WEEKLY EPIDEMIOLOGICAL REPORT

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Ministry of Health

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Antimicrobial Resistance– (Part I)

This is the first in a series of two article on antimicrobial resistance.

Key facts

- Antimicrobial resistance (AMR) threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi.
- It is an increasingly serious threat to global public health that requires action across all government sectors and society.
- AMR is present in all parts of the world. New resistance mechanisms emerge and spread globally.
- In 2012, there were about 450 000 new cases of multidrug-resistant tuberculosis (MDR-TB). Extensively drug-resistant tuberculosis (XDR-TB) has been identified in 92 countries. MDR-TB requires treatment courses that are much longer and less effective than those for non-resistant TB.
- Resistance to earlier generation antimalarial drugs is widespread in most malaria-endemic countries. Further spread, or emergence in other regions, of artemisinin-resistant strains of malaria could jeopardize important recent gains in control of the disease.
- There are high proportions of antibiotic resistance (ABR) in bacteria that cause common infections (e.g. urinary tract infections, pneumonia, bloodstream infections) in all regions of the world. A high percentage of hospital-acquired infections are caused by highly resistant bacteria such as methicillin-resistant *Staphylococcus aureus* (MRSA) or multidrug-resistant Gram-negative bacteria.
- Treatment failures due to resistance to treatments of last resort for gonorrhoea (third-generation cephalosporins) have now been reported from 10 countries. Gonorrhoea may soon become untreatable as no vaccines or new drugs are in development.
- Patients with infections caused by drug-resistant bacteria are generally at increased risk of worse clinical outcomes and death, and consume more healthcare resources than patients infected with the same bacteria that are not resistant.

What is antimicrobial resistance?

Antimicrobial resistance (AMR) is resistance of a microorganism to an antimicrobial drug that was originally effective for treatment of infections caused by it.

Resistant microorganisms (including bacteria, fungi, viruses and parasites) are able to withstand attack by antimicrobial drugs, such as antibacterial drugs (e.g., antibiotics), antifungals, antivirals, and antimalarials, so that standard treatments become ineffective and infections persist, increasing the risk of spread to others.

The evolution of resistant strains is a natural phenomenon that occurs when microorganisms

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replicate themselves erroneously or when resistant traits are exchanged between them. The use and misuse of antimicrobial drugs accelerates the emergence of drug-resistant strains. Poor infection control practices, inadequate sanitary conditions and inappropriate food-handling encourages the further spread of AMR.

What is the difference between antibiotic and antimicrobial resistance?

Antibiotic resistance refers specifically to the resistance to antibiotics that occurs in common bacteria that cause infections. Antimicrobial resistance is a broader term, encompassing resistance to drugs to treat infections caused by other microbes as well, such as parasites (e.g. malaria), viruses (e.g. HIV) and fungi (e.g. *Candida*).

Why is antimicrobial resistance a global concern?

New resistance mechanisms emerge and spread globally threatening our ability to treat common infectious diseases, resulting in death and disability of individuals who until recently could continue a normal course of life.

Without effective anti-infective treatment, many standard medical treatments will fail or turn into very high risk procedures.

AMR kills

Infections caused by resistant microorganisms often fail to respond to the standard treatment, resulting in prolonged illness, higher health care expenditures, and a greater risk of death.

As an example, the death rate for patients with serious infections caused by common bacteria treated in hospitals can be about twice that of patients with infections caused by the same non-resistant bacteria. For example, people with MRSA (methicillin-resistant *Staphylococcus aureus*, another common source of severe infections in the community and in hospitals) are estimated to be 64% more likely to die than people with a non-resistant form of the infection.

AMR hampers the control of infectious diseases

AMR reduces the effectiveness of treatment; thus patients remain infectious for a longer time, increasing the risk of spreading resistant microorganisms to others. For example, the emergence of *Plasmodium falciparum* resistance to artemisinin in the Greater Mekong subregion is an urgent public health concern that is threatening global efforts to reduce the burden of malaria.

Although MDR-TB is a growing concern, it is still largely under-reported, compromising control efforts.

AMR increases the costs of health care

When infections become resistant to first-line drugs, more expensive therapies must be used. A longer duration of illness and treatment, often in hospitals, increases health care costs as well as the economic burden on families and societies.

AMR jeopardizes health care gains to society

The achievements of modern medicine are put at risk by AMR. Without effective antimicrobials for prevention and treatment of infections, the success of organ transplantation, cancer chemotherapy and major surgery would be compromised.

AMR has the potential to threaten health security, and damage trade and economies

The growth of global trade and travel allows resistant microorganisms to spread rapidly to distant countries and continents through humans and food. Estimates show that AMR may give rise to losses in Gross Domestic Product of more than 1% and that the indirect costs affecting society may be more than 3 times the direct health care expenditures. It affects developing economies proportionally more than developed ones.

Name of Bacterium/resistance	Examples of typical diseases	No. out of 194 Member states providing data	No. WHO regions with national reports of 50% resistance or more
Escherichia coli	Urinary tract infections, blood infections		
-vs 3rd generation cephalosporins		86	5/6
-vs fluoroquinolones		92	5/6
Klebsiella pneumoniae	Pneumonia, blood stream infections, urinary tract infections		
-vs 3rd generation cephalosporins		87	6/6
-vs fluoroquinolones		71	2/6
Staphylococcus aureus	Wound infections, blood stream infections		
-vs methicillin"MRSA"		85	5/6

Bacteria mainly causing infections in the community

Sources

WHO-antimicrobial resistance global report on surveillance, available at http://www.who.int/mediacentre/factsheets/fs194/en/

Compiled by Dr. C U D Gunasekara of the epidemiology unit.

To be Continued….

