

A Study on Tuberculosis Epidemic and Related Infection Control Measures of Populous Institutions in Taipei City and New Taipei City, Taiwan, 2013–2016

Ling-Ling Lin*, Chun-Ru Du, Hsiao-Ping Tung, Hui-Rong Liu, Jer-Jea Yen

Abstract

In response to entering into the aging society, the demand for long-term care institutions is increasing in Taiwan. The government has also devoted considerable efforts to integrating relevant resources and improve our long-term care system in recent years. According to the surveillance data, 601 tuberculosis (TB) cases were reported from the populous institutions in Taipei City and New Taipei City during 2013 to 2016, of which 80% were over 65 years of age; about half of the cases (51.4%) died from TB. Because the populous institution residents were mostly elder, with lower immunity function, and the environment was crowded, TB outbreaks occurred easily. A total of 37 institutions reported TB cases. Among them, 35 were long-term care service institutions; accounting for 94.6%, of which 62.9% were nursing care institutions. Moreover, the number of confirmed outbreaks was increasing by year. We examined the implementation of TB-related infection control measures in those institutions without TB outbreaks and found that they were more likely to have implemented relevant control measures (36%–100%). For effectively preventing TB outbreaks in institutions, and strengthening the self-monitoring ability, by referring to the TB guidelines of infection control by U.S. CDC and the recommendations from expert meetings, we recommended that institutions must have a clear infection control program or standard operating procedures, ensure the quality of chest X-ray interpretation, implement TB-related symptoms monitoring, strengthen training of nursing care workers about TB infection control, and measure the concentration of carbon dioxide regularly.

Keywords: Long-term care institution, Tuberculosis, Outbreak, Infection control measures

Taipei Regional Center, Centers for Disease Control,
Ministry of Health and Welfare, Taiwan
Corresponding author: Ling-Ling Lin*
E-mail: lingling@cdc.gov.tw

Received: May. 31, 2017

Accepted: Aug. 29, 2017

DOI: 10.6525/TEB.20171205.33(23).001

Investigation of Tuberculosis Clusters in a Long-Term Psychiatric Institution in Eastern Taiwan, 2012–2016

Po-Yi Sun Lin*, Mei-Chu Lee, Pei-Ching Huang

Abstract

During April 17–August 14, 2014, eight cases of tuberculosis (TB) were notified (seven confirmed; one excluded) in a long-term psychiatric institution in eastern Taiwan. Six cases were living in the same ward, with identified epidemiologic links, and two confirmed cases were infected with the same genotype. The outbreak had been confirmed. As of August 2016, 302 TB cases in the institution had been reported; 22 were confirmed, and 1,609 contacts were monitored. The completion rates of four times of contact tracing were 99.2%, 92.8%, 95.5% and 94.9%, respectively. From the surveillance database we also identified 10 confirmed TB cases in the same institution between 2012 and 2013. After all, among these 32 confirmed cases, 10 had clustered genotypes (A group: 3; B group: 5; and C group: 2), 16 had separate genotypes and 6 had no culture results. Based on the recommendations from three expert meetings, the institution recruited two infection control specialists, implemented symptom surveillance and reporting, improved transfer records, ensured isolation for TB patients, improved the environment ventilation, and strengthened contact tracing every six months. From April 2015 to August 2016, no TB cases of the same genotype had been identified in the institution. Long-term psychiatric institutions must pay attention to the quality of infection control, maintain adequate human resources, and cooperate with public health authorities in order to lower risks of TB clusters.

