

March 23, 2021 Vol.37 No.6

Outbreak Investigation

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

Jui-Nien Hsi^{*}, Po-Yi Sun Lin, Wan-Ju Wei, Mei-Chu Lee, Pei-ching Huang, Ta-Jen Chieh

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

Eastern Regional Center, Centers for Disease Control, Ministry of Health and Welfare, Taiwan. Corresponding author: Jui-Nien His^{*} E-mail: nien0703@cdc.gov.tw Received: Jul. 04, 2019 Accepted: Jul. 20, 2020 DOI: 10.6525/TEB.202103_37(6).0001

Centers for Disease Control, R.O.C.

Disease Surveillance

week 9-10(Feb.28-Mar.13, 2021)

DOI: 10.6525/TEB.202103_37(6).0002

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

Plague 1000 Cases Cases Total Cases Cases Total Cases Cases Category I Rables 0				_	2021		2020		
Rabies Smalpox 0	Classification	Disease Diagnosed	2021	2020	Total cases★		Total cases★	Importe cases	
SARS 0			-	-	-	-	-	0	
Smallpox 0<	Category I			-					
Acute Flactd Paralysis 1 2 5 0 4 0 19 4 Acute Viral Hepatitis type A 1 7 29 11 41 22 Anthrax 0			-						
Acute Viral Hepatitis type A 1 7 23 11 44 Anthrax 0			-		-	-	-	-	
Amoebiasis 1 7 29 11 41 22 Anthrax 0			-		-	-	-	-	
Anthras 0 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>21</td>						-		21	
Chikungunya Fever 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0					-				
Cholera 0 </td <td></td> <td></td> <td>-</td> <td></td> <td></td> <td>-</td> <td></td> <td></td>			-			-			
Dengue Fever 0 3 3 3 41 42 Category II Enterohemorrhagic E. coli infection 0					-	-			
Dipritheria Enterohemorrhagic E. coli infection 0			-	-	-	-	-	41	
Enterohemorrhagic E. coli linfection 0			-		-	-			
Epidemic Typhus Fever 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				0	0			0	
Lategory II Hantavirus Pulmonary Syndrome 0			0	0	0	0	0	0	
Lategory II Hemorrhagic Fever with Renal Syndrome 0 0 3 0 2 0 Malaria 0 0 0 0 0 0 2 2 Meningococcal Meningitis 0			0	0	0	0	0	0	
Malaria 0 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 </td <td>Lategory II</td> <td></td> <td>0</td> <td>0</td> <td>3</td> <td>0</td> <td>2</td> <td>0</td>	Lategory II		0	0	3	0	2	0	
Meningcoccal Meningitis 0			0	0	1	1	1	1	
ParatyPhoid Fever 0		Measles	0	0	0	0	2	2	
Poliomyelitis 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		Meningococcal Meningitis	0	0	0	0	3	0	
Rubella 0 </td <td></td> <td>Paratyphoid Fever</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td>		Paratyphoid Fever	0	0	0	0	0	0	
Shigellosis 5 2 30 0 33 11 Typhoid fever 1 1 1 0 </td <td></td> <td>Poliomyelitis</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td>		Poliomyelitis	0	0	0	0	0	0	
Typ boid fever West Nile Fever 1 1 1 1 0 <th< td=""><td></td><td>Rubella</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></th<>		Rubella	0	0	0	0	0	0	
West Nile Fever 0 0 0 0 0 0 1 0 0 1 Acute Viral Hepatitis type B 0 0 15 0 117 1 Acute Viral Hepatitis type C 13 16 110 0 117 1 Acute Viral Hepatitis type D 0		Shigellosis	5	2	30	0	33	14	
Zika virus infection 0 1 0 0 1 1 Acute Viral Hepatitis type D 0		Typhoid fever	1	1	1	0	3	1	
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		West Nile Fever	0	0	0	0	0	0	
Acute Viral Hepatitis type C 13 16 110 0 117 1 Acute Viral Hepatitis type D 0			0	1	0	0	1	1	
Acute Viral Hepatitis type D 0		Acute Viral Hepatitis type B	0	0	15	0	19	2	
Acute Viral Hepatitis type E 0 1 1 0 4 0 Congenital Syphilis 0<			13	16	110	0	117	1	
Category III Congenital Syphilis 0 <th< td=""><td></td><td>Acute Viral Hepatitis type D</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></th<>		Acute Viral Hepatitis type D	0	0	0	0	0	0	
Congenital Rubella Syndrome 0<		Acute Viral Hepatitis type E	0	1	1	0	4	0	
Category III Enteroviruses Infection with Severe Complications 0 0 1 0 6 0 Japanese Encephalitis 0		Congenital Syphilis	0	0	0	0	0	0	
