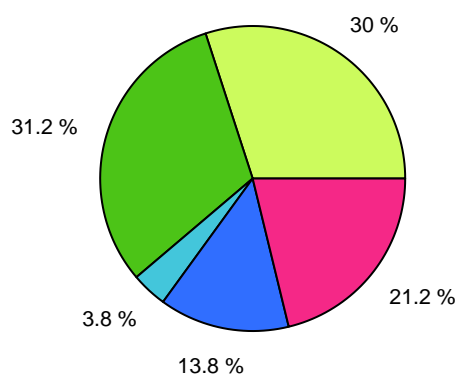
Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Overall proportional antibiotic use – neonatal ICU patients.

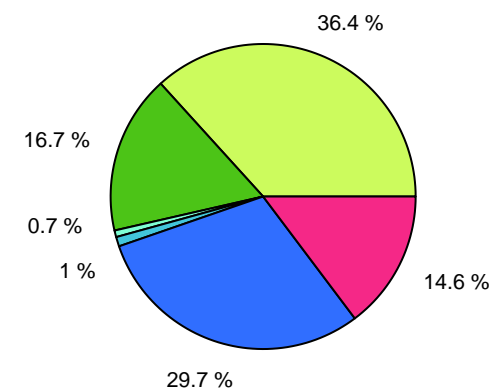
Continent (n= 11 hospitals)



Hospital type (n= 7 hospitals)



Europe (N= 41 hospitals)



- Penicillins
- Other beta-lactams
- Sulfonamides and Trimethoprim
- Macrolides, Lincosamides and Streptogramins
- Aminoglycosides
- Other antibacterials

Percentage of antibacterials for systemic use (ATC J01) at ATC3 level (pharmacological subgroup).
Proportional antibiotic use below 0.5% is not reported.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Therapeutic antimicrobial use for community acquired and healthcare associated infections by type of treatment.

	CAI Empiric		CAI Targeted		CAI Total	
	N	%	N	%	N	%
Our hospital	331	83.2	67	16.8	398	62.7
Country	922	77.0	276	23.0	1198	64.5
Continent	2280	76.3	710	23.7	2990	57.1
Hospital type	1919	76.2	601	23.8	2520	59.1

	HAI Empiric		HAI Targeted		HAI Total	
	N	%	N	%	N	%
Our hospital	169	71.3	68	28.7	237	37.3
Country	445	67.4	215	32.6	660	35.5
Continent	1474	65.6	772	34.4	2246	42.9
Hospital type	1139	65.2	607	34.8	1746	40.9

CAI= Community Acquired Infections; HAI=Healthcare Associated Infections

Type of treatment= empiric versus targeted treatment.

For each subgroup of therapeutic use (CAI or HAI) the number of antimicrobials and proportion (%) for empiric versus targeted prescribing is reported.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Prophylactic antimicrobial use by indication.

	Medical		Surgical	
	N	%	N	%
Our hospital	89	47.3	99	52.7
Country	166	46.1	194	53.9
Continent	1293	46.2	1506	53.8
Hospital type	893	40.0	1342	60.0

Percentage of antimicrobials prescribed for medical or surgical prophylaxis. Antimicrobials include the antibacterials, antifungals and antivirals for systemic use as well as antibiotics used as intestinal anti-infectives and drugs to treat tuberculosis.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Ten most common diagnoses to be treated with therapeutic antimicrobials.

Diagnosis	Our hospital		Country		Continent		Hospital type		Europe	
	N	%	N	%	N	%	N	%	N	%
SST	105	21.3	246	17.3	427	11.1	372	12.2	1483	10.0
Pneu	86	17.5	360	25.3	950	24.7	756	24.9	4107	27.8
IA	62	12.6	146	10.3	443	11.5	302	9.9	1209	8.2
SEPSIS	35	7.1	74	5.2	172	4.5	149	4.9	483	3.3
GI	32	6.5	76	5.3	192	5.0	148	4.9	660	4.5
Cys	31	6.3	114	8.0	163	4.2	146	4.8	1115	7.5
BJ	23	4.7	58	4.1	139	3.6	116	3.8	485	3.3
Pye	22	4.5	75	5.3	256	6.7	165	5.4	962	6.5
ENT	13	2.6	29	2.0	129	3.4	97	3.2	566	3.8
PUO	13	2.6	18	1.3	68	1.8	57	1.9	336	2.3

Top ten diagnoses in our hospital. Count on the number of diagnoses treated with at least one antimicrobial. This implies that a patient with multiple diagnoses can be counted several times. Prophylactic prescribing and patients admitted on NICU or NMW are excluded from this analysis.

Country: SG Continent: East & South Asia Hospital type: Tertiary hospital

CNS=infection of central nervous system; Eye=eye infections; ENT=ear, nose and throat infections; URTI=upper respiratory tract infection; Bron=bronchitis; Pneu=Pneumonia or lower respiratory tract infection; TB=tuberculosis; CVS=cardiovascular system infections; GI=gastro-intestinal infections; IA=intra-abdominal sepsis; SST=skin and soft tissue; BJ=bone/joint infections; Cys=lower urinary tract infection; Pye=Upper urinary tract infection; OBGY=obstetric/gynaecological infections; GUM=genito-urinary males; BAC=bacteraemia; PUO=pyrexia of unknown origin; PUO-HO=fever syndrome in non-neutropaenic haematology-oncology patient; FN=fever neutropaenic patient; LYMPH=infection lymphatics

Summary of quality indicators for antibiotic use.

	Hospital		Country		Continent		Hospital type		Europe	
	N	%	N	%	N	%	N	%	N	%
Medical										
Reason in notes	371	86.3	1163	89.5	3285	79.1	2600	80.6	10567	81.0
Guidelines missing	118	27.4	293	22.6	884	21.3	752	23.3	1963	15.1
Guideline compliant	179	74.0	632	79.6	2129	83.1	1531	83.0	6789	80.5
Stop/review date documented	200	46.5	694	53.4	1884	45.4	1575	48.8	4768	36.6
Surgical										
Reason in notes	258	76.8	513	78.4	1700	68.8	1462	69.9	5468	69.8
Guidelines missing	56	16.7	119	18.2	551	22.3	498	23.8	1526	19.5
Guideline compliant	119	62.3	251	64.9	1110	74.6	875	72.6	3472	71.7
Stop/review date documented	141	42.0	277	42.4	1016	41.1	870	41.6	3385	43.2
ICU										
Reason in notes	23	95.8	104	88.1	666	75.9	599	74.8	2506	78.8
Guidelines missing	5	20.8	23	19.5	202	23.0	196	24.5	618	19.4
Guideline compliant	16	94.1	69	90.8	366	77.7	322	76.5	1481	84.6
Stop/review date	9	37.5	68	57.6	493	56.2	460	57.4	1245	39.2

Antibiotic quality indicators by activity (medical, surgery, ICU) for all patients receiving antibacterials for systemic use (ATC J01).

- For reason in notes and stop/review date documented: Count at antibacterial level.
- For guidelines missing: Count on NA (= no local guidelines for the specific indication) at patient level and diagnosis over total scores for this indicator.
- For guideline compliance: Count at patient level and diagnosis for compliance= yes or no only. For combination therapy with >1 antibiotic: if 1 antibiotic by diagnosis is not compliant, this combination therapy as a whole for this diagnosis will be counted as non-compliant.

Antibiotic quality indicators – adult wards.

	Hospital		Country		Continent		Hospital type		Europe	
	N	%	N	%	N	%	N	%	N	%
Medical										
Reason in notes	366	87.4	1136	89.8	2920	80.0	2340	80.7	8800	81.3
Guidelines missing	116	27.7	288	22.8	761	20.9	658	22.7	1498	13.8
Guideline compliant	179	74.6	615	79.4	1884	83.4	1388	83.2	5808	79.7
Stop/review date documented	189	45.1	672	53.1	1643	45.0	1403	48.4	3989	36.9
Surgical										
Reason in notes	258	76.8	510	78.6	1663	68.8	1445	69.9	5051	69.1
Guidelines missing	56	16.7	117	18.0	543	22.5	491	23.7	1400	19.2
Guideline compliant	119	62.3	249	64.7	1079	74.4	864	72.4	3208	71.0
Stop/review date documented	141	42.0	274	42.2	988	40.9	860	41.6	3175	43.4
ICU										
Reason in notes	23	95.8	93	86.9	514	72.0	476	71.3	1879	76.2
Guidelines missing	5	20.8	21	19.6	145	20.3	139	20.8	451	18.3
Guideline compliant	16	94.1	64	91.4	305	75.9	284	75.5	1173	83.3
Stop/review date documented	9	37.5	63	58.9	399	55.9	390	58.4	912	37.0

Antibiotic quality indicators by activity (medical, surgical, ICU) for patients admitted on adult wards receiving antibacterials for systemic use (ATC J01).

- For reason in notes and stop/review date documented: Count at antibacterial level.
- For guidelines missing: Count on NA (= no local guidelines for the specific indication) at patient level and diagnosis over total scores for this indicator.
- For guideline compliance: Count at patient level and diagnosis for compliance = yes or no only. For combination therapy with >1 antibiotic: if 1 antibiotic by diagnosis is not compliant, this combination therapy as a whole for this diagnosis will be counted as non-compliant.

