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Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

Supplement to: Versporten A, Zarb P, Caniaux I, et al. Antimicrobial consumption and resistance in adult hospital inpatients in 53 countries: results of an internet-based global point prevalence survey. *Lancet Glob Health* 2018; published online April 19. http://dx.doi.org/10.1016/S2214-109X(18)30186-4.

Appendix: Details on the number of countries and hospitals participating to the 2015 Global-PPS. Countries are classified using United Nation Region methodology (https://unstats.un.org/unsd/methodology/m49)

Continent	Country	World Bank classification by income 2015[#]	Number of hospitals	Type of hospital			
				Tertiary care & infectious diseases	Secondary care	Primary care	Paediatric hospital
Eastern Europe	BULGARIA	UM	1	1			
	RUSSIAN FEDERATION	UM	7	1	3		3
Total			**8**	**2**	**3**		**3**
Northern Europe	FINLAND	H	1		1		
	IRELAND	H	2	1			1
	LATVIA	H	2	1			1
	LITHUANIA	H	1				1
	UNITED KINGDOM	H	30	4	12	11	3
Total			**36**	**6**	**13**	**11**	**6**
Southern Europe	ALBANIA	UM	8	4	4		
	BOSNIA & HERZEGOVINA	UM	2	2			
	CROATIA	H	3	3			
	CYPRUS	H	1	1			
	GREECE	H	1	1			
	ITALY	H	2	1			1
	KOSOVO*	LM	7	1	6		
	FYROM°	UM	13	12	1		
	MALTA	H	1	1			
	MONTENEGRO	UM	5	2	3		
	SERBIA	UM	6	3	2		1
	SLOVENIA	H28 H	1	1			
	SPAIN	H	3	3			
Total			**53**	**35**	**16**		**2**
Western Europe	BELGIUM	H	100	9	68	23	
	FRANCE	H	3	3			
	GERMANY	H	6		2	2	2
	NETHERLANDS	H	8	1	5	2	
	SWITZERLAND	H	1	1			
Total			**118**	**14**	**75**	**27**	**2**
Africa	BENIN	L	5	1	1	3	
	GHANA	LM	1	1			
	GUINEA	L	1	1			
	NIGERIA	LM	4	4			
	SOUTH AFRICA	UM	1	1			
Total			**12**	**8**	**1**	**3**	
Southern, Eastern & South-eastern Asia	CHINA	UM	1	1			
	INDIA	LM	2	2			
	IRAN	UM	4	3	1		

	JAPAN	H	18	9	7		2
	REPUBLIC OF KOREA	H	1	1			
	SINGAPORE	H	3	3			
Total			**29**	**19**	**8**		**2**
Western & Central Asia	ARMENIA	LM	2		1		1
	BAHRAIN	H	1	1			
	GEORGIA	UM	4	2	1		1
	IRAQ	UM	8	3	1	1	3
	ISRAEL	H	5	3	2		
	JORDAN	UM	3	1	2		
	KYRGYZSTAN	LM	2	1			1
	LEBANON	UM	1	1			
	SAUDI ARABIA	H	1	1			
Total			**27**	**13**	**7**	**1**	**6**
Oceania	AUSTRALIA	H	7	6	1		
	NEW ZEALAND	H	2		2		
Total			**9**	**6**	**3**		
Latin America	ARGENTINA	UM	5	5			
	BRAZIL	UM	2	1	1		
	CHILE	H	12	12			
	COSTA RICA	UM	2	2			
Total			**21**	**20**	**1**		
Northern America	CANADA	H	7	4	1	1	1
	UNITED STATES	H	15	6	5	4	
Total			**22**	**9**	**6**	**5**	**1**
Overall total		**2 L ; 6 LM ; 17 UM ; 28 H**	**335**	**133**	**133**	**47**	**22**

# World Bank classification by income 2015 = GNI per capita in US$ (Atlas methodology), Bank's fiscal year: FY17, Data for calendar year : 2015. Low income (L) <= 1,025; Lower middle income (LM) 1,026-4,035; Upper middle income (UM) 4,036-12,475; High income (H) > 12,475
Ref= https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups
* Kosovo in accordance with UN Security Council resolution 1244 [1999]
° THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

Definitions of the type of hospital (see also appendix: Global-PPS protocol, page 10):
Primary level: often referred to as a district hospital or first-level referral. The hospital has few specialities, mainly internal medicine, obstetrics-gynaecology, paediatrics, and general surgery, or only general practice; limited laboratory services are available for general, but not for specialized pathological analysis. Often corresponds to general hospital without teaching function. **Secondary level:** often referred to as provincial hospital. A hospital highly differentiated by function with five to ten clinical specialities including some haematology, oncology, renal and ICU beds; takes some referrals from other (Primary) hospitals. Often corresponds to general hospital with teaching function. **Tertiary level:** often referred to as central, regional or tertiary-level hospital. A hospital with highly specialized staff and technical equipment, e.g., ICU, Haematology, Transplantation, cardio-thoracic surgery, neurosurgery and specialized imaging units; clinical services are highly differentiated by function; provides regional services and regularly takes referrals from other (primary and secondary) hospitals. Often correspond to University hospital. **Specialized hospital:** Single clinical specialty, possibly with sub-specialties; highly specialized staff and technical equipment. E.g. paediatric hospital, infectious diseases hospital

			Medical Wards			Surgical Wards			Intensive-care units			Haematology oncology wards			Pneumology wards			Transplant (bone marrow or solid transplants)			Total adult wards		
	Countries (n)	Hospitals (n)	Admitted (n)	Treated (n)	Anti-microbial use (%)	Admitted (n)	Treated (n)	Anti-microbial use (%)	Admitted (n)	Treated (n)	Anti-microbial use (%)	Admitted (n)	Treated (n)	Anti-microbial use (%)	Admitted (n)	Treated (n)	Anti-microbial use (%)	Admitted (n)	Treated (n)	Anti-microbial use (%)	Admitted (n)	Treated (n)	Antimicrobial use (%, country range)
Eastern Europe	2	8	778	90	11.6	1381	458	33.2	107	72	67.3	11	1	9.1	105	32	30.5				2382	653	27.4 (23.7-27.8)
Northern Europe	5	36	4959	1476	29.8	2371	895	37.7	370	207	55.9	242	120	49.6	101	54	53.5	51	31	60.8	8094	2783	34.4 (29.0-37.8)
Southern Europe	13	53	6443	2103	32.6	5475	2189	40.0	1010	647	64.1	646	217	33.6	561	338	60.2	52	40	76.9	14187	5534	39.0 (27.2-62.0)
Western Europe	5	118	17483	4083	23.4	8851	2477	28.0	1467	822	56.0	1048	452	43.1	1111	552	49.7	89	72	80.9	30049	8458	28.1 (25.1-37.1)
Africa	5	12	619	309	49.9	1101	540	49.0	64	41	64.1										1798	899	50.0 (27.8-74.7)
East & south Asia	6	29	6644	2195	33.0	5663	1936	34.2	702	460	65.5	847	457	54.0	409	189	46.2	146	126	86.3	14411	5363	37.2 (29.6-78.5)
West and central Asia	9	27	1873	787	42.0	1249	558	44.7	396	189	47.7	156	75	48.1							3677	1612	43.8 (22.4-85.7)
Oceania	2	9	1781	530	29.8	604	317	52.5	76	53	69.7	46	25	54.3							2516	932	37.0 (33.3-38.5)
Latin America	4	19	1942	617	31.8	1571	586	37.3	468	258	55.1	92	26	28.3				41	27	65.9	4122	1518	36.8 (32.5-43.4)
North America	2	24	3605	1168	32.4	1136	502	44.2	524	311	59.4	202	112	55.4	34	20	58.8	39	26	66.7	5540	2139	38.6 (30.9-44.8)
Total	**53**	**335**	**46127**	**13358**	**29.0**	**29402**	**10458**	**35.6**	**5184**	**3060**	**59.0**	**3298**	**1489**	**45.1**	**2344**	**1202**	**51.3**	**421**	**324**	**77.0**	**86776**	**29891**	**34.4 (22.4-85.7)**

Table 1: Antimicrobial use in adult hospital inpatients by UN region, 2015.

Empty cells: No cases or too few cases (less than 10 admitted and/or treated patients) which are counted in 'total adult wards' only
East & south Asia includes south, east & southeast Asia

	n patients	Eastern Europe % (n=646 patients)	n patients	Northern Europe % (n=2791 patients)	n patients	Southern Europe % (n=5452 patients)	n patients	Western Europe % (n=8414 patients)	n patients	Africa % (n=870 patients)	n patients	East & south Asia % (n=5402 patients)	n patients	West & Central Asia % (n=1626 patients)	n patients	Oceania % (n=967 patients)	n patients	Latin America % (n=1554 patients)	n patients	North America % (n=2139 patients)	n patients	Total % (n=29861 patients)
Pneumonia or LRTI	98	15.2	786	28.2	778	14.3	1962	23.3	90	10.3	876	16.2	240	14.8	184	19.0	257	16.5	451	21.1	5722	19.2
Skin & Soft Tissue inf.	87	13.5	255	9.1	368	6.7	671	8.0	141	16.2	444	8.2	128	7.9	151	15.6	194	12.5	249	11.6	2688	9.0
Intra-abdominal inf.	8	1.2	231	8.3	308	5.6	599	7.1	33	3.8	424	7.8	84	5.2	88	9.1	158	10.2	158	7.4	2091	7.0
Lower UTI (cystitis)	3	0.5	187	6.7	232	4.3	678	8.1	21	2.4	191	3.5	75	4.6	82	8.5	86	5.5	240	11.2	1795	6.0
Upper UTI	30	4.6	166	5.9	234	4.3	415	4.9	12	1.4	243	4.5	86	5.3	35	3.6	93	6.0	93	4.3	1407	4.7
Proph Bone Joint	49	7.6	67	2.4	344	6.3	399	4.7	57	6.6	239	4.4	50	3.1	59	6.1	64	4.1	74	3.5	1402	4.7
URTI (Bronchitis)	36	5.6	98	3.5	245	4.5	613	7.3	6	0.7	58	1.1	85	5.2	29	3.0	28	1.8	63	2.9	1261	4.2
Proph Gastro-intestinal	41	6.3	50	1.8	440	8.1	203	2.4	24	2.8	232	4.3	134	8.2	16	1.7	82	5.3	37	1.7	1259	4.2
Med Proph in general	18	2.8	63	2.3	273	5.0	225	2.7	25	2.9	318	5.9	20	1.2	48	5.0	61	3.9	75	3.5	1126	3.8
Unknown	5	0.8	99	3.5	148	2.7	244	2.9	99	11.4	163	3.0	33	2.0	18	1.9	26	1.7	86	4.0	921	3.1
Proph Obstetrics/Gyn.	25	3.9	70	2.5	240	4.4	78	0.9	85	9.8	235	4.4	62	3.8	13	1.3	45	2.9	55	2.6	908	3.0
Bone Joint inf.	22	3.4	62	2.2	88	1.6	296	3.5	26	3.0	130	2.4	53	3.3	36	3.7	41	2.6	73	3.4	827	2.8
Sepsis	1	0.2	110	3.9	114	2.1	196	2.3	33	3.8	153	2.8	73	4.5	7	0.7	41	2.6	82	3.8	810	2.7
Proph UTI	34	5.3	56	2.0	187	3.4	235	2.8	15	1.7	79	1.5	73	4.5	25	2.6	43	2.8	28	1.3	775	2.6
Gastro-intestinal inf.	31	4.8	41	1.5	123	2.3	190	2.3	21	2.4	124	2.3	72	4.4	14	1.4	26	1.7	62	2.9	704	2.4

