

**ANTIMICROBIAL RESISTANCE (AMR)
SURVEILLANCE PROGRAMME
Monthly Bulletin
April,2017**



**Ministry of Health
Department of Health Services
National Public Health Laboratory
Teku,Kathmandu**

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This bulletin includes the data generated by the AMR surveillance Network laboratories for the month of April, 2017. It includes the main trend on antibiotic resistance on ten organisms of interest.

The main objective of the bulletin is to summarize and disseminate the findings of monthly report to raise awareness among health practitioners and consumers on rational use of antibiotics.

1: Introduction to AMR surveillance in Nepal

Antimicrobial resistance (AMR) is one of the major challenges faced in public health in this century and a threat to current and future medical advances. AMR problem is more frequent in a developing country like Nepal where indiscriminate, inadequate and inappropriate use of antimicrobials and self-medication are quite common.

AMR surveillance program was first started in 1999 with the financial support of USAID and technical support of ICDDR, B (International Centre for Diarrhoeal Disease Research/ Bangladesh). Since 2004, NPHL, being the national coordinating laboratory, has been conducting this program. Since 2006 this program is being supported by the WHO.

AMR surveillance in Nepal started out with nine laboratories in its initial phase monitoring six pathogens of interest. Currently, 21 hospitals/laboratories are included in AMR programme monitoring ten organisms of interest.

2: List of participating laboratories

Eastern Development Region (3)

1. Mechi Zonal Hospital (since 2012)
2. B. P. Koirala Institute of Health Sciences, Dharan
3. Koshi Zonal Hospital, Biratnagar

Central Development Region (9)

1. Patan Hospital ,Lalitpur
2. Kanti Children's Hospital, Kathmandu
3. Tribhuvan University Teaching Hospital ,Kathmandu
4. Kathmandu Model Hospital , Kathmandu (since 2012)
5. KIST Medical College, Lalitpur (since 2012)
6. Dhulikhel Hospital, Kavre
7. Central Veterinary Lab , Kathmandu (since 2012)
8. Paropakar Maternity & Women's Hospital, Kathmandu (since 2016)
9. Sukraraj Tropical & Infectious Disease Hospital, Kathmandu (since 2016)

Western Development Region (4)

1. Western Regional Hospital, Pokhara
2. Manipal Teaching Hospital,Pokhara
3. Lumbini Zonal Hospital, Butwal
4. United Mission Hospital,Palpa

Mid Western Development Region (2)

1. Mid Western Regional Hospital, Surkhet
2. Bheri Zonal Hospital,Nepalgunj

Far Western Development Region(3)

1. Seti Zonal Hospital,Dhangadi
2. Mahakali Zonal Hospital,Mahendranagar
3. Bayalpata Hospital, Achham

4. List of pathogens monitored in AMR surveillance

Currently, 10 organisms of interest are being monitored

1. *Vibrio cholerae*
2. *Shigella* spp
3. *Streptococcus pneumoniae*
4. *Haemophilus influenzae*
5. *Neisseria gonorrhoeae*
6. *Salmonella* spp
7. ESBL strains of *Escherichia coli*
8. Methicillin resistant strains of *Staphylococcus aureus*
9. Multidrug resistant *Klebsiella* spp
10. Multidrug resistant *Acinetobacter* spp

5. MONTHLY ISOLATES REPORTED AND SHARED FROM VARIOUS SITES

5.1 Enteric fever and Diarrheal Disease pathogens

S.No	Laboratory Code	<i>Salmonella</i>		<i>Shigella</i>		<i>V.cholerae</i>	
		Reported	Isolate shared	Reported	Isolate shared	Reported	Isolate shared
1	NPHL	0	0	0	0	0	0
2	SKH	4	0	0	0	0	0
3	KMH	9	0	0	0	0	0
4	DH	10	0	0	0	0	0
5	KCH	2	0	0	0	0	0
6	KIST	0	0	0	0	0	0
7	BPKIHS	0	0	0	0	0	0
8	MkZH	0	0	0	0	0	0
9	MWRH	0	0	0	0	0	0
10	UMH	0	0	0	0	0	0
11	MTH	0	0	0	0	0	0
12	WRH	0	0	0	0	0	0
13	BYH	0	0	0	0	0	0
14	PMH	0	0	0	0	0	0
15	KZH						
16	SZH						
17	LZH						
18	Patan						
19	TUTH						
20	CVL						
21	BZH						
22	MZH						