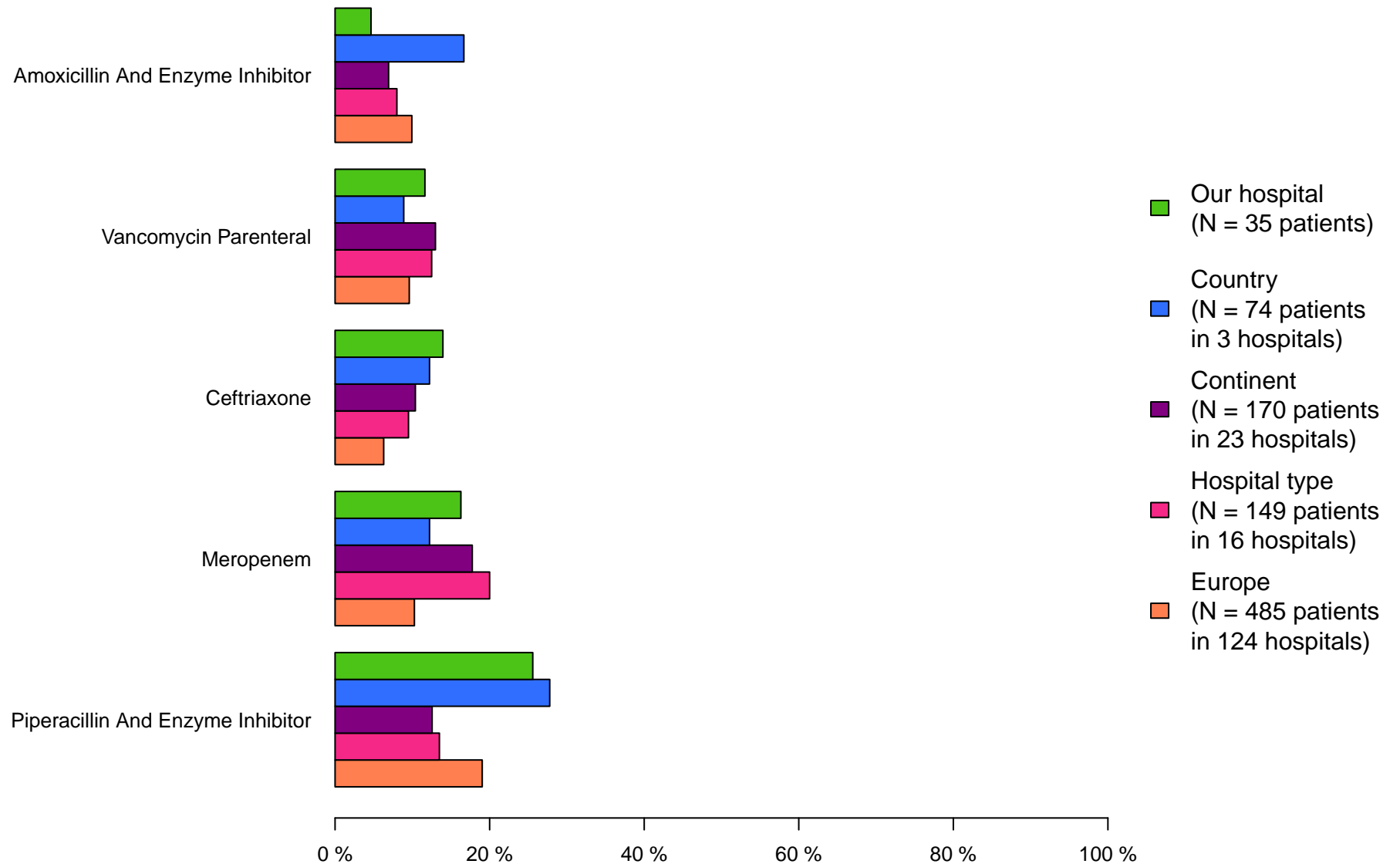
Antibiotic quality indicators – paediatric and neonatal wards.

	Hospital		Country		Continent		Hospital type		Europe		
	N	%	N	%	N	%	N	%	N	%	
Medical											
Reason in notes	5	45.5			365	72.7	260	79.8	1767	79.8	
Guidelines missing	2	18.2			123	24.5	94	28.8	465	21.0	
Guideline compliant	0	0.0			245	80.3	143	80.8	981	85.8	
Stop/review date documented	11	100.0			241	48.0	172	52.8	779	35.2	
Surgical											
Reason in notes	0	0.0			37	68.5	17	68.0	417	79.3	
Guidelines missing	0	0.0			8	14.8	7	28.0	126	24.0	
Guideline compliant	0	0.0			31	83.8	11	91.7	264	81.5	
Stop/review date documented	0	0.0			28	51.9	10	40.0	210	39.9	
ICU											
Reason in notes	0	0.0			152	92.7	123	92.5	627	87.9	
Guidelines missing	0	0.0			57	34.8	57	42.9	167	23.4	
Guideline compliant	0	0.0			61	88.4	38	84.4	308	90.1	
Stop/review date documented	0	0.0			94	57.3	70	52.6	333	46.7	

Antibiotic quality indicators by activity (medical, surgical, ICU) for patients admitted on paediatric and neonatal wards receiving antibacterials for systemic use (ATC J01).

- For reason in notes and stop/review date documented: Count at antibacterial level.
- For guidelines missing: Count on NA (= no local guidelines for the specific indication) at patient level and diagnosis over total scores for this indicator
- For guideline compliance: Count at patient level and diagnosis for compliance = yes or no only. For combination therapy with >1 antibiotic: if 1 antibiotic by diagnosis is not compliant, this combination therapy as a whole for this diagnosis will be counted as non-compliant.

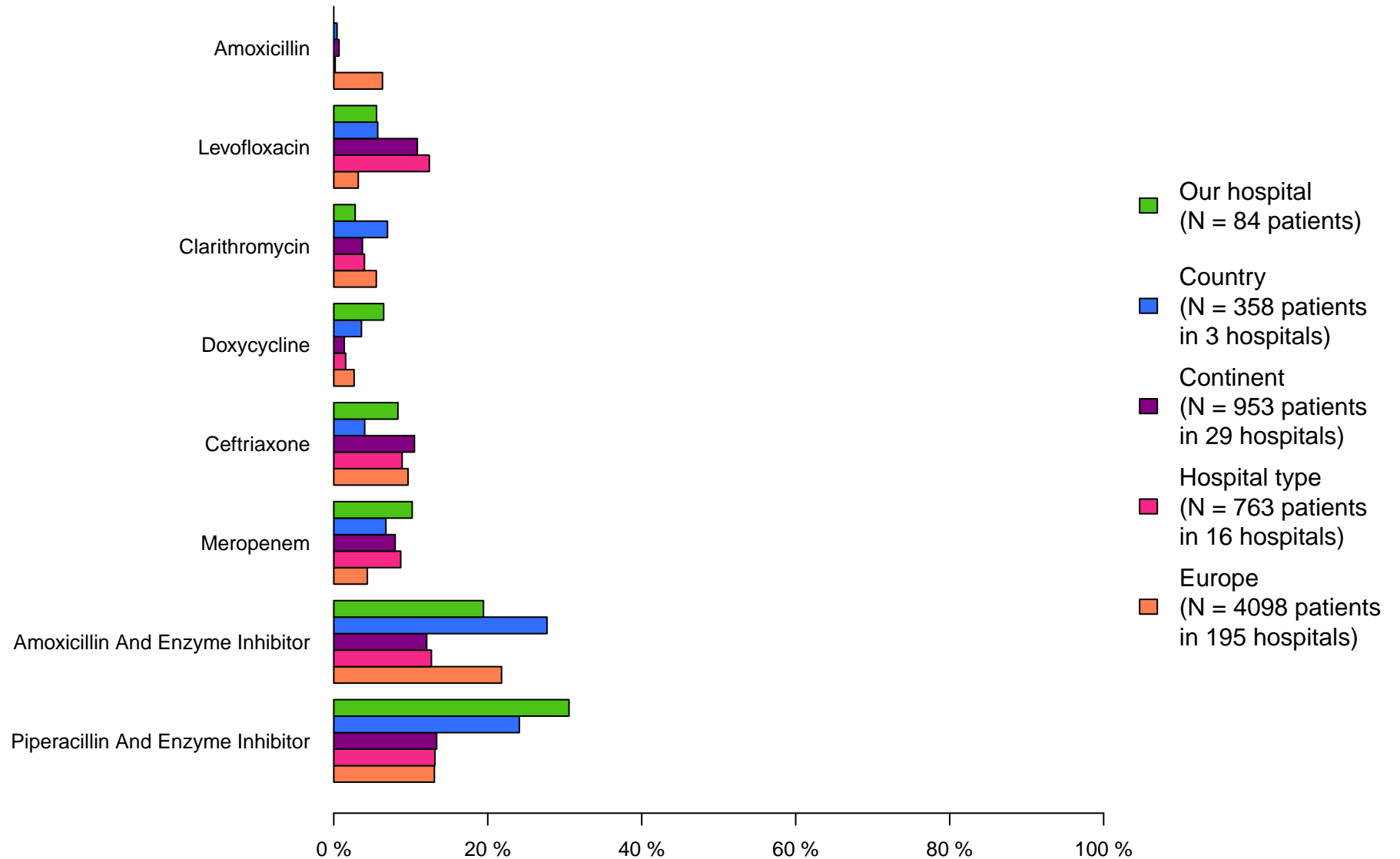
Top 5 most frequently used antibiotics for sepsis in adults and children.



Selection on antibacterials for systemic use (J01). Top 5 most prescribed antibiotics (ATC5, substance level) for sepsis at hospital level, supplemented with the most prescribed antibiotics at country, continental and hospital type level if they do not fall within top 5 of the hospital. Selection on diagnostic code = sepsis; All patients are included with exception of patients admitted on NMW and NICU.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

