

### **Preliminary Investigation of Drinking Water Quality on Passenger Ships in National Ports of Northern Taiwan and Ports of Mini-Three-Links**

Ming-Ching Liu<sup>1\*</sup>, Yu-Jia Huang<sup>2</sup>, Chun-Hui Wu<sup>1</sup>, Hsiao-Yun Tseng<sup>1</sup>,  
Chia-Wen Lee<sup>1</sup>, Jiun-Shian Kuo<sup>1</sup>, Jer-Jea Yen<sup>1</sup>

#### **Abstract**

Quarantine officers implemented drinking water quality testing and documents inspection of 12 passenger ships in national ports of northern Taiwan and ports of Mini-three-links from March to August in 2017. The testing results of drinking water on ships showed that pH values were 100% qualified, whereas residual chlorine values were 50% qualified. Investigation of drinking-water supply and transfer chain and regular testing results indicated that Keelung port was the only port to implement the drinking water sampling in shore water supply point to ensure the safety of drinking water between shore water supply point and distributing reservoir. Besides, the abnormality of drinking water on ships may result from the poor design and construction of storage tanks and inappropriate distribution. In this study, all inspection results were notified immediately to the shipmaster and port authority concerned to proceed corrective measures and obtained satisfied outcomes. Passenger ships with drinking water supply system in Keelung port could implement all steps in the “ship drinking water and sanitation inspection flow chart” issued by Taiwan Centers for Disease Control in 2017. Passenger ships in other ports, which are small-scaled, short-voyaged and without drinking water supply system and required documents of water quality, use the bottled water for drinking, therefore, pose lower risks of outbreak

<sup>1</sup>Taipei Regional Center, Centers for Disease Control, Ministry of Health and Welfare, Taiwan

<sup>2</sup>Kao-Ping Regional Center, Centers for Disease Control, Ministry of Health and Welfare, Taiwan

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Corresponding author: Ming-Ching Liu<sup>1\*</sup>

E-mail: liugem@cdc.gov.tw

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of water-borne diseases. Implementation of the strict regulation “ship drinking water and sanitation inspection flow chart “for the passenger ships with drinking water supply system should be justifiable.

**Keywords:** Passenger ship, drinking water test, ship sanitation inspection, quarantine, residual chlorine

week 40–41(Sep. 30–Oct. 13, 2018)

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Weekly Data of Notifiable Infectious Diseases (by week of diagnosis)

Case diagnosis year		Week 40★		Week 1-40			
Classification	Disease Diagnosed	2018	2017	2018		2017	
				Total cases★	Imported cases	Total cases★	Imported cases
Category I	Plague	0	0	0	0	0	0
	Rabies	0	0	0	0	0	0
	SARS	0	0	0	0	0	0
	Smallpox	0	0	0	0	0	0
	Acute Flaccid Paralysis	2	1	56	0	26	0
Category II	Acute Viral Hepatitis type A	1	1	70	27	339	42
	Amoebiasis	9	7	248	105	284	154
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	1	0	6	6	11	11
	Cholera	1	0	7	0	1	0
	Dengue Fever	20	11	373	227	257	250
	Diphtheria	0	0	0	0	0	0
	Enterohemorrhagic E. coli Infection	0	0	0	0	0	0
	Epidemic Typhus Fever	0	0	0	0	0	0
	Hantavirus Pulmonary Syndrome	0	0	0	0	0	0
	Hemorrhagic Fever with Renal Syndrome	0	0	1	0	1	0
	Malaria	1	0	4	4	7	7
	Measles	0	0	35	9	5	5
	Meningococcal Meningitis	0	0	5	1	11	0
	Paratyphoid Fever	0	0	6	5	4	3
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	9	8	3	2
	Shigellosis	4	0	130	42	127	46
	Typhoid fever	0	0	13	10	16	14
West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	3	2	112	8	121	7
	Acute Viral Hepatitis type C	5	7	350	3	226	1
	Acute Viral Hepatitis type D	0	0	0	0	1	0
	Acute Viral Hepatitis type E	0	0	6	0	13	3
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	1	0	0	1	1
	Enteroviruses Infection with Severe Complications	0	0	33	0	9	0
	Haemophilus Influenza type b Infection	0	1	5	0	5	0
	Japanese Encephalitis	0	0	35	0	23	0
	Legionellosis	6	2	156	5	122	12
	Mumps	16	11	470	7	514	8
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	1	25	2	29	0
Tetanus	0	0	5	0	8	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	1	0	43	0	22	1
	Endemic Typhus Fever	0	0	20	0	33	1
	Herpesvirus B Infection	0	0	0	0	0	0
	Invasive Pneumococcal Disease	5	5	370	0	363	2
	Leptospirosis	6	3	66	0	74	1
	Listeriosis	4	0	133	1	0	0
	Lyme Disease	1	1	2	2	1	1
	Melioidosis	2	0	22	1	21	0
	Q Fever	0	0	13	1	14	0
	Scrub Typhus	4	6	271	0	343	0
	Severe Complicated Influenza	14	4	1020	5	1254	6
Toxoplasmosis	0	0	12	1	15	0	
Tularemia	0	0	0	0	0	0	
Category V	Ebola Virus Disease	0	0	0	0	0	0
	Lassa Fever	0	0	0	0	0	0
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome Coronavirus	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	0	0	1	1
	Rift Valley Fever	0	0	0	0	0	0
	Yellow Fever	0	0	0	0	0	0
Zika virus infection	1	0	2	2	4	4	