Keywords: Tuberculosis, Long-term psychiatric institution, Tuberculosis outbreak, Infection control

Eastern Regional Center, Centers for Disease Control, Ministry of Health and Welfare, Taiwan
Corresponding author: Po-Yi Sun Lin*
E-mail: sandra@cdc.gov.tw

Received: May. 17, 2017
Accepted: Aug. 21, 2017
DOI: 10.6525/TEB.20171205.33(23).002

week 46–47(Nov. 12–Nov. 25, 2017)

DOI: 10.6525/TEB.20171205.33(23).003

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

Case diagnosis year		Week 46★		Week 1-46			
Classification	Disease Diagnosed	2017	2016	2017		2016	
				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
		0	0	0	0	0	0
Category II	Acute Flaccid Paralysis	3	0	33	0	36	0
	Acute Viral Hepatitis type A	5	24	355	47	1007	75
	Amoebiasis	8	8	312	172	282	146
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	11	11	9	9
	Cholera	0	0	2	1	9	0
	Dengue Fever	4	9	313	303	768	328
	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	1	0	3	0
	Malaria	0	0	7	7	14	14
	Measles	0	0	5	5	13	7
	Meningococcal Meningitis	0	0	11	0	6	0
	Paratyphoid Fever	0	0	5	4	5	2
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	3	2	4	3
	Shigellosis	7	4	151	52	196	95
	Typhoid fever	0	0	17	14	7	3
West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	6	2	140	8	97	4
	Acute Viral Hepatitis type C	10	2	277	2	176	2
	Acute Viral Hepatitis type D	0	0	1	0	1	0
	Acute Viral Hepatitis type E	1	0	15	3	15	5
	Acute Viral Hepatitis untype	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	1	1	0	0
	Enteroviruses Infection with Severe Complications	0	3	11	0	30	0
	Haemophilus Influenza type b Infection	0	0	5	0	14	0
	Japanese Encephalitis	0	0	25	0	23	0
	Legionellosis	2	6	150	12	103	3
	Mumps	14	13	580	9	553	7
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	34	0	18	0
	Tetanus	0	0	9	0	10	0
	Category IV	Botulism	0	0	0	0	5
Brucellosis		0	0	0	0	0	0
Complicated Influenza		2	24	1289	6	1979	2
Complicated Varicella		2	0	28	1	37	0
Endemic Typhus Fever		1	0	35	1	13	0
Herpesvirus B Infection		0	0	0	0	0	0
Invasive Pneumococcal Disease		8	13	407	3	515	0
Leptospirosis		7	6	92	1	113	2
Lyme Disease		0	0	1	1	2	2
Melioidosis		1	0	24	0	43	1
Q Fever		0	0	17	0	42	3
Scrub Typhus		3	15	391	0	441	3
Toxoplasmosis		1	0	18	0	8	0
Tularremia		0	0	0	0	0	0
Category V	Ebola Virus Disease	0	0	0	0	0	0
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	1	1	0	0
	Lassa Fever	0	0	0	0	0	0
	Rift Valley Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome Coronavirus	0	0	0	0	0	0
	Yellow Fever	0	0	0	0	0	0
	Zika Virus Infection	0	0	4	4	13	13

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
2. The following 8 chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
3. Numbers of mumps and tetanus cases are summed up by the week of report.
4. in 2016/1/22, "Zika Virus Infection" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Fifteen clusters were reported, including 8 tuberculosis clusters, 4 diarrhea clusters, 1 enterovirus cluster and 2 varicella clusters.

Imported Infectious Diseases

- 14 confirmed cases were imported from 4 countries during Week 46 of 2017.

Disease \ Country	Indonesia	Philippines	Thailand	Vietnam	Total
Amoebiasis	6	1			7
DF	1	1		2	4
Shigellosis	2				2
Hepatitis B			1		1
Total	9	2	1	2	14

Note: The statistics listed in this table include imported cases that were either **confirmed** or **updated** in the previous week.

- A total of 662 confirmed cases were imported from 36 countries in 2017.
- Top 3 imported diseases : Dengue fever (303), Amoebiasis (172), Shigellosis (52).
- Top 3 countries responsible for most imported cases : Indonesia (217), Vietnam (109), Philippines (82).

Summary of Epidemic

- **Enterovirus** : Most reported cases experience mild symptoms. EV71 virus is still circulating in the community.