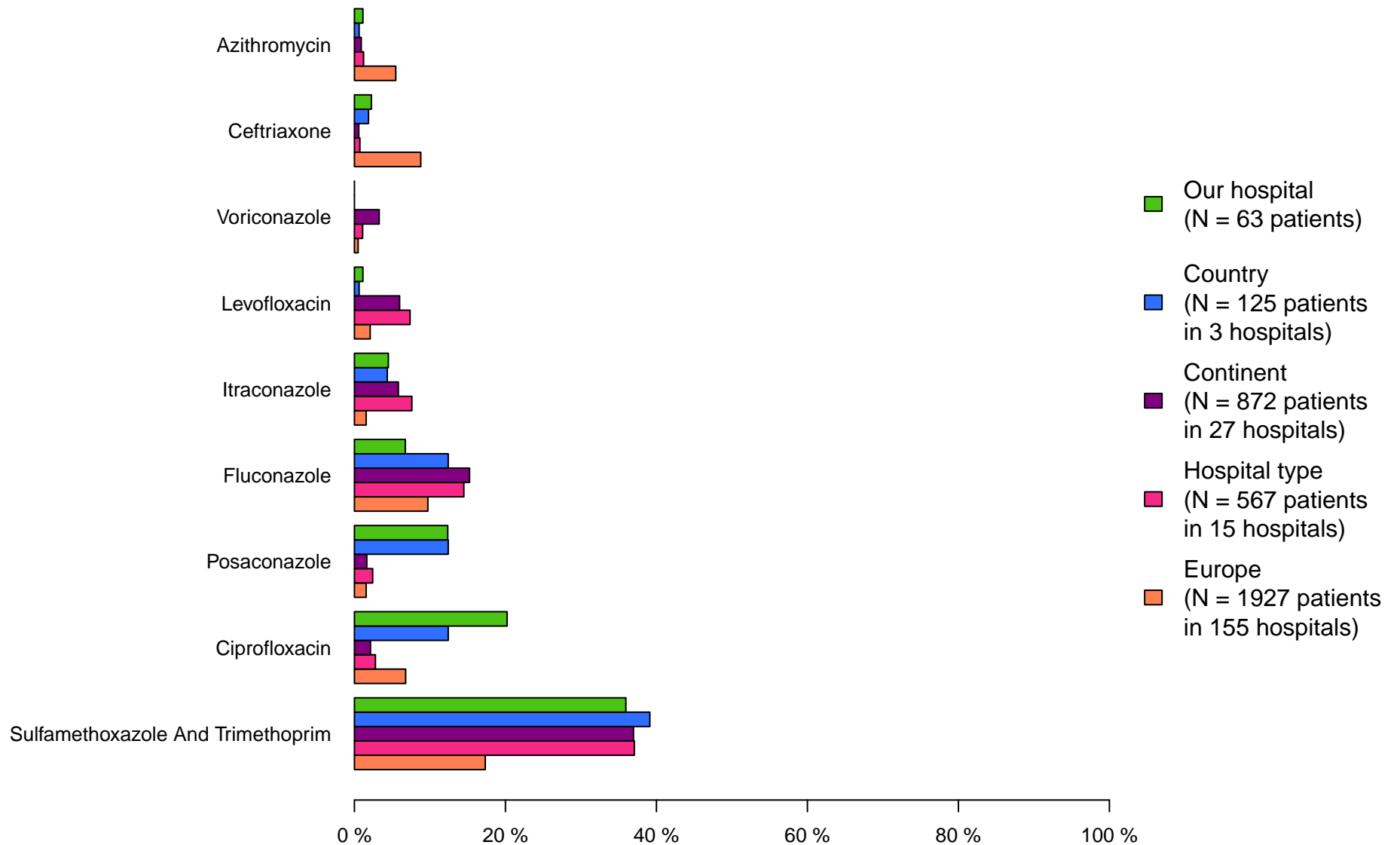
Top 5 most frequently used antibiotics for pneumonia in adults and children.



Selection on antibacterials for systemic use (J01). Top 5 most prescribed antibiotics (ATC5, substance level) for pneumonia at hospital level, supplemented with the most prescribed antibiotics at country, continent and hospital type level if they do not fall within top 5 of the hospital. Selection on diagnostic code = pneu; All patients are included with exception of patients admitted on NMW and NICU.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

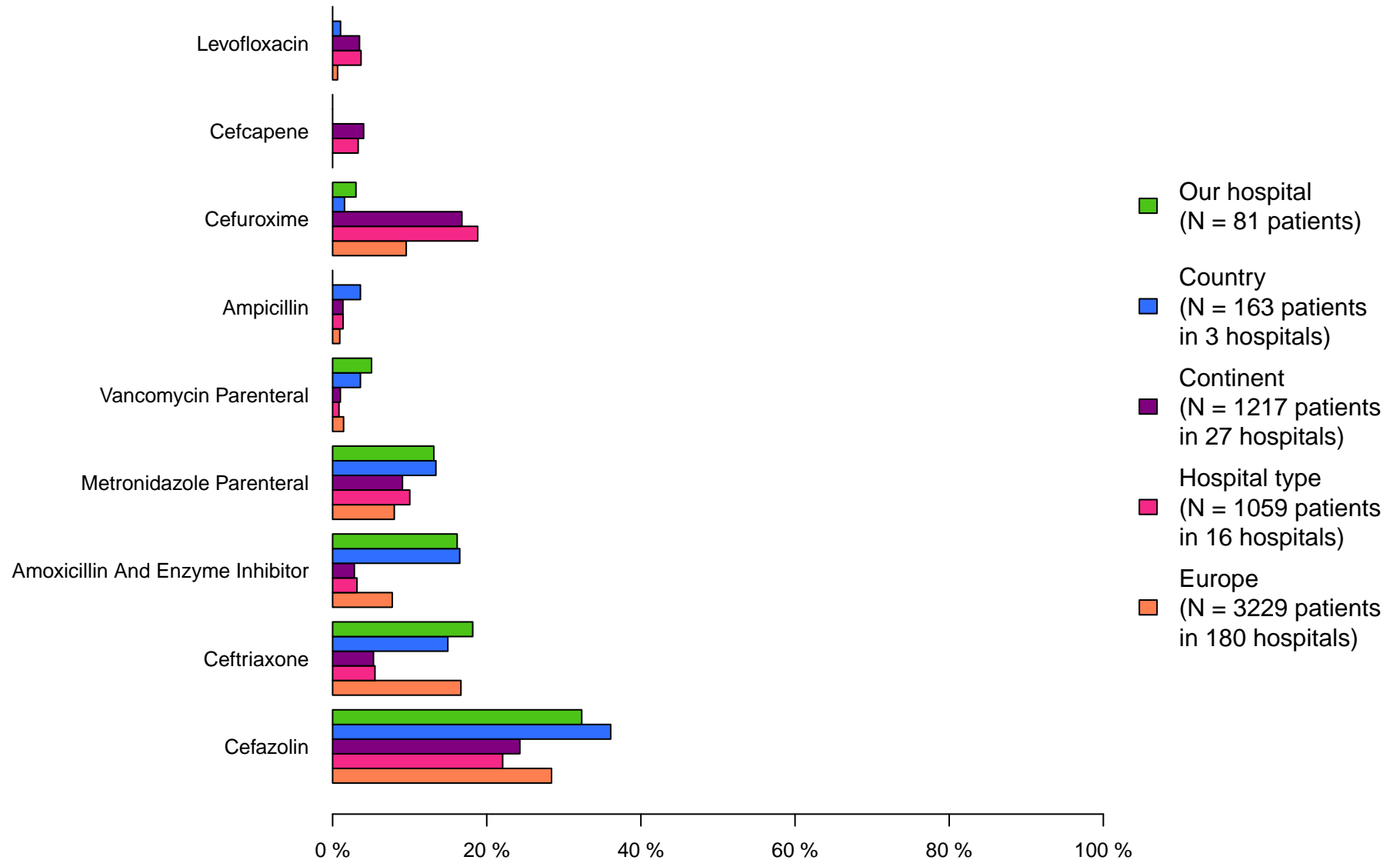
Top 5 most frequently used antimicrobials for medical prophylaxis in adults and children.



Top 5 most prescribed antimicrobials (ATC5, substance level) for medical prophylaxis at hospital level, supplemented with the most prescribed antimicrobials at country, continent and hospital type level if they do not fall within top 5 of the hospital.
Selection on indication = MP; All patients are included with exception of patients admitted on NMW and NICU.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

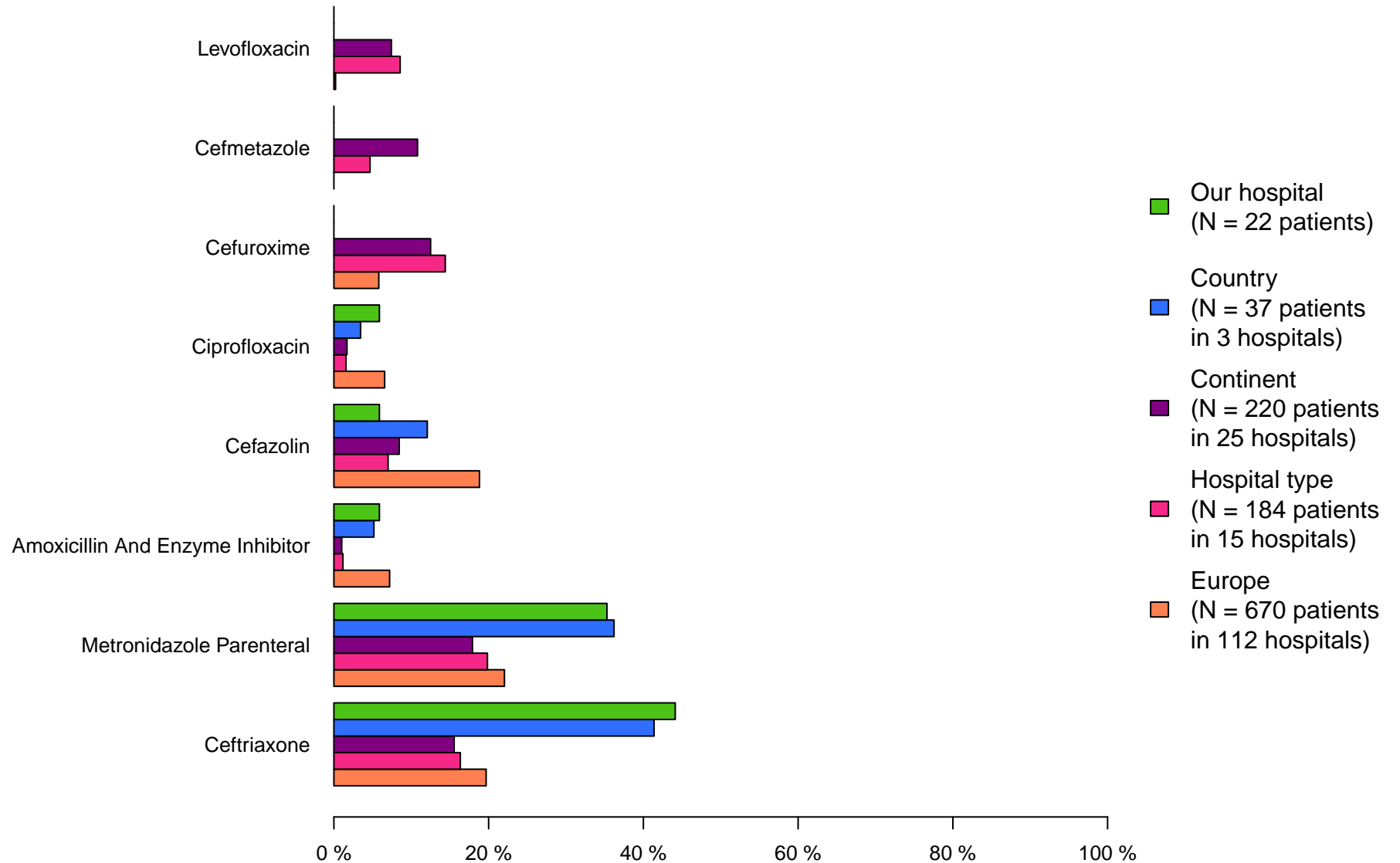
Top 5 most frequently used antibiotics for surgical prophylaxis in adults and children.