4.2 Fastidious pathogens

S.No	Laboratory Code	<i>S.pneumoniae</i>		<i>H.influenzae</i>		<i>Neisseria gonorrhoea</i>	
		Reported	Isolate Shared	Reported	Isolate Shared	Reported	Isolate Shared
1	NPHL	0	0	0	0	0	0
2	SKH	0	0	0	0	0	0
3	KMH	0	0	0	0	0	0
4	DH	9	0	0	0	1	0
5	KCH	0	0	0	0	0	0
6	KIST	0	0	0	0	0	0
7	BPKIHS	0	0	0	0	0	0
8	MkZH	0	0	0	0	0	0
9	MWRH	0	0	0	0	0	0
10	UMH	0	0	0	0	0	0
11	MTH	0	0	0	0	0	0
12	WRH	0	0	0	0	0	0
13	BYH	0	0	0	0	0	0
14	PMH	0	0	0	0	0	0
15	KZH						
16	SZH						
17	LZH						
18	Patan						
19	TUTH						
20	CVL						
21	BZH						
22	MZH						

4.3 Other pathogens

S.No	Laboratory Code	ESBL <i>E.coli</i>			Methicillin resistant <i>Staphylococcus aureus</i>			MDR <i>Klebsiella</i> spp			MDR <i>Acinetobacter</i> spp		
		Total No. of <i>E.coli</i> reported	ESBL + <i>E.coli</i>	Isolate Shared	Total No. of <i>S. aureus</i> reported	MRSA	Isolate Shared	Total No. of <i>Klebsiella</i> reported	No. of MDR <i>Klebsiella</i>	Isolate Shared	Total No. of <i>Acinetobacter</i> reported	No. of MDR <i>Acinetobacter</i>	Isolate Shared
1	NPHL	23	3	3	0	0	0	7	0	0	0	0	0
2	SKH	13	1	0	0	0	0	0	0	0	0	0	0
3	KMH	70	40	0	17	7	0	15	7	0	3	2	0
4	DH	-	34	0	-	0	0	-	6	0	-	2	0
5	KCH	19	0	0	12	0	0	3	1	0	1	0	0
6	KIST	-	3	0	0	4	0	0	2	0	0	5	0
7	BPKIHS	-	21	0	0	0	0	0	0	0	0	0	0
8	MkZH	0	0	0	0	0	0	0	0	0	0	0	0
9	MWRH	0	0	0	0	0	0	0	0	0	0	0	0
10	UMH	-	16	0	-	4	0	-	2	0	-	0	0
11	MTH	28	0	0	13	8	0	16	9	0	3	3	0
12	WRH	22	8	0	11	4	0	5	2	0	0	0	0
13	BYH	2	1	0	0	0	0	0	0	0	0	0	0
14	PMH	70	0	0	4	0	0	47	0	0	3	0	0
15	KZH												
16	SZH												
17	LZH												
18	Patan												
19	TUTH												
20	CVL												
21	BZH												
22	MZH												

5 Antibiogram of various pathogens of interest

5.1. Salmonella spp – 25

S. No	Laboratory Code	Number Reported			Antibiogram of total Salmonella isolates (% Resistance)							
		S.Typhi	S.Paratyphi	Other Salmonella Spp	AMP / AMX	CIP	COT	NA	CTR	C	LEV	AZT
1	KMH	7	2	0	0	100	0	-	0	0	100	14
2	SKH	1	3	0	50	50	0	100	0	0	-	-
3	DH	10	0	0	0	100	0	100	0	-	-	55
4.	KCH	0	2	0	50	0	0	50	0	-	-	-