Table 2: Most common reasons to treat adult inpatients with at least one antibiotic for systemic use (ATC J01), 2015.

Patients recorded with more than one diagnoses were counted by number of diagnosis. Patients not treated with antibiotics for systemic use, but who were treated with other antimicrobials (eg antimalarials) were not included

LRTI= Pneumonia or LRTI (lower respiratory tract infections); Skin & Soft Tissue: Cellulitis, wound including surgical site infection, deep soft tissue not involving bone e.g., infected pressure or diabetic ulcer, abscess; Intra-abdominal= Intra-abdominal sepsis including hepatobiliary, intra-abdominal abscess *etc*.; Lower UTI= Lower urinary tract infection, cystitis; Upper UTI=upper urinary tract infection including catheter related urinary tract infection, pyelonephritis; Proph Bone Joint=Prophylaxis for SST, for plastic or orthopaedic surgery (Bone or Joint); URTI (bronchitis)= Acute Bronchitis or exacerbations of chronic bronchitis; Proph Gastro-intestinal= Surgery of the Gastro-Intestinal tract, liver or biliary tree, GI prophylaxis in neutropaenic patients or hepatic failure , Med Proph in general=Drug is used as Medical Prophylaxis in general, without targeting a specific site; Unknown=Completely Unknown Indication; Proph Obstretrics/Gyn.= Prophylaxis for Obstetric or Gynaecological surgery; Bone joint Infection: Septic arthritis (including prosthetic joint), osteomyelitis, Sepsis= sepsis, sepsis syndrome or septic shock with no clear anatomic site, Proph UTI= Prophylaxis for urological surgery (SP) or recurrent Urinary Tract Infection (MP); Gastro-intestinal = Gastro intestinal infections (salmonellosis, *Campylobacter*, parasitic, *C.difficile*, etc.).

East & south Asia includes south, east & southeast Asia

	Total antibiotic (J01) prescriptions	Therapeutic use								Prophylactic use			
		n antibiotics	Community acquired infection (%)	n antibiotics	Targeted prescribing for a CAI (%)	n antibiotics	Health-care associated infection (%)	n antibiotics	Targeted prescribing for a HAI (%)	n antibiotics	Medical (%)	n antibiotics	Surgical (%)
Eastern Europe	708	329	46.5	40	12.2	82	11.6	28	34.1	168	23.7	124	17.5
Northern Europe	3536	1992	56.3	280	14.1	886	25.1	181	20.4	205	5.8	335	9.5
Southern Europe	6837	2506	36.7	416	16.6	1410	20.6	582	41.3	561	8.2	1995	29.2
Western Europe	9485	4836	51.0	1310	27.1	2688	28.3	1166	43.4	564	5.9	1136	12.0
Africa	1213	696	57.4	136	19.5	115	9.5	39	33.9	43	3.5	282	23.2
East & south Asia	6781	2500	36.9	555	22.2	1880	27.7	596	31.7	663	9.8	1443	21.3
West and central Asia	2084	933	44.8	125	13.4	435	20.9	160	36.8	160	7.7	483	23.2
Oceania	1226	654	53.3	151	23.1	289	23.6	111	38.4	93	7.6	155	12.6
Latin America	2170	899	41.4	172	19.1	758	34.9	334	44.1	121	5.6	348	16.0
North America	2752	1436	52.2	328	22.8	718	26.1	224	31.2	139	5.1	237	8.6
Total	**36792**	**16781**	**45.6**	**3513**	**20.9**	**9261**	**25.2**	**3421**	**36.9**	**2717**	**7.4**	**6538**	**17.8**

Table 3: Antibiotic use (ATC J01) by indication and type of treatment (ie, targeted versus empiric) for adult inpatients in 2015, by region

CAI= Community-acquired infection; HAI=health-care associated infection.
Overall, 486 antibiotics were recorded with 'another' indication; 1009 antibiotics with unknown indication; these antibiotics are not listed in the table.
East & south Asia includes south, east & southeast Asia

	Denominators					Antimicrobial/Antibiotic quality indicators															
	n treated patients	n anti-microbial prescrip-tions	n antibiotic (J01) prescriptions	n patients with targeted treatment§	n patients with targeted treatment against resistant organisms	% patients targeted treatment§	% patients treated with antibiotics targeting resistant organisms	n anti-microbials	% reason in notes*	n anti-microbials	% stop/review date documented*	n patients	% patients with parenteral RoA°	N anti-biotics	% antibiotic prescriptions for which guidelines were available°°	n anti-biotics	% antibiotic prescriptions compliant to local guidelines+	n anti-biotics	% antibiotic prescriptions for which no guidelines were available++	n anti-biotics	% Prolonged surgical prophylaxis >24h
Eastern Europe	653	747	708	51	42	7.8	6.4	480	64.3	377	50.5	572	87.6	565	79.8	484	85.7	136	19.2	107	86.3
Northern Europe	2783	3880	3536	396	80	14.2	2.9	3159	81.4	2002	51.6	1730	62.2	3184	90.0	2655	83.4	231	6.5	119	35.5
Southern Europe	5534	7674	6837	838	292	15.1	5.3	5334	69.5	2234	29.1	4425	80.0	4134	60.5	2925	70.8	2022	29.6	1695	85.0
Western Europe	8458	10612	9485	2204	469	26.1	5.5	8543	80.5	4272	40.3	5409	64.0	7685	81.0	6051	78.7	962	10.1	335	29.5
Africa	899	1502	1213	131	25	14.6	2.8	1057	70.4	550	36.6	564	62.7	601	49.5	408	67.9	324	26.7	261	92.6
East & south Asia	5363	7607	6781	938	287	17.5	5.4	5672	74.6	3310	43.5	3849	71.8	5183	76.4	4225	81.5	1449	21.4	1090	75.5
West and central Asia	1612	2252	2084	236	153	14.6	9.5	1640	72.8	445	19.8	1373	85.2	1112	53.4	737	66.3	843	40.5	345	71.4
Oceania	932	1411	1226	218	63	23.4	6.8	1201	85.1	381	27.0	564	60.5	1072	87.4	785	73.2	143	11.7	63	40.6
Latin America	1518	2403	2170	403	231	26.5	15.2	1955	81.4	969	40.3	1281	84.4	1660	76.5	1064	64.1	431	19.9	220	63.2
North America	2139	3125	2752	511	127	23.9	5.9	2653	84.9	1238	39.6	1564	73.1	2127	77.3	1824	85.8	509	18.5	87	36.7
Total	**29891**	**41213**	**36792**	**5926**	**1769**	**19.8**	**5.9**	**31694**	**76.9**	**15778**	**38.3**	**21331**	**71.4**	**27323**	**74.3**	**21158**	**77.4**	**7050**	**19.2**	**4322**	**66.1**

Table 4: Overview of antimicrobial/antibiotic quality indicators for adult inpatients by region, year 2015.

§ % patients receiving at least one antibiotic for systemic use (ATC J01), selection has been made for therapeutic antibiotic use only (HAI and CAI). Calculation= n patients with targeted treatment for CAI or HAI/n treated patients.

