

### Investigation of The Legionnaires' Disease Outbreak in Southern Taiwan, 2020

Yun-Hsuan Yang<sup>1\*</sup>, Chia-Tzu Liu<sup>2</sup>, Yu-Lan Tsai<sup>2</sup>, Hui-Pin Ho<sup>2</sup>,  
Min-Nan Hung<sup>1</sup>, Yen-Chang Tuan<sup>1</sup>, Hui-Chen Lin<sup>1</sup>

#### Abstract

From December 2020–January 2021, 17 confirmed cases of Legionnaires' disease occurred in Southern Taiwan. The Taiwan Centers for Disease Control and local health agencies conducted home and community environmental inspection and sampling. No suspicious source of infection was found near patient's home, but many factories near the industrial area had cooling towers. In order to control the epidemic as early as possible, cross-departmental collaboration was carried out before the environmental inspection report was issued. The factories were coordinated to clean and sanitize the cooling tower and the households were recommended cleaning waterway of the house, and thus the epidemic was effectively controlled. Although serogroup 1 of *Legionella pneumophila* was detected in some houses and the cooling towers of factories, however no bacteria were isolated from the clinical specimens of cases. Therefore, we could not compare the strains from cases and environment. The possibility that this community outbreak of Legionnaires' disease was related with common source of infection and some cases might be infected from the waterway of home could not be ruled out.

**Keywords:** Legionnaires' disease, *Legionella pneumophila*, environmental survey, cooling tower, cross-departmental collaboration

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

<sup>2</sup>Department of Health, Kaohsiung City Government  
DOI: 10.6525/TEB.202207\_38(14).0001

Corresponding author: Yun-Hsuan Yang\*

E-mail: E110617@nhi.gov.tw

Received: Jun. 25, 2021

Accepted: Jul. 30, 2021

week 26–27 (Jun. 26–Jul. 9, 2022)

DOI: 10.6525/TEB.202207\_38(14).0002

Weekly Data of Notifiable Inases (by week of diagnosis)

Case diagnosis year		Week 26★		Week 1-26			
Classification	Disease Diagnosed	2022	2021	2022		2021	
				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	14	0	15	0
	Acute Viral Hepatitis type A	5	0	100	1	37	0
	Amoebiasis	0	0	0	27	0	40
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	0	0	1	1
	Cholera	0	0	0	0	0	0
	Dengue Fever	1	0	5	5	5	5
	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 syndrome	0	0	0	0	7	0
	Malaria	0	0	2	2	1	1
	Measles	0	0	0	0	0	0
	Meningococcal Meningitis	0	0	0	0	2	0
	Paratyphoid Fever	0	0	0	0	2	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
	Shigellosis	3	0	43	0	77	0
Typhoid fever	0	0	1	0	1	0	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	1	5	48	0	78	2
	Acute Viral Hepatitis type C	8	13	223	1	290	0
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	7	0	5	0
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	0	0	1	0
	Haemophilus Influenza type b Infection	0	0	1	0	1	0
	Japanese Encephalitis	1	3	4	0	7	0
	Legionnaires' Disease	0	5	0	1	168	0
	Mumps	3	7	103	0	225	1
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	0	0
Tetanus	0	0	2	0	2	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	2	15	0	29	0
	Endemic Typhus Fever	0	1	5	1	21	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	0	0	0	1	0
	Invasive Pneumococcal Disease	4	2	99	0	144	0
	Leptospirosis	0	0	0	0	0	0
	Listeriosis	2	5	70	0	96	0
	Lyme Disease	0	0	1	1	0	0
	Melioidosis	0	0	0	0	0	0
	Q Fever	0	0	0	0	0	0
Scrub Typhus	5	6	81	0	123	0	
Toxoplasmosis	0	0	12	0	7	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	0	0	0	0	0	0
	Coronavirus Infections	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	0	0	1	0
	Rift Valley Fever	0	0	0	0	0	0
Severe Pneumonia with Novel Pathogens	257382	446	3853447	12512	14178	481	
Yellow Fever	0	0	0	0	0	0	

- ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
- MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen’s Disease and Creutzfeldt-Jakob Disease are excluded from the table.
- Numbers of mumps and tetanus cases are summed up by the week of report.

## Suspected Clusters

- Eight clusters related to diarrhea (2), tuberculosis (6) were reported during week 26.

## Imported Infectious Diseases

- There were 628 imported cases from 31 countries during week 26.
  - Severe Pneumonia with Novel Pathogens:** 625 cases from USA 56, Germany 23, Vietnam 21, France 12, Turkey 10, Canada 10 and the remaining 24 countries have less than 10 cases, 424 unknowns.
  - Dengue Fever:** 1 case from Vietnam.
  - Amoebiasis:** 1 case from Indonesia.
  - Acute Hepatitis A:** 1 case from unknown.
- During week 1-26, there were 12551 imported cases from 116 countries. The top three countries are Vietnam (2358), USA (1423), Indonesia (1063).
- During week 1-26, the notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (12512).

## Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens :** Taiwan is in the stage of widespread transmission of COVID-19, and the epidemic is slow down gradually. Global COVID-19 cases increase, the risk of COVID-19 transmission remains high. The activity of the Omicron BA2.12.1、BA.4 and BA.5 subvariants and their impact need continuous monitoring.
- **Japanese Encephalitis:** Taiwan is in the midst of Japanese Encephalitis season, individuals living in all counties in Taiwan are at risk of infection.

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

Case diagnosis year		Week 27★		Week 1-27			
Classification	Disease Diagnosed	2022	2021	2022		2021	
				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	2	0	16	0	15	0
	Acute Viral Hepatitis type A	1	1	101	1	38	0
	Amoebiasis	0	0	0	27	0	40
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	0	0	1	1
	Cholera	0	0	0	0	0	0
	Dengue Fever	3	0	8	8	5	5
	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 syndrome	0	0	0	0	7	0
	Malaria	0	0	2	2	1	1
	Measles	0	0	0	0	0	0
	Meningococcal Meningitis	0	0	0	0	2	0
	Paratyphoid Fever	0	0	0	0	2	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
Shigellosis	0	2	43	0	79	0	
Typhoid fever	0	0	1	0	1	0	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	5	1	52	0	79	2
	Acute Viral Hepatitis type C	14	10	237	1	300	0
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	7	0	5	0
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	0	0	1	0
	Haemophilus Influenza type b Infection	0	0	1	0	1	0
	Japanese Encephalitis	1	3	5	0	10	0
	Legionnaires' Disease	0	0	0	1	70	0
	Mumps	2	4	105	0	229	1
	Neonatal Tetanus	0	0	0	0	0	0
Pertussis	0	0	0	0	0	0	
Tetanus	0	0	2	0	2	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	0	15	0	29	0
	Endemic Typhus Fever	1	0	6	1	21	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	0	0	0	1	0
	Invasive Pneumococcal Disease	3	1	102	0	145	0
	Leptospirosis	0	0	0	0	0	0
	Listeriosis	3	4	73	0	100	0
	Lyme Disease	0	0	1	1	0	0
	Melioidosis	0	0	0	0	0	0
	Q Fever	0	0	0	0	0	0
	Scrub Typhus	20	7	101	0	130	0
Toxoplasmosis	1	0	13	0	7	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	0	0	0	0	0	0
	Coronavirus Infections	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	0	0	1	0
	Rift Valley Fever	0	0	0	0	0	0
	Severe Pneumonia with Novel Pathogens	211548	228	4064951	13271	14406	501
Yellow Fever	0	0	0	0	0	0	

- ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
- MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen's Disease and Creutzfeldt-Jakob Disease are excluded from the table.
- Numbers of mumps and tetanus cases are summed up by the week of report.

## Suspected Clusters

- Ten clusters related to diarrhea (1), tuberculosis (9) were reported during week 27.

## Imported Infectious Diseases

- There were 757 imported cases from 35 countries during week 27.
  - Severe Pneumonia with Novel Pathogens:** 754 cases from USA 43, Vietnam 18, Thailand 14, Germany 14, UAE 11, Netherlands 11 and the remaining 29 countries have less than 10 cases, 553 unknowns.
  - Dengue Fever:** 3 case from Vietnam.
- During week 1-27, there were 13313 imported cases from 118 countries. The top three countries are Vietnam (2380), USA (1472), Indonesia (1065).
- During week 1-27, the notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (13271).

## Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens :** Taiwan is in the stage of widespread transmission of COVID-19, and the epidemic is slow down gradually. Global COVID-19 cases increase, the risk of COVID-19 transmission remains high. The activity of the Omicron subvariants and their impact need continuous monitoring.
- **Japanese Encephalitis:** Taiwan is in the midst of Japanese Encephalitis season, individuals living in all counties in Taiwan are at risk of infection.

The Taiwan Epidemiology Bulletin series of publications is published by Centers for Disease Control, Ministry of Health and Welfare, Taiwan (R.O.C.) since Dec. 15, 1984.

**Publisher:** Jih-Haw Chou

**Editor-in-Chief:** Yung-Ching Lin

**Executive Editor:** Hsueh-Ju Chen, Hsin-Lun Lee

**Address:** No.6, Linsen S. Rd, Jhongjheng District, Taipei City 10050, Taiwan (R.O.C.)

**Telephone No:** +886-2-2395-9825

**Website:** <https://www.cdc.gov.tw/En>

**Suggested Citation:**

[Author].[Article title].Taiwan Epidemiol Bull 2022;38:[inclusive page numbers]. [DOI]