

The Model and Effects of Interdepartmental Dengue Fever Prevention and Control, Taichung City, 2015

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Abstract

The number of confirmed dengue fever cases reached up to 43,784 cases (43,419 indigenous and 365 imported cases) in Taiwan in 2015, the most in recent 10 years. In the same year, Taichung City identified 125 confirmed dengue fever cases (76 indigenous and 49 imported cases), which showed the severity of local dengue fever in Taiwan. In the meantime, Zika virus infections prevailed in Central and South America. The first and the second Zika virus infected cases, imported from Thailand, were identified in Taichung City in January and May of 2016, respectively. To prevent and control these mosquito-borne diseases due to climate change and frequent human activities, Taichung City government initiated interdepartmental collaboration in September 2015. Each bureau of Taichung City government supervised the reduction and removal of mosquito breeding sites and raised public awareness in the field. Through these efforts, the dengue fever endemic in Taichung City was under control. Taichung City's experiences in dengue fever control addressed in this article provide an example for other cities and counties.

Keywords: Dengue fever, Zika virus, Cross-bureau, Control

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The Impact of Public Places on the Initial Stage of Dengue Outbreak: Study of the Dengue Fever Cluster in Ximending Flea Market, Tainan City, 2015

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Abstract

In 2015, Tainan city had faced the most severe indigenous dengue fever outbreak. Since the first case was confirmed on 21 May, 2015, the outbreak had lasted for 36 weeks and caused 22,765 infections. Tainan city government had experiences of dealing with dengue fever epidemics through the past 10 years, however, the outbreak in 2015 was difficult to manage. In retrospect, delay in identifying mosquito breeding sites in Ximending flea market to interrupt transmission routes in the initial stage of the epidemic was the major factor leading to the spread of the outbreak. The dengue cluster associated with Ximending flea market included 74 confirmed cases and lasted for 12 weeks. The residence of cases located over 15 villages and districts in 3 counties. With cooperation of city government and vendors, the outbreak had been under control after implementing breeding sites elimination, chemical control, environmental sanitation improvement and business suspension. This investigation describes the process of the cluster, control strategies and experiences learned. As a reference, these experiences may prevent future dengue fever outbreak facilitated by public place.

Keywords: Tainan city, Dengue fever, Public place, Initial stage of epidemic, Market

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

Case diagnosis year		Week 18★		Week 1-18			
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
	Acute Flaccid Paralysis	0	0	14	0	13	0
Category II	Acute Viral Hepatitis type A	2	26	227	22	239	19
	Amoebiasis	6	5	122	62	88	37
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	5	5	4	4
	Cholera	0	0	0	0	0	0
	Dengue Fever	6	5	82	82	533	98
	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	1	1	1	1	5	5
	Measles	0	1	5	4	3	2
	Meningococcal Meningitis	1	0	6	0	2	0
	Paratyphoid Fever	0	0	3	3	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	4	3
	Shigellosis	7	3	77	30	79	40
	Typhoid fever	0	1	8	7	2	1
	West Nile Fever	0	0	0	0	0	0
Category III	Acute Viral Hepatitis type B	2	2	55	2	31	0
	Acute Viral Hepatitis type C	2	4	80	0	67	1
	Acute Viral Hepatitis type D	0	0	1	0	1	0
	Acute Viral Hepatitis type E	0	1	7	2	7	3
	Acute Viral Hepatitis untype	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	1	0	4	0
	Haemophilus Influenza type b Infection	0	1	2	0	4	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionellosis	5	3	42	5	37	0
	Mumps	19	13	225	2	186	3
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	1	0	10	0	6	0
	Tetanus	0	0	3	0	3	0
Category IV	Botulism	0	0	0	0	1	0
	Brucellosis	0	0	0	0	0	0
	Complicated Influenza	14	6	200	3	1817	2
	Complicated Varicella	0	0	6	1	15	0
	Endemic Typhus Fever	3	0	10	1	3	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Invasive Pneumococcal Disease	9	13	203	2	281	0
	Leptospirosis	0	0	24	0	14	1
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	0	7	0	5	0
	Q Fever	0	2	4	0	13	2
	Scrub Typhus	4	5	101	0	79	0
	Toxoplasmosis	0	0	6	0	5	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	1	1	1	1	

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. The numbers of mumps and tetanus cases are summed up by the weekly report.
4. Since 2016/1/22, "Zika Virus Infection" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Twenty-six clusters were reported, including 6 tuberculosis clusters, 7 diarrhea clusters, 9 upper respiratory tract infection clusters and 4 influenza-like illness clusters.