* Including all antimicrobials. Denominator=n antimicrobial prescriptions

° % patients receiving at least one parenteral antibiotic for systemic use (ATC J01). Denominator=n treated patients

°° % antibiotic prescriptions for which guidelines were available to guide antibiotic choice (not route, dose, duration) which was calculated as all antibiotic prescriptions for which a local guideline was available/all antibiotic prescriptions

+ The number of antibiotic prescriptions (J01) for which guidelines were available was used as the denominator to calculate percentages

++ Denominator used are all antibiotic (J01) prescriptions

East & south Asia includes south, east & southeast Asia

	n patients received a targeted treatment*	n patients with targeted treatment against resistant organisms	n patients	% patients MRSA	n patients	% patients MRCoNS	n patients	% patients VRE	n patients	% patients ESBL	n patients	% patients 3rd gen cep	n patients	% patients CRE	n patients	% patients ESBL non fermenter	n patients	% patients CR non fermenter	n patients	% patients other MDRO	n patients with GNB	proportion of patients (%) treated for GNB°
Eastern Europe	53	42	4	7.5	1	1.9			20	37.7	3	5.7			8	15.1	11	20.8	2	3.8	37	88.1
Northern Europe	435	80	23	5.3	3	0.7	7	1.6	26	6.0	4	0.9	1	0.2	1	0.2	8	1.8	10	2.3	39	48.8
Southern Europe	1021	292	51	5.0	22	2.2	30	2.9	86	8.4	15	1.5	21	2.1	29	2.8	37	3.6	50	4.9	168	57.5
Western Europe	2472	469	83	3.4	45	1.8	6	0.2	175	7.1	73	3.0	10	0.4	12	0.5	15	0.6	69	2.8	276	58.8
Africa	170	25	2	1.2	1	0.6			9	5.3	1	0.6			3	1.8	4	2.4	5	2.9	15	60.0
East & south Asia	1070	287	66	6.2	30	2.8	10	0.9	70	6.5	38	3.6	23	2.1	18	1.7	39	3.6	26	2.4	170	59.2
West and central Asia	266	153	26	9.8	3	1.1	2	0.8	37	13.9	10	3.8	8	3.0	18	6.8	20	7.5	40	15.0	83	54.2
Oceania	227	63	11	4.8	4	1.8	4	1.8	15	6.6	6	2.6	1	0.4	26	11.5	4	1.8	2	0.9	47	74.6
Latin America	450	231	47	10.4	22	4.9	6	1.3	86	19.1	20	4.4	18	4.0	11	2.4	5	1.1	20	4.4	149	64.5
North America	586	127	46	7.8	12	2.0	8	1.4	25	4.3	17	2.9			8	1.4	30	5.1	18	3.1	48	37.8
Total	**6750**	**1769**	**359**	**5.3**	**143**	**2.1**	**73**	**1.1**	**549**	**8.1**	**187**	**2.8**	**82**	**1.2**	**134**	**2.0**	**173**	**2.6**	**242**	**3.6**	**1032**	**58.3**

Table 5: Prevalence of resistant organisms in adult inpatients who received targeted antibiotics in 2015, by region

* denominator = number of patients receiving a targeted treatment

Targeted treatment = based upon microbiological result. Microbiology result can be any culture and/or sensitivity result from a relevant clinical (e.g., blood, sputum, etc.,) [but not screening] specimen as well as any other microbiology result like for example Legionella Urinary Antigen.

Patients could be counted twice depending on the number of targeted antibiotics administered for more than one resistant micro-organism.

MRSA=meticillin-resistant *Staphylococcus aureus*, MRCoNS=meticillin-resistant coagulase-negative staphylococci, VRE=vancomycin-resistant enterococci, ESBL=Enterobacteriaceae producing extended-spectrum beta-lactamase, 3rd gen cep=3rd generation cephalosporin resistant Enterobacteriaceae non-ESBL producing or ESBL status unknown, CRE=carbapenem-resistant Enterobacteriaceae, ESBL non-fermenter= ESBL-producing non-fermenter Gram-negative bacilli, CR non-fermenter=carbapenem-resistant non-fermenter Gram-negative bacilli, Other MDRO=other multi-drug resistant organisms, GNB= Gram-negative bacteria

°denominator=N patients with targeted treatment against resistant organisms

East & south Asia includes south, east & southeast Asia

Eastern Europe % (n=708; 2C)	
Ceftriaxone	36.3
Ciprofloxacin	9.6
Amoxicillin & enz. inh.	9.0
Cefotaxime	8.8
Cefazolin	6.6
Cefuroxime	4.8
Cefoperazone, comb.	3.4
Metronidazole	2.5
Gentamicin	2.0
Levofloxacin	2.0
Meropenem	2.0
Amikacin	1.7
Cefepime	1.6

Northern Europe % (n=3536; 5C)	
Amoxicillin & enz. inh.	14.4
Piperacillin & enz. inh.	14.2
Amoxicillin	8.1
Metronidazole	6.0
Doxycycline	5.3
Ciprofloxacin	5.2
Flucloxacillin	4.7
Clarithromycin	4.6
Gentamicin	4.2
Meropenem	4.1
Teicoplanin	3.5
Cefuroxime	3.4
Trimethoprim	2.6
Ceftriaxone	2.6
Sulfa/trimethoprim	2.0
Benzylpenicillin	1.8
Vancomycin	1.5
Clindamycin	1.2
Cefalexin	1.0

Southern Europe % (n=6837; 12C)	
Ceftriaxone	19.6
Ciprofloxacin	10.3
Cefazolin	8.2
Metronidazole	6.5
Amoxicillin & enz. inh.	6.0
Piperacillin & enz. inh.	5.8
Gentamicin	4.6
Levofloxacin	3.6
Vancomycin	3.1
Cefuroxime	2.9
Meropenem	2.7
Amoxicillin	2.5
Clindamycin	2.2
Amikacin	2.2
Sulfa/trimethoprim	2.0
Ampicillin	1.7
Imipenem & enz. inh.	1.6
Ceftazidime	1.3
Azithromycin	1.1
Cefepime	1.0
Ertapenem	0.8
Clarithromycin	0.8

Western Europe % (n=9485, 5C)	
Amoxicillin & enz. inh.	25.6
Piperacillin & enz. inh.	8.4
Cefazolin	7.1
Ciprofloxacin	7.0
Ceftriaxone	5.0
Cefuroxime	4.4
Sulfa/trimethoprim	3.6
Meropenem	3.5
Moxifloxacin	3.2
Levofloxacin	3.0
Amoxicillin	2.9
Vancomycin	2.9
Metronidazole	2.6
Clindamycin	2.5
Flucloxacillin	1.9
Ceftazidime	1.5
Clarithromycin	1.4
Temocillin	1.3
Azithromycin	1.3
Cefepime	1.1
Nitrofurantoin	1.1

Africa % (n=1213, 4C)	
Ceftriaxone	19.3
Metronidazole	17.4
Ciprofloxacin	10.3
Cefuroxime	9.9
Amoxicillin & enz. inh.	9.6
Amoxicillin	5.4
Clindamycin	4.3
Levofloxacin	3.1
Sulfa/trimethoprim	2.6
Azithromycin	2.2
Ertapenem	1.6
Meropenem	1.3
Ampicillin	1.2
Gentamicin	1.0
Amikacin	0.9

East & south Asia % (n=6781, 6C)	
Amoxicillin & enz. inh.	7.9
Levofloxacin	7.4
Ceftriaxone	7.3
Piperacillin & enz. inh.	7.1
Cefazolin	6.8
Sulfa/trimethoprim	6.1
Meropenem	5.7
Cefuroxime	5.4
Metronidazole	4.2
Vancomycin	4.2
Ciprofloxacin	3.8
Ampicillin & enz. inh.	3.3
Clindamycin	2.0
Cefmetazole	1.9
Cefepime	1.7
Cefoperazone, comb.	1.5
Clarithromycin	1.4
Cefcapene	1.4
Teicoplanin	1.3
Azithromycin	1.2
Ampicillin	1.1
Ceftazidime	1.0
Amoxicillin	0.9
Imipenem & enz. inh.	0.9
Gentamicin	0.9
Cefotiam	0.8
Amikacin	0.7
Cefditoren	0.6
Cloxacillin	0.6
Doxycycline	0.6
Minocycline	0.6

West & central Asia % (n=2084, 9C)	
Ceftriaxone	20.2
Metronidazole	8.3
Ciprofloxacin	7.0
Cefuroxime	6.4
Meropenem	5.5
Piperacillin & enz. inh.	5.5
Vancomycin	4.1
Cefazolin	4.1
Amoxicillin & enz. inh.	3.3
Azithromycin	3.0
Amoxicillin	3.0
Imipenem & enz. inh.	3.0
Cefotaxime	2.4
Gentamicin	2.1
Cefepime	2.0
Colistin	1.7
Ampicillin	1.5
Sulfa/trimethoprim	1.4
Ampicillin, comb.	1.4
Moxifloxacin	1.4
Amikacin	1.3
Ceftazidime	1.0
Ceftizoxime	0.9

Oceania % (n=1226, 2C)	
Cefazolin	10.8
Ceftriaxone	8.3
Amoxicillin & enz. inh.	8.1
Piperacillin & enz. inh.	7.8
Metronidazole	7.4
Sulfa/trimethoprim	5.9
Flucloxacillin	5.1
Amoxicillin	4.6
Doxycycline	4.6
Cefuroxime	4.3
Vancomycin	3.6
Ciprofloxacin	3.3
Cefalexin	3.2
Azithromycin	2.7
Meropenem	2.6
Benzylpenicillin	1.9
Roxithromycin	1.9
Gentamicin	1.5
Cefaclor	1.5
Clindamycin	1.4

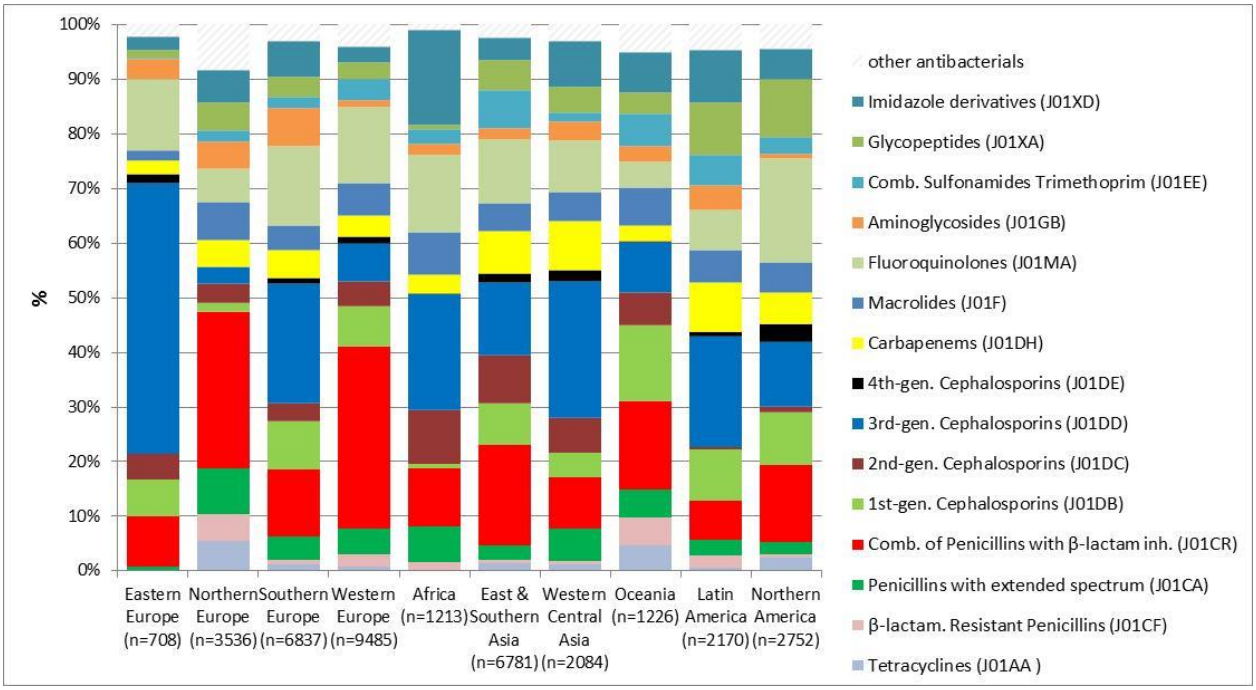
Latin America % (n=2170, 4C)	
Ceftriaxone	14.4
Metronidazole	9.5
Vancomycin	9.5
Cefazolin	6.1
Ciprofloxacin	5.9
Sulfa/trimethoprim	5.4
Piperacillin & enz. inh.	5.3
Meropenem	4.8
Cefotaxime	4.2
Cefalotin	2.8
Imipenem & enz. inh.	2.8
Clindamycin	2.7
Amikacin	2.4
Gentamicin	2.3
Clarithromycin	2.1
Colistin	1.9
Ampicillin	1.8
Cloxacillin	1.8
Ceftazidime	1.6
Ertapenem	1.4
Levofloxacin	1.2
Azithromycin	1.0

