



WEEKLY EPIDEMIOLOGICAL REPORT

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Antimicrobial Resistance Part II

This is the last article of series of two articles.

What is the situation today? Resistance in bacteria

Currently, we are running out of effective antibiotics to treat common infections like Urinary tract infections (UTI), Sepsis, sexually transmitted diseases, Tuberculosis, and some form of diarrhoea as high rates of resistance. For example, Ciprofloxacin-an antibiotic that is widely used to treat UTIs has high resistant rates varying from 8.4% to 92.9% for Escherichia Coli and from 4.1% to 79.4% for klebsiella pneumonia according to the Global Antimicrobial Resistance and use Surveillance System. (GLASS)

Klebsiella Pneumonia is a bacteria that can cause life-threatening hospital-acquired infections and resistant species to last resource treatment (carbapenem antibiotics) has spread all over the world. Therefore, it has become a challenge to treat hospital-acquired infections such as pneumonia, bloodstream infections, and infections in newborns and intensive-care unit patients.

Colistin is the antibiotic of choice for many carbapenem-resistant bacterial infections. But now colistin-resistant bacteria have been detected in many countries and many regions making it impossible to treat. Staphylococcus aureus is a bacteria found in our skin's normal flora. People with methicillin-resistant Staphylococcus aureus (MRSA) infections are 64% more likely to die than people with drug-sensitive infections. Further, it has become complicated to treat gonorrhoea as widespread resistance has been found. Re-

sistance has rapidly emerged to sulphonamides, penicillins, tetracyclines, macrolides, fluoroquinolones, and early-generation cephalosporins.

Drug resistance in Mycobacterium Tuberculosis

WHO estimates that, in 2018, there were about half a million new cases of rifampicin-resistant TB (RR-TB) identified globally, of which the vast majority have multi-drug resistant TB (MDR-TB), a form of tuberculosis that is resistant to the two most powerful anti-TB drugs. Multi-drug-resistant TB needs more expensive and more toxic

	2015	2016	2017	2018	2019	2020	2021
Number of laboratories that confirmed MDRTB patients	13	17	25	12	21	14	10
Number enrolled in treatment in the same year	13	17	24	12	21	14	10
Number enrolled in treatment in the next year	-	-	-	-	-	-	-
Total number enrolled in treatment	13 10 0 %	17 10 0 0%	24 96 %	12 10 0 %	21 10 0 0%	14 10 0 %	10 10 0 %

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drugs for a longer duration to get a cure. Widely spreading MDR TB is a public health issue that needs more concern.

Table 01 - MDR patients reported and their treatment enrolment 2010 – 2021 in Sri Lanka

In Sri Lanka, there is a very active TB control program under the Ministry of Health. Therefore, the actions like intensive patient detection and timely treatment with proper antibiotics under direct observation have contributed to a low number of MDR TB.

Drug resistance in viruses

Antiviral drug resistance in the immunocompromised population is an emerging health issue where resistance has developed to most antiretroviral drugs. (ARV). Therefore, ARV drugs including the newest classes are becoming partially or fully inactive against Human Immunodeficiency Virus (HIV). People receiving antiretroviral therapy can acquire HIVDR, and people can also be infected with HIV that is already drug-resistant. 10% of pre-treatment adults are resistant to non-nucleoside reverse transcriptase inhibitors (NNRTI) in the majority of monitored countries in Africa, Asia, and Latin America. In sub-Saharan Africa, over 50% of newly diagnosed HIV infants carry a virus that is resistant to NNRTI. Therefore, the newest WHO-ARV guidelines recommend using Dolutegravir as the first line for adults and children.

Drug resistance in Malaria parasites

The emergence of drug-resistant malaria parasites has interfered badly with malaria control and has caused increasing morbidity and mortality. In the WHO Western Pacific Region and the WHO South-East Asia Region, partial resistance to artemisinin and resistance to a number of the ACT partner drugs has been confirmed in Cambodia, Lao People’s Democratic Republic, Myanmar, Thailand, and Viet Nam through studies conducted between 2001 and 2019. This makes it very difficult to select the right treatment. And also, the resistant variants of Plasmodium falciparum to sulfadoxine-pyrimethamine have led to artesunate-sulfadoxine-pyrimethamine failure in some countries, especially in the eastern Mediterranean region. If the resistance to artemisinin and artemisinin-based combination therapy-partner drugs spreads further, it could pose a major public health challenge and jeopardize important gains in malaria control.

