

A Tuberculosis Outbreak in A University of Eastern Taiwan, 2014–2016

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Abstract

A university in eastern Taiwan reported two confirmed tuberculosis (TB) cases from June 6 to September 5 in 2014. No epidemiologic link between these two cases was identified. Contact investigation discovered two more active TB cases from one index case. The pathogens isolated from the cases shared the same genotype and thus the outbreak was confirmed. By November 3, 2016, a total of 1,318 contacts were investigated and additional 19 cases found. Among the 19 cases, 10 had same genotype, and 3 had no bacteria isolated but had epidemiologic links.

Prevention and control measures implemented included strengthening disease cognition in teachers and students, improving classroom air quality, contact investigation, and latent tuberculosis infection therapy. By June 2019, no new TB cases were identified.

Keywords: Tuberculosis, TB outbreak in a school, air quality, latent tuberculosis infection

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

Case diagnosis year		Week 9★		Week 1-9			
Classification	Disease Diagnosed	2021	2020	2021		2020	
				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	2	5	0	4	0
	Acute Viral Hepatitis type A	1	2	13	0	19	4
	Amoebiasis	1	7	29	11	41	21
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	0	0	1	1
	Cholera	0	0	0	0	0	0
	Dengue Fever	0	3	3	3	41	41
	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	3	0	2	0
	Malaria	0	0	1	1	1	1
	Measles	0	0	0	0	2	2
	Meningococcal Meningitis	0	0	0	0	3	0
	Paratyphoid Fever	0	0	0	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
Shigellosis	5	2	30	0	33	14	
Typhoid fever	1	1	1	0	3	1	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	1	0	0	1	1	
Category III	Acute Viral Hepatitis type B	0	0	15	0	19	2
	Acute Viral Hepatitis type C	13	16	110	0	117	1
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	1	1	0	4	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	1	0	6	0
	Haemophilus Influenza type b Infection	0	0	0	0	0	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	5	10	66	0	54	7
	Mumps	10	9	90	0	82	3
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	5	0
Tetanus	0	0	1	0	0	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	0	10	0	12	0
	Endemic Typhus Fever	1	0	5	0	0	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	6	0	0	545	6
	Invasive Pneumococcal Disease	9	2	65	0	106	0
	Leptospirosis	0	1	8	0	7	0
	Listeriosis	0	0	24	0	20	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	0	5	0	2	1
	Q Fever	0	0	0	0	0	0
	Scrub Typhus	0	2	46	0	42	1
Toxoplasmosis	0	0	2	0	0	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	13	13	159	138	39	18	
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.
- Since 2020/1/15, "Severe Pneumonia with Novel Pathogens" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Thirty-three clusters related to diarrhea (28), tuberculosis (2), upper respiratory tract infection (1), enterovirus (1), and varicella (1) were reported during week 9.

Imported Infectious Diseases

- There were 13 imported cases from 6 countries during week 9.

Diseases \ Countries	Countries						Total
	Philippines	Poland	Indonesia	Canada	USA	Nigeria	
Severe Pneumonia with Novel Pathogens	6	2	2	1	1	1	13
Total	6	2	2	1	1	1	13

- During week 1-9, there were 153 imported cases from 29 countries. The top three countries are Indonesia (37), the Philippines (35), and USA (30).
- During week 1-9, the three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (138), Amoebiasis (11), and Dengue Fever (3).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : Because the number of global COVID-19 new cases reported increased in the past two weeks, the imported cases continue to occur.
- **Diarrhea** : The epidemic status of diarrhea is expected to continue.

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

Case diagnosis year		Week 10★		Week 1-10			
Classification	Disease Diagnosed	2021	2020	2021		2020	
				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	0	0	5	0	4	0
	Acute Viral Hepatitis type A	2	3	15	0	22	4
	Amoebiasis	9	6	38	12	47	26
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	0	0	1	1
	Cholera	0	0	0	0	0	0
	Dengue Fever	0	4	3	3	45	45
	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	1	3	0	3	0
	Malaria	0	0	1	1	1	1
	Measles	0	0	0	0	2	2
	Meningococcal Meningitis	0	0	0	0	3	0
	Paratyphoid Fever	0	0	0	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
Shigellosis	2	3	32	0	36	14	
Typhoid fever	0	1	1	0	4	2	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	1	1	
Category III	Acute Viral Hepatitis type B	2	2	17	0	21	2
	Acute Viral Hepatitis type C	16	17	126	0	134	1
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	2	0	3	0	4	0
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	1	1	0	7	0
	Haemophilus Influenza type b Infection	0	0	0	0	0	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	3	2	69	0	56	7
	Mumps	7	8	97	0	90	5
	Neonatal Tetanus	0	0	0	0	0	0
Pertussis	0	3	0	0	8	0	
Tetanus	0	0	1	0	0	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	1	0	11	0	12	0
	Endemic Typhus Fever	0	0	5	0	0	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	0	0	0	545	6
	Invasive Pneumococcal Disease	7	3	72	0	109	0
	Leptospirosis	1	0	9	0	7	0
	Listeriosis	7	1	31	0	21	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	0	5	0	2	1
	Q Fever	0	0	0	0	0	0
	Scrub Typhus	1	3	47	0	45	1
Toxoplasmosis	0	0	2	0	0	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	17	6	176	155	45	20
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 2020/1/15, "Severe Pneumonia with Novel Pathogens" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Fifty clusters related to diarrhea (34), tuberculosis (10), varicella (4), upper respiratory tract infection (1), and enterovirus (1) were reported during week 10.

Imported Infectious Diseases

- There were 18 imported cases from 8 countries during week 10.

Diseases	Countries								Total
	Philippines	UK	Indonesia	Paraguay	USA	France	India	Honduras	
Severe Pneumonia with Novel Pathogens	6	3	2	2	1	1	1	1	17
Amoebiasis			1						1
Total	6	3	3	2	1	1	1	1	18

- During week 1-10, there were 171 imported cases from 31 countries. The top three countries are the Philippines (41), Indonesia (40), and USA (31).
- During week 1-10, the three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (155), Amoebiasis (12), and Dengue Fever (3).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : Because the number of global COVID-19 new cases reported and Taiwan entry persons increased in the past three weeks, the imported cases continue to occur.
- **Diarrhea** : The epidemic status of diarrhea is expected to continue.

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