North America % (n=2752, 2C)	
Levofloxacin	12.8
Piperacillin & enz. inh.	11.8
Ceftriaxone	11.2
Vancomycin	10.6
Cefazolin	8.0
Ciprofloxacin	6.1
Metronidazole	5.5
Meropenem	5.2
Azithromycin	3.3
Cefepime	3.3
Sulfa/trimethoprim	2.9
Doxycycline	2.1
Clindamycin	1.7
Cefalexin	1.5
Amoxicillin & enz. inh.	1.5
Linezolid	1.5
Amoxicillin	1.4

Appendix: Most prescribed antibiotics for systemic use (ATC J01, 5th level) to adult hospital inpatients by UN region, ranked at overall drug utilization 90% (DU90%), 2015

Grey lines provides drug utilization up to 75% (DU75%) by UN region; C=countries
East and south Asia includes south, east and southeast Asia

Appendix: Proportion of prescribed antibiotics for systemic use (ATC4 level, N=36,792) among adult inpatients in 2015, by region



Not colored striped part of stacked bar represents other antibacterial subgroups
N=number of reported antibiotics for systemic use at regional level
East and south Asia includes south, east and southeast Asia

Global Point Prevalence Survey of

Antimicrobial Consumption and Resistance

(GLOBAL-PPS)

PROTOCOL – version 2 – 18/12/2014

Sponsoring Agent: World HAI Forum – BioMérieux

Funding Authority: BioMérieux

Lead Investigators: Herman Goossens (University Hospital of Antwerp, Belgium) & Dilip Nathwani (Ninewells Hospital and Medical School, Dundee, Scotland)

GLOBAL-PPS Development Group:

Tasks:

- To develop the GLOBAL-PPS (develop and approve protocols and forms; identify countries and opinion leaders to participate in the GLOBAL-PPS; develop dissemination and publication plan; etc).
- The academic partners will help testing the web-based forms and participate in the feasibility, pilot and full PPS.

Members: Isabelle Caniaux (Isabelle.caniaux@biomerieux.com); Herman Goossens (herman.goossens@uza.be); Marie Françoise Gross (marie-francoise.gros@biomerieux.com); Vincent Jarlier (vincent.jarlier@psl.aphp.fr); Mark Miller (mark.miller@biomerieux.com); Dilip Nathwani (dilip.nathwani@nhs.net); Peter Zarb (peter.zarb@gov.mt)

Coordinating Centre & Technical Support: Ann Versporten, Nico Drapier and Herman Goossens, Laboratory of Medical Microbiology, University of Antwerp, Antwerp, Belgium.

Timelines:

- **Feasibility survey**: April 2014 (with the support of the Global PPS Steering Group)
- **Pilot survey**: October 2014 (with the support of the Global PPS Coordination Group)
- **Global Survey**: February-April 2015 (with the support of the Global PPS Coordination Group): any hospital from any country worldwide is welcome to participate.

Dissemination:

Preliminary discussion of first results and future plans at 5th HAI Forum: June 2015.

Global dissemination at the (European) Antibiotic Awareness Day/Week: 18 November 2015.

Contents

THE DATA COLLECTION FORMS AND APPENDICES ARE AVAILABLE AS A SEPARATE DOCUMENT TO THIS PROTOCOL:

FORMS:

- WARD FORM
- PATIENT FORM

APPENDICES:

- APPENDIX I: Combination anti-infective agents
- APPENDIX II : Diagnosis Group Codes
- APPENDIX III : Type of Indication

Print one ward form and all appendices for each different ward.

Print one patient form for each patient on antibiotics. No need to fill in the patient form for patients not on antimicrobial treatment.

BACKGROUND - AIMS

Background

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (**GLOBAL-PPS**) is an ambitious project funded by BioMérieux to develop further on the three point-prevalence surveys (PPS) carried out by the European Surveillance of Antimicrobial Consumption (ESAC) project between 2006 and 2009. The first ESAC PPS started with 20 hospitals from 20 European countries, whilst in the final ESAC PPS there were almost 200 hospitals from 25 European countries. With the coordination of the ESAC Group a number of studies have shown the applicability of this tool across a range of European countries [1-4]. Notably this tool has illustrated many benefits;

1] the web based tool is easy to use, requiring minimal training for data entry and analysis and provides rapid feedback;

2] there is evidence of consistency and reproducibility with the data entry using this tool;

3] the PPS protocol/tool allows to survey performance indicators (e.g., compliance with local antibiotic guidelines) thereby identifying targets for quality improvement;

4] participation in the survey has encouraged, thorough engagement and feedback enhancing communication between prescribers and the local infection community.

In summary the use of PPS, can identify problem areas and thereby investigate the introduction of measures that aim at improving prescribing practices. The roll-out of ESAC project has been successful in Europe. Good practice examples exist [5, 6]. The experience from these studies confirms its value, broad adaptability and suitability for a range of health care resource settings.

The ESAC PPS methodology has previously already been adapted for the Antibiotic Resistance and Prescribing in European Children – (ARPEC) work Package 5 (WP5) subproject that focused on paediatric and neonatal patients admitted in European hospitals [7]. The methodology was also modified and adapted for the European Centre for Disease Prevention and Control (ECDC) PPS of healthcare-associated infections and antimicrobial use in acute care hospitals (ECDC-PPS). A pilot survey was conducted in 66 hospitals from 23 European countries in 2010. This survey used the online tool for data entry and feedback [8].

The 4th world HAI forum “Control of Antimicrobial Resistance without borders” took place at the *Fondation Mérieux* in Annecy, France between June 23rd and 25th 2013. The meeting concluded with a consensus that identified 2 key priorities for action. One of these was to undertake a global point prevalent survey of antibiotic use in hospitals (and the community). BioMérieux funds the GLOBAL-PPS because this initiative meets one of the aims of the company and the World HAI Forum to support global initiatives to better control antibiotic resistance through stewardship interventions in a range of resource and geographical settings.

Aims

The GLOBAL-PPS aims to expand the standardised surveillance method of data collection at a global level, in order to monitor rates of antimicrobial prescribing in hospitalised patients. The GLOBAL-PPS will determine the global variation in antibiotic prescribing in hospitalised patients across all continents.

The GLOBAL-PPS should:

1. Identify targets for quality improvement (e.g. duration of peri-operative prophylaxis; compliance with local hospital guidelines; documentation of indication for prescription of antibiotic therapy);
2. Help in designing hospital interventions that aim at promoting prudent use of antimicrobials;
3. Allow to assess the effectiveness of such interventions, through repeat PPS.

This GLOBAL-PPS aims to establish a global network for point prevalence surveys. In order to maximise participation by as many hospitals from as many countries from all continents, certain information requested is simplified in order to facilitate participation from areas with limited resources.

The GLOBAL-PPS research questions are related to the observed variations prescribing patterns and resistance profiles among different:

1. continents
2. countries;
3. indications,
4. ward categories and
5. hospital characteristics

The aim is NOT to perform benchmarking between hospitals, countries, geographical regions or any other form of benchmarking across categories.

In conclusion, the main aim of the GLOBAL-PPS is to help hospitals by developing and providing a tool to identify targets for quality improvement of antimicrobial prescribing, to change practise and to measure impact of interventions.

GLOBAL-PPS PROTOCOL SPECIFICS

1. Time planning for the PPS

Any participating hospital must complete the Point Prevalence Survey (PPS) within a maximum of *4 consecutive weeks* from the time when the hospital starts data collection.

Two periods of data collection are foreseen:

1. Pilot survey: October 2014.
2. Global survey: February-April 2015.

2. Departments involved

All wards (or units/departments) within the participating hospital must be included. Each ward has to be surveyed only once on a single day in order to calculate correctly the denominator (number of admitted patients. However, different wards can be surveyed on different days.

Each hospital shall decide on which day/s data collection shall take place (depends on the size of the hospital and own organization) as long as it is within the stipulated time-frame.

The departments are grouped into 5 paediatric, 2 neonatal and 6 adult departments (see page 11: "Prepare hospital department list").

Surgical Wards (PSW, ASW) should **NOT** be surveyed **on a day following a weekend day or bank holiday (e.g., not on Monday in Europe; not on Saturday in Islamic countries)**, but on the other days of the week in order to capture information about prophylaxis in the previous 24 hours.

