

A Cluster of Tuberculosis Among the Crew of An Oil Tanker, 2017

Li-Chuan Wu*, Hsin-Chun Lee, Hui-Chen Lin, Chiou-Yue You

Abstract

During July and October 2017, two crew members of an oil tanker were diagnosed with pulmonary tuberculosis (TB). Bacterial strains from the two cases shared identical genotype, so a cluster of TB was confirmed. The index case, a 68-year-old male, had a cough for 5 months before diagnosis. The other case was identified through the contact investigation with the index case, remaining asymptomatic at diagnosis. Three of the other 12 contacts (crew members) were confirmed being latent TB infection (LTBI) by chest radiography and an interferon- γ release assay. Directly observed prevention therapy (DOPT) for LTBI was successfully completed through prescription of 12-week regimen (rifapentine plus isoniazid) and integration of onshore in-person observation and electronic device-assisted programs delivered at multiple seaports. This report demonstrated a flexible, individualized DOPT program achieved the public health goal while fulfilling patients' needs. It also highlighted the necessity of periodic TB screening for ship crew members because of the cramped working environment and some workers being at the ageing group (≥ 65 years) with an increased risk of TB.

Keywords: Tuberculosis, cluster, ship, environment

A Pulmonary Tuberculosis Cluster in A Hospital in Southern Taiwan, 2009–2014

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Abstract

In Taiwan, tuberculosis has always been the notifiable disease with the largest number of confirmed cases every year. Tuberculosis infection possesses a great occupational risk to health care workers, and might even cause clusters. From December 2009 to November 2014, a total of 8 confirmed tuberculosis cases had been reported from Hospital A in southern Taiwan. Based on epidemiological investigation, 4 cases had common activity in a certain office space. Bacterial strains from 6 cases shared identical genotype, so a tuberculosis cluster was confirmed. According to the environmental investigation, one of the main factors might be due to poor ventilation. Therefore, the authorities and experts suggested that Hospital A should improve ventilation, infection control and staff health monitoring. This cluster was monitored for one year and no new case was reported by December 2015. Except one foreign worker case went back to home country, 7 other cases had completed treatment courses. The event indicated that hospitals need to actively monitor air quality, improve ventilation and strengthen the health care workers' willingness on latent tuberculosis infection screening and treatment, in order to decrease the risk for respiratory disease clusters in the future.

Keywords: Tuberculosis, health care worker, cluster

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

Case diagnosis year		Week 42★		Week 1–42			
Classification	Disease Diagnosed	2019	2018	2019		2018	
				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	0	0	39	0	50	0
Category II	Acute Viral Hepatitis type A	5	3	62	17	63	26
	Amoebiasis	5	7	211	105	188	85
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	7	0	35	34	4	4
	Cholera	0	0	0	0	4	0
	Dengue Fever	24	13	398	324	167	149
	Diphtheria	0	0	0	0	0	0
	Enterohemorrhagic E. coli Infection	0	0	1	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	0	0	1	0
	Malaria	1	1	3	3	2	2
	Measles	7	0	120	48	31	7
	Meningococcal Meningitis	1	0	3	0	5	1
	Paratyphoid Fever	0	1	5	4	5	4
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	1	20	17	8	7
	Shigellosis	2	4	91	31	102	35
	Typhoid fever	0	0	18	14	7	5
	West Nile Fever	0	0	0	0	0	0
Zika virus infection	1	0	3	3	1	1	
Category III	Acute Viral Hepatitis type B	1	4	68	1	85	7
	Acute Viral Hepatitis type C	12	9	383	2	300	3
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	7	2	5	0
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	2	1	27	1	29	0
	Haemophilus Influenza type b Infection	0	0	1	0	4	0
	Japanese Encephalitis	0	0	20	0	34	0
	Legionellosis	3	10	173	11	113	2
	Mumps	8	10	379	4	370	6
	Neonatal Tetanus	0	0	0	0	0	0
Category IV	Pertussis	0	1	23	0	16	0
	Tetanus	0	1	1	0	5	0
	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	1	2	41	1	34	0
	Endemic Typhus Fever	1	0	15	1	18	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Invasive Pneumococcal Disease	8	8	285	2	321	0
	Leptospirosis	3	1	52	0	38	0
	Listeriosis	0	0	121	1	111	1
	Lyme Disease	0	1	1	1	1	1
	Melioidosis	1	1	15	0	11	1
	Q Fever	1	0	15	2	9	1
	Scrub Typhus	14	10	288	3	225	0
Category V	Severe Complicated Influenza	50	33	1400	6	880	5
	Toxoplasmosis	0	0	9	1	12	1
	Tularemia	0	0	0	0	0	0
	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
Category V	Middle East Respiratory Syndrome Coronavirus	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
	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 2018/1/1, "Listeriosis" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Thirty-eight clusters were reported during week 42, including 6 tuberculosis clusters, 15 diarrhea clusters, 3 upper respiratory tract infection clusters, 12 influenza-like illness clusters, and 2 varicella clusters.

