

Preliminary Study on Outcomes of Dengue Fever Prevention and Control Strategies, Tainan City, 2017

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Abstract

Learning from experience of dengue outbreaks in Tainan City in 2015, the Tainan health authorities collected weekly Ovitrap data through GIS, and had taken integrated control strategies, including eliminating mosquito habitats, on-site survey, and use of preventive pesticide, in 2017. With this effort, the authorities successfully smashed more than 1.2 million mosquitoes.

Furthermore, the number of healthcare facilities providing NS1 antigen rapid test increased from 22, in 2015 to 259 in 2017. The patient hidden period, defined as the interval between symptom onset and notification, decreased to less than 3 days.

The health authorities established district-level command centers, responsible for epidemic prevention, monitoring the high-risk spots, mapping the epidemic area, and evaluating the risk profile. Besides, after rain, command centers immediately mobilized personnel and other resources to manage the environmental sanitation, breeding site elimination and chemical control for mosquitoes.

Finally, Tainan City cooperated with academic research units to develop diversified prevention strategies, such as Gravitrap, mosquito trap, and education in schools. The authorities established a scientific and systematic vector monitoring mechanism to prevent dengue fever infections, and thus no further domestic case was notified in Tainan in 2017.

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We recommended that other health authorities following the strategies of Tainan government, and setting up vector surveillance mechanism to eliminate vector breeding sources and effectively lower mosquito density.

Keywords: Dengue fever, Tainan City, vector surveillance, NS1 antigen rapid test institution, prevention district

week 27–28(Jun. 28–Jul. 11, 2020)

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

Case diagnosis year		Week 27★		Week 1-27			
Classification	Disease Diagnosed	2020	2019	2020		2019	
				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	1	17	0	32	0
	Acute Viral Hepatitis type A	2	0	44	7	46	13
	Amoebiasis	3	11	125	69	180	94
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	3	3	7	7
	Cholera	0	0	0	0	0	0
	Dengue Fever	0	23	60	60	247	205
	Diphtheria	0	0	0	0	0	0
	Enterohemorrhagic E. coli Infection	0	0	0	0	1	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	8	0	0	0
	Malaria	0	0	1	1	1	1
	Measles	0	2	2	2	104	38
	Meningococcal Meningitis	0	0	5	0	2	0
	Paratyphoid Fever	0	0	0	0	2	1
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	1	0	0	18	15
	Shigellosis	4	2	86	20	74	26
	Typhoid fever	0	1	5	3	13	12
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	2	2	1	1	
Category III	Acute Viral Hepatitis type B	2	2	48	2	56	1
	Acute Viral Hepatitis type C	12	7	325	2	318	2
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	6	0	7	3
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	3	7	0	16	1
	Haemophilus Influenza type b Infection	0	0	3	0	0	0
	Japanese Encephalitis	0	0	4	0	11	0
	Legionnaires' Disease	7	3	134	7	135	10
	Mumps	6	10	249	6	316	3
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	8	0	22	0
Tetanus	0	0	6	0	0	0	
Category IV	Botulism	1	0	1	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	2	30	0	31	1
	Endemic Typhus Fever	1	1	9	0	5	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	1	38	548	6	1088	6
	Invasive Pneumococcal Disease	2	6	154	0	241	2
	Leptospirosis	1	2	22	0	32	0
	Listeriosis	2	4	72	0	103	1
	Lyme Disease	0	0	0	0	1	1
	Melioidosis	0	1	8	1	5	0
	Q Fever	0	0	8	0	11	2
	Scrub Typhus	10	22	153	1	214	3
Toxoplasmosis	0	0	2	0	7	0	
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	0	0	0	0	0	0
	Coronavirus Infections	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
Severe Pneumonia with Novel Pathogens	2	-	449	394	-	-	
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 2020/1/15, "Severe Pneumonia with Novel Pathogens" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Eleven clusters related to diarrhea (5), tuberculosis (5) and upper respiratory tract infection (1) were reported during week 27.

Imported Infectious Diseases

- There were 4 imported cases from 3 countries during week 27.