Intensive Care and Medical wards (all other wards) can be surveyed at any weekday except on weekends or bank-holidays. Departments should not be further sub-divided (e.g., Psychiatric, Orthopaedic, *etc.*)

3. Inclusion criteria

All inpatients admitted on a ward (excluding day admissions such as endoscopy or renal units) ***at 8 o'clock*** in the morning on the day of survey count in the denominator. All inpatients "***on antimicrobial agents" at 8 o'clock*** in the morning on the day of survey are to be included in the numerator (i.e., a patient form is to be filled in for these patients only).

- Definition of "***on antimicrobial agents"*** :
  - A patient receiving an antibiotic e.g. every 48 hours but not receiving this antibiotic on the survey day must be included = ongoing antimicrobial treatment.
  - An antibiotic prescribed at one o'clock (during the ward round or when results become available or for surgical prophylaxis) in the afternoon on the day of the survey must **not** be included (not active or ongoing at 8 o'clock in the morning).
- Include new-born healthy children on a maternity ward. Encode this ward as a NMW.

4. Exclusion criteria

- Exclude day hospitalizations and outpatients. These are defined as ambulatory care patients. So, data from "day" surgery and "day" hospital units should be excluded from the survey.

- Exclude admissions admitted after 8 o'clock on the day of the survey even though these would be present by the time the survey is carried out. All patients/wards falling in the exclusion criteria must be excluded from BOTH the nominator and denominator data.

5. Denominator data

- ***Total number of eligible inpatients* at 8 am** of the ward surveyed. Do not collect data from patients discharged before 8 o'clock and/or patients admitted after that time. In the Ward Form, the denominator refers to the total number of eligible admitted patients on the ward at 8 o'clock.
- ***Total number of eligible beds* attributed to inpatients at 8 am** of the ward surveyed. This means the number of total inpatient beds at the time of the survey.

Number of beds = total beds in ward (=occupied + empty beds). N beds should always be ≥N inpatients present at 8 o'clock.

6. Included antimicrobial agents.

- ***Antibacterials for systemic use***: J01
- ***Antimycotics and antifungals for systemic use***: J02 and D01BA (including griseofulvin and terbinafine)
- ***Drugs for treatment of tuberculosis***: J04A (these are the antibiotics as well as all other drugs to treat tuberculosis)
- ***Antibiotics used as intestinal anti-infectives***: A07AA
- ***Antiprotozoals used as antibacterial agents, nitroimidazole derivatives*** (P01AB)
- ***Antivirals used for influenza - Neuraminidase inhibitors*** (J05AH)
- ***Antimalarials***: P01B

Antimicrobials for topical use are excluded from the survey.

The *WebPPS* program provides the list of all antimicrobials to be surveyed according to the WHO ATC classification[1]. This list can be extracted in a Microsoft Excel® file through the GLOBAL-*PPS* program. The file contains all substances and their route of administration.

In case a drug is not in the provided list, contact Ann Versporten (Global-PPS@uantwerpen.be) who will manually enter the drug into the *GLOBAL-PPS* program.

For each additional drug, the following information is needed:

- the trade name and/or the ATC name at substance level (ATC level 5) when trade name is not used. This field is mandatory, it will be used in all the pull-down lists of drugs in the *GLOBAL-PPS* program,
- the ATC code at substance level (7 digit code),
- the route of administration.

[1] http://www.whocc.no/atc_ddd_index/

7. Multidisciplinary team

The hospitals are invited to create a multidisciplinary team of colleagues familiar with reading patient notes and having adequate knowledge on local guidelines (e.g., infectious Disease specialists, microbiologists, pharmacists, infection control specialists, nurses or other healthcare professionals). A *local administrator* has to be assigned.

The local administrator is responsible for:

- the online registration of the hospital,
- entering patient specific data into the *GLOBAL-PPS* program,
- the data validation and
- the production of the local feedback reports.

Extra hospital users may however be registered with the GLOBAL-PPS program in order to help the hospital administrator with data-entry.

8. *Data Privacy*

A sequence number will be assigned to each *hospital* after registration to the *GLOBAL-PPS* program. Hospital names will never be revealed in any report or publication.

Patients are completely anonymised in the GLOBAL-PPS program. Every patient record will be given a unique not identifiable survey number. This number is automatically generated by the computer program based on several internal codes. This number identifies uniquely the patient in the *GLOBAL-PPS* database.

9. Data ownership

- ✓ Data are the property of their respective hospital.
- ✓ The Coordinating Centre & Technical Support team at the University of Antwerp, Belgium is guardian of the data within the database.
- ✓ The Coordinating Centre & Technical Support team will analyse the data and generate reports. These analyses and reports are property of the GLOBAL-PPS.
- ✓ The GLOBAL-PPS Coordination Group encourages country specific analyses.

10. Ethical approval

For approval by ethical committee & privacy legislation requirements, the GLOBAL-PPS management team can provide, on request, a letter that can be submitted to hospitals ethical committees (contact Global-PPS@uantwerpen.be).

11. Technical support

The Coordinating Centre & Technical Support team at the University of Antwerp will provide the "help desk" for software or any other issues encountered and/or questions during the data collection and data entering (Global-PPS@uantwerpen.be or tel.: +32 32652418 : Monday-Friday 9am-5pm CET). The Coordinating Centre & Technical Support team will continually be available for general queries about the project.

- ✓ Web page layout for the forms will be the similar to the paper version.

The GLOBAL-PPS program http://app.globalpps.uantwerpen.be/globalpps_webpps offers:

1. internal checks in order to avoid invalid or erroneous figures (e.g. for out of ranges values)
2. boxes popping up in order to guide you to fill out a field
3. help functions which provides supplementary information on each screen (on top, left side of screen)
4. Help pages, manuals, and the "FAQ" section.
5. The easy to follow online training video teaching you to efficiently enter data using the GLOBAL-PPS program (http://app.globalpps.uantwerpen.be/globalpps_webpps)

✓ Regular backups of the database will guarantee the integrity of data.
✓ The format to export data is Microsoft Excel®.

The software and database will be hosted at the University of Antwerp in Belgium, Europe.

12. Publication policy

The GLOBAL-PPS Coordination Group should look for opportunities for dissemination and encourage country specific analyses, in conjunction and agreement with the GLOBAL-PPS Development Group. For publications at national or regional level, **participants need to comply with the publication strategy** as designed by the GLOBAL-PPS Development Group. The publication strategy will guide you how to proceed. Please, send email to Global-PPS@uantwerpen.be in order to receive a copy of the publication strategy.

« WEBPPS STEP BY STEP PROCEDURE »

ALL THE FOLLOWING STEPS MUST BE COMPLETED BEFORE ENTRY OF ANY PATIENT DATA

Before the hospital submits any patient data to the WebPPS, the following steps must be completed:

1. ***Register the hospital on the Global-PPS website*** :

http://app.globalpps.uantwerpen.be/globalpps_webpps

- First participation to the GLOBAL-PPS: also if the hospital was registered with previous WebPPS (ESAC, ARPEC, ECDC-PPS), please register as a new hospital.

- Second and subsequent participations to GLOBAL-PPS: If the hospital has already been registered with the GLOBAL-PPS, maybe by a colleague or after having participated in a Pilot GLOBAL-PPS, the hospital has to use the existing login (username) and password. If this information has been lost, please contact Ann Versporten (Global-PPS@uantwerpen.be) providing your respective contact details (hospital name and country).

- First time participants, must click on the tab 'register' in the menu on top of the home page. Information about the hospital and the local *GLOBAL-PPS* administrator will need to be inputted. Fields with * are mandatory.

- Name of the institution*
- Code* : Fill in CAPTCHA (this is a registration code to avoid spam registration)
- Hospital type* : Primary, Secondary, Tertiary, Specialized hospital[2]
- Teaching hospital*: Yes or No
- Generic Email* (could also be the administrator's email address)
- Postal Address
- Country / County / District*. If County and district are not used please fill in the country.
- Name* function and email address* of the local *WebPPS* administrator
- Login and password*: to be chosen by local *WebPPS* administrator

[2] **Primary level:** often referred to as a district hospital or first-level referral. The hospital has few specialities, mainly internal medicine, obstetrics-gynaecology, paediatrics, and general surgery, or only general practice; limited laboratory services are available for general, but not for specialized pathological analysis. Often corresponds to general hospital without teaching function. **Secondary level:** often referred to as provincial hospital. A hospital highly differentiated by function with five to ten clinical specialities including some haematology, oncology, renal and ICU beds; takes some referrals from other (Primary) hospitals. Often corresponds to general hospital with teaching function. **Tertiary level:** often referred to as central, regional or tertiary-level hospital. A hospital with highly specialized staff and technical equipment, e.g., ICU, Haematology, Transplantation, cardio-thoracic surgery, neurosurgery and specialized imaging units; clinical services are highly differentiated by function; provides regional services and regularly takes referrals from other (primary and secondary) hospitals. Often correspond to University hospital. **Specialized hospital:** Single clinical specialty, possibly with sub-specialties; highly specialized staff and technical equipment. E.g. paediatric hospital, infectious diseases hospital

Press FINISH to confirm registration.

- After a successful registration, the local administrator will be able to login to the *GLOBAL-PPS* program having access to all its functionalities.

- The local administrator can add a contact in order to give a supplementary person the rights to enter data as well. This additional person, however, will only be able to add new and/or amend patient data. Only the local administrator will be granted rights to add or change departments, extract data into an excel file, validate the data and generate reports.

2. ***Prepare the hospital department list.***

After login, one first needs to define ALL the hospital's wards (units/departments) as these will afterwards appear in the drop down lists when entering patient information.

The definition of a department follows a hierarchical structure. For each department, the following information is needed:

- The **NAME** of the department. This field is mandatory; it will be used in the department drop down lists in the *GLOBAL-PPS* program. For example, for the category "general medical ward" various different wards may exist. If these wards have particular/appropriate names, write them down accordingly (e.g. Medical Ward 1 through Medical ward 'N' including the Neuromedical Ward and other wards such as Psychiatric wards'. **All** inpatient adult, paediatric and neonatal departments must be included (i.e., no hospital sampling).
- Code and description = optional
- The **TYPE** of department. Mandatory field, provided by the *GLOBAL-PPS* program. Choose between the following thirteen major types:

Paediatric departments:

- PMW (Paediatric Medical Ward)
- HO-PMW (Haematology-Oncology PMW)
- T-PMW (Transplant (BMT/Solid) PMW)
- PSW (Paediatric Surgical Ward)
- PICU (Paediatric Intensive Care Unit)

Neonatal departments:

- NMW (Neonatal Medical Ward).
- NICU (Neonatal Intensive Care Unit)

Adult departments:

- 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)

Examples of difficult cases:

- A mixed PICU and NICU department should be split up if the number of NICU and PICU assigned beds for the mixed NICU-PICU ward is reasonably stable. Thus, define the ward into 2 different wards (a PICU and NICU ward).

