

Investigation of the First Dengue Cluster, Kaohsiung City, 2017

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Abstract

Dengue is the most important vector-borne infectious disease in southern Taiwan. The first indigenous dengue case in 2017 was reported in Nanzih District, Kaohsiung in July. The public health agencies initiated an epidemiological investigation and found two more dengue cases. Taiwan Centers for Diseases Control and the local government cooperated with each other to control the dengue cluster, assessing the effectiveness of vector control measures using the Gravitrapp and Ovitrap provided by the National Mosquito-Borne Diseases Control Research Center. This dengue cluster was terminated quickly and involved only three cases. We recommended using multiple ways of advocacy for dengue control to the public and health care workers to facilitate early detection of dengue cases. Outdoors ovitrap performed well and could be used with other tools to monitor the vector density and assess the effectiveness of control measures.

Keywords: Dengue cluster, Gravitrapp, Ovitrap

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

Case diagnosis year		Week 31★		Week 1-31			
Classification	Disease Diagnosed	2018	2017	2018		2017	
				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	48	0	22	0
	Acute Viral Hepatitis type A	5	2	59	21	309	31
	Amoebiasis	6	8	171	68	212	120
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	1	2	2	8	8
	Cholera	0	0	2	0	0	0
	Dengue Fever	16	11	143	133	164	161
	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	1	0
	Malaria	0	1	1	1	4	4
	Measles	0	0	31	12	5	5
	Meningococcal Meningitis	0	1	5	1	10	0
	Paratyphoid Fever	0	0	4	2	3	3
	Poliomyelitis	0	0	0	0	0	0
	Rubella	1	0	6	5	2	2
Shigellosis	3	1	96	30	108	41	
Typhoid fever	0	0	7	5	11	10	
West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	2	4	78	6	102	3
	Acute Viral Hepatitis type C	11	12	279	3	180	1
	Acute Viral Hepatitis type D	0	0	0	0	1	0
	Acute Viral Hepatitis type E	0	0	5	0	12	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	1	0	26	0	6	0
	Haemophilus Influenza type b Infection	0	0	4	0	3	0
	Japanese Encephalitis	2	2	34	0	22	0
	Legionellosis	4	3	101	2	100	10
	Mumps	11	14	346	4	401	6
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	13	0	19	0
	Tetanus	0	0	4	0	6	0
	Category IV	Botulism	0	0	0	0	0
Brucellosis		0	0	0	0	0	0
Complicated Influenza		2	0	29	0	15	1
Complicated Varicella		0	1	18	0	27	1
Endemic Typhus Fever		0	0	0	0	0	0
Herpesvirus B Infection		4	6	305	0	305	2
Invasive Pneumococcal Disease		2	2	33	0	51	1
Leptospirosis		6	0	108	0	0	0
Lyme Disease		0	0	0	0	0	0
Melioidosis		0	0	9	1	12	0
Q Fever		0	0	8	1	11	0
Scrub Typhus		14	14	200	0	260	0
Toxoplasmosis		24	59	827	5	1064	6
Tularremia		0	0	11	1	8	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	0	0	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	1	1
	Yellow Fever	0	0	0	0	0	0
Zika Virus Infection	0	0	0	0	0	0	

- ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
- The following chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
- Numbers of mumps, neonatal tetanus 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.
- Since 2018/1/1, "Listeriosis" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Eighteen clusters were reported, including 3 tuberculosis clusters, 5 diarrhea clusters, 2 upper respiratory tract infection clusters, 7 influenza-like illness clusters, and 1 enterovirus cluster.

Imported Infectious Diseases

- There were 13 confirmed imported cases from 7 countries during week 31 of 2018.

Country \ Disease	Thailand	Philippines	Indonesia	Malaysia	Vietnam	China	Myanmar	Total
DF	3	2	1	2	2		1	11
Rubella						1		1
Shigellosis			1					1
Total	3	2	2	2	2	1	1	13

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

- There are 299 confirmed imported cases from 24 different countries in 2018. The top 3 countries are Indonesia (87), Philippines (41), and Thailand (34).
- Top 3 imported diseases are Dengue Fever (133), Amoebiasis (68), and Shigellosis (29).

Summary of Epidemic

- **Enterovirus:** Taiwan is in the midst of enterovirus season. Most reported cases experienced mild symptoms. In addition, the cases of EV71 infection in the community remain elevated, we should stay alert against enterovirus infection.
- **Dengue Fever:** The epidemic has increased in Southeast Asian countries, therefore, the imported cases are continuously increasing. In addition, there is a second wave of indigenous dengue fever in Taiwan. As the temperature and rainfall increase, the numbers of water-holding container and the rate of mosquito development are increasing. Therefore, the risk of dengue fever for both imported and indigenous cases is expected to be higher.
- **Japanese Encephalitis:** Taiwan is in the midst of Japanese encephalitis season. New cases are primarily in central and northern Taiwan in these couple of weeks. Most Japanese encephalitis cases are sporadic.
- **Scrub Typhus:** Taiwan is in the midst of scrub typhus season. The current primarily affected areas include Hualien County and Taitung County.

