

### Investigation of a Multi-Drug Resistant Tuberculosis Cluster in an Entertainment Place, Southern Taiwan, 2018

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#### Abstract

In April 2018, the Kaohsiung-Pingtung Regional Center was notified of four multidrug-resistant tuberculosis (MDR-TB) cases with the same genotypes by the Diagnostics and Vaccine Development Center of the Taiwan Centers for Disease Control. In order to clarify the epidemiological relevance of these four cases, the local Public Health Bureau initiated a cross-county investigation and found that all these cases had a history of bowling alley activities. The similar activity indicated the highly probable epidemiological link between the cases. However, making the contact history of those four cases clear was difficult since the bowling alley did not have a customer record or contact information, so we cooperated with the place owner and encouraged visitors to accept chest X-ray examinations and questionnaire surveys to find out the potential high-risk contact consumers. Such strategies facilitate the identification of high-risk contacts and the two-year follow-up to detect active cases early and trace close contacts.

**Keywords:** Multi-drug resistant tuberculosis, cluster events, bowling alley

## Investigation of a Multi-Drug Resistant Tuberculosis Cluster in a Family and Campus, Central Taiwan, 2018

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### Abstract

In 2018, a family cluster of multi-drug resistant tuberculosis (MDR-TB) occurred in central Taiwan. Among the 5 family members, 4 were diagnosed with MDR-TB. The isolates were sent to the Mycobacterium Laboratory at Center for Research, Diagnostics and Vaccine Development for genotyping, and the results showed the same genotype. The index case went to a hospital due to a persistent cough in November 2018 and was diagnosed with pulmonary tuberculosis. We conducted a contact investigation immediately, and two household contacts were diagnosed with MDR-TB. One more household contact developed MDR-TB one year later during follow-up. In addition to household contacts, two other contacts were diagnosed with MDR-TB. One contact had the same genotype isolate, and the other one had no culture report. Through our contact investigation and health education, we found cases more efficiently. We suspected one of these cases was the primary case because the case had an abnormal chest X-ray report in 2017, but he did not seek medical advice. We recommend establishing a reporting system for abnormal physical examinations. Besides, we also recommend encouraging contacts to receive latent tuberculosis infection treatment to lower the risk of becoming an active MDR-TB case.

**Keywords:** Multiple drug resistance tuberculosis (MDR-TB), cluster, treatment of latent tuberculosis infection in contacts with multiple drug resistance tuberculosis (MDR-LTBI)

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week 9–week 10, 2023 (Feb. 26, 2023–Mar. 11, 2023)

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Weekly Data of Notifiable Inases (by week of diagnosis)

Case diagnosis year		Week 9★		Week 1-9			
Classification	Disease Diagnosed	2023	2022	2023		2022	
				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	5	0	4	0
	Acute Viral Hepatitis type A	0	0	20	0	58	0
	Amoebiasis	2	4	44	12	39	9
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	2	2	0	0
	Cholera	0	0	0	0	0	0
	Dengue Fever	2	0	15	15	0	0
	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	1	2	0	1	0
	Malaria	0	0	1	1	0	0
	Measles	0	0	0	0	0	0
	Meningococcal Meningitis	0	0	0	0	0	0
	Paratyphoid Fever	0	0	1	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
	Shigellosis	1	2	8	3	18	0
	Typhoid fever	0	0	0	0	0	0
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	0	0	
Mpox	3	-	4	1	-	-	
Category III	Acute Viral Hepatitis type B	4	2	31	1	22	0
	Acute Viral Hepatitis type C	6	16	107	0	70	0
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	2	1	2	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	4	0	0	0
	Haemophilus Influenza type b Infection	0	0	0	0	0	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	2	5	49	0	60	0
	Mumps	4	9	41	1	43	0
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	0	0
Tetanus	0	0	0	0	1	0	
Category IV	Botulism	0	0	0	0	0	0
	Bruellosis	0	0	0	0	0	0
	Complicated Varicella	1	2	9	0	6	0
	Endemic Typhus Fever	0	0	2	0	0	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	3	0	36	1	0	0
	Invasive Pneumococcal Disease	6	4	62	0	28	0
	Leptospirosis	0	1	4	0	6	0
	Listeriosis	5	2	31	0	19	0
	Lyme Disease	0	0	0	0	1	1
	Melioidosis	0	0	5	0	0	0
	Q Fever	0	0	1	0	2	0
	Scrub Typhus	0	8	27	0	29	0
Toxoplasmosis	0	0	4	0	4	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	0	0
	Rift Valley Fever	0	0	0	0	0	0
Severe Pneumonia with Novel Pathogens	79680	423	1232348	15851	3762	2905	
Yellow Fever	0	0	0	0	0	0	

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.  
 2. MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen's Disease and Creutzfeldt-Jakob Disease are excluded from the table.  
 3. Numbers of mumps and tetanus cases are summed up by the week of report.  
 4. Since 2022/6/23, " Monkeypox " was listed as a Notifiable Infectious Disease.