Top 5 most prescribed antibacterials for systemic use (ATC code J01) for surgical prophylaxis use at hospital level, supplemented with the most prescribed antibiotics at country, continent and hospital type level if they do not fall within the top 5 of the hospital.
Selection on indication = SP; All patients are included with exception of patients admitted on NMW and NICU.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

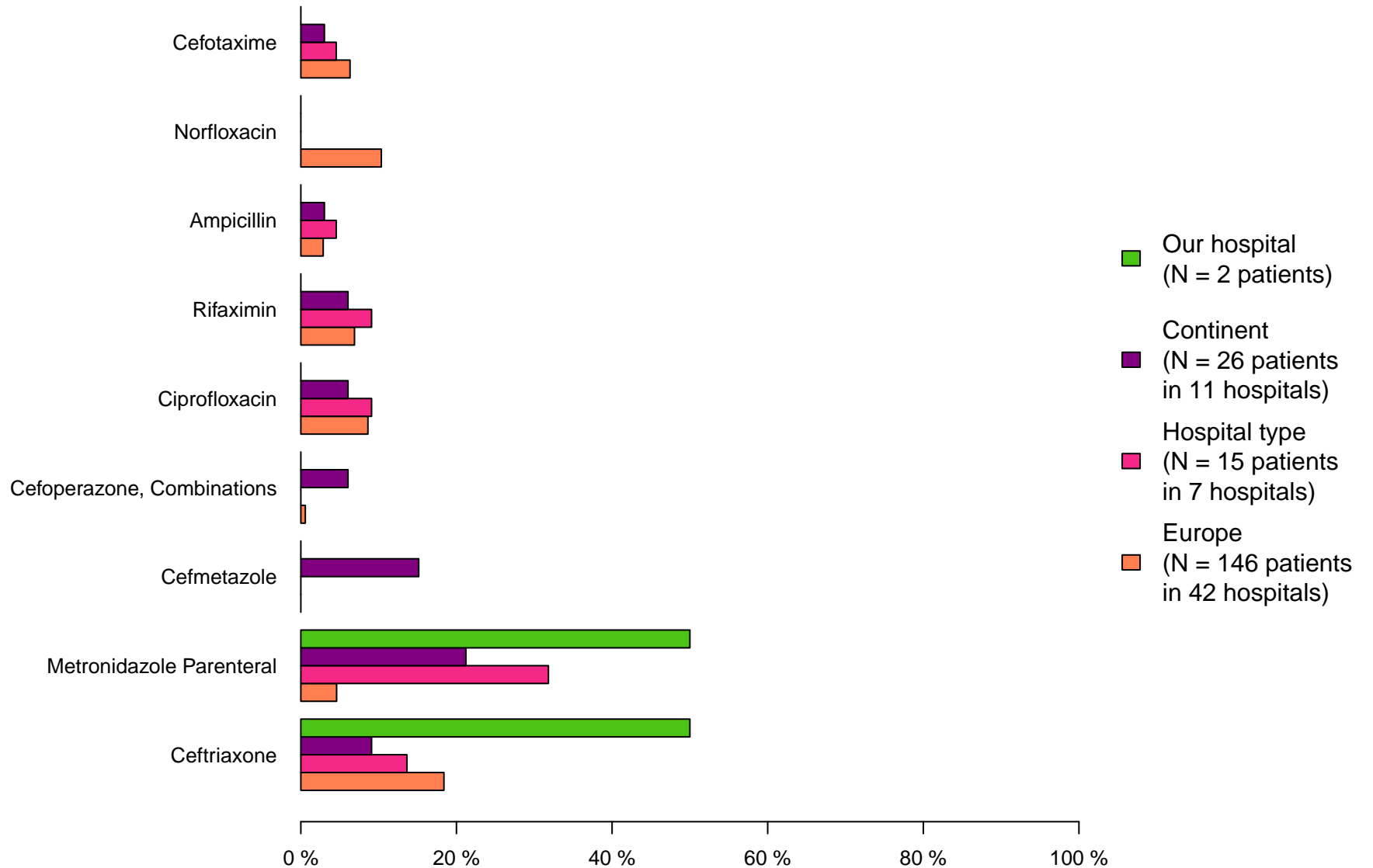
Top 5 most frequently used antibiotics for surgical prophylaxis of the gastro-intestinal tract in adults and children.



Selection on antibacterials for systemic use (J01). Top 5 antibiotics (ATC5, substance level) prescribed for surgical prophylaxis of the gastro-intestinal tract at hospital level, supplemented with the most prescribed antibiotics at country, continent and hospital type level if they do not fall within top 5 of the hospital. Selection on diagnostic code = Proph GI and indication = SP; All patients are included with exception of patients admitted on NMW and NICU.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

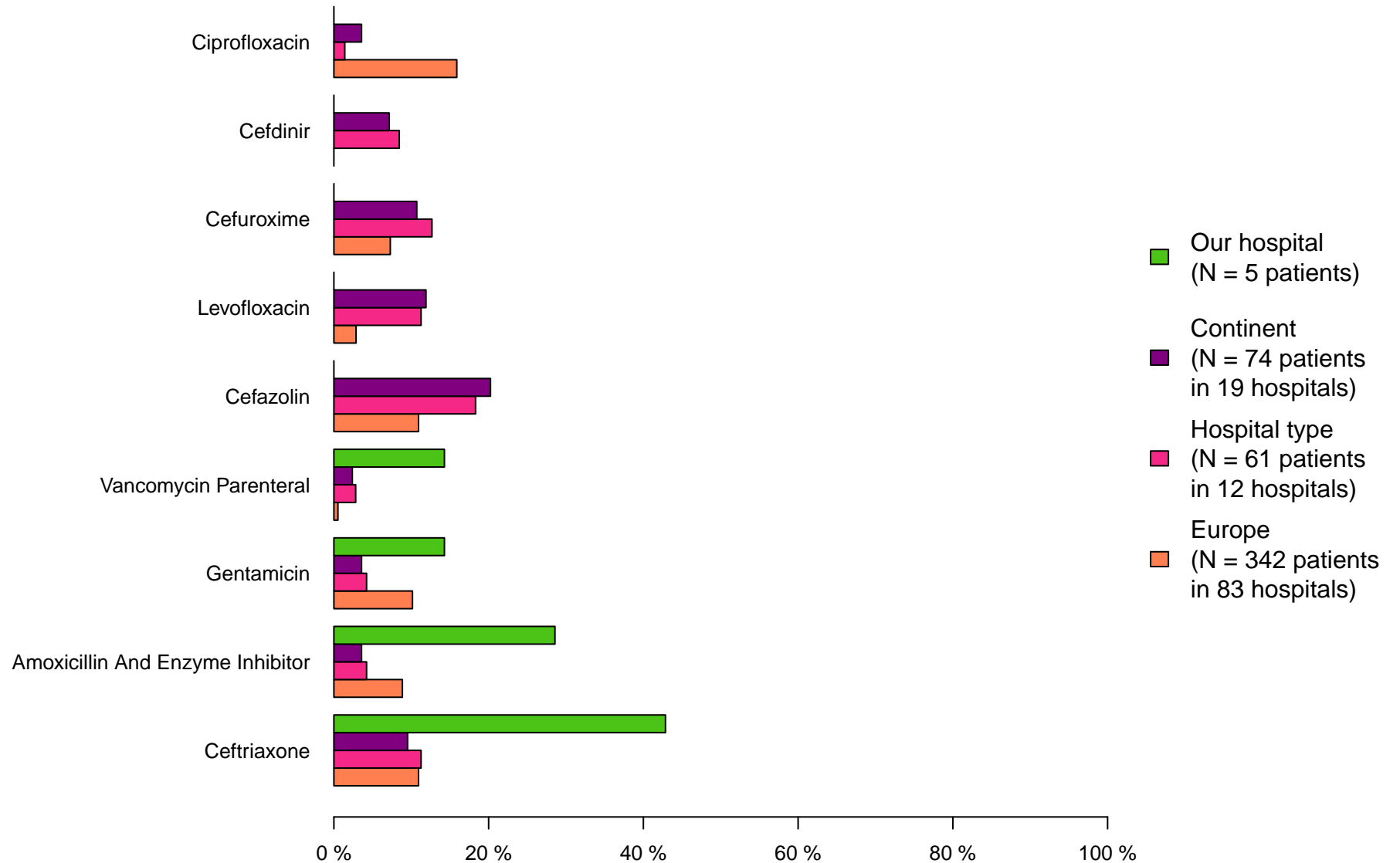
Top 5 most frequently used antimicrobials for medical prophylaxis of the gastro-intestinal tract.