Diseases	Countries			Total
	Indonesia	Mexico	South Africa	
Severe Pneumonia with Novel Pathogens		1	1	2
Amoebiasis	2			2
Total	2	1	1	4

- As of week 27, there were 580 imported cases from 46 different countries. The top 3 countries are Indonesia (110), USA (92), UK (72).
- The three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (394), Amoebiasis (69), Dengue Fever (60).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : The risk of acquiring SARS-CoV-2 infection in Taiwan is low. However, due to the severe international epidemic, the sporadic imported cases are expected.
- **Japanese Encephalitis** : Taiwan is in the midst of Japanese Encephalitis season. More cases are in southern Taiwan.
- **Scrub Typhus** : Taiwan is in the midst of Scrub Typhus season, the highest risk area is in eastern Taiwan.
- **Enterovirus** : The epidemic status of enterovirus infection is low.

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

Case diagnosis year		Week 28★		Week 1-28			
Classification	Disease Diagnosed	2020	2019	2020		2019	
				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	0	18	0	32	0
	Acute Viral Hepatitis type A	2	4	46	7	50	13
	Amoebiasis	6	5	131	70	185	99
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	3	3	3	10	10
	Cholera	0	0	0	0	0	0
	Dengue Fever	1	22	61	61	269	221
	Diphtheria	0	0	0	0	0	0
	Enterohemorrhagic E. coli Infection	0	0	0	0	1	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	8	0	0	0
	Malaria	0	0	1	1	1	1
	Measles	0	2	2	2	106	40
	Meningococcal Meningitis	0	0	5	0	2	0
	Paratyphoid Fever	0	0	0	0	2	1
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	1	0	0	19	15
	Shigellosis	3	2	89	20	76	28
Typhoid fever	0	4	5	3	17	13	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	2	2	1	1	
Category III	Acute Viral Hepatitis type B	3	1	51	2	57	1
	Acute Viral Hepatitis type C	19	12	344	2	330	2
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	6	0	7	3
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	2	7	0	18	1
	Haemophilus Influenza type b Infection	0	0	3	0	0	0
	Japanese Encephalitis	7	1	11	0	12	0
	Legionnaires' Disease	2	12	136	8	147	10
	Mumps	7	11	256	6	327	3
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	8	0	22	0
Tetanus	0	1	6	0	1	0	
Category IV	Botulism	0	0	1	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	2	30	0	33	1
	Endemic Typhus Fever	0	2	9	0	7	1
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	41	548	6	1129	6
	Invasive Pneumococcal Disease	3	3	157	0	244	2
	Leptospirosis	2	2	24	0	34	0
	Listeriosis	6	5	78	0	108	1
	Lyme Disease	0	0	0	0	1	1
	Melioidosis	0	1	8	1	6	0
	Q Fever	1	1	9	0	12	2
	Scrub Typhus	27	15	180	1	229	3
Toxoplasmosis	0	1	2	0	8	0	
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	0	0	0	0	0	0
	Coronavirus Infections	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
Severe Pneumonia with Novel Pathogens	2	-	451	396	-	-	
Yellow Fever	0	0	0	0	0	0	

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
2. MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen's Disease and Creutzfeldt-Jakob Disease are excluded from the table.
3. Numbers of mumps and tetanus cases are summed up by the week of report.
4. Since 2020/1/15, "Severe Pneumonia with Novel Pathogens" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Eighteen clusters related to diarrhea (11), tuberculosis (4) and upper respiratory tract infection (3) were reported during week 28.

Imported Infectious Diseases

- There were 5 imported cases from 5 countries during week 28.

Diseases	Countries					Total
	Singapore	Indonesia	Oman	Japan	USA	
Severe Pneumonia with Novel Pathogens			1		1	2
Legionnaires' Disease				1		1
Dengue Fever	1					1
Amoebiasis		1				1
Total	1	1	1	1	1	5

- As of week 28, there were 585 imported cases from 47 different countries. The top 3 countries are Indonesia (111), USA (93), UK (72).
- The three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (396), Amoebiasis (70), Dengue Fever (61).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : The risk of acquiring SARS-CoV-2 infection in Taiwan is low. However, due to the severe international epidemic, the sporadic imported cases are expected.
- **Japanese Encephalitis** : Taiwan is in the midst of Japanese Encephalitis season. More cases are in central and southern Taiwan.
- **Scrub Typhus** : Taiwan is in the midst of Scrub Typhus season, the highest risk area is in eastern Taiwan.
- **Enterovirus** : The epidemic status of enterovirus infection is low.

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