



# WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiology Unit  
Ministry of Health, Nutrition & Indigenous Medicine

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## Mercury and Health

Mercury is a naturally occurring heavy metal. It is a silvery-white liquid in room temperature and normal pressure. The symbol of mercury is “Hg” came from its previous Greek name Hydrogarum meaning liquid silver. It is commonly named as quicksilver.

Mercury occurs naturally in the earth crust. It is commonly found in “Cinnabar” in the form of mercuric sulphide.

It exists in three forms i.e. elemental mercury, inorganic salts and organic mercury. The properties, uses and toxic effects are also different among these three types.

### Uses of Mercury

The uses of mercury are known to mankind since ancient times. The reddish deposits of mercury in rock used as a pigment for colouring since prehistoric times. The Romans used mercury mines for the punishment of criminals. In ancient China, mercury was considered as a substance for longevity and immortality. Mercury was used for the treatment of Syphilis in the first half of the 16<sup>th</sup> century. It was used for tanning of felt for hats in the 17<sup>th</sup> and 18<sup>th</sup> centuries.

Though the use of mercury and its compounds have been reduced over the years, it is still used in industry, in agriculture, in laboratories and in the health sector.

Elemental mercury is used in medical equipment such as thermometers, sphygmomanometers, in medical preparations in indigenous medicine and for tooth fillings in dentistry. Skin whitening creams and soaps may contain inorganic salts of mercury.

### The Release of Mercury to the Environment

Mercury is released to the environment through natural sources such as weathering, volcanic eruptions or due to anthropogenic causes. The anthropogenic activities are the main cause of mercury release particularly due to industrial emissions, improper disposal and mining of mer-

cury, gold and other metals.

Once released to the atmosphere mercury can be transformed to methyl mercury highly by microorganisms. It can be accumulated in organisms and bodies of animals and magnified at various levels of the food chain.

### Human exposure and impact on health

Humans can be exposed to mercury or mercury compounds in different circumstances.

It can enter the body through alimentary tract by consuming food contaminated with mercury or its products, through inhalation of mercury vapour during work or absorption through the skin.

The level of toxicity depends on the following factors i.e. type of mercury, dose, duration of exposure, the route of exposure and the age or developmental stage of the person exposed. The foetuses are more susceptible to mercury toxicity. Methyl mercury has an adverse impact on the development of the brain and the nervous system.

Elemental mercury and methyl mercury are toxic to the central and peripheral nervous systems. The acute inhalation of large amounts of mercury vapour may cause lung damage, have harmful effects on nervous, digestive immune systems and may be fatal. Ingestion of inorganic salts may cause irritation and corrosive effect to the digestive system and may cause damage to Kidney function.

Neurological and behavioural disorders may be observed after inhalation, ingestion or skin contact of different mercury compounds. Symptoms include tremors, sleeping disturbances, memory loss, neuromuscular effects, cognitive and motor dysfunction.

### Outbreaks of Mercury Poisoning

There were several massive disasters reported in the globe due to mercury poisoning.

The disease known as “Mad Hatters Disease” was an occupational disease caused by chronic mercury poisoning. This disease was seen

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among hat makers in the 17<sup>th</sup> and early 18<sup>th</sup> centuries who used mercury nitrate for tanning of fur to make hats. The workers were exposed to mercury fumes during the process of making fur to felt. They suffered from tremors, abnormal shyness, loss of coordination and irritability and the use of mercury in felt industry in the USA was banned in 1941.

The largest disaster due to chronic mercury poisoning was reported in 1956 in Minamata city Japan. This was caused by the release of industrial wastewater containing methyl mercury into the Minamata Bay. The people who ate fish in this bay showed signs and symptoms of severe mercury poisoning which was thereby named as Minamata Disease. There were more than 1500 deaths due to Minamata disease and 2265 people have been reported as victims of the disease.

A similar disaster was reported in 1965 in Niigata, Japan affecting a large number of people in the banks of the river.

An outbreak of mercury poisoning was reported in Iraq in 1971-1972 when rural people consumed bread prepared using grains treated with mercury-containing fungicide. This caused death among more than 400 people and affected over 6000 persons.

### Minamata Convention

The Minamata Convention on Mercury is a global treaty to protect human health and the environment from the adverse effects of mercury. It was agreed at the fifth session of the Intergovernmental Negotiating Committee on mercury in Geneva, Switzerland on 19 January 2013 and adopted later that year on 10 October 2013 at a Diplomatic Conference, held in Kumamoto, Japan.

The Convention draws attention to a global and ubiquitous metal that, while naturally occurring, has broad uses in everyday objects and is released to the atmosphere, soil and water from a variety of sources. Controlling the anthropogenic releases of mercury throughout its lifecycle has been a key factor in shaping the obligations under the Convention.