Note: Azithromycin for S.Typhi isolates only

5.2. Shigella Spp – 0 reported

5.3. *Vibrio cholerae*- 0 reported

5.4. *Streptococcus pneumoniae* -9

S.No	Laboratory Code	Number Reported	Antibiogram of <i>S.pneumoniae</i> isolates (% Resistance)										
			First Line										
			PG	Amox	COT	Ery	Cip	CTR	C	Lev	Doxy	Van (MIC)	AZT
1.	DH	9	0	0	57	33	11	0	0	-	-	-	0

5.5. *Haemophilus influenzae* – 0 reported

5.6 *Neisseria gonorrhoea* – 1 reported

S.No	Laboratory Code	Number Reported	Antibiogram of <i>N.gonorrhoeae</i> isolates (% Resistance)										
			PG	Amox	COT	Ery	Cip	CTR	C	Lev	Doxy	Van	Tet
1.	DH	1	R	-	-	R	S	S	S	-	-	-	-

5.7. Extended Spectrum Beta Lactamase Producing *E.coli* – 127

S.No	Laboratory Code	Number Reported	Antibiogram of total <i>ESBL E.coli</i> isolates (% Resistance)											
			First Line						Second Line					
			Amx	Cip	Ts	NF	NX	CTR	AK	GM	Pip/Tz	LEV	Tob	Imi
1.	NPHL	3	100	100	100	33	100	100	0	33	-	100	-	0
2.	DH	34	100	71	64	6	74	76	32	24	-	-	70	0
3.	KMH	40	100	63	69	7	59	100	0	17	15	60	-	7
4.	UMH	16	100	100	57	84	-	63	-	13	-	-	-	-
5.	BPKIHS	21	100	94	70	10	-	100	-	-	-	-	-	10
6.	BYH	1	R	R	R	S	-	-	-	-	-	S	-	-
7.	KIST	3	100	100	100	0	100	100	33	33	-	-	-	-
8.	SKH	1	R	R	R	S	-	R	-	S	-	R	-	-
9.	WRH	8	-	50	60	0	-	100	0	-	-	-	-	0

5.8 Methicillin Resistant *S.aureus*(MRSA) -27

S.No	Laboratory Code	Number Reported	Antibiogram of total <i>MRSA</i> isolates (% Resistance)										
			First Line						Second Line				
			Ery	C	Amx	COT	Cip	AMC	Dox	Tei	GM	TgC	Van
1.	KMH	7	100	0	100	58	100	72	0	0	29	0	0
2.	UMH	4	100	0	-	50	100	-	50	-	-	-	-
3.	MTH	8	15	-	-	43	25	-	-	-	43	-	0
4.	KIST	4	-	-	100	-	100	-	0	-	25	-	0
5.	WRH	4	-	-	-	75	75	-	-	-	-	-	-

5.9 MDR *Klebsiella* spp -19

S.No	Laboratory Code	Number Reported	Antibiogram of total <i>MDR Klebsiella</i> isolates (% Resistance)										
			First Line					Second Line					
			Amx	CIP	CTR	COT	CAZ	AMC	AK	GM	PIP/TZ	Imi	lev
1	DH	6	100	84	84	100	-	100	50	84	-	50	-
2	KMH	7	100	100	100	86	100	100	29	43	75	-	100
3	MTH	9	-	100	67	75	-	-	13	45	-	100	-
4	UMH	2	100	0	100	100	-	100	-	50	-	60	-
5	KIST	2	100	100	-	100	100	-	100	100	-	50	100
6	KCH	1	R	-	R	S	R	-	R	R	-	S	-
7	WRH	2	-	50	100	0	-	-	0	-	-	0	-