Table 1: Selected notifiable diseases reported by Medical Officers of Health 17th – 23rd Jan 2015 (04th Week)

RDHS Division	Dengue Fever		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Chickenpox		Meningitis		Leishmaniasis		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	439	1316	6	19	1	1	2	3	7	7	3	18	0	0	1	5	1	1	7	24	0	3	0	0	**88**	**13**
Gampaha	37	434	0	2	0	2	0	2	1	1	1	23	0	1	1	7	0	0	2	5	0	2	0	0	**33**	**67**
Kalutara	64	241	1	5	0	1	0	5	0	3	8	38	0	0	2	4	0	0	4	11	0	4	0	0	**100**	**0**
Kandy	65	206	4	22	0	0	3	5	0	0	2	6	0	11	3	26	0	0	3	19	0	2	0	1	**87**	**13**
Matale	28	121	2	5	0	0	0	1	0	0	3	10	0	1	0	1	0	0	0	1	0	0	0	0	**77**	**23**
NuwaraEliya	10	26	9	22	0	0	1	2	0	0	1	4	1	2	2	20	0	0	0	1	1	4	0	0	**85**	**15**
Galle	31	109	1	11	0	0	0	0	0	4	11	28	0	5	1	1	0	0	6	20	2	10	0	0	**80**	**20**
Hambantota	9	35	0	4	0	0	0	3	0	0	2	14	2	4	3	4	0	0	0	4	1	1	5	21	**83**	**17**
Matara	22	64	2	6	0	0	0	1	1	19	4	18	0	3	3	3	0	0	12	26	2	6	3	7	**100**	**0**
Jaffna	111	558	20	67	0	3	16	45	1	1	0	4	54	215	0	3	0	0	4	15	0	1	0	0	**100**	**0**
Kilinochchi	3	10	1	10	0	0	1	2	0	2	0	0	0	3	0	0	0	0	0	0	0	0	0	0	**50**	**50**
Mannar	9	46	0	1	0	0	3	3	0	1	2	2	2	4	0	0	0	0	0	0	0	0	0	0	**80**	**20**
Vavuniya	7	21	0	4	0	1	1	5	1	1	2	6	0	7	0	0	0	0	0	1	0	0	0	0	**100**	**0**
Mullaitivu	7	30	0	5	0	0	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	**80**	**20**
Batticaloa	67	217	4	16	0	1	1	1	0	0	0	1	0	0	0	0	0	0	2	3	0	2	0	0	**86**	**14**
Ampara	3	9	2	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	16	0	3	0	0	**71**	**29**
Trincomalee	45	91	1	2	0	0	1	4	0	22	0	4	0	0	0	0	0	0	0	3	0	0	0	0	**92**	**8**
Kurunegala	71	238	3	18	0	1	0	1	0	0	6	25	2	6	6	7	0	0	6	19	1	3	1	4	**78**	**22**
Puttalam	58	198	2	6	0	0	0	0	0	0	2	6	2	2	0	0	0	0	1	2	0	1	0	0	**69**	**31**
Anuradhapura	44	100	4	7	0	0	0	0	1	2	19	52	0	3	2	2	0	0	4	12	1	4	7	16	**89**	**11**
Polonnaruwa	17	38	1	5	0	0	0	0	0	0	5	23	0	0	0	1	0	0	1	11	2	4	1	3	**71**	**29**
Badulla	32	148	7	18	0	0	0	1	0	0	1	1	5	8	1	8	0	0	3	10	3	6	0	0	**88**	**12**
Monaragala	12	39	2	16	0	0	1	3	0	1	14	48	4	6	2	3	0	0	6	7	0	0	2	4	**91**	**9**
Ratnapura	29	95	5	17	0	1	2	4	1	1	11	21	3	7	13	26	0	0	2	4	0	3	0	3	**67**	**33**
Kegalle	13	82	0	6	2	2	4	14	0	0	10	25	0	2	4	15	0	0	5	11	1	6	0	0	**91**	**9**
Kalmune	42	187	2	15	0	0	0	0	0	4	0	1	0	0	0	0	0	0	4	13	0	0	0	0	**69**	**31**
SRILANKA	**1275**	**4659**	**79**	**321**	**3**	**13**	**37**	**106**	**13**	**70**	**108**	**379**	**75**	**290**	**44**	**136**	**1**	**1**	**73**	**238**	**14**	**66**	**19**	**59**	**82**	**18**

Source: Weekly Returns of Communicable Diseases (WRCD).

*T=Timeliness refers to returns received on or before 23rd January , 2015 Total number of reporting units 337 Number of reporting units data provided for the current week: 278 C**-Completeness

Table 2: Vaccine-Preventable Diseases & AFP

17th – 23rd Jan 2015 (04th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2015	Number of cases during same week in 2014	Total number of cases to date in 2015	Total number of cases to date in 2014	Difference between the number of cases to date in 2014& 2015
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	00	00	00	00	00	00	00	00	00	01	06	04	-50%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Mumps	04	01	00	01	00	01	01	01	02	11	12	27	79	-65.9%
Measles	04	03	08	01	00	05	05	02	04	32	74	108	362	-70.2%
Rubella	00	00	00	00	00	00	00	00	00	00	00	02	00	0%
CRS**	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Tetanus	01	00	00	00	00	00	00	00	00	01	01	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	03	02	08	-75%
Whooping Cough	01	00	00	01	00	00	00	00	00	02	02	08	03	+166.7%
Tuberculosis	254	22	28	12	17	15	01	08	72	429	261	795	946	-16.1%

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

AFP and all clinically confirmed Vaccine Preventable Diseases except Tuberculosis and Mumps should be investigated by the MOH

Dengue Prevention and Control Health Messages

Look for plants such as bamboo, bohemia, rampe and banana in your surroundings and maintain them

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ON STATE SERVICE

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