Lategory III Haemophilus Influenza type b Infection 0 <th< td=""><td></td><td>Congenital Rubella Syndrome</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></th<>		Congenital Rubella Syndrome	0	0	0	0	0	0	
Category IV Fraction Internation Dependence 0	Catagory III	Enteroviruses Infection with Severe Complications	0	0	1	0	6	0	
Legionnaires' Disease 5 10 66 0 54 7 Mumps 10 9 90 0 82 3 Neonatal Tetanus 0<	Lategory III	Haemophilus Influenza type b Infection	0	0	0	0	0	0	
Mumps Neonatal Tetanus 10 9 90 0 82 33 Neonatal Tetanus 0		Japanese Encephalitis	0	0	0	0	0	0	
Neonatal Tetanus 0		Legionnaires' Disease	5	10	66	0	54	7	
Pertussis 0		Mumps	10	9	90	0	82	3	
Tetanus 0 0 1 0 0 0 Botulism 0		Neonatal Tetanus	0	0	0	0	0	0	
Botulism 0<		Pertussis	0	0	0	0	5	0	
Brucellosis 0 <th< td=""><td></td><td>Tetanus</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td><td>0</td></th<>		Tetanus	0	0	1	0	0	0	
Brucellosis 0 <th< td=""><td></td><td></td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></th<>			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 0 0 Influenza Case with Severe Complications 0 6 0 0 545 6 Invasive Pneumococcal Disease 9 2 65 0 106 0 Category IV Leptospirosis 0 1 8 0 7 0 Listeriosis 0 0 0 0 24 0 20 0 Melioidosis 0 0 0 0 0 0 0 0 0 Toxoplasmosis 0 0 0 0 0 0 0 0 0 Category V Ebola Virus Disease 0 0 0 0 0 0 0 0 0			0	0		0	0	0	
Endemic Typhus Fever 1 0 5 0 0 0 Herpesvirus B Infection 0			0	0	10	0	12	0	
Herpesvirus B Infection 0			-	-	-	-		-	
Influenza Case with Severe Complications 0 6 0 0 545 6 Invasive Pneumococcal Disease 9 2 65 0 106 0 Category IV Leptospirosis 0 1 8 0 7 0 Listeriosis 0 0 0 24 0 20 0 Lyme Disease 0		<i>·</i> ··				-			
Invasive Pneumococcal Disease 9 2 65 0 106 0 Category IV Leptospirosis 0 1 8 0 7 0 Listeriosis 0 0 0 24 0 20 0 Lyme Disease 0		•	-		-	-		-	
Category IV Leptospirosis 0 1 8 0 7 0 Listeriosis 0 0 0 24 0 20 0 Lyme Disease 0<			-						
Listeriosis 0 0 24 0 20 0 Lyme Disease 0 <td rowspan="2"></td> <td></td> <td>-</td> <td></td> <td></td> <td>-</td> <td>-</td> <td>-</td>			-			-	-	-	
Lyme Disease 0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>									
Melioidosis 0 0 5 0 2 1 Q Fever 0						-			
Q Fever 0 </td <td></td> <td>•</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td>		•	-	-	-	-	-	-	
Scrub Typhus 0 2 46 0 42 1 Toxoplasmosis 0 0 0 2 0 </td <td></td> <td></td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td></td> <td></td>			-	-	-	-			
Toxoplasmosis 0 0 2 0 0 0 Tularemia 0			-	-	-	-	-	-	
Tularemia 0		<i>,</i> ,	-			-			
Ebola Virus Disease 0			-	-		-	-	-	
Lassa Fever000000Marburg Hemorrhagic Fever000000Middle East Respiratory Syndrome Coronavirus Infections000000Novel Influenza A Virus Infections0000000Rift Valley Fever0000000Severe Pneumonia with Novel Pathogens13131591383918			-	-	-	-	-	-	
Marburg Hemorrhagic Fever00000Middle East Respiratory Syndrome Coronavirus Infections000000Novel Influenza A Virus Infections0000000Rift Valley Fever0000000Severe Pneumonia with Novel Pathogens13131591383918			-		-	-	-	0	
Category VMiddle East Respiratory Syndrome Coronavirus Infections00000Novel Influenza A Virus Infections000000Rift Valley Fever000000Severe Pneumonia with Novel Pathogens13131591383918					-	-	-	0	
Category VCoronavirus Infections00000Novel Influenza A Virus Infections000000Rift Valley Fever000000Severe Pneumonia with Novel Pathogens13131591383918		0 0	0	0	0	0	0	0	
Coronavirus Infections0000Novel Influenza A Virus Infections0000Rift Valley Fever0000Severe Pneumonia with Novel Pathogens13131591383918			Ω	Ω	Ο	Ο	0	0	
Rift Valley Fever 0	Lategory V		-	-	-	-	-	-	
Severe Pneumonia with Novel Pathogens 13 13 159 138 39 18			-	-	-	-	-	0	
			-	-	-	-	-	0	
Yellow Fever 0 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>18</td></t<>								18	
		Yellow Fever	0	0	0	0	0	0	