5.9 MDR *Acinetobacter* spp -12

S.No	Laboratory Code	Number Reported	Antibiogram of <i>MDR Acinetobacter</i> isolates (% Resistance)										
			First Line					Second Line					
			CAZ	COT	GM	Cip	Pip/Tz	AK	Colistin	IMI	PB	Tob	TGC
1.	DH	2	50	-	50	50	0	50	0	100	-	0	-
2.	KMH	2	100	100	100	100	100	100	0	100	17	100	17
3.	MTH	3	100	100	100	100	100	100	0	100	0	-	50
4.	KIST	5	100	-	100	100	-	100	0	33	-	-	0

6.Acknowledgements

National Public Health Laboratory highly acknowledges the contribution of WHO for its continual support for smooth running of the surveillance program. We also acknowledge laboratory personnel, hospital administration from the following participating laboratories for their valuable contribution in timely data sharing which in turn helped in preparing this bulletin.

1. Mechi Zonal Hospital, Jhapa
2. B. P. Koirala Institute of Health Sciences, Dharan
3. Koshi Zonal Hospital, Biratnagar
4. Patan Hospital ,Lalitpur
5. Kanti Children's Hospital, Kathmandu
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7. Kathmandu Model Hospital , Kathmandu
8. Kathmandu Medical College , Kathmandu
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11. Central Veterinary Lab , Kathmandu
12. Paropakar Maternity & Women's Hospital, Kathmandu
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14. Western Regional Hospital, Pokhara
15. Manipal Teaching Hospital, Pokhara
16. Lumbini Zonal Hospital, Butwal
17. United Mission Hospital,Palpa
18. Mid Western Regional Hospital,Surkhet
19. Bheri Zonal Hospital,Nepalgunj
20. Seti Zonal Hospital, Dhangadi
21. Mahakali Zonal Hospital, Mahendranagar

8. Challenges:

1. Timeliness of data reporting.
2. Sharing of isolates for validation and further testing.

7. Annexes

ANNEX-I

Legends for hospital code

NPHL	National Public Health Laboratory
KMH	Kathmandu Model Hospital
PTH	Patan Hospital
KCH	Kanti Children's Hospital
TUTH	Tribhuvan University Teaching Hospital
BPKIHS	B.P Koirala Institute of Health Sciences
MTH	Manipal Teaching Hospital
WRH	Western Regional Hospital
UMH	United Mission Hospital
LZH	Lumbini Zonal Hospital
DH	Dhulikhel Hospital
SZH	Seti Zonal Hospital
MkZH	Mahakali Zonal Hospital
MZH	Mechi Zonal Hospital
CVL	Central Veterinary laboratory
KZH	Koshi Zonal Hospital
KiMC	KIST Medical College
BZH	Bheri Zonal Hospital
MWRH	Mid- Western Regional Hospital
BYL	Bayalpata Hospital
SKH	Sukraraj Tropical and Infectious Disease Hospital
PMH	Paropkar Maternity and Women's Hospital

ANNEX-II

Legends for antibiotics

legend	antibiotic
Amp	Ampicillin
Cip	Ciprofloxacin
C	Chloramphenicol
Cot	Cotrimoxazole
NA	Nalidixic Acid
CTR	Ceftriaxone
Ofx	Ofloxacin
Nx	Norfloxacin
E	Erythromycin
T	Tetracycline
Azt	Azithromycin
Nf	Nitrofurantoin
Pg	Penicillin G
AMC	Amox-Clav
Gm	Gentamicin
Ctx	Cefotaxime
Nx	Norfloxacin
Caz	Ceftazidime
Lev	Levofloxacin
Pip/Taz	Piperacillin/Tazobactam
Cef/sul	Cefoperazone/Sulbactam
Amp/Sul	Ampicillin /Sulbactam
Mer	Meropenem
Fox	Cefoxitin
Imi	Imipenem
Ak	Amikacin
FR	Furazolidone
Lin	Linezolid
Van	Vancomycin
Dox	Doxycycline
Ex	Enrofloxacin
CP	Cephalexin
Orflo	Orfloxacin
TGC	Tigecycline
Tob	Tobramycin