Top 5 antimicrobials (ATC5, substance level) prescribed for medical prophylaxis of the gastro-intestinal tract at hospital level, supplemented with the most prescribed antimicrobials at country, continent and hospital type level if they do not fall within top 5 of the hospital. Selection on diagnostic code = Proph GI and indication = MP; All patients are included with exception of patients admitted on NMW and NICU.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

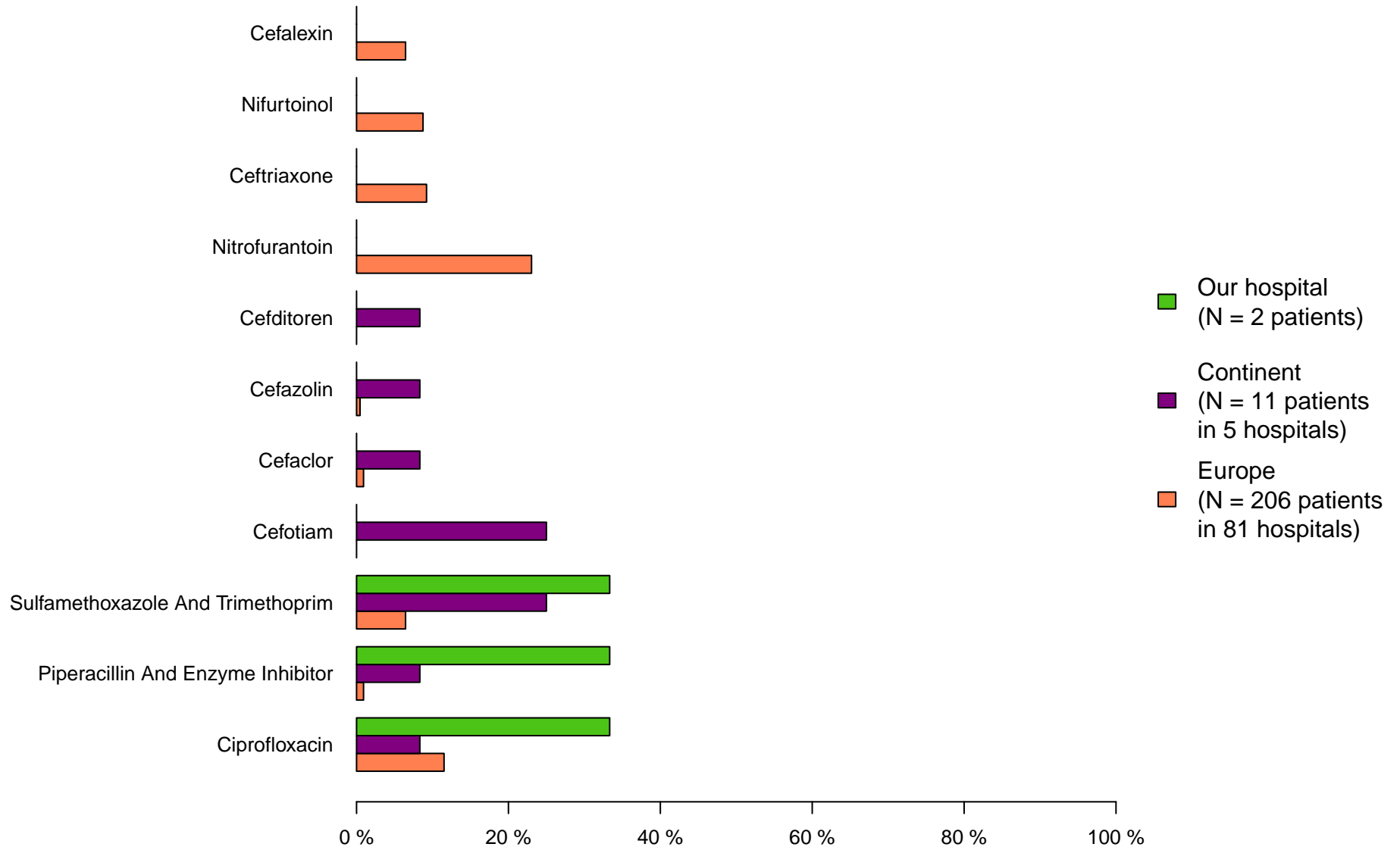
Top 5 most frequently used antibiotics for surgical UTI prophylaxis.



Selection on antibacterials for systemic use (J01). Top 5 antibiotics (ATC5, substance level) prescribed for surgical prophylaxis of the urinary tract at hospital level, supplemented with the most prescribed antibiotics at country, continent and hospital type level if they do not fall within top 5 of the hospital. Selection on diagnostic code = Proph UTI and indication = SP; All patients are included with exception of patients admitted on NMW and NICU.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

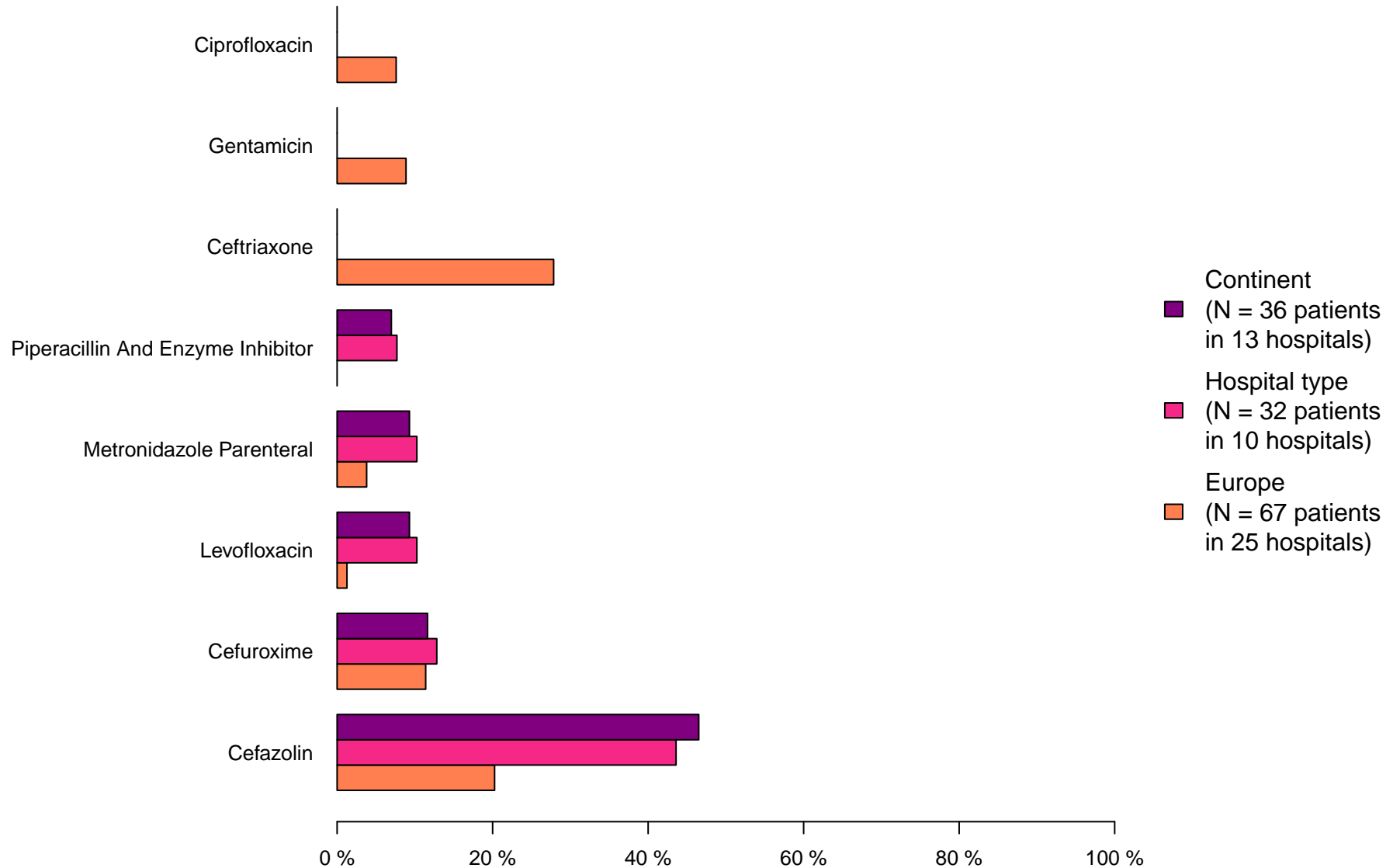
Top 5 most frequently used antimicrobials for medical UTI prophylaxis.



Top 5 antimicrobials (ATC5, substance level) prescribed for medical prophylaxis of the urinary tract at hospital level, supplemented with the most prescribed antimicrobials at country, continent and hospital type level if they do not fall within top 5 of the hospital. Selection on diagnostic code = Proph UTI and indication = MP; All patients are included with exception of patients admitted on NMW and NICU.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

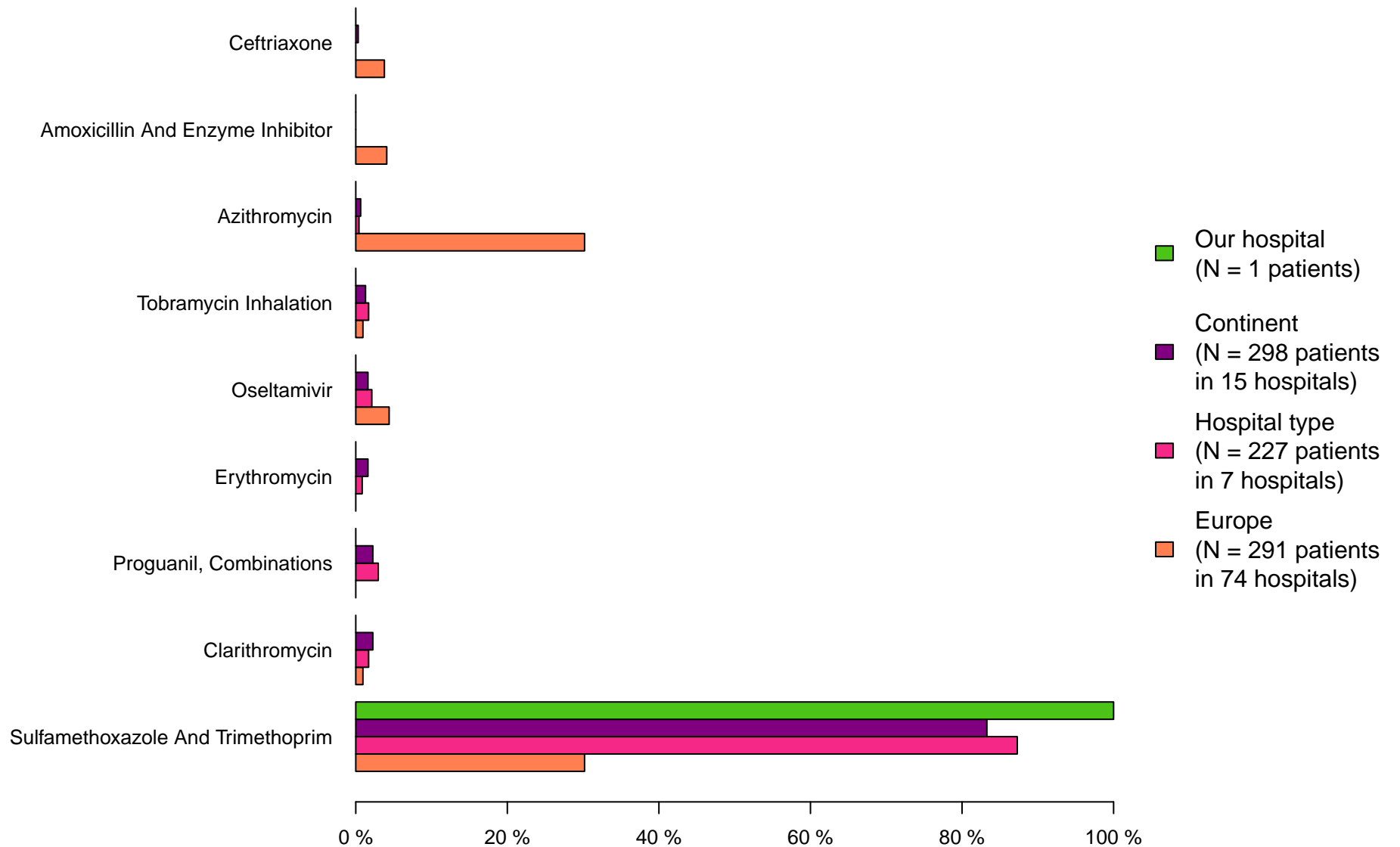
Top 5 most frequently used antibiotics for surgical respiratory prophylaxis.