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.  
 2. The following chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.  
 3. Numbers of mumps, neonatal tetanus and tetanus cases are summed up by the week of report.  
 4. Since 2016/1/22, "Zika Virus Infection" was listed as a Notifiable Infectious Disease.  
 5. Since 2018/1/1, "Listeriosis" was listed as a Notifiable Infectious Disease.

### Suspected Clusters

- Twenty-nine clusters were reported, including 5 tuberculosis clusters, 8 diarrhea clusters, 4 upper respiratory tract infection clusters, 3 influenza-like illness clusters, and 9 varicella clusters.

### Imported Infectious Diseases

- There were 21 confirmed imported cases from 11 countries during week 40 of 2018.

Disease \ Country	Indonesia	Philippines	Vietnam	India	Malaysia	Thailand	Sri Lanka	China	Uganda	Cambodia	USA	Total
DF	1	3	3	2	2	1	1			1		14
Amoebiasis	1					1						2
Legionellosis								1				1
Malaria									1			1
Lyme Disease											1	1
Chikungunya Fever	1											1
Shigellosis	1											1
Total	4	3	3	2	2	2	1	1	1	1	1	21

Note: The table summarized the number of imported cases that were either **confirmed** or **updated** in the given week.

- There are 476 confirmed imported cases from 29 different countries in 2018. The top 3 countries are Indonesia (144), Philippines (63), and Cambodia (48).
- Top 3 imported diseases are Dengue Fever (227), Amoebiasis (105), and Shigellosis (42).

### Summary of Epidemic

- **Dengue Fever:** The epidemic is still high in the nearby Asian countries; therefore, the potential risks of imported cases remain elevated in Taiwan. There have been indigenous dengue fever epidemics; in addition, rainy weather created breeding sites for mosquitoes, the risk of indigenous epidemics remain high.
- **Enterovirus:** Schools have started, the epidemic is expected to fluctuate by close contact between individuals.
- **Influenza:** Influenza activity is expected to fluctuate due to large temperature differences between night and day during the fall season.