Imported Infectious Diseases

- There were 20 imported cases from 9 countries during week 42 of 2019.

Countries \ Diseases	Myanmar	Indonesia	Thailand	Vietnam	Macau	Cambodia	China	Philippines	Australia	Total
Dengue Fever			4	2				1		7
Chikungunya Fever	4									4
Amoebiasis		2					1			3
Shigellosis		2								2
Measles						1				1
Acute Hepatitis E					1					1
Q Fever									1	1
Acute Hepatitis B				1						1
Total	4	4	4	3	1	1	1	1	1	20

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

- There are 869 imported cases from 39 different countries in 2019. The top 3 countries are Indonesia (238), Vietnam (130), and the Philippines (108).
- Top 3 imported diseases are Dengue Fever (435), Amoebiasis (143), and Chikungunya Fever (79).

Summary of Epidemic

- **Enterovirus** : The epidemic has gradually slowed down, but it is still in the epidemic period. EV71 is still circulating in the community.
- **Dengue** : The indigenous epidemics in Taipei City, New Taipei City, Taichung City and Tainan City are still under surveillance; the risk of epidemic is persistence.

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

Case diagnosis year		Week 43★		Week 1–43			
Classification	Disease Diagnosed	2019	2018	2019		2018	
				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	2	53	1	59	0
	Acute Viral Hepatitis type A	2	2	78	20	74	29
	Amoebiasis	8	7	277	145	266	129
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	4	0	104	83	6	6
	Cholera	0	0	0	0	7	0
	Dengue Fever	13	27	547	448	419	250
	Diphtheria	0	0	0	0	0	0
	Enterohemorrhagic E. coli Infection	0	0	1	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	0	0	6	6	5	5
	Measles	0	0	133	53	36	9
	Meningococcal Meningitis	1	0	5	0	5	1
	Paratyphoid Fever	0	0	7	6	7	6
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	21	17	9	8
Shigellosis	6	3	117	37	141	47	
Typhoid fever	0	0	23	19	13	10	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	4	4	2	2	
Category III	Acute Viral Hepatitis type B	1	1	91	2	121	8
	Acute Viral Hepatitis type C	16	8	512	2	376	3
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	8	4	6	0
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	5	2	54	1	36	0
	Haemophilus Influenza type b Infection	1	0	2	0	5	0
	Japanese Encephalitis	0	0	21	0	36	0
	Legionellosis	9	3	226	14	166	7
	Mumps	12	10	507	7	506	8
Neonatal Tetanus	0	0	0	0	0	0	
Pertussis	1	0	25	0	27	2	
Tetanus	0	0	3	0	5	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	3	54	1	50	0
	Endemic Typhus Fever	1	0	25	3	22	1
	Herpesvirus B Infection	0	0	0	0	0	0
	Invasive Pneumococcal Disease	4	5	354	2	391	0
	Leptospirosis	2	3	105	0	80	1
	Listeriosis	5	0	156	1	139	1
	Lyme Disease	0	0	1	1	2	2
	Melioidosis	2	0	43	0	23	1
	Q Fever	1	0	22	5	15	1
	Scrub Typhus	14	6	395	4	299	1
	Severe Complicated Influenza	32	7	1935	8	1061	5
Toxoplasmosis	0	0	13	2	14	1	
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	0	0
	Rift Valley Fever	0	0	0	0	0	0
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 2018/1/1, "Listeriosis" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Forty-three clusters were reported during week 43, including 8 tuberculosis clusters, 14 diarrhea clusters, 9 upper respiratory tract infection clusters, 8 influenza-like illness clusters, 3 varicella clusters, and 1 enterovirus cluster.

Imported Infectious Diseases

- There were 20 imported cases from 10 countries during week 43 of 2019.

Diseases	Countries										Total
	Vietnam	Myanmar	Nepal	Philippines	Indonesia	Malaysia	Thailand	Cambodia	China	India	
Dengue Fever	4		2	2		2	1	1		1	13
Chikungunya Fever		3					1				4
Amoebiasis					2						2
Legionnaires' Disease									1		1
Total	4	3	2	2	2	2	2	1	1	1	20

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

- There are 889 imported cases from 39 different countries in 2019. The top 3 countries are Indonesia (240), Vietnam (134), and the Philippines (110).
- Top 3 imported diseases are Dengue Fever (448), Amoebiasis (145), and Chikungunya Fever (83).

Summary of Epidemic

- **Enterovirus** : The epidemic has gradually slowed down, but it is still in the epidemic period. EV71 is still circulating in the community.
- **Dengue** : The indigenous epidemics in New Taipei City, Taichung City and Tainan City are still under observation; the epidemic has gradually slowed down.

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