Major highlights of the Minamata Convention include a ban on new mercury mines, the phase-out of existing ones, the phase-out and phase down of mercury use in a number of products and processes, control measures on emissions to air and on releases to land and water and the regulation of the informal sector of artisanal and small-scale gold mining.

The Convention also addresses interim storage of mercury and its disposal once it becomes waste, sites contaminated by mercury as well as health issues.

### How to prevent humans from mercury exposures

- Prohibit mercury mining. This is not applicable to Sri Lanka as there aren't any mercury mines.
- Limit usage of mercury in industries.
- There are no major industries using mercury or mercury products as an ingredient. However, mercury is used in smaller quantities in gold industry for the separation of the gold from gold dust. Therefore, occupational exposure to mercury fumes can be a possibility, especially among small scale jewellers.
- Phase out usage of mercury-containing equipment and promote the use of substitute equipment. Ministry of Health has already taken steps to substitute mercury-

containing thermometers and sphygmomanometers with digital equipment and to replace dental amalgam containing mercury with composite fillings.

- Promote safe handling of mercury-containing equipment
- Provision of collection/ transportation and disposal of mercury containing products and equipment.
- Preparation / enactment of legislation.
- Establishment of permissible levels, Provision of facilities for laboratory testing.
- Create awareness among general public, occupational groups on safe handling, measures to be taken during spillage/ breakage of equipment, safe disposal.

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### References

[www.mercuryconvention.org/](http://www.mercuryconvention.org/) [www.who.int/factsheets/](http://www.who.int/factsheets/)

**Table 1 : Water Quality Surveillance  
 Number of microbiological water samples May 2018**

District	MOH areas	No: Expected *	No: Received
Colombo	15	90	<b>88</b>
Gampaha	15	90	<b>NR</b>
Kalutara	12	72	<b>NR</b>
Kalutara NIHS	2	12	<b>7</b>
Kandy	23	138	<b>15</b>
Matale	13	78	<b>44</b>
Nuwara Eliya	13	78	<b>7</b>
Galle	20	120	<b>39</b>
Matara	17	102	<b>NR</b>
Hambantota	12	72	<b>69</b>
Jaffna	12	72	<b>133</b>
Kilinochchi	4	24	<b>40</b>
Manner	5	30	<b>NR</b>
Vavuniya	4	24	<b>49</b>
Mullatvu	5	30	<b>NR</b>
Batticaloa	14	84	<b>78</b>
Ampara	7	42	<b>33</b>
Trincomalee	11	66	<b>46</b>
Kurunegala	29	174	<b>42</b>
Puttalam	13	78	<b>77</b>
Anuradhapura	19	114	<b>67</b>
Polonnaruwa	7	42	<b>43</b>
Badulla	16	96	<b>88</b>
Moneragala	11	66	<b>93</b>
Rathnapura	18	108	<b>47</b>
Kegalle	11	66	<b>8</b>
Kalmunai	13	78	<b>75</b>