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

Case diagnosis year		Week 32★		Week 1-32			
Classification	Disease Diagnosed	2018	2017	2018		2017	
				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	2	0	50	0	22	0
	Acute Viral Hepatitis type A	2	3	61	22	312	32
	Amoebiasis	10	4	181	74	216	122
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	2	0	4	4	8	8
	Cholera	2	0	4	0	0	0
	Dengue Fever	11	15	154	141	179	176
	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	1	0
	Malaria	0	0	1	1	4	4
	Measles	0	0	31	12	5	5
	Meningococcal Meningitis	0	0	5	1	10	0
	Paratyphoid Fever	0	0	4	2	3	3
	Poliomyelitis	0	0	0	0	0	0
	Rubella	1	0	7	6	2	2
	Shigellosis	2	2	98	32	110	41
	Typhoid fever	0	0	7	5	11	10
West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	3	2	81	6	104	4
	Acute Viral Hepatitis type C	13	5	291	3	185	1
	Acute Viral Hepatitis type D	0	0	0	0	1	0
	Acute Viral Hepatitis type E	0	1	5	0	13	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	2	1	28	0	7	0
	Haemophilus Influenza type b Infection	0	0	4	0	3	0
	Japanese Encephalitis	0	0	34	0	22	0
	Legionellosis	2	3	103	2	103	10
	Mumps	14	8	360	5	409	6
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	2	1	15	0	20	0
	Tetanus	0	0	4	0	6	0
	Category IV	Botulism	0	0	0	0	0
Brucellosis		0	0	0	0	0	0
Complicated Influenza		3	3	32	0	18	1
Complicated Varicella		0	1	18	0	28	1
Endemic Typhus Fever		0	0	0	0	0	0
Herpesvirus B Infection		8	7	313	0	312	2
Invasive Pneumococcal Disease		4	3	37	0	54	1
Leptospirosis		3	0	111	1	0	0
Lyme Disease		0	0	0	0	0	0
Melioidosis		1	1	10	1	13	0
Q Fever		1	0	9	1	11	0
Scrub Typhus		15	13	215	0	273	0
Toxoplasmosis		20	39	847	5	1103	6
Tularremia		1	0	12	1	8	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	0	0	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	1	1
	Yellow Fever	0	0	0	0	0	0
Zika Virus Infection	0	0	0	0	0	0	

1. ★ The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
2. The following 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, neonatal tetanus 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.
5. Since 2018/1/1, "Listeriosis" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Nineteen clusters were reported, including 8 tuberculosis clusters, 7 diarrhea clusters, 2 upper respiratory tract infection clusters, 1 influenza-like illness cluster, and 1 varicella cluster.

Imported Infectious Diseases

- There were 22 confirmed imported cases from 7 countries during week 32 of 2018.

Disease \ Country	Country							Total
	Indonesia	Philippines	Vietnam	Malaysia	Thailand	Cambodia	China	
DF		3	2	1	1	2		9
Amoebiasis	5							5
Shigellosis	2			1				3
Chikungunya Fever		2						2
Rubella							1	1
Listeriosis					1			1
Acute Hepatitis A	1							1
Total	8	5	2	2	2	2	1	22

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

- There are 321 confirmed imported cases from 24 different countries in 2018. The top 3 countries are Indonesia (95), Philippines (46), and Thailand (36).
- Top 3 imported diseases are Dengue Fever (142), Amoebiasis (73), and Shigellosis (32).

Summary of Epidemic

- **Enterovirus:** Taiwan is in the midst of enterovirus season. Most reported cases experienced mild symptoms. In addition, the cases of EV71 infection in the community remain elevated, we should stay alert against enterovirus infection.
- **Dengue Fever:** The epidemic has increased in Southeast Asian countries; therefore, the imported cases are continuously increasing in Taiwan. In addition, there is a second wave of the indigenous dengue fever in Taiwan. As the temperature and rainfall increase, the numbers of water-holding container and the rate of mosquito development are increasing. Therefore, the risk of dengue fever for both imported and indigenous cases is expected to be higher.

- **Japanese Encephalitis:** The epidemic has passed its peak, but it is still in the midst of Japanese encephalitis season. Cases are likely to occur sporadically.
- **Scrub Typhus:** Taiwan is in the midst of scrub typhus season. The current primarily affected areas include Hualien County and Taitung County.

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