Imported Infectious Diseases

- 9 confirmed cases were imported from 5 countries during Week 18 of 2017.

Country Disease	Indonesia	Thailand	India	Maldives	Philippines	Total
DF	1	3	1	1		6
Amoebiasis					1	1
Shigellosis	1					1
Malaria	1					1
Total	3	3	1	1	1	9

- A total of 234 confirmed cases were imported from 18 countries in 2017.
- Top 3 imported diseases : Dengue fever (82), Amoebiasis (62), Shigellosis (30).
- Top 3 countries responsible for most imported cases : Indonesia (101), Vietnam (23), Philippines (23).

Summary of Epidemic

- **Influenza** : Influenza activity in the community has continued to persist. The number of influenza cases among children and severe cases may increase slightly.
- **Scrub Typhus** : The scrub typhus epidemic season has begun. The affected areas primarily include Hualien County and Taitung County.
- **Enterovirus** : Currently, enterovirus activity in the community remains low, and most cases are mild cases. EV71 is still circulating in the community.

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

Case diagnosis year		Week 19★		Week 1-19			
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	0	0	14	0	13	0
	Acute Viral Hepatitis type A	9	37	236	24	276	24
	Amoebiasis	6	3	128	70	91	40
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	5	5	4	4
	Cholera	0	0	0	0	0	0
	Dengue Fever	1	4	83	83	537	102
	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	1	1	5	5
	Measles	0	1	5	5	4	3
	Meningococcal Meningitis	0	0	6	0	2	0
	Paratyphoid Fever	0	0	3	3	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	4	3
	Shigellosis	5	5	82	31	84	42
Typhoid fever	1	0	9	8	2	1	
West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	5	1	60	3	32	0
	Acute Viral Hepatitis type C	4	8	84	0	75	1
	Acute Viral Hepatitis type D	0	0	1	0	1	0
	Acute Viral Hepatitis type E	0	0	7	2	7	3
	Acute Viral Hepatitis untype	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	1	0	4	0
	Haemophilus Influenza type b Infection	0	1	2	0	5	0
	Japanese Encephalitis	0	1	0	0	1	0
	Legionellosis	7	2	49	5	39	0
	Mumps	16	11	241	2	197	3
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	1	0	11	0	6	0
	Tetanus	0	0	3	0	3	0
Category IV	Botulism	0	0	0	0	1	0
	Brucellosis	0	0	0	0	0	0
	Complicated Influenza	26	7	226	3	1824	2
	Complicated Varicella	0	0	6	1	15	0
	Endemic Typhus Fever	0	0	10	1	3	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Invasive Pneumococcal Disease	13	11	216	2	292	0
	Leptospirosis	0	2	24	0	16	1
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	0	7	0	5	0
	Q Fever	0	0	4	0	13	2
	Scrub Typhus	4	11	105	0	90	0
	Toxoplasmosis	0	0	6	0	5	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	1	1	1	1

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

Suspected Clusters

- Thirty-nine clusters were reported, including 4 tuberculosis clusters, 16 diarrhea clusters, 15 upper respiratory tract infection clusters, 3 influenza-like illness clusters and 1 varicella cluster.

Imported Infectious Diseases

- 15 confirmed cases were imported from 7 countries during Week 19 of 2017.

Country Disease	Indonesia	Philippines	Singapore	Vietnam	Thailand	Japan	Cambodia	Unknown	Total
Amoebiasis	6	1			1				8
Hepatitis A						1	1		2
DF		1							1
Hepatitis B				1					1
Measles								1	1
Shigellosis	1								1
Typhoid fever			1						1
Total	7	2	1	1	1	1	1	1	15

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

- A total of 249 confirmed cases were imported from 18 countries in 2017.
- Top 3 imported diseases : Dengue fever (83), Amoebiasis (70), Shigellosis (31).
- Top 3 countries responsible for most imported cases : Indonesia (108), Philippines (25), Vietnam (24).

Summary of Epidemic

- **Influenza** : Influenza activity in the community has continued to persist. The number of severe cases may increase slightly.
- **Scrub Typhus** : The scrub typhus epidemic season has begun. The affected areas primarily include Hualien County and Taitung County.
- **Enterovirus** : Currently, enterovirus activity in the community remains low, and most cases are mild cases. EV71 is still circulating in the community.

● **Dengue Fever** : The first indigenous dengue case was confirmed during week 20. As the temperature has increased and the rain has continued to occur, the risk of indigenous epidemic is elevated

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