Table 7.2. Specimens, pathogens, and antimicrobial drugs selected for the global surveillance of AMR

Specimen	Laboratory case definition	Pathogens under surveillance	Antimicrobial group (ATC)	Antimicrobials to report to GLASS if tested [a]
Blood	Isolation of pathogen from blood [b]	*Acinetobacter* spp.	Tetracyclines	Tigecycline, minocycline
			Aminoglycosides	Gentamicin, amikacin
			Carbapenems [c]	Imipenem, meropenem, doripenem
			Polymyxins	Colistin
		E. coli and *K. pneumoniae*	Sulfonamides and trimethoprim	Co-trimoxazole
			Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Fourth-generation cephalosporins	Cefepime
			Carbapenems [c]	Imipenem, meropenem, ertapenem, doripenem
			Polymyxins	Colistin
		P. aeruginosa	Third-generation cephalosporins	Ceftazidime
			Combinations of penicillins, including beta-lactamase inhibitors	Piperacillin/tazobactam
			Aminoglycosides	Gentamicin, amikacin, tobramycin
			Carbapenems [c]	Imipenem, meropenem, doripenem
			Polymyxins	Colistin
		S. aureus	Beta-lactamase resistant penicillins	Oxacillin
			Second-generation cephalosporins	Cefoxitin [d]
		S. pneumoniae	Beta-lactamase sensitive penicillins	Penicillin G
			Beta-lactamase resistant penicillins	Oxacillin [e]
			Third-generation cephalosporins	Ceftriaxone, cefotaxime
			Sulfonamides and trimethoprim	Co-trimoxazole
			Macrolides	Erythromycin

Specimen	Laboratory case definition	Pathogens under surveillance	Antimicrobial group (ATC)	Antimicrobials to report to GLASS if tested [a]
		Salmonella spp.[f]	Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Carbapenems [c]	Imipenem, meropenem, ertapenem, doripenem
		Salmonella enterica serovar Typhi and *Salmonella enterica* serovar Paratyphi A	Amphenicols	Chloramphenicol
			Penicillins with extended spectrum	Ampicillin
			Sulfonamides and trimethoprim	Co-trimoxazole
			Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Macrolides	Azithromycin
CSF	Isolation of pathogen from cerebrospinal fluid	*S. pneumoniae*	Beta-lactamase sensitive penicillins	Penicillin G
			Beta-lactamase resistant penicillins	Oxacillin e
			Third-generation cephalosporins	Ceftriaxone, cefotaxime
			Sulfonamides and trimethoprim	Co-trimoxazole
		N. meningitidis	Beta-lactamase sensitive penicillins	Penicillin G
			Rifamycins	Rifampicin
			Fluoroquinolones	Ciprofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime
		H. influenzae	Penicillins with extended spectrum	Ampicillin
			Combinations of penicillins, including beta-lactamase inhibitors	Amoxicillin-clavulanic acid
			Third-generation cephalosporins	Ceftriaxone, cefotaxime
			Sulfonamides and trimethoprim	Co-trimoxazole
Urine	Significant growth in urine specimen [g]	*E. coli* and *K. pneumoniae*	Nitrofuran derivatives	Nitrofurantoin (for *E. coli*)
			Penicillins with extended spectrum	Mecillinam
			Sulfonamides and trimethoprim	Co-trimoxazole
			Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Fourth-generation cephalosporins	Cefepime
			Carbapenems [c]	Imipenem, meropenem, ertapenem, doripenem
			Polymyxins	Colistin

Specimen	Laboratory case definition	Pathogens under surveillance	Antimicrobial group (ATC)	Antimicrobials to report to GLASS if tested [a]
Stool	Isolation of *Salmonella* spp.[h] or *Shigella* spp. from stool	*Salmonella* spp.	Sulfonamides and trimethoprim	Co-trimoxazole
			Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Carbapenems [c]	Imipenem, meropenem, ertapenem, doripenem
		Shigella spp.	Sulfonamides and trimethoprim	Co-trimoxazole
			Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Macrolides	Azithromycin
Lower respiratory tract	Significant growth in representative sputum samples or in material obtained from lower respiratory tract by the procedures listed in Section 7.1.1.5	*S. pneumoniae*	Beta-lactamase sensitive penicillins	Penicillin G
			Beta-lactamase resistant penicillins	Oxacilline
			Third-generation cephalosporins	Ceftriaxone, cefotaxime
			Sulfonamides and trimethoprim	Co-trimoxazole
		H. influenzae	Penicillins with extended spectrum	Ampicillin
			Combinations of penicillins, including beta-lactamase inhibitors	Amoxicillin-clavulanic acid
			Third-generation cephalosporins	Ceftriaxone, cefotaxime
			Fluoroquinolones	Ciprofloxacin, levofloxacin
			Sulfonamides and trimethoprim	Co-trimoxazole
		S. aureus	Beta-lactamase resistant penicillins	Oxacillin
			Second-generation cephalosporins	Cefoxitin [d]
		Acinetobacter spp.	Tetracyclines	Tigecycline, minocycline
			Aminoglycosides	Gentamicin, amikacin
			Carbapenems [c]	Imipenem, meropenem, doripenem
			Polymyxins	Colistin

Specimen	Laboratory case definition	Pathogens under surveillance	Antimicrobial group (ATC)	Antimicrobials to report to GLASS if tested [a]
		E. coli and *K. pneumoniae*	Sulfonamides and trimethoprim	Co-trimoxazole
			Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Fourth-generation cephalosporins	Cefepime
			Carbapenems [c]	Imipenem, meropenem, ertapenem, doripenem
			Polymyxins	Colistin
		P. aeruginosa	Third-generation cephalosporins	Ceftazidime
			Combinations of penicillins, including beta-lactamase inhibitors	Piperacillin/tazobactam
			Aminoglycosides	Gentamicin, amikacin, tobramycin
			Carbapenems [c]	Imipenem, meropenem, doripenem
			Polymyxins	Colistin
Urethral, cervical, rectal, pharyngeal swabs	Isolation of *Neisseria gonorrhoeae*	*N. gonorrhoeae*	Third-generation cephalosporins	Ceftriaxone, cefixime
			Macrolides	Azithromycin
			Aminocyclitol	Spectinomycin
			Fluoroquinolones	Ciprofloxacin
			Aminoglycosides	Gentamicin

[a] The listed substances are priorities for the surveillance of resistance in each pathogen, although they may not be first-line options for treatment. One or more of the drugs listed may be tested. AST results and numerator and denominator data for each drug will be reported separately

[b] Any pathogen isolated from a blood culture may be significant for local and national surveillance; only the pathogens selected for global surveillance are listed here

[c] Imipenem or meropenem is preferred to represent the group when available.

[d] Recommended for the detection of methicillin resistance in *S. aureus* when using disk diffusion testing.

[e] Oxacillin disk testing is a screening for reduced susceptibility or resistance to penicillin.

[f] Not serovar Typhi or Paratyphi A.

[g] Urinary catheter samples should be excluded if possible.

[h] Discriminate between serovar Typhi or Paratyphi A whenever possible. Data collected and included in the official GLASS report when available.