

**Table S1.** Priority specimens and pathogens for surveillance of AMR<sup>1</sup> according to GLASS<sup>2</sup> criteria for Nepal

Specimen	Priority pathogens for surveillance
	<i>Escherichia coli</i>
Blood	<i>Klebsiella pneumoniae</i> <i>Acinetobacter baumannii</i> <i>Staphylococcus aureus</i> <i>Streptococcus pneumoniae</i> <i>Salmonella</i> spp. <sup>3</sup>
Urine	<i>Escherichia coli</i> <i>Klebsiella pneumoniae</i>
Stool	<i>Salmonella</i> spp. <i>Shigella</i> spp.
Genital swabs	<i>Neisseria gonorrhoeae</i>

<sup>1</sup>AMR, antimicrobial resistance; <sup>2</sup>GLASS, Global Antimicrobial Resistance Surveillance System; <sup>3</sup>spp., species

**Table S2.** Pathogen–antibacterial combinations on which GLASS<sup>1</sup> gathers data

Pathogen	Antibacterial agents that may be used for AST <sup>2</sup>
<i>Escherichia coli</i>	Ampicillin Co-trimoxazole Ciprofloxacin or levofloxacin Ceftriaxone or cefotaxime and ceftazidime Cefepime Imipenem, meropenem, ertapenem, or doripenem Colistin
<i>Klebsiella pneumoniae</i>	Co-trimoxazole Ciprofloxacin or levofloxacin Ceftriaxone or cefotaxime and ceftazidime, Cefepime Imipenem, meropenem, ertapenem, or doripenem Colistin
<i>Acinetobacter</i> spp. <sup>3</sup>	Tigecycline or minocycline Gentamicin and amikacin Imipenem, meropenem, or doripenem Colistin
<i>Streptococcus pneumoniae</i>	Penicillin G Co-trimoxazole Ceftriaxone or cefotaxime Ciprofloxacin or Levofloxacin
<i>Salmonella</i> spp. <sup>3</sup>	Ceftriaxone or Cefotaxime and Ceftazidime Imipenem, Meropenem, Ertapenem, or Doripenem
<i>Shigella</i> spp. <sup>3</sup>	Ciprofloxacin or levofloxacin Ceftriaxone or cefotaxime and ceftazidime Azithromycin
<i>Neisseria gonorrhoeae</i>	Cefixime Ceftriaxone Azithromycin Spectinomycin Ciprofloxacin Gentamicin

<sup>1</sup>GLASS, Global Antimicrobial Resistance Surveillance System; <sup>2</sup>AST: antibiotic susceptibility test- ing; <sup>3</sup>spp., species

**Table S3.** Operational definitions

Terminology	Operational definition
AMR data	AMR data is defined as the detailed identification and antibiotic susceptibility report along with unique identifiers, specimen, origin, date of sampling and demographic data from surveillance sites' microbiology laboratory records.
Deadline for report submission to NPHL	For a particular month, the deadline for submission of surveillance reports by the surveillance site to NPHL is the last working day of the following month.
Timeliness of report submission	Report of AMR surveillance, for a particular month, received within deadline for submission, i.e., last working day of the following month.
Specimen-pathogen combination	Combination of priority specimens (namely, blood, urine, stool, or genital swabs) with priority pathogens according to the GLASS. The valid combinations of specimen-pathogen as per GLASS are provided in Table S1.
Pathogen-antibacterial combination	Combination of eight priority pathogens and the relevant listed antibiotics according to the GLASS. The valid combinations of pathogen-antimicrobial as per GLASS are provided in Table S2.
Completeness of data	Completeness signifies no missing variables required according to GLASS criteria: age, sex, pathogen, origin, specimen, antibiotic susceptibility results and date of specimen collection.
Non-reporting sites	The surveillance sites that have not sent any AMR laboratory data to NPHL for 90 consecutive days will be defined as "non-reporting" sites.
Basic infrastructure	The definition of basic infrastructure is the basic facilities and equipment required by the AMR surveillance site to send the AMR reports to NPHL.
Specific requirements	Includes the specific requirements such as qualification of data entry person, trainings received on AMR surveillance, data management, WHONET, and Agreement with NPHL/TOR, institutional restrictions on data sharing (other than the basic infrastructure) to send the AMR reports regularly to NPHL.

Abbreviations: AMR: Antimicrobial resistance, GLASS: Global Antimicrobial Surveillance and Use System, NPHL: National Public Health Laboratory

**Table S4.** Consistency in pathogen-antibacterial combination of AMR surveillance data according to GLASS from five AMR surveillance sites in Bagmati Province of Nepal during July-December 2022 compared to January-June 2019<sup>1</sup>