Selection on antibacterials for systemic use (J01). Top 5 antibiotics (ATC5, substance level) prescribed for surgical prophylaxis of the respiratory tract at hospital level, supplemented with the most prescribed antibiotics at country, continent and hospital type level if they do not fall within top 5 of the hospital. Selection on diagnostic code = Proph RESP and indication = SP; All patients are included with exception of patients admitted on NMW and NICU.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

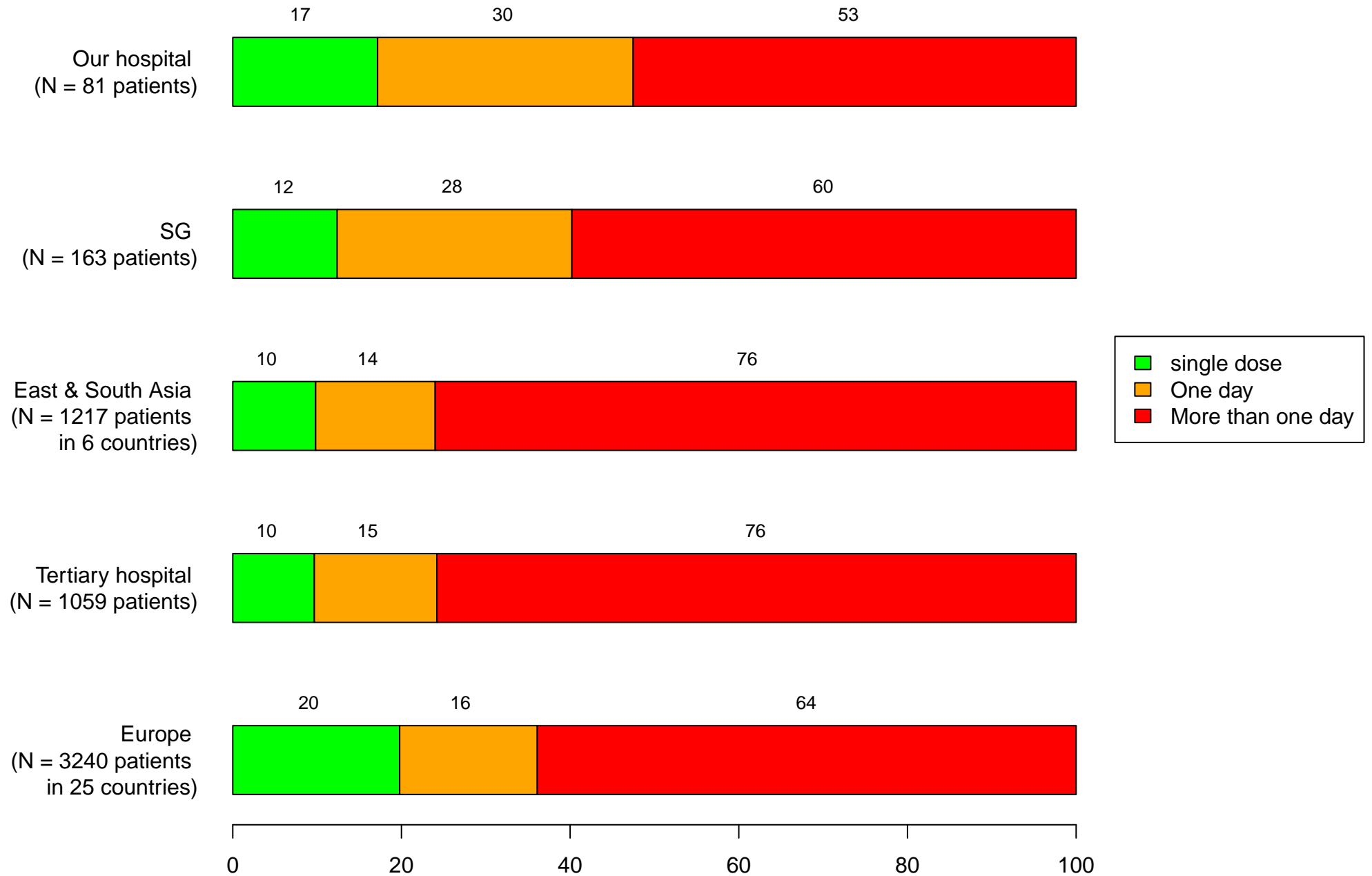
Top 5 most frequently used antimicrobials for medical respiratory prophylaxis.



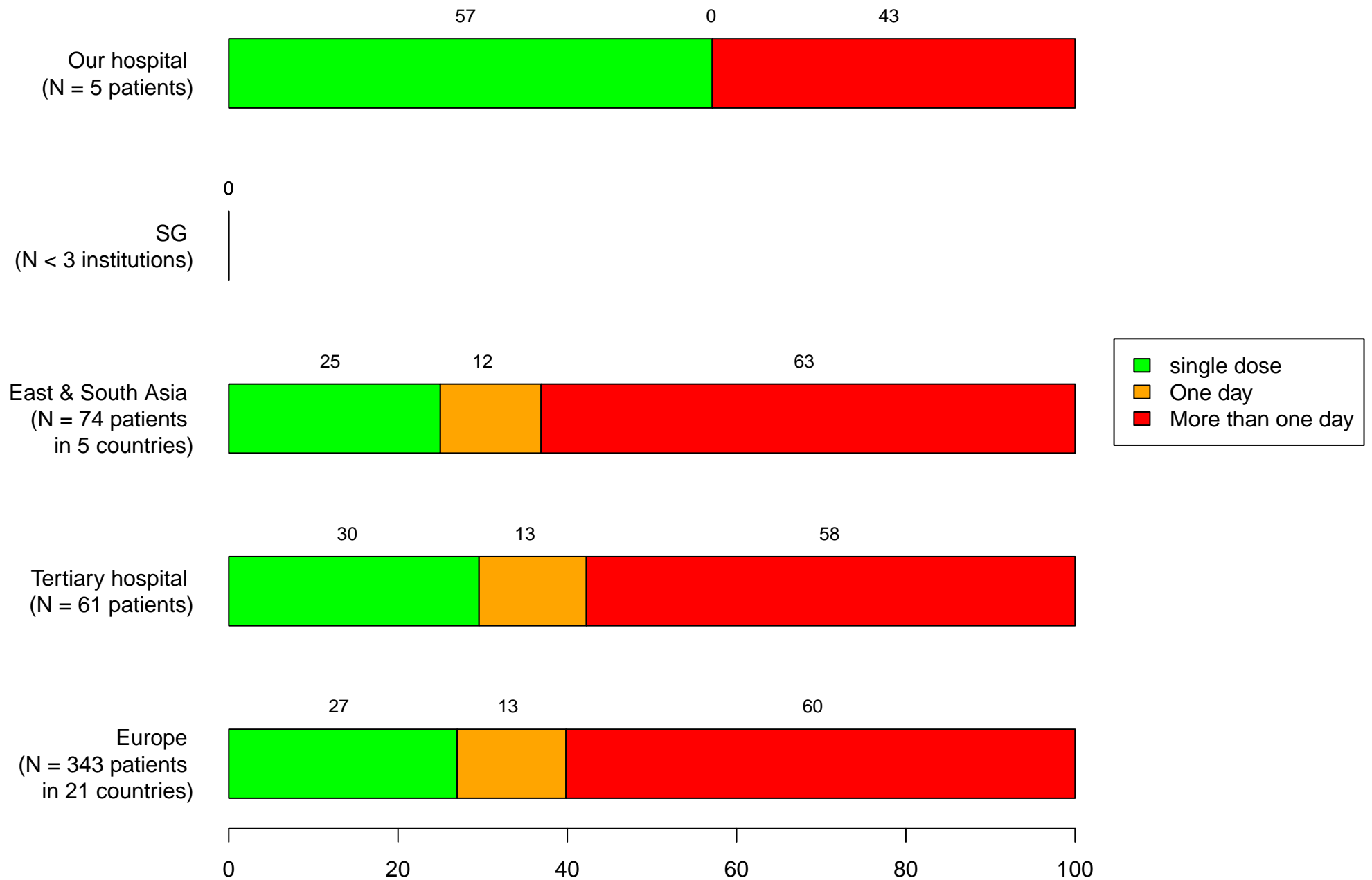
Top 5 antimicrobials (ATC5, substance level) prescribed for medical prophylaxis of the respiratory tract at hospital level, supplemented with the most prescribed antimicrobials at country, continent and hospital type level if they do not fall within top 5 of the hospital. Selection on diagnostic code = Proph RESP and indication = MP; All patients are included with exception of patients admitted on NMW and NICU.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