- The **ACTIVITY** for a department (**Medicine, Surgery, Intensive Care**) is automatically assigned by the software based on the selected type of department. This is the "MAIN" attributed activity of a certain department. This main activity can never be changed or deactivated. Besides the "main" activity of a department, it is still possible to define the department as a mixed department on the day of the survey (if on the day some of the patients are from a different activity). This has to be done when entering the denominator data (see 'the Ward form', in the separate 'Forms' document).

The different departments are ***manually*** entered into the *GLOBAL-PPS* program.

3. Select appropriate survey

Select the appropriate survey online*: go to Survey*

4. Complete denominators for ALL wards surveyed

See data collection forms – "Ward form"

*One needs to complete denominator data (=N patients and N beds) for wards surveyed "**before**" entering the first patient.*

ONLY after all the above mentioned steps have been carried out, one can start to enter patient data.

Teach yourself how to register the hospital, to define the departments, to activate a survey and to add patient data. Go to the online training sessions available at (videos are available in English, Spanish, Russian):

http://app.globalpps.uantwerpen.be/globalpps_webpps

DATA COLLECTION FORMS

To facilitate the data collection, one paper ward form and the corresponding appendices should be printed for each ward. The number of 'patient forms' shall depend on the number of patients on the ward who are on antimicrobial therapy. The forms correspond to the online web forms.

- Ward form
- Patient form

After data collection for each ward, attach to the ward form all the individual patient forms (for those patients with antimicrobial treatment (including prophylaxis).

❖ ***The WARD form***

Date of survey – The date the department/ward is surveyed: DDWWYYYY.

Auditor code – Code (numeric or alphanumeric) of the auditor. It should be unique within the hospital. The code is used to track possible bias linked to the auditor.

Hospital – The hospital name.

Ward – The name and optionally code of the department/ward.

Department Type – The official ward type (e.g. if a surgical ward is taking overflow from Medicine it is still to be listed as Surgery)

> **A special case: a mixed department with mixed activity:** In hospitals with shared beds and mixed wards the denominator is difficult to measure. In fact, there are two separate issues: i) wards which occasionally take patients from a different specialty than their 'official' department and ii) permanently mixed wards with no available data on number of beds for each speciality.
>
> For that reason, during data entry and when necessary, it is possible to define a department as mixed department. In this case, the different ***activities*** encountered at the day of survey should be specified, as well as the total number of admitted patients and total number of beds for each activity according to the defined activity. If needed, the auditor should ask a ward healthcare worker if any patients belonging to another department are present, before starting the ward survey.
>
> In summary, a mixed department will be defined based on the activity level.

Mixed department – If the department is mixed, tick the Y case, if not, tick the N case.

Activity –Select all the encountered activities (Medicine, Surgery, Intensive Care) based on the activity on the day of the survey. A supplementary ward activity may be defined besides the "main" activity (main activity is automatically attributed by the GLOBAL-PPS

program during the department list preparation (see "*Prepare the hospital department list.*"). (e.g. if a surgical ward is taking overflow from Medicine it is still to be listed as Surgery: Define here a mixed department by ticking the box medicine beside the surgery main activity, which will already be marked in the GLOBAL-PPS program.)

Denominators -

1. **Total number of admitted inpatients at 8 am** on the day of the PPS should be entered in the column of the corresponding activity. In case of mixed department, the number of admitted patients corresponding to each of the encountered activities should be entered. Reminder: Do not count patients discharged before 8 o'clock and/or patients with admission planned after that time.

2. **Total number of "eligible" beds for inpatients in the department at 8 am** on the day of the PPS. In case of mixed department, fill the total number of beds corresponding to each of the encountered activities.

   Number of beds = total beds in ward (=occupied + empty beds). N beds is always ≥ N inpatients present at 8 am.

Examples of challenging denominator attribution:

- *Mixed department surgical-medical*: fill in N surgical and medical patients and, when not exactly defined following formal hospital listing, distribute surgical and medical empty beds proportionally (or evenly) in N surgical and medical beds.
- *An overbooked department*: provide information of the "actual real situation" on the day of the PPS providing e.g. the total number of patients admitted and total N beds on the day of the survey.
- *There are more patients than beds on the ward*: fill in the total number of inpatients for the total number of beds. As such, N beds = N inpatients present at 8 am on the day of the PPS.

*Complete denominator data (=N patients and N beds) for wards surveyed "**before"** entering the first patient.*

❖ *The PATIENT form*

Ward (Name/code)– This is the **name** of the ward studied. This name is selected using the drop down list in the *Global-PPS* program, as this department name has been defined during the preparation of the hospital department list (see step "prepare the hospital department list", page 11)

Activity – When the ward is a **mixed department**, the activity to which the patient belongs must be specified (M: Medicine, S: Surgery, ICU: Intensive Care).

Full Patient Identifier – This is a unique number allowing local tracing to the patient level for eventual clarifications. (For example the clinical record/note number, hospital number, etc.) This information will not be reported or submitted in the *GLOBAL-PPS* database.

Survey Number – It's a unique non identifiable number generated by the GLOBAL-PPS for each patient record. Please ensure that the person entering the data online ***writes down this number immediately when it is generated by the program as it will not be displayed again***. This number identifies uniquely the patient in the *GLOBAL-PPS* database.

Age – Three fields, one for the year, one for the month and one for the days are available. ***It is important to remember that only one of these fields is to be used as follows:***

- If less than 30 days old write the exact numbers of days completed.
- For patients older than 1 month and younger than 2 years fill in month field. (e.g. 19 months)
- If the patient is at least 2 years old then only the year field is to be inputted.

Weight – Write the current weight in Kg with two decimal numbers. Optional field.

Gender – M (Male), F (Female)

Drug Name – This is the generic name (e.g. amoxicillin+clavulanate and not Augmentin®). Antimicrobials for *topical use* applied on the skin/eye/ear etc are not included. Oral topical use however is included in the PPS (e.g. oral vancomycin). The antimicrobial data are recorded automatically using the ATC classification by the WHO Collaborating Centre for Drug Statistics (http://www.whocc.no/atc_ddd_index/).

Prescribed antimicrobials included in the survey are:

1. All antimicrobials for systemic use: J01
2. Antimycotics and antifungals: J02 and D01BA (including griseovulvine and terbinafine)
3. Drugs for treatment of tuberculosis: J04A (these are the antibiotics as well as all other drugs to treat tuberculosis)
4. Antibiotics used as intestinal anti-infectives: A07AA
5. Antiprotozoals used as antibacterial agents, nitroimidazole derivatives (P01AB)
6. Antivirals used for influenza - Neuraminidase inhibitors (J05AH)
7. Antimalarials: P01B

Administered "Single Unit Dose" and "Unit" of Dose – Administered dose is the actual prescribed single unit dose per administration, expressed in mg or IU. Milligram is the default unit measure. (e.g., note down 400mg of amoxicillin in 457mg of co-amoxiclav; provide number of times/day given in next variable). NOTE: this must still be listed as co-amoxiclav and NOT amoxicillin.

- For combinations with two or more active ingredients like co-trimoxazole the total content should be entered in *GLOBAL-PPS*. For example sulfamethoxazole 200 mg/ trimethoprim 40 mg will be recorded as 240 mg.
- For combination with one active ingredient as the main antimicrobial agent, like penicillins with enzyme inhibitors, only the content of active ingredient should be entered in *GLOBAL-PPS*. For example co-amoxiclav 125/31 (amoxicillin 125 mg and clavulanic acid 31 mg as potassium salt) should be entered as 125 mg.

  Other combinations of an antibiotic and an enzyme inhibitor:

  J01CR01 Ampicillin and enzyme inhibitor: report only ampicillin dose
  J01CR02 Amoxicillin and enzyme inhibitor: report only amoxicillin dose
  J01CR03 Ticarcillin and enzyme inhibitor: report only ticarcillin dose

J01CR05 Piperacillin and enzyme inhibitor: report only piperacillin dose

Examples can be found on: http://www.whocc.no/ddd/list_of_ddds_combined_products/

Times per Day – This refers to the number of actual prescribed doses per 24 hours. For example every 6 hours = 4; every 8h = 3, every 12h = 2, every 16h = 1.5, every 36h = 0.67, and every 48h = 0.5 doses per day.

Route – Route of Administration.

Four routes of administration are included: Parenteral (P), Oral (O), Rectal (R), Inhalation (I).

Diagnosis – This is the reason to treat the patient (list available within 'forms' document, appendix II). Select ONLY ONE of the possibilities. If more categories are possible, write the one most applicable. Request additional information from doctors, nurses, or pharmacists if needed!

Type of indication – The indication for treatment can be found in the records and/or obtained from ward staff. This section should be completed using the indication codes as provided within 'forms' document, appendix III.

- For **surgical patients**, administration of antimicrobial prophylaxis **should be checked in the previous 24 hours** in order to encode the duration of prophylaxis as either one dose, one day (=multiple doses given in one day) or >1 day.

Reason in notes – "Yes" or "No". Depends on whether the indication is documented in medical records.

It refers to whether or not a diagnosis or indication for treatment was recorded in the notes when antimicrobial treatment started. As a key quality measure, it is important that this information is collected in a unique and consistent manner: based on the information available in the notes on the day of the audit. It should be completed without asking anyone or looking in the records another day. It refers only to time of the audit and should be derived from records only.

Guideline compliance – This depends on whether the antibiotic choice is in compliance with local guidelines Y: Yes (compliant with local policy or infection specialist advice); N: No; NA: Not Assessable (no local guidelines for the specific indication); NI: No Information (because indication is unknown). Thus, appropriateness refers EXCLUSIVELY to drug choice, not the dose, route, or duration, as this is more contentious. NOTE: Therapy directed by an infection specialist is "Yes-compliant".