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

Case diagnosis year		Week 47★		Week 1-47			
Classification	Disease Diagnosed	2017	2016	2017		2016	
				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	4	0	37	0	36	0
	Acute Viral Hepatitis type A	8	23	363	48	1030	75
	Amoebiasis	4	4	316	175	286	148
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	11	11	9	9
	Cholera	0	0	2	1	9	0
	Dengue Fever	4	7	317	307	775	334
	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	1	0	3	0
	Malaria	0	0	7	7	14	14
	Measles	0	0	5	5	13	7
	Meningococcal Meningitis	0	1	11	0	7	0
	Paratyphoid Fever	0	0	5	4	5	2
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	3	2	4	3
	Shigellosis	3	6	154	54	202	99
Typhoid fever	0	0	17	14	7	3	
West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	0	3	140	8	100	5
	Acute Viral Hepatitis type C	2	4	279	2	180	2
	Acute Viral Hepatitis type D	0	0	1	0	1	0
	Acute Viral Hepatitis type E	0	0	15	3	15	5
	Acute Viral Hepatitis untype	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	1	1	0	0
	Enteroviruses Infection with Severe Complications	0	0	11	0	30	0
	Haemophilus Influenza type b Infection	0	0	5	0	14	0
	Japanese Encephalitis	0	0	25	0	23	0
	Legionellosis	3	2	153	13	105	3
	Mumps	15	9	595	9	562	7
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	34	0	18	0
	Tetanus	1	0	10	0	10	0
Category IV	Botulism	0	0	0	0	5	0
	Brucellosis	0	0	0	0	0	0
	Complicated Influenza	4	21	1293	6	2000	2
	Complicated Varicella	0	0	28	1	37	0
	Endemic Typhus Fever	0	1	35	1	14	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Invasive Pneumococcal Disease	9	14	416	3	529	0
	Leptospirosis	4	2	96	1	115	2
	Lyme Disease	0	0	1	1	2	2
	Melioidosis	0	2	24	0	45	1
	Q Fever	1	1	18	0	43	3
	Scrub Typhus	1	11	391	0	452	4
	Toxoplasmosis	1	2	19	0	10	0
Tularemia	0	0	0	0	0	0	
Category V	Ebola Virus Disease	0	0	0	0	0	0
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	1	1	0	0
	Lassa Fever	0	0	0	0	0	0
	Rift Valley Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome Coronavirus	0	0	0	0	0	0
	Yellow Fever	0	0	0	0	0	0
	Zika Virus Infection	0	0	4	4	13	13

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
2. The following 8 chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
3. Numbers of mumps and tetanus cases are summed up by the week of report.
4. Since 2016/1/22, "Zika Virus Infection" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Eighteen clusters were reported, including 4 tuberculosis clusters, 5 diarrhea clusters, 2 upper respiratory tract infection clusters, 4 influenza-like illness clusters and 3 varicella clusters.

Imported Infectious Diseases

- 11 confirmed cases were imported from 5 countries during Week 47 of 2017.

Disease \ Country	Indonesia	Vietnam	Philippines	Thailand	China	Total
DF		2	2			4
Amoebiasis	3					3
Shigellosis	2					2
Legionellosis					1	1
Hepatitis A				1		1
Total	5	2	2	1	1	11

Note: The statistics listed in this table include imported cases that were either **confirmed** or **updated** in the previous week.

- A total of 673 confirmed cases were imported from 36 countries in 2017.
- Top 3 imported diseases : Dengue fever (307), Amoebiasis (175), Shigellosis (54).
- Top 3 countries responsible for most imported cases : Indonesia (222), Vietnam (111), Philippines (84)

Summary of Epidemic

- **Enterovirus** : Most reported cases experience mild symptoms. EV71 virus is still circulating in the community.
- **Influenza** : The epidemic activity remains low.

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, Zhongjheng District, Taipei City 10050, Taiwan (R.O.C.)

Telephone No: (02) 2395-9825

Website: <http://www.cdc.gov.tw/>

Suggested Citation:

[Author].[Article title].Taiwan Epidemiol Bull 2017;33:[inclusive page numbers]. [DOI]