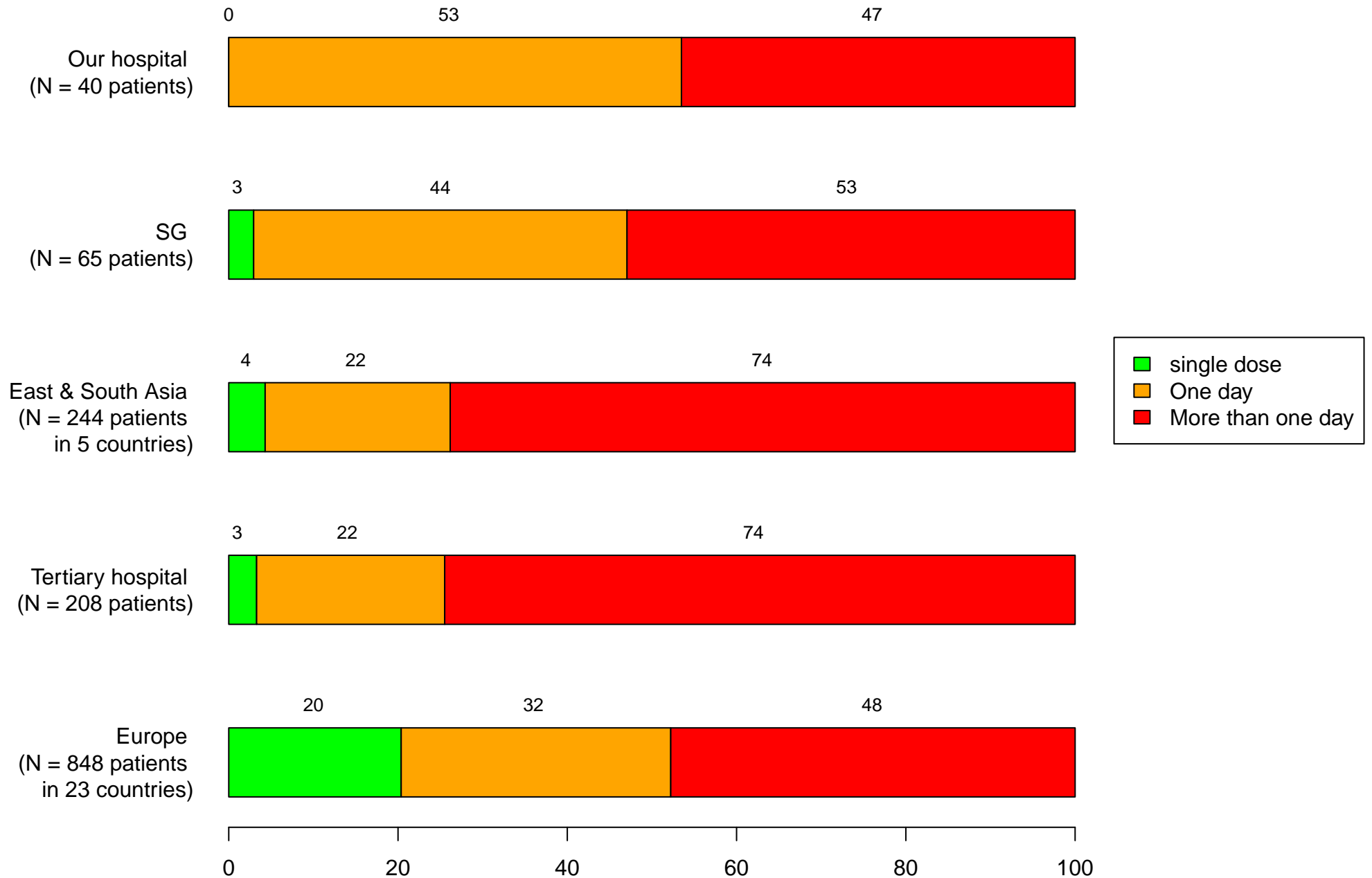
Duration of surgical prophylaxis in adults and children.



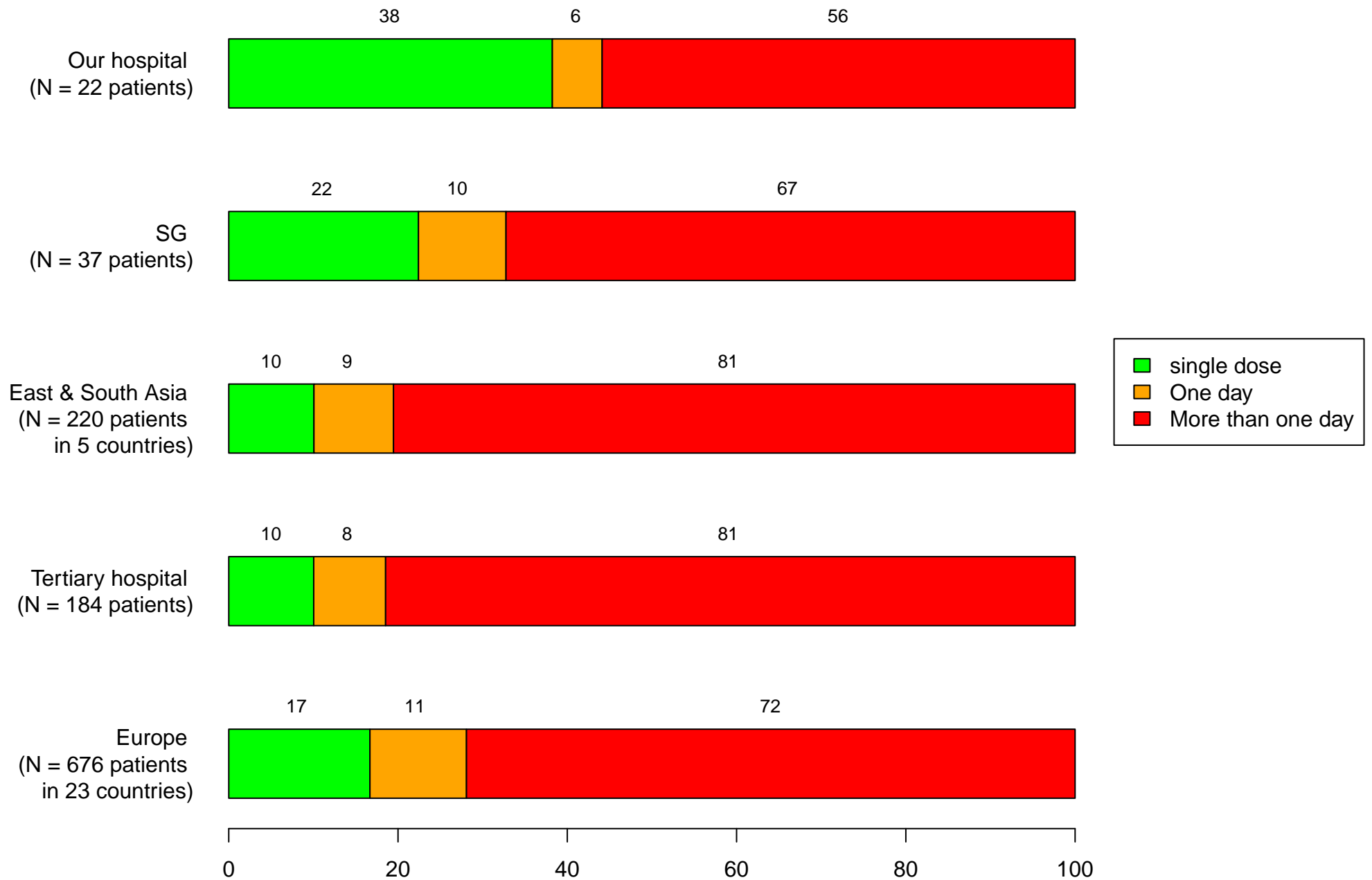
Duration of UTI prophylaxis in adults and children.



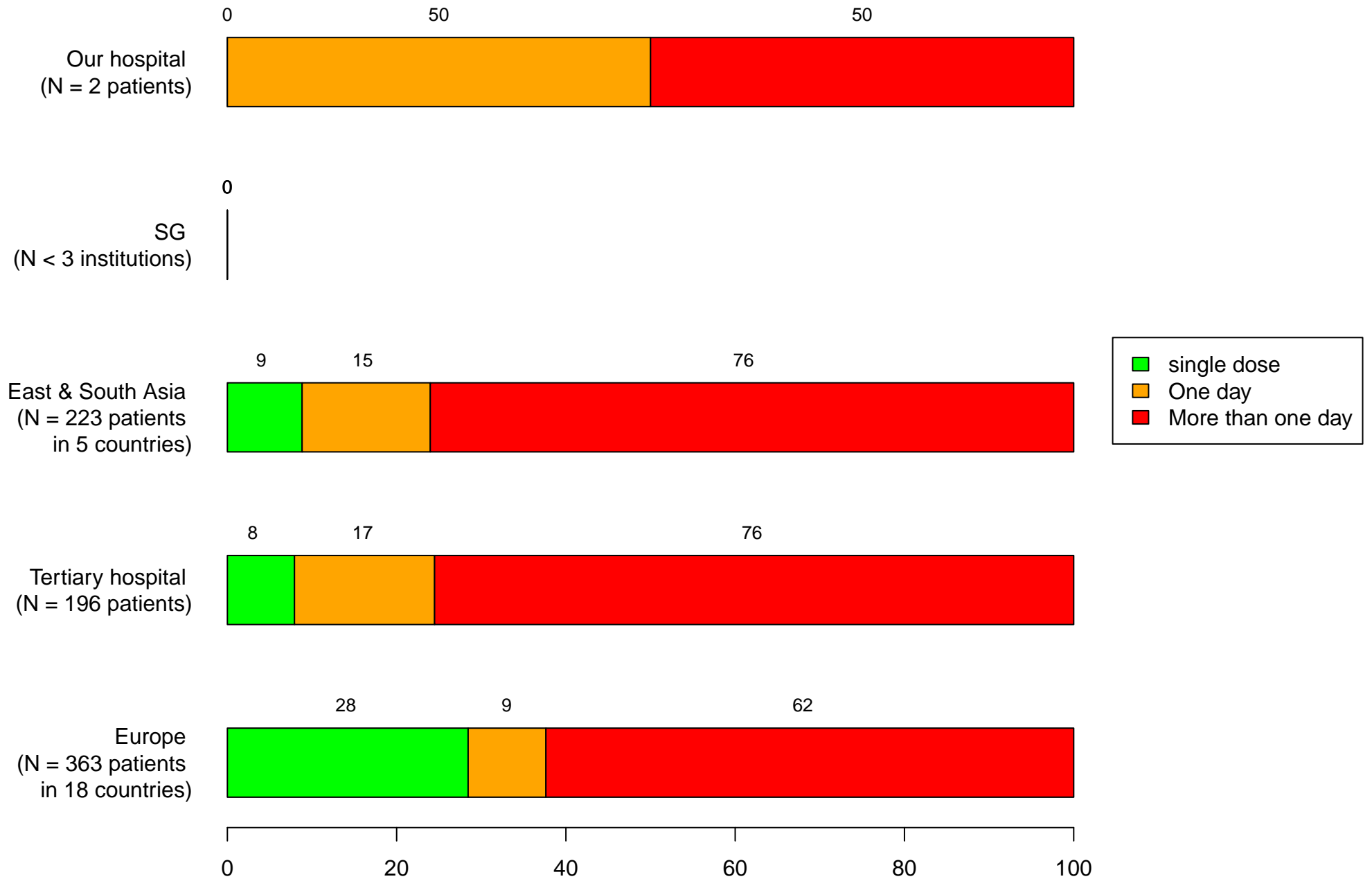
Duration of prophylaxis for plastic and orthopedic surgery in adults and children.