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.

Countries Diseases	Philippines	Poland	Indonesia	Canada	USA	Nigeria	Total
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.

	Case diagnosis year	Weel	(10★			(1-10	
Classification	Disease Diagnosed	2021	2020	2021	Imported	2020) Importe
	_			Total cases★	cases	Total cases★	cases
	Plague	0	0	0	0	0	0
Category I	Rabies SARS	0	0 0	0 0	0 0	0 0	0
	Smallpox	0	0	0	0	0	0
	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
Category II	Hantavirus Pulmonary Syndrome	0	0	0	0	0	0
	Hemorrhagic Fever with Renal Syndrome	0	1 0	3 1	0 1	3 1	0 1
	Malaria 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	Ő	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
	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
Category III	Enteroviruses Infection with Severe Complications	0	1	1	0	7	0
0,	Haemophilus Influenza type b Infection	0	0	0	0	0	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease Mumps	3 7	2 8	69 97	0	56 90	7 5
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	3	0	0	8	0
	Tetanus	0	0	1	0	0	0 0
	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
Category IV	Leptospirosis	1	0	9	0	7	0
	Listeriosis	7	1	31	0	21	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis Q Fever	0	0	5	0	2	1
	Scrub Typhus	0 1	0 3	0 47	0 0	0 45	0 1
	Toxoplasmosis	0	3 0	47	0	45 0	0
	Tularemia	0	0	0	0	0	0
	Ebola Virus Disease	0	0	0	0	0	0
	Lassa Fever	Ő	Ő	Ő	Ő	Ő	Ő
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome	0	0	0	0	0	0
Category v	Coronavirus Infections	-	-	-		-	-
	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

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

 The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases
MDR-TB, Tuberculosis, Syphilis, Gonorrhea, 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

● 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.

Countries Diseases	Philippines	UK	Indonesia	Paraguay	USA	France	India	Honduras	Total
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.

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 2021;37:[inclusive page numbers]. [DOI]