Is a stop/review date documented? "Yes" or "No". This has to be filled-in for all included antibiotics even if it is long term medical prophylaxis where a stop/review day is unlikely.

Type of treatment – E versus T

- Empirical treatment (E) = empiric – when the antibiotic is being used as per a local guideline – as a best guess - treatment by means which experience has proved to be beneficial
- Targeted treatment (T) = based upon microbiological result. Microbiology result can be any culture and/or sensitivity result from a relevant clinical (e.g., blood, sputum, etc.,) [BUT not screening] specimen as well as any other microbiology result like for example Legionella Urinary Antigen.

Note down the information which is available at the time of survey (e.g. empirical even when confirmation of positive blood culture day after survey)

Treatment based on biomarker data – 'Yes' versus 'No'
It refers to whether or not biomarker results are used to define the treatment. If yes, next line should be filled in with the biomarker.

Treatment based on use of biomarker data – CRP or PCT or Other
Three answers are possible:

- **CRP** = in case the treatment is based on results of the biomarker CRP (*C-reactive protein)*
- **PCT** = in case the treatment is based on results of the biomarker PCT (*procalcitonin*)
- **Other =** in case the empirical treatment is based on results of another lab-based biomarker than CRP or PCT

When treatment choice is based on microbiological data (treatment=targeted), the fields below should be filled in. NOTE: Microbiology data refers to any culture and sensitivity result from a relevant clinical (not screening) sample as well as any other microbiology result like for example Legionella Urinary Antigen.

Targeted treatment against MRSA – 'Yes' versus 'No'
It refers to whether or not the chosen drug is targeting methicillin-resistant *Staphylococcus aureus*..

Targeted treatment against MRCoNS – 'Yes' versus 'No'. It refers to whether or not the chosen drug is targeting methicillin-resistant coagulase-negative staphylococci.

Targeted treatment against VRE – 'Yes' versus 'No'
It refers to whether or not the chosen drug is targeting vancomycin-resistant enterococci.

Targeted treatment against ESBL-producing Enterobacteriaceae – 'Yes' versus 'No'
It refers to whether or not the chosen drug is targeting Enterobacteriaceae producing extended-spectrum beta-lactamase.

Targeted treatment 3rd generation cephalosporin resistant Enterobacteriaceae non-ESBL producing or ESBL status unknown – 'Yes' versus 'No'
This refers to whether or not the chosen drug is targeting Enterobacteriaceae and either the ESBL status is unknown or another resistance mechanism is present.

Targeted treatment against Carbapenem-resistant Enterobacteriaceae – 'Yes' or 'No'
This refers to whether or not the chosen drug is targeting Carbapenem-resistant Enterobacteriaceae.

Targeted treatment against ESBL-producing nonfermenter Gram-negative bacilli – 'Yes' versus 'No'. It refers to whether or not the chosen drug is targeting nonfermenters (*Pseudomonas aeruginosa, Acinetobacter baumannii, Burkholderia spp., Stenotrophomonas maltophilia*) producing extended-spectrum beta-lactamase.

Targeted treatment against carbapenem-resistant non fermenter Gram-negative bacilli – 'Yes' versus 'No'
It refers to whether or not the chosen drug is targeting carbapenem-resistant nonfermenters (*Pseudomonas aeruginosa*, *Acinetobacter baumannii*, *Burkholderia spp.*, *Stenotrophomonas maltophilia*).

Targeted treatment against MDR organisms – 'Yes' versus 'No'
It refers to whether or not the chosen drug is targeting multi-drug resistant organisms, other than the ones listed above.

EXPORT YOUR DATA

Data can be exported into a Microsoft Excel® file. One can do this at any time during the process of data entry. It contains the raw recorded department and patient data. It allows the user/s to verify own data (correctness and completeness of data). It also enables hospitals to perform analysis for own data.

VALIDATION PROCESS

After the denominator data and all patient data have been entered into the GLOBAL-PPS program, the "local administrator" needs to complete the validation process in order to be able to generate a feedback presentation.

The validation process identifies small, basic issues, warnings or errors in the survey, for example:

- ✓ Surveys without data entry
- ✓ Incomplete departments (missing values for auditor code, denominator values)
- ✓ Departments without patient data
- ✓ Patient data without antibiotic treatments or with duplicated antibiotics
- ✓ Warnings about extremely high values.

The validation process in the GLOBAL-PPS program

FEEDBACK

The software is designed to produce an automated feedback for each participating hospital. We anticipate sending data back in a simple, easy to use feedback, with own data ready to use for local presentations. The feedback compares hospital data to i] National (if N≥3 institutions) and ii] Continental results.

Feedback reports can only be produced after the data entry/validation time-window has been closed AND only if the hospital data have been validated. This delay is needed in order to produce reliable antimicrobial use rates at country and continental level (at the end of the survey). The feedback report shall include various tables (and charts) on the prevalence of antimicrobial use and resistance.

In case of questions or difficulties:
contact Ann Versporten (Global-PPS@uantwerpen.be)

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Global Point Prevalence Survey (PPS)

(GLOBAL-PPS)

Note: The aim of this GLOBAL-PPS is to find out what the physicians intend treating and not to base the diagnosis on any case definitions. To obtain this information the primary source should be looking at all [medical, nursing and drug prescription chart] patient records. If the information available is not sufficient surveyor/s may request additional information from nurses, pharmacists or doctors caring for the patient. Searching for information from other sources such a laboratory computer systems, phoning laboratories *etc.,* is not required. **At no point shall there be any discussion about the appropriateness (or lack thereof) of the prescribed medication. The ward staff MUST NOT feel evaluated at the individual level**.

Include in the survey: All patients who are receiving anti-infective agents (ATC codes: J01, J02, A07AA, P01AB, D01BA, J04A, J05AH and P01B) and who are in the hospital at 8:00 am on the day of survey should be included in the study.

Prophylaxis: Include any patient who received one or more doses of anti-infective agents intended as surgical prophylaxis in the 24 h prior to 8:00 am on the day of the survey. Checking for any doses administered on the previous day/s will allow the surveyor to code the surgical prophylaxis as either 1 dose, 1 day (multiple doses within 24 hours) or >24hours.

Diagnosis Group: This information is obtained from Appendix II. The conditions are grouped by anatomical site and whether the indication (treatment intent) is prophylaxis or therapeutic.

Global Point Prevalence Survey (GLOBAL-PPS)

Ward Form

Please fill in one form for each ward included in the PPS

Date of survey (dd/mm/year)	_____/_____/_____		
Person completing form (Auditor code)			
Hospital			
Ward Name			
Department Type: Place a tick against the type of department	**Paediatric departments:** ☐ **PMW** (Paediatric Medical Ward) ☐ **HO-PMW** (Haematology-Oncology PMW) ☐ **T-PMW** (Transplant (BMT/Solid) PMW) ☐ **PSW** (Paediatric Surgical Ward) ☐ **PICU** (Paediatric Intensive Care Unit) **Neonatal departments:** ☐ **NMW** (Neonatal Medical Ward) ☐ **NICU** (Neonatal Intensive Care Unit)	**Adult departments:** ☐ **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)	
Mixed Department	☐ **Yes**	☐ **No**	
Activity: Tick as appropriate. In case of mixed departments, tick all the encountered specialities	☐ **Medicine**	☐ **Surgery**	☐ **Intensive Care**
Total number of eligible patients on the ward present at 8.00 am on day of PPS by specialty. In case of mixed department, fill the total number of patients corresponding to each of the encountered specialities.			
Total number of beds on the ward present at 8:00 am on day of PPS by speciality. For mixed departments fill in the total number of beds corresponding to each of the encountered specialities.			

Include only inpatients admitted before 08:00 hours on the day of the PPS.

GLOBAL-PPS PATIENT Form (Please fill in one form per patient on antimicrobial treatment/prophylaxis)

Ward Name/code	Activity [i] (M, S, IC)	Patient Identifier [ii]	Survey Number [iii]	Patient Age [iv]			Weight In kg, 2 decimals	Gender M or F
				Years (if ≥ 2 years)	Months (1-23 month)	Days (if <1 month)		

Antimicrobial Name [v]		1.		2.		3.		4.		5.	
Single Unit Dose [vi]	**Unit** (g, mg, or IU) [vii]										
Doses/ day [viii]	**Route** (P, O, R, I) [ix]										
Diagnosis [x] (see appendix II)											
Type of indication [xi] (see appendix III)											
Reason in Notes (Yes or No) [xii]											
Guideline Compliance (Y, N, NA, NI) [xiii]											
Is a stop/review date documented? (Yes/No)											
Treatment (E: Empirical; T: Targeted)											
Treatment based on biomarker data (Yes or No) [xiv]											
If yes, on which biomarker [xv] (fill in: CRP, PCT or other)											
The next section is to be filled in only if the treatment choice is based on microbiology data (Treatment=targeted) AND the organism is one of the following											
MRSA (Yes or No) [xvi]											
MRCoNS (Yes or No) [xvii]											
VRE (Yes or No) [xviii]											
ESBL-producing Enterobacteriaceae (Yes or No) [xix]											
3rd generation cephalosporin resistant Enterobacteriaceae non-ESBL producing or ESBL status unknown (Yes or No)											
Carbapenem-resistant Enterobacteriaceae (Yes or No) [xx]											
ESBL-producing non fermenter Gram-negative bacilli (Yes or No) [xxi]											
Carbapenem-resistant non fermenter Gram-negative bacilli (Yes or No) [xxii]											
Targeted treatment against other MDR organisms (Yes or No) [xxiii]											

[i] M: medicine (including Psychiatric cases, *etc.*), S: surgery (including orthopaedics, obstetrics and gynaecology, *etc.*), IC: intensive care

[ii] - A unique patient identifier that allows linkage to patient records at local level for more detailed audit. This unique identifier will not be included in the online database.

[iii] A unique non-identifiable number given by WebPPS for each patient entered in the database. Leave blank but note down the number after the patient data has been recorded in the online database. The number is displayed once (and only) after the patient data has been recorded in the online database.