Pathogens	First OR study			Second OR study			p-value <sup>2</sup>
	January-June 2019		July-December 2022				
	Total records examined N	Consistent records n (%)	Total records examined N	Consistent records n (%)			
<b>Overall</b>							
<i>Escherichia coli</i>	1020	641 (63)	2571	2147 (84)	<0.001		
<i>Klebsiella pneumoniae</i>	242	127 (52)	565	435 (77)	<0.001		
<i>Acinetobacter baumannii</i>	64	17 (27)	173	173 (100)	<0.001		
<i>Staphylococcus aureus</i>	168	73 (43)	60	44 (73)	<0.001		
<i>Streptococcus pneumoniae</i>	1	0 (0)	8	2 (25)	NA		
<i>Salmonella species</i>	251	153 (61)	183	179 (98)	<0.001		
<i>Shigella species</i>	103	12 (12)	2	2 (100)	0.0003		
<i>Neisseria gonorrhoeae</i>	4	0 (0)	5	4 (80)	0.0020		
<b>Site A</b>							
<i>Escherichia coli</i>	354	172 (49)	361	315 (87)	<0.001		
<i>Klebsiella pneumoniae</i>	31	15 (48)	44	38 (86)	0.0004		
<i>Acinetobacter baumannii</i>	4	4 (100)	0	0 NA	NA		
<i>Staphylococcus aureus</i>	4	0 (0)	2	2 (100)	0.01		
<i>Streptococcus pneumoniae</i>	0	NA NA	0	0 NA	NA		
<i>Salmonella species</i>	34	32 (94)	13	11 (85)	0.29		
<i>Shigella species</i>	0	NA NA	0	0 NA	NA		
<i>Neisseria gonorrhoeae</i>	1	0 (0)	0	0 NA	NA		
<b>Site B</b>							
<i>Escherichia coli</i>	220	110 (50)	1134	1017 (90)	<0.001		
<i>Klebsiella pneumoniae</i>	67	37 (55)	261	221 (85)	<0.001		
<i>Acinetobacter baumannii</i>	15	0 (0)	21	21 (100)	<0.001		
<i>Staphylococcus aureus</i>	19	19 (100)	16	16 (100)	NA		
<i>Streptococcus pneumoniae</i>	0	NA NA	8	2 (25)	NA		
<i>Salmonella species</i>	56	55 (98)	152	151 (99)	0.45		
<i>Shigella species</i>	3	0 (0)	1	1 (100)	0.045		
<i>Neisseria gonorrhoeae</i>	1	0 (0)	5	4 (80)	NA		
<b>Site C</b>							
<i>Escherichia coli</i>	218	199 (91)	422	201 (48)	<0.001		
<i>Klebsiella pneumoniae</i>	94	44 (47)	114	35 (31)	0.017		
<i>Acinetobacter baumannii</i>	44	13 (30)	96	96 (100)	<0.001		
<i>Staphylococcus aureus</i>	16	16 (100)	0	0 NA	NA		
<i>Streptococcus pneumoniae</i>	0	NA NA	0	0 NA	NA		
<i>Salmonella species</i>	0	NA NA	0	0 NA	NA		
<i>Shigella species</i>	0	NA NA	0	0 NA	NA		
<i>Neisseria gonorrhoeae</i>	0	NA NA	0	0 NA	NA		
<b>Site D</b>							
<i>Escherichia coli</i>	109	93 (85)	34	15 (44)	<0.001		
<i>Klebsiella pneumoniae</i>	10	7 (70)	5	5 (100)	0.17		
<i>Acinetobacter baumannii</i>	1	0 (0)	4	4 (100)	NA		
<i>Staphylococcus aureus</i>	29	29 (100)	8	8 (100)	NA		

<i>Streptococcus pneumoniae</i>	1	0	(0)	0	0	NA	NA
<i>Salmonella species</i>	66	63	(95)	13	12	(92)	0.63
<i>Shigella species</i>	14	12	(86)	0	0	NA	NA
<i>Neisseria gonorrhoeae</i>	2	0	(0)	0	0	NA	NA
<b>Site E</b>							
<i>Escherichia coli</i>	119	67	(56)	116	114	(98)	<0.001
<i>Klebsiella pneumoniae</i>	40	24	(60)	22	20	(91)	0.01
<i>Acinetobacter baumannii</i>	0	NA	NA	0	0	NA	NA
<i>Staphylococcus aureus</i>	100	9	(9)	4	3	(75)	0.001
<i>Streptococcus pneumoniae</i>	0	0	NA	0	0	NA	NA
<i>Salmonella species</i>	95	3	(3)	1	1	(100)	<0.001
<i>Shigella species</i>	86	0	(0)	1	1	(100)	<0.001
<i>Neisseria gonorrhoeae</i>	0	NA	NA	0	NA	NA	NA
<b>Site F<sup>3</sup></b>							
<i>Escherichia coli</i>	-	-	-	411	400	(97)	NA
<i>Klebsiella pneumoniae</i>	-	-	-	109	106	(97)	NA
<i>Acinetobacter baumannii</i>	-	-	-	47	47	(100)	NA
<i>Staphylococcus aureus</i>	-	-	-	23	12	(52)	NA
<i>Streptococcus pneumoniae</i>	-	-	-	0	NA	NA	NA
<i>Salmonella species</i>	-	-	-	0	NA	NA	NA
<i>Shigella species</i>	-	-	-	0	NA	NA	NA
<i>Neisseria gonorrhoeae</i>	-	-	-	0	NA	NA	NA
<b>Site G<sup>3</sup></b>							
<i>Escherichia coli</i>	-	-	-	93	85	(91)	NA
<i>Klebsiella pneumoniae</i>	-	-	-	10	10	(100)	NA
<i>Acinetobacter baumannii</i>	-	-	-	5	5	(100)	NA
<i>Staphylococcus aureus</i>	-	-	-	7	3	(43)	NA
<i>Streptococcus pneumoniae</i>	-	-	-	0	NA	NA	NA
<i>Salmonella species</i>	-	-	-	4	4	(100)	NA
<i>Shigella species</i>	-	-	-	0	NA	NA	NA
<i>Neisseria gonorrhoeae</i>	-	-	-	0	NA	NA	NA

<sup>1</sup>Data for period January-June 2019 has been published and can be accessed at 10.3390/tropicalmed6020060 (last accessed on 01 Aug 2023)

<sup>2</sup>Two-proportion Z-test

<sup>3</sup>Sites F and G had not submitted any data during January-June 2019

Abbreviations: AMR: Antimicrobial resistance, GLASS: Global Antimicrobial Resistance Surveillance System, NA: Not applicable, OR: Operational Research

Pink Color denotes a decline in consistency; Green Color denotes an improvement in consistency