### Weekly Data of Notifiable Infectious Diseases (by week of diagnosis)

Case diagnosis year		Week 41★		Week 1-41			
Classification	Disease Diagnosed	2018	2017	2018		2017	
				Total cases★	Imported cases	Total cases★	Imported cases
Category I	Plague	0	0	0	0	0	0
	Rabies	0	0	0	0	0	0
	SARS	0	0	0	0	0	0
	Smallpox	0	0	0	0	0	0
Category II	Acute Flaccid Paralysis	1	0	57	0	26	0
	Acute Viral Hepatitis type A	0	2	70	27	341	43
	Amoebiasis	6	1	254	106	285	155
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	6	6	11	11
	Cholera	0	0	7	0	1	0
	Dengue Fever	12	13	385	233	270	261
	Diphtheria	0	0	0	0	0	0
	Enterohemorrhagic E. coli Infection	0	0	0	0	0	0
	Epidemic Typhus Fever	0	0	0	0	0	0
	Hantavirus Pulmonary Syndrome	0	0	0	0	0	0
	Hemorrhagic Fever with Renal Syndrome	0	0	1	0	1	0
	Malaria	1	0	5	5	7	7
	Measles	1	0	36	9	5	5
	Meningococcal Meningitis	0	0	5	1	11	0
	Paratyphoid Fever	1	1	7	5	5	4
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	9	8	3	2
Shigellosis	3	4	133	43	131	46	
Typhoid fever	0	0	13	10	16	14	
West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	6	1	118	8	122	7
	Acute Viral Hepatitis type C	11	9	361	3	235	1
	Acute Viral Hepatitis type D	0	0	0	0	1	0
	Acute Viral Hepatitis type E	0	0	6	0	13	3
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	1	1
	Enteroviruses Infection with Severe Complications	1	0	34	0	9	0
	Haemophilus Influenza type b Infection	0	0	5	0	5	0
	Japanese Encephalitis	0	1	35	0	24	0
	Legionellosis	4	2	160	6	124	12
	Mumps	12	9	482	7	523	8
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	1	0	26	2	29	0
Tetanus	0	0	5	0	8	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	3	0	46	0	22	1
	Endemic Typhus Fever	2	0	22	0	33	1
	Herpesvirus B Infection	0	0	0	0	0	0
	Invasive Pneumococcal Disease	6	3	376	0	366	3
	Leptospirosis	9	2	75	0	76	1
	Listeriosis	0	0	133	1	0	0
	Lyme Disease	0	0	2	2	1	1
	Melioidosis	0	0	22	1	21	0
	Q Fever	1	0	14	1	14	0
	Scrub Typhus	11	7	282	1	350	0
	Severe Complicated Influenza	15	6	1035	5	1260	7
Toxoplasmosis	0	1	12	1	16	0	
Tularemia	0	0	0	0	0	0	
Category V	Ebola Virus Disease	0	0	0	0	0	0
	Lassa Fever	0	0	0	0	0	0
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome Coronavirus	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	0	0	1	1
	Rift Valley Fever	0	0	0	0	0	0
	Yellow Fever	0	0	0	0	0	0
Zika virus infection	0	0	2	2	4	4	

1. ★ The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.  
2. The following chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.  
3. Numbers of mumps, neonatal tetanus and tetanus cases are summed up by the week of report.  
4. Since 2016/1/22, "Zika Virus Infection" was listed as a Notifiable Infectious Disease.  
5. Since 2018/1/1, "Listeriosis" was listed as a Notifiable Infectious Disease.

## Suspected Clusters

- Twenty-three clusters were reported, including 11 diarrhea clusters, 6 upper respiratory tract infection clusters, 1 influenza-like illness cluster, and 5 varicella clusters.

## Imported Infectious Diseases

- There were 9 confirmed imported cases from 7 countries during week 41 of 2018.

Country Disease	Cambodia	Philippines	China	Malaysia	Uganda	Indonesia	Vietnam	Total
DF	2	1		1			1	5
Scrub Typhus		1						1
Legionellosis			1					1
Malaria					1			1
Amoebiasis						1		1
Total	2	2	1	1	1	1	1	9

Note: The table summarized the number of imported cases that were either **confirmed** or **updated** in the given week.

- There are 485 confirmed imported cases from 29 different countries in 2018. The top 3 countries are Indonesia (145), Philippines (65), and Cambodia (50).
- Top 3 imported diseases are Dengue Fever (233), Amoebiasis (106), and Shigellosis (43).

## Summary of Epidemic

- **Dengue Fever:** The epidemic has decreased gradually in the nearby Asian countries. The indigenous epidemic and risk have been slowed down in Taiwan; however, sporadic cases are expected to occur.
- **Enterovirus:** The epidemic is expected to slow down gradually.
- **Influenza:** Influenza activity is expected to fluctuate due to large temperature differences between night and day during the fall season.

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