Drug resistance to fungal infections

The prevalence of drug-resistant fungi is higher now. Many fungal infections are still difficult to treat as drug toxicity and existing underlying infections like HIV. Candida auris is one of the most invasive fungal infections which has become resistant to fluconazole, amphotericin B, and voriconazole.

Covid 19 pandemic and antibiotic resistance

Although covid 19 is a viral infection, there may be a need for antibiotics when there is a secondary bacterial

infection. But there is a high chance of inappropriate use of antibiotics for covid 19 patients and it may drive the spread of resistance against some of our clinically important antibiotics. Few studies done in Wuhan have revealed that almost all covid 19 patients were being treated with antibiotics. So, vaccination against Covid 19 plays an important role in reducing the spread and severity of covid 19 and the chance of using antibiotics. And also, vaccinations against some bacteria that can cause secondary bacterial infections like streptococcus pneumonia and Haemophilus influenza type B can reduce this burden.

How to prevent antimicrobial resistance

- Prevent infection and their spread
 - * Good hygiene
 - * Vaccinations
 - * Practice healthy habits around animals
 - * Prepare food safely
 - * Stay healthy when travelling abroad
 - * Prevent STDs
- Managing chronic conditions well
- Improve antibiotics and antifungal prescribing by following clinical and treatment guidelines
- Optimal TB treatment with the correct dose, correct combination, and proper duration.
- Be aware of drug-resistant infections and infection patterns in healthcare facilities and take necessary actions to prevent the spread.
- Keep animals healthy in livestock and poultry production

Need for coordinated action

AMR is a complex problem that requires a united multi-sectoral approach. The One Health approach brings together multiple sectors and stakeholders engaged in human, terrestrial, and aquatic animal and plant health, food and feed production, and the environment to communicate and work together in the design and implementation of programs, policies, legislation, and research to attain better public health outcomes.

References

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- * <https://www.cdc.gov/drugresistance/livestock-poultry-producers.html>
- * <https://www.nptccd.health.gov.lk/wp-content/uploads/2022/12/TB-Annual-Report-2021.pdf>

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Table 1: Selected notifiable diseases reported by Medical Officers of Health 21st-27th Jan 2023(4th Week)

RDHS	Dengue Fever		Dysentery		Encephaliti		Enteric Fever		Food Poi-		Leptospirosis		Typhus		Viral Hep-		Human		Chickenpox		Meningitis		Leishmania-		WRCD		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	T*	C**	
Colombo	279	1083	0	0	1	2	0	0	1	2	3	15	0	0	0	0	0	0	0	0	14	0	0	0	3	25	75
Gampaha	218	1021	0	0	2	0	0	0	0	0	2	17	0	0	0	0	0	0	0	4	8	2	11	1	2	2	73
Kalutara	94	376	0	1	0	0	0	0	2	10	40	0	0	0	1	0	0	0	1	21	4	12	0	0	4	7	
Kandy	72	296	2	5	0	0	0	0	1	3	15	1	10	0	0	0	0	0	3	21	0	1	0	2	28	100	
Matale	22	123	0	0	0	0	1	0	0	0	1	8	0	1	0	2	0	0	2	4	0	1	2	23	33	100	
NuwareEliya	3	16	1	4	0	0	0	0	3	3	8	0	6	0	0	0	0	0	3	8	0	0	0	0	46	71	
Galle	48	169	1	3	0	1	0	0	3	9	47	3	6	0	0	0	0	0	5	22	0	1	0	0	24	100	
Hambantota	22	79	0	0	0	0	0	0	0	0	9	20	3	9	0	4	0	0	3	16	2	2	23	42	31	100	
Matarra	34	153	1	2	0	0	0	0	3	3	32	1	5	0	1	0	0	0	1	11	0	2	2	9	54	93	
Jaiffna	70	421	0	4	1	1	0	1	3	1	4	28	157	0	0	1	1	0	1	11	0	0	0	0	92	80	
Kilinochchi	0	14	0	2	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	13	94	
Mannar	2	16	0	3	0	0	0	0	0	0	5	0	1	0	0	0	0	0	0	0	0	1	0	0	31	65	
Vavuniya	1	7	0	3	0	0	0	0	0	0	4	0	2	0	0	0	0	0	0	0	0	1	0	0	0	94	
Mullativu	1	4	1	4	0	0	0	0	0	0	2	0	3	0	0	0	0	0	0	1	0	0	0	0	21	79	
Batticaloa	38	146	8	27	1	4	1	1	2	1	12	0	0	0	0	0	0	0	3	8	0	3	0	0	34	100	
Ampara	1	22	0	1	0	0	0	0	0	0	7	0	0	0	1	0	0	0	0	5	0	2	0	0	17	86	
Trincomalee	34	125	0	0	0	0	0	0	0	0	6	0	1	0	0	0	0	0	4	0	3	0	0	0	21	90	
Kurunegala	51	278	0	2	0	1	0	0	0	7	31	0	1	1	2	0	0	0	6	33	2	13	12	44	25	93	
Puttalam	117	756	0	0	0	0	0	0	0	0	2	0	3	0	0	0	0	0	2	8	1	9	0	0	14	83	
Anuradhapur	15	56	0	0	0	0	0	0	1	11	42	2	10	0	0	0	0	0	5	18	3	5	19	54	19	97	
Polonnaruwa	11	74	0	0	0	2	0	0	0	4	19	1	2	0	1	0	0	0	4	4	0	7	18	46	22	75	
Badulla	38	156	0	4	0	0	0	0	4	11	25	0	2	7	14	0	0	0	1	11	0	3	0	5	41	100	
Monaragala	8	36	1	2	0	0	0	0	0	5	45	1	6	0	0	0	0	0	2	3	2	11	2	17	14	98	
Ratnapura	20	145	0	4	0	0	0	0	4	14	69	2	8	0	1	0	0	0	0	2	4	13	3	17	27	93	
Kegalle	43	211	0	0	0	0	0	0	0	6	22	0	1	0	1	0	0	0	4	21	2	6	0	1	26	89	
Kalmune	108	512	2	10	0	0	0	0	0	1	6	0	0	0	0	0	0	0	0	1	0	1	0	0	44	100	
SRI LANKA	135	6295	17	81	3	13	1	3	1	28	10	504	42	236	8	28	1	1	45	255	22	108	82	265	29	90	

