

# THE LANCET

## Global Health

### **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: Hsia Y, Lee BR, Versporten A, et al. Use of the WHO Access, Watch, and Reserve classification to define patterns of hospital antibiotic use (AWaRe): an analysis of paediatric survey data from 56 countries. *Lancet Glob Health* 2019; **7**: e861–71.

**Supplementary Table 1. Diagnosis mapping: Global-PPS and GARPEC PPS data**

<b>Global-PPS diagnosis</b>	<b>Mapping to GARPEC diagnosis</b>
Acute Bronchitis or exacerbations of chronic bronchitis	Proven or probable Viral LRTI
Antibiotic prescribed with documentation for which there is no above diagnosis group	Other
Antimicrobial (e.g. erythromycin) prescribed for Prokinetic use	Other
Bone/Joint Infections: Septic arthritis (including prosthetic joint), osteomyelitis	Joint/Bone Infections
Cardiac or Vascular Surgery, endocarditis prophylaxis	Prophylaxis for Surgical disease
CardioVascular System infections: endocarditis, endovascular prosthesis or device e.g pacemaker, vascular graft	Cardiac Infections
Completely Unknown Indication	Unknown
Drug is used as Medical Prophylaxis for MATERNAL risk factors e.g. maternal prolonged rupture of membranes	Newborn Prophylaxis for Maternal Risk Factors
Drug is used as Medical Prophylaxis for NEWBORN risk factors e.g. VLBW (Very Low Birth Weight) and IUGR (Intrauterine Growth Restriction)	Newborn Prophylaxis for Newborn Risk Factors
Drug is used as Medical Prophylaxis in general, without targeting a specific site, e.g. antifungal prophylaxis during immunosuppression	Prophylaxis for Medical problems
Fever in the Neutropaenic patient	Febrile neutropenia/Fever
Fever syndrome in the non-neutropaenic Haematology, Oncology patient with no identified source of pathogen	Febrile neutropenia/Fever
GI infections (salmonellosis, Campylobacter, parasitic, C.difficile, etc.)	GI tract infections
Genito-Urinary Males + Prostatitis, epididymo-orchitis, STD in men	Other
Infection of the lymphatics as the primary source of infection e.g. suppurative lymphadenitis	Lymphadenitis
Infections of the Central Nervous System	Central Nervous System infections
Intra-abdominal sepsis including hepatobiliary, intra-abdominal abscess etc.	Treatment for Surgical disease
Lower UTI	Urinary Tract Infections
Lung abscess including aspergilloma	Other
Obstetric/Gynaecological infections, Sexual Transmitted Diseases (STD) in women	Other
Pneumonia or LRTI (lower respiratory tract infections)	Proven or probable Bacterial LRTI
Prophylaxis for CNS (neurosurgery, meningococcal)	Prophylaxis for Medical problems
Prophylaxis for Ear, Nose, Throat (Surgical or Medical prophylaxis=SP/MP)	Prophylaxis for Medical problems
Prophylaxis for Obstetric or Gynaecological surgery	Prophylaxis for Surgical disease
Prophylaxis for eye operations	Prophylaxis for Surgical disease
Prophylaxis for plastic or orthopaedic surgery (Bone or Joint)	Prophylaxis for Surgical disease
Prophylaxis for urological surgery (SP) or recurrent Urinary Tract Infection (MP)	Prophylaxis for Surgical disease
Pulmonary TB (Tuberculosis)	Tuberculosis
Pulmonary surgery, prophylaxis for Respiratory pathogens	Prophylaxis for Surgical disease
Pyrexia of Unknown Origin - Fever syndrome with no identified source or site of infection	Pyrexia of Unknown Origin
Sepsis, sepsis syndrome or septic shock with no clear anatomic site	Sepsis
Skin and Soft Tissue: Cellulitis, wound including surgical site infection, deep soft tissue not involving bone e.g., infected pressure or diabetic ulcer, abscess	Skin/Soft Tissue Infections
Surgery of the Gastro-Intestinal tract, liver or biliary tree, GI prophylaxis in neutropaenic patients or hepatic failure	Prophylaxis for Surgical disease
Therapy for Ear, Nose, Throat infections including mouth, sinuses, larynx	Otitis media
Upper Respiratory Tract viral Infections including influenza but not ENT	Upper Respiratory Infections
Upper UTI including catheter related urinary tract infection, pyelonephritis	Urinary Tract Infections
Bacteraemia with no clear anatomical site	Sepsis
Endophthalmitis	Other