## Suspected Clusters

- Thirty clusters related to diarrhea (21), tuberculosis (2), varicella (1) and upper respiratory tract infection (6) were reported during week 9.

## Imported Infectious Diseases

- There were 1220 imported cases from at least 27 countries / areas during week 9.

**Severe Pneumonia with Novel Pathogens** : 1217 cases from Japan (45), Korea (17), USA (13), Hong Kong (9), Thailand (9), Vietnam (8), Malaysia (6), Germany (5), Turkey (5), Singapore (4), Indonesia (4), Canada (4), New Zealand (3), China (3), India (2), France (2), the Philippines (2), Macau (1), South Africa (1), Qatar (1), Hungary (1), UK (1), Austria (1), Mexico (1), UAE (1), Egypt (1), Australia (1), and Unknown (1066).

**Shigellosis** : 1 case from Indonesia (1).

**Dengue Fever** : 2 cases from Vietnam (1), Malaysia (1).

- During week 1-9, there were 15889 imported cases from at least 40 countries / areas. The top three countries are China (3145), Japan (583), Korea (136).
- During week 1-9, the notifiable diseases with the highest number of imported cases is Severe Pneumonia with Novel Pathogens (15851).

## Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : The epidemic is gradually declining.

### Weekly Data of Notifiable Inases (by week of diagnosis)

Case diagnosis year		Week 10★		Week 1-10			
Classification	Disease Diagnosed	2023	2022	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	1	6	0	5	0
	Acute Viral Hepatitis type A	4	6	24	0	64	0
	Amoebiasis	6	3	50	12	42	10
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	2	2	0	0
	Cholera	0	0	0	0	0	0
	Dengue Fever	0	0	15	15	0	0
	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	2	0	1	0
	Malaria	0	0	1	1	0	0
	Measles	0	0	0	0	0	0
	Meningococcal Meningitis	0	0	0	0	0	0
	Paratyphoid Fever	0	0	1	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
	Shigellosis	1	0	9	3	18	0
	Typhoid fever	0	0	0	0	0	0
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	0	0	
Mpox	4	-	8	1	-	-	
Category III	Acute Viral Hepatitis type B	1	2	32	1	24	0
	Acute Viral Hepatitis type C	13	4	120	0	74	0
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	2	1	2	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	4	0	0	0
	Haemophilus Influenza type b Infection	0	0	0	0	0	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	6	11	55	0	71	0
	Mumps	6	2	47	1	45	0
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	0	0
Tetanus	1	0	1	0	1	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	0	9	0	6	0
	Endemic Typhus Fever	1	0	3	0	0	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	4	0	40	1	0	0
	Invasive Pneumococcal Disease	10	0	72	1	28	0
	Leptospirosis	0	1	4	0	7	0
	Listeriosis	5	4	36	0	23	0
	Lyme Disease	0	0	0	0	1	1
	Melioidosis	0	0	5	0	0	0
	Q Fever	0	0	1	0	2	0
	Scrub Typhus	0	3	27	0	32	0
Toxoplasmosis	0	1	4	0	5	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	0	0
	Rift Valley Fever	0	0	0	0	0	0
	Severe Pneumonia with Novel Pathogens	65549	436	1297891	16847	4198	3314
Yellow Fever	0	0	0	0	0	0	

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.  
2. MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen’s Disease and Creutzfeldt-Jakob Disease are excluded from the table.  
3. Numbers of mumps and tetanus cases are summed up by the week of report.  
4. Since 2022/6/23, " Monkeypox " was listed as a Notifiable Infectious Disease.

## Suspected Clusters

- Twenty-eight clusters related to diarrhea (20), tuberculosis (2), enterovirus (1) and upper respiratory tract infection (5) were reported during week 10.

## Imported Infectious Diseases

- There were 992 imported cases from at least 25 countries / areas during week 10.
  - Severe Pneumonia with Novel Pathogens** : 991 cases from Japan (44), Korea (21), Thailand (12), Singapore (11), Vietnam (10), the Philippines (7), Hong Kong (5), Germany (4), New Zealand (4), Austria (3), China (3), UAE (3), Norway (2), Macau (2), India (2), Malaysia (2), USA (2), Netherlands (2), UK (1), Saudi Arabia (1), Indonesia (1), Italy (1), Turkey (1), France (1), Australia (1), and Unknown (845).
  - Invasive Pneumococcal Disease** : 1 case from Indonesia (1).
- During week 1-10, there were 16886 imported cases from at least 44 countries / areas. The top three countries are China (3148), Japan (627), Korea (159).
- During week 1-10, the notifiable diseases with the highest number of imported cases is Severe Pneumonia with Novel Pathogens (16847).

## Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : The epidemic is gradually declining.
- **Influenza**: Influenza virus activity is persistence.
- **Enterovirus**: The epidemic is gradually increasing.

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