Source: Weekly Returns of Communicable Diseases (esurveillance.epid.gov.lk). T=Timeliness refers to returns received on or before 27th Jan , 2023 Total number of reporting units 358 Number of reporting units data provided for the current week: 289 C**-Completeness

Table 2: Vaccine-Preventable Diseases & AFP

21st– 27th Jan 2023(4th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2023	Number of cases during same week in 2022	Total number of cases to date in 2023	Total number of cases to date in 2022	Difference between the number of cases to date in 2023 & 2022
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	00	00	00	00	00	00	00	00	00	02	06	06	0 %
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	01	00	01	00	00	01	00	00	00	03	01	09	04	125 %
Measles	00	00	00	00	00	00	00	00	00	00	00	00	01	0 %
Rubella	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
CRS**	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Tetanus	00	00	00	00	00	00	00	00	00	00	00	01	01	0 %
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Japanese Encephalitis	00	00	00	00	00	00	00	00	00	00	00	00	01	0 %
Whooping Cough	01	00	00	00	00	00	00	00	00	01	00	00	00	0 %
Tuberculosis	156	27	11	07	05	00	02	06	12	226	109	593	385	54.0 %

Key to Table 1 & 2

Provinces: W: Western, C: Central, S: Southern, N: North, E: East, NC: North Central, NW: North Western, U: Uva, Sab: Sabaragamuwa.
RDHS Divisions: CB: Colombo, GM: Gampaha, KL: Kalutara, KD: Kandy, ML: Matale, NE: Nuwara Eliya, GL: Galle, HB: Hambantota, MT: Matara, JF: Jaffna, KN: Killinochchi, MN: Mannar, VA: Vavuniya, MU: Mullaitivu, BT: Batticaloa, AM: Ampara, TR: Trincomalee, KM: Kalmunai, KR: Kurunegala, PU: Puttalam, AP: Anuradhapura, PO: Polonnaruwa, BD: Badulla, MO: Moneragala, RP: Ratnapura, KG: Kegalle.
Data Sources: Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Neonatal Tetanus, Whooping Cough, Chickenpox, Meningitis, Mumps., Rubella, CRS, Special Surveillance: AFP* (Acute Flaccid Paralysis), Japanese Encephalitis
CRS** =Congenital Rubella Syndrome
NA = Not Available

Number of Malaria Cases Up to End of January 2023,
01
All are Imported!!!

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ON STATE SERVICE

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