[iv] If the patient is 2 years old or older, specify only the number of years, if between 1 and 23 months specify only the number of months, if less than 1 month specify the number of days.

[V] Insert generic name.

[vi] Numeric value for dose per administration in grams, milligrams or IU.

[vii] The unit for the dose (g, mg or IU)

[viii] if necessary provide fractions of doses: (e.g., every 16h = 1.5 doses per day, every 36h = 0.67 doses per day, every 48h = 0.5 doses per day)

[ix] Routes of administration are: Parenteral (P), Oral (O), Rectal (R), Inhalation (I).

[x] See diagnoses groups list (Appendix II)

[xi] See Indication codes (Appendix III)

[xii] A diagnosis / indication for treatment is recorded in the patient's documentation (treatment chart, notes, etc.) at the start of antibiotic treatment (Yes or No)

[xiii] Antibiotic choice (not route, dose, duration etc) in compliance with local guidelines (Y: Yes; N: No; NA: Not assessable because no local guidelines for the specific indication; NI: no information because indication is unknown)

[xiv] Treatment based on biomarker(Yes/No)

[xv] If treatment based on biomarker, specify which one: CRP (C-reactive protein), PCT (Procalcitonin) or Other (=lab-based culture and sensitivity result from a relevant clinical sample)

[xvi] Methicillin-resistant *Staphylococcus aureus* (MRSA)

[xvii] Methicillin-resistant coagulase negative staphylococci (MRCoNS)

[xviii] Vancomycin-resistant enterococci (VRE)

[xix] Bacteria, producing extended-spectrum beta-lactamases (ESBL)

[xx] Carbapenem-resistant *Enterobacteriaceae* (CRE) – enteric bacteria resistant to imipenem, meropenem or other carbapenems

[xxi] Nonfermenters: *Pseudomonas aeruginosa, Acinetobacter baumannii, Burkholderia spp., Stenotrophomonas maltophilia* [xxii] Carbapenem-resistant Nonfermenters (CR-NF) – nonfermenters resistant to imipenem, meropenem or other carbapenems

[xxiii] Multi-drug resistant (MDR) pathogens, others than the listed above.

Appendix I: Combination anti-infective agents

Combinations of an antibiotic and an enzyme inhibitor:

Ampicillin and enzyme inhibitor: report only ampicillin dose (J01CR01)
Amoxicillin and enzyme inhibitor: report only amoxicillin dose (J01CR02)
Ticarcillin and enzyme inhibitor: report only ticarcillin dose (J01CR03)
Piperacillin and enzyme inhibitor: report only piperacillin dose (J01CR05)
Imipenem and enzyme inhibitor: report only imipenem dose (J01DH51)
Panipenem and betamipron: report only panipenem (J01DH55)

Example:
Augmentin® 1.2g IV → 1g (amoxicillin) + 200mg (clavulanic acid), report only 1000mg

Other combinations of multiple antimicrobial substances:

J01EE01 Sulfamethoxazole and Trimethoprim: report the total amount of sulfamethoxazole and trimethoprim
Example:
Co-trimoxazole 960mg: (sulfamethoxazole. 800mg + trimethoprim 160mg), report 960mg

Further information on agents included for the Global-PPS is available in the antimicrobial list. Only antimicrobial substance name need to be written down, NOT the ATC codes!
(excel file - available at website under documents: Global-PPS_antimicrobial_list.xlsx)
http://www.global-pps.com/

Appendix II - Diagnostic codes (what the clinician aims at treating)

Site	Codes	Examples
CNS	**Proph CNS**	Prophylaxis for CNS (neurosurgery, meningococcal)
	CNS	Infections of the **C**entral **N**ervous **S**ystem
EYE	**Proph EYE**	Prophylaxis for Eye operations
	EYE	Therapy for Eye infections e.g., Endophthalmitis
ENT	**Proph ENT**	Prophylaxis for **E**ar, **N**ose, **T**hroat (**Surgical or Medical prophylaxis=SP/MP**)
	ENT	Therapy for **E**ar, **N**ose, **T**hroat infections including mouth, sinuses, larynx
RESP	**Proph RESP**	Pulmonary surgery, prophylaxis for **Resp**iratory pathogens
	LUNG	Lung abscess including aspergilloma
	URTI	**U**pper **R**espiratory **T**ract viral **I**nfections including influenza but not ENT
	Bron	Acute **Bron**chitis or exacerbations of chronic bronchitis
	Pneu	**Pneu**monia or LRTI (lower respiratory tract infections)
	TB	Pulmonary TB (Tuberculosis)
CVS	**Proph CVS**	**C**ardiac or **V**ascular Surgery, endocarditis prophylaxis
	CVS	**C**ardio**V**ascular **S**ystem infections: endocarditis, endovascular prosthesis or device e.g pacemaker, vascular graft
GI	**Proph GI**	Surgery of the **G**astro-**I**ntestinal tract, liver or biliary tree, GI prophylaxis in neutropaenic patients or hepatic failure
	GI	GI infections (salmonellosis, *Campylobacter*, parasitic, *C.difficile*, etc.)
	IA	**I**ntra-**A**bdominal sepsis including hepatobiliary, intra-abdominal abscess *etc*.
SSTBJ	**Proph BJ**	Prophylaxis for plastic or orthopaedic surgery (**B**one or **J**oint)
	SST	**S**kin and **S**oft Tissue: Cellulitis, wound including surgical site infection, deep soft tissue not involving bone e.g., infected pressure or diabetic ulcer, abscess
	BJ	**B**one/**J**oint Infections: Septic arthritis (including prosthetic joint), osteomyelitis
UTI	**Proph UTI**	Prophylaxis for urological surgery **(SP)** or recurrent **U**rinary **T**ract **I**nfection **(MP)**
	Cys	Lower UTI
	Pye	Upper UTI including catheter related urinary tract infection, pyelonephritis
GUOB	**Proph OBGY**	Prophylaxis for **OB**stetric or **GY**naecological surgery
	OBGY	**Ob**stetric/**Gy**naecological infections, **S**exual **T**ransmitted **D**iseases (**STD**) in women
	GUM	**G**enito-**U**rinary **M**ales + Prostatitis, epididymo-orchitis, STD in men
No defined site (NDS)	**BAC**	Bacteraemia with no clear anatomic site and no shock
	SEPSIS	Sepsis, sepsis syndrome or septic shock with no clear anatomic site
	Malaria	
	PUO	**P**yrexia of **U**nknown **O**rigin - Fever syndrome with no identified source or site of infection
	PUO-HO	Fever syndrome in the non-neutropaenic **H**aematology–**O**ncolgy patient with no identified source of pathogen
	FN	**F**ever in the **N**eutropaenic patient
	LYMPH	Infection of the **lymph**atics as the primary source of infection e.g.suppurative lymphadenitis
	Other	Antibiotic prescribed with documentation for which there is no above diagnosis group
	MP-GEN	Drug is used as **M**edical **P**rophylaxis in **gen**eral, without targeting a specific site, e.g. antifungal prophylaxis during imuunosuppression
	UNK	Completely **Unk**nown Indication
	PROK	Antimicrobial (e.g. erythromycin) prescribed for **Prok**inetic use
Neonatal	**MP-MAT**	Drug is used as **M**edical **P**rophylaxis for **MAT**ERNAL risk factors e.g. maternal prolonged rupture of membranes
	NEO-MP	Drug is used as **M**edical **P**rophylaxis for **NE**WBORN risk factors e.g. VLBW (Very Low Birth Weight) and IUGR (Intrauterine Growth Restriction)

APPENDIX III - Type of Indication

<table>
<tr><td><u>CAI</u> Community acquired infection</td><td colspan="3">Symptoms started <48 hours from admission to hospital (or present on admission).</td></tr>
<tr><td rowspan="6"><u>HAI</u> Healthcare-Associated Infection
➢ Symptoms start 48 hours after admission to hospital</td><td colspan="3"><u>HAI1</u> Post-operative surgical site infection (within: 30 days of surgery OR; 1 year after implant surgery)</td></tr>
<tr><td colspan="3"><u>HAI2</u> Intervention related infections including CR-BSI, VAP and C-UTI</td></tr>
<tr><td colspan="3"><u>HAI3</u> C. difficile associated diarrhoea (CDAD) (>48 h post-admission or <30 days after discharge from previous admission episode.</td></tr>
<tr><td colspan="3"><u>HAI4</u> Other hospital acquired infection (includes HAP, etc)</td></tr>
<tr><td colspan="3"><u>HAI5</u> Infection present on admission from another hospital</td></tr>
<tr><td colspan="3"><u>HAI6</u> Infection present on admission from long-term care facility (LTCF) or Nursing Home*.</td></tr>
<tr><td><u>SP</u> Surgical prophylaxis</td><td><u>SP1</u> Single dose</td><td><u>SP2</u> one day</td><td><u>SP3</u> >1 day</td></tr>
<tr><td colspan="4">For surgical patients, administration of prophylactic antimicrobials should be checked in the previous 24 hours in order to encode the duration of prophylaxis as either one dose, one day (= multiple doses given within 24 hours) or >1 day.</td></tr>
<tr><td><u>MP</u> Medical prophylaxis</td><td colspan="3">For example long term use to prevent UTI’s or use of antifungals in patients undergoing chemotherapy or penicillin in asplenic patients etc.</td></tr>
<tr><td><u>OTH</u> Other</td><td colspan="3">For example erythromycin as a motility agent (motilin agonist).</td></tr>
<tr><td><u>UNK</u></td><td colspan="3">Completely unknown indication</td></tr>
</table>

Select 1 possibility for each reported antimicrobial

CR-BSI= Catheter related-Blood Stream Infection
C-UTI= Catheter related-Urinary Tract Infection
HAP=Hospital Acquired Pneumonia
VAP=Ventilator Associated Pneumonia
* Long-term care facilities represent a heterogeneous group of healthcare facilities, with care ranging from social to medical care. These are places of collective living where care and accommodation is provided as a package by a public-agency, non-profit or private company (e.g. nursing homes, residential homes).