**Supplementary Table 2. WHO-EMLc: Access, Watch, and Reserve antibiotics**

<b>Core Access antibiotics</b>	<b>ATC code</b>
Amoxicillin	J01CA04
Amoxicillin and clavulanic acid	J01CR02
Ampicillin	J01CA01
Benzathine benzylpenicillin	J01CE08
Benzylpenicillin	J01CE01
Cefalexin	J01DB01
Cefazolin	J01DB04
Chloramphenicol	J01BA01
Clindamycin	J01FF01
Cloxacillin	J01CF01
Doxycycline	J01AA02
Gentamicin	J01GB03
Amikacin	J01GB06
Metronidazole	J01XD01
Nitrofurantoin	J01XE01
Phenoxymethylpenicillin	J01CE02
Procaine benzylpenicillin	J01CE09
Spectinomycin	J01XX04
Sulfamethoxazole and trimethoprim	J01EE01
<b>Watch antibiotics</b>	<b>ATC code</b>
<i>Anti-pseudomonal penicillins with beta-lactamase inhibitor</i>	
Piperacillin and tazobactam	J01CR05
<i>Carbapenems or penems</i>	
Faropenem	J01DI03
Imipenem and cilastatin	J01DH51
Meropenem	J01DH02
<i>3<sup>rd</sup> generation cephalosporins (with or without beta-lactamase inhibitor)</i>	
Cefixime	J01DD08
Cefotaxime	J01DD01
Ceftazidime	J01DD02
Ceftriaxone	J01DD04
<i>Glycopeptides</i>	
Teicoplanin	J01XA02
Vancomycin	J01XA01
<i>Macrolides</i>	
Azithromycin	J01FA10
Clarithromycin	J01FA09
Erythromycin	J01FA01
<i>Quinolones and fluoroquinolones</i>	
Ciprofloxacin	J01MA02
Levofloxacin	J01MA12
<b>Reserve antibiotics</b>	<b>ATC code</b>
Aztreonam	J01DF01
4 <sup>th</sup> generation cephalosporins: Cefepime	J01DE01
5 <sup>th</sup> generation cephalosporins: Ceftaroline	J01DI02
Oxazolidinones: Linezolid	J01XX08
Daptomycin	J01XX09
Fosfomycin	J01XX01
Polymyxins: Colistin	J01XB01
Polymyxin B	J01XB02
Tigecycline	J01AA12

Abbreviation: EMLc: Essential Medicine List for Children.

**Supplementary Table 3. Description of participating countries by income\***

Country	WHO-region	OECD member	GARPEC PPS	
			Total no. hospitals	Total no. prescriptions <sup>†</sup>
<b>High-income countries</b>				
Australia	Western Pacific	Yes	4	423
Finland	Europe	Yes	1	256
Greece	Europe	Yes	5	506
Germany	Europe	Yes	5	624
Israel	Europe	Yes	1	30
Italy	Europe	Yes	4	851
Japan	Western Pacific	Yes	1	303
Poland	Europe	Yes	2	14
Singapore	Western Pacific	No	1	89
Slovenia	Europe	Yes	1	189
Spain	Europe	Yes	2	316
Taiwan	Western Pacific	No	1	53
UK	Europe	Yes	12	2,277
USA	Americas	Yes	31	19340
<b>Upper-middle income countries</b>				
Argentina	Americas	No	1	83
Brazil	Americas	No	7	1133
China	Western Pacific	No	18	3788
South Africa	Africa	No	2	606
Thailand	SEA	No	2	506
Turkey	Europe	Yes	1	24
<b>Lower-middle income countries</b>				
India	SEA	No	10	1000
Nigeria	Africa	No	2	156
Pakistan	Eastern Mediterranean	No	1	213
<b>Low-income country</b>				
Gambia	Africa	No	1	22
Country	WHO-region	OECD member	Global-PPS	
			Total no. hospitals	Total no. prescriptions <sup>†</sup>
<b>High-income countries</b>				
Australia	Western Pacific	Yes	3	93
Bahrain	Eastern Mediterranean	No	1	104
Belgium	Europe	Yes	60	473
Canada	Americas	Yes	7	93
Chile	Americas	Yes	3	123
Croatia	Europe	No	3	14
Finland	Europe	Yes	1	10
France	Europe	Yes	1	4

Greece	Europe	Yes	1	119
Germany	Europe	Yes	2	95
Ireland	Europe	Yes	2	58
Italy	Europe	Yes	2	88
Japan	Western Pacific	Yes	13	287
South Korea	Western Pacific	Yes	1	11
Latvia	Europe	Yes	2	148
Lithuania	Europe	Yes	1	82
Malta	Europe	No	1	25
Netherlands	Europe	Yes	1	3
New Zealand	Western Pacific	Yes	1	3
Saudi Arabia	Eastern Mediterranean	No	1	162
Singapore	Western Pacific	No	2	49
Slovenia	Europe	Yes	1	70
Spain	Europe	Yes	1	18
Switzerland	Europe	Yes	1	25
UK	Europe	Yes	14	595
USA	Americas	Yes	10	241
<b>Upper-middle income countries</b>				
Albania	Europe	No	6	265
Argentina	Americas	No	4	41
Bosnia and Herzegovina	Europe	No	2	94
Brazil	Americas	No	1	40
China	Western Pacific	No	1	62
Costa Rica	Americas	No	2	14
Guinea	Africa	No	1	63
Georgia	Europe	No	3	66
Jordan	Eastern Mediterranean	No	2	22
Iran	Eastern Mediterranean	No	3	282
Iraq	Eastern Mediterranean	No	3	232
FYROM (Macedonia)	Europe	No	4	178
Mexico	Americas	No	1	693
Montenegro	Europe	No	5	98
Russian Federation	Europe	No	5	325
Serbia	Europe	No	4	210
South Africa	Africa	No	1	179
<b>Lower-middle income countries</b>				
Armenia	Europe	No	2	114
Ghana	Africa	No	1	71
Kosovo <sup>‡</sup>	Europe	No	6	190
Kyrgyzstan	Europe	No	2	298
Nigeria	Africa	No	4	288

Abbreviations: SEA, South-East Asia; OECD, the Organisation for Economic Cooperation and Development. \* World Bank Country and Leading groups (<https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>). <sup>†</sup> Total number of antibiotic prescriptions under WHO ATC code: J01. <sup>‡</sup>Kosovo (in accordance with UN Security Council resolution 1244 [1999])