\* No of samples expected (6 / MOH area / Month)  
 NR = Return not received

Table 1: Selected notifiable diseases reported by Medical Officers of Health 09<sup>th</sup> - 15<sup>th</sup> June 2018 (24<sup>th</sup> 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	266	3971	0	42	1	5	1	29	8	22	4	103	0	6	0	3	0	0	11	387	1	26	0	2	62	100
paha	120	2068	1	34	0	5	0	12	0	14	5	124	0	4	2	10	0	0	8	401	2	23	1	18	67	100
Kalutara	59	1556	1	39	0	3	0	5	1	36	16	280	0	5	1	6	0	0	15	319	1	38	2	9	52	100
Kandy	85	1622	1	38	0	4	0	3	0	9	4	30	0	62	1	15	0	0	3	178	0	17	2	14	61	100
Matale	16	523	0	8	0	1	0	1	19	31	3	48	0	2	0	3	0	0	0	21	1	7	1	53	59	100
NuwaraEliya	8	92	4	31	0	3	0	9	0	9	0	13	0	81	2	17	0	0	2	134	1	22	0	0	30	100
Galle	18	531	2	24	0	7	0	0	0	2	4	223	0	16	0	2	0	1	10	167	3	31	0	5	12	100
Hambantota	11	488	0	9	0	3	0	2	0	4	2	27	1	23	0	1	0	1	5	145	0	2	11	319	75	100
Matarata	8	463	1	25	0	5	0	4	0	21	6	122	0	21	0	6	0	0	7	157	0	5	6	210	54	100
Jaffna	94	1589	7	82	1	1	1	29	1	203	0	8	2	231	0	1	0	2	4	183	0	8	0	3	38	93
Kilinochchi	11	159	0	17	0	1	0	8	0	1	0	2	0	8	0	0	0	1	1	28	0	2	0	1	50	100
Mannar	0	32	0	11	0	0	0	2	0	2	0	1	0	0	0	0	0	0	0	25	0	1	0	2	37	100
Vavuniya	15	246	1	9	0	3	2	30	1	9	1	21	0	7	0	0	0	1	0	36	0	3	0	3	56	100
Mullaitivu	4	43	1	5	0	0	0	8	0	9	0	8	0	3	0	0	0	0	0	6	0	1	0	1	19	100
Batticaloa	129	3472	3	92	0	5	0	2	0	20	2	28	0	1	0	2	0	2	5	82	0	11	0	0	66	100
Ampara	4	96	0	26	0	1	0	1	0	2	0	30	0	0	0	4	0	1	2	125	0	11	0	1	66	100
Trincomalee	33	532	1	32	0	1	0	4	2	10	0	37	0	16	0	1	0	0	3	130	0	3	0	18	28	100
Kurunegala	21	1311	1	71	0	8	0	9	0	3	6	67	0	10	0	9	0	1	8	283	0	47	7	122	67	100
Puttalam	15	1162	2	23	0	4	0	3	0	4	1	18	0	6	0	2	0	0	3	86	0	41	0	1	72	100
Anuradhapura	7	466	0	27	0	4	0	2	3	37	4	76	0	13	0	4	0	1	9	245	0	20	5	188	42	95
Polonnaruwa	3	156	1	15	0	1	0	0	1	12	2	67	0	0	0	3	0	0	4	134	0	8	0	114	61	88
Badulla	15	233	3	60	0	4	0	6	0	10	5	90	0	36	0	17	0	0	4	274	1	60	0	4	46	100
Monaragala	18	531	0	44	0	2	0	1	0	2	6	189	1	74	0	14	0	0	5	92	2	33	1	21	64	100
Ratnapura	44	1113	0	89	0	26	0	15	1	3	25	280	0	21	0	12	0	1	8	175	0	59	5	129	45	100
Kegalle	16	684	1	36	0	7	0	4	0	71	9	113	0	48	0	8	0	0	8	196	0	25	0	5	66	100
Kalmune	24	1300	0	24	0	0	0	1	0	20	0	3	0	0	0	1	0	0	10	114	0	6	0	1	50	100
<b>SRILANKA</b>	<b>1044</b>	<b>24439</b>	<b>31</b>	<b>913</b>	<b>2</b>	<b>104</b>	<b>4</b>	<b>190</b>	<b>37</b>	<b>566</b>	<b>10</b>	<b>2008</b>	<b>4</b>	<b>694</b>	<b>6</b>	<b>141</b>	<b>0</b>	<b>12</b>	<b>135</b>	<b>4123</b>	<b>12</b>	<b>510</b>	<b>41</b>	<b>1244</b>	<b>53</b>	<b>99</b>

Source: Weekly Returns of Communicable Diseases (WRCD).

\*T=Timeliness refers to returns received on or before 15<sup>th</sup> June, 2018. Total number of reporting units 353. Number of reporting units data provided for the current week: 351. C\*\*=Completeness. A = Cases reported during the current week. B = Cumulative cases for the year.

**Table 2: Vaccine-Preventable Diseases & AFP**

**09<sup>th</sup> – 15<sup>th</sup> June 2018 (24<sup>th</sup> Week)**

Disease	No. of Cases by Province									Number of cases during current week in 2018	Number of cases during same week in 2017	Total number of cases to date in 2018	Total number of cases to date in 2017	Difference between the number of cases to date in 2018 & 2017
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	02	00	00	00	00	00	00	00	02	01	29	37	- 21.6 %
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Mumps	01	00	00	00	00	01	00	00	02	04	08	175	162	8 %
Measles	01	00	00	00	01	00	00	00	00	02	04	60	174	-65.5 %
Rubella	00	00	00	00	00	00	00	00	00	00	00	04	06	-33.3%
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	11	09	22.2 %
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	15	21	- 28.5 %
Whooping Cough	01	00	00	00	00	00	00	00	00	01	00	28	08	250 %
Tuberculosis	18	05	10	16	07	00	08	08	12	84	78	3815	3730	2.2 %

**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

Influenza Surveillance in Sentinel Hospitals - ILI & SARI							
Month	Human				Animal		
	No Total	No Positive	Infl A	Infl B	Pooled samples	Serum Samples	Positives
June	226	40	39	1	1950	810	0

Source: Medical Research Institute & Veterinary Research Institute

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