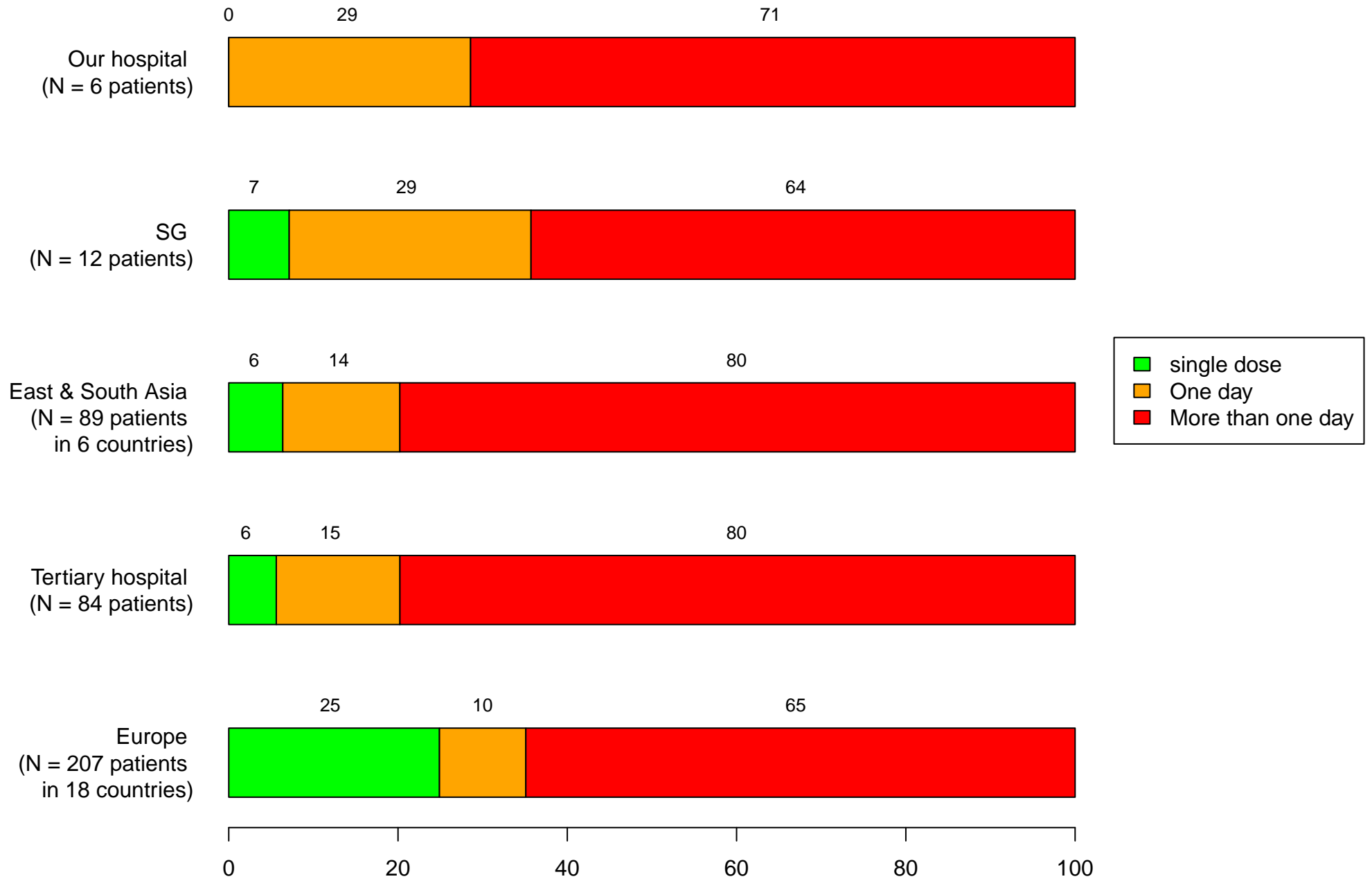
Duration of GI prophylaxis in adults and children.



Duration of obstetric or gynaecological prophylaxis in adult wards.



Duration of CNS prophylaxis in adults and children.



Key prescription patterns (adults and children).

	Hospital		Country		Continent		Hospital type		Europe	
	N	%	N	%	N	%	N	%	N	%
All patients										
IV therapy	431	72.4	1103	68.4	4113	73.7	3325	75.2	13748	72.7
Multiple ATB diagnosis	145	23.3	356	21.4	1268	21.7	1143	24.6	3479	17.8
Multiple ATB patient	160	26.9	392	24.3	1454	26.1	1283	29.0	3960	20.9
Medical										
IV therapy	218	61.8	641	58.4	2107	63.1	1595	63.5	6915	61.7
Multiple ATB diagnosis	72	21.1	212	20.0	679	20.6	595	24.1	1698	15.5
Multiple ATB patient	83	25.8	239	23.5	817	26.4	696	30.1	1977	18.7
Surgical										
IV therapy	197	74.1	384	72.9	1537	74.6	1303	75.9	5002	76.1
Multiple ATB diagnosis	69	26.6	127	24.7	403	20.0	372	22.2	1198	18.4
Multiple ATB patient	71	27.6	132	25.9	424	21.3	387	23.4	1301	20.3
ICU										
IV therapy	16	94.1	78	87.6	469	88.3	427	87.5	1831	90.8
Multiple ATB diagnosis	4	20.0	17	18.5	186	34.1	176	35.3	583	27.9
Multiple ATB patient	6	37.5	21	24.7	213	42.8	200	44.0	682	35.2

Analyses at patient level. Patients admitted on a NMW and NICU are excluded.

Multiple ATB diagnosis is defined as receiving > 1 antibiotic (J01) for a single identified reason to treat (=diagnose code) at patient level.

Multiple ATB patient is defined as receiving > 1 antibiotic (J01) at patient level.

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Type of antibiotic treatment – Summary.

	Hospital		Country		Continent		Hospital type		Europe	
	N	%	N	%	N	%	N	%	N	%
All patients										
Empiric	674	85.3	1671	80.7	5613	80.6	4512	80.6	18221	79.4
Targetted	116	14.7	400	19.3	1347	19.4	1086	19.4	4728	20.6
Adults (>= 18 years)										
Empiric	661	85.1	1620	80.4	4947	80.0	4040	80.2	14766	78.3
Targetted	116	14.9	395	19.6	1238	20.0	999	19.8	4101	21.7
Children (< 18 years)										
Empiric	13	100.0	45	93.8	583	85.7	404	84.0	3092	84.0
Targetted	0	0.0	3	6.2	97	14.3	77	16.0	587	16.0
Neonates (NICU)										
Empiric	0	0.0	6	75.0	83	87.4	68	87.2	363	90.1
Targetted	0	0.0	2	25.0	12	12.6	10	12.8	40	9.9

Selection on antibiotic treatments.

N = number of antibiotics (J01) included per type of treatment and subgroup (all patients, adults, children and neonates).

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Type of antibiotic treatment by activity.

	Hospital		Country		Continent		Hospital type		Europe	
	N	%	N	%	N	%	N	%	N	%
All patients										
Empiric	473	81.0	1291	76.8	3547	74.1	2885	74.0	12580	73.6
Targetted	111	19.0	389	23.2	1238	25.9	1014	26.0	4509	26.4
Medical										
Empiric	286	81.5	905	79.8	2361	76.0	1898	76.2	8249	76.1
Targetted	65	18.5	229	20.2	747	24.0	592	23.8	2595	23.9
Surgical										
Empiric	173	81.6	330	72.4	828	71.4	670	70.8	2968	72.9
Targetted	39	18.4	126	27.6	331	28.6	276	29.2	1106	27.1
ICU										
Empiric	14	66.7	56	62.2	358	69.1	317	68.5	1363	62.8
Targetted	7	33.3	34	37.8	160	30.9	146	31.5	808	37.2

Selection on antibiotic treatments (prophylactic prescribing is excluded) by activity.
N = number of antibiotics (J01) included per type of treatment and activity (medical, surgical, ICU).

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital

Treatment based on microbiology data.

	Hospital		Country		Continent		Hospital type		Europe	
	N	%	N	%	N	%	N	%	N	%
	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
MRSA	4	0.9	17	1.3	68	1.9	53	1.9	164	1.2
MRCoNS	2	0.4	4	0.3	38	1.1	27	0.9	79	0.6
VRE	2	0.4	2	0.2	10	0.3	10	0.4	44	0.3
ESBL	15	3.3	26	2.0	77	2.1	66	2.3	332	2.4
3-ceph	2	0.4	25	1.9	37	1.0	30	1.1	102	0.7
CRE	0	0.0	3	0.2	23	0.6	23	0.8	37	0.3
ESBL-NF	2	0.4	2	0.2	21	0.6	21	0.7	59	0.4
CR-NF	2	0.4	18	1.4	38	1.1	38	1.3	91	0.7
Other MDR	4	0.9	16	1.2	24	0.7	22	0.8	143	1.0
Any of the above	30	6.6	104	7.8	302	8.4	259	9.1	942	6.8

N = the number of patients reported to have received a targeted treatment against one of the 9 microbiological results.
 % = 100*(the number of patients reported to have received a targeted treatment/total number of patients receiving a therapeutic treatment (CAI or HAI) with at least one antibacterial for systemic use (J01)).

Country: SG ; Continent: East & South Asia ; Hospital type: Tertiary hospital