

Design And Implementation of Field Epidemiology Trainings for Zoonotic Diseases

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Abstract

Emerging and re-emerging diseases pose a great threat to the global economy and public health. In 2016, Taiwan Centers for Disease Control used the Joint External Evaluation Tool proposed by the World Health Organization to evaluate our capacities in maintaining health security, and it was found that the public health workforce, as well as the veterinary or animal health workforce, were still insufficient. According to the target set by the Global Health Security Agenda Workforce Development Action Package, the five-year target of workforce development in Taiwan is set at 118 field epidemiologists and 12 trained veterinarians. This article summarizes several training activities for field epidemiology and zoonotic diseases that have been implemented since 2017, including field epidemiology training for veterinarians, zoonosis workshop, case study writing workshop, and veterinary epidemiology training. The project aims to increase the capacity of field epidemiologists for both human and animal health in Taiwan, in the hopes that an inter-departmental team for responding to zoonoses outbreaks could be established based on the “One Health” approach.

Keywords: Global Health Security Agenda, Joint External Evaluation Tool, Zoonosis, One Health

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

Case diagnosis year		Week 19★		Week 1-19			
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	0	0	12	0	20	0
	Acute Viral Hepatitis type A	1	2	30	7	36	10
	Amoebiasis	7	10	94	47	118	59
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	2	2	2	3	3
	Cholera	0	0	0	0	0	0
	Dengue Fever	0	8	56	56	146	145
	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	2	0	6	0	0	0
	Malaria	0	0	1	1	1	1
	Measles	0	10	2	2	92	31
	Meningococcal Meningitis	0	0	4	0	2	0
	Paratyphoid Fever	0	0	0	0	2	1
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	2	0	0	13	11
	Shigellosis	6	3	70	20	53	17
	Typhoid fever	0	0	5	3	8	8
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	2	36	2	41	1
	Acute Viral Hepatitis type C	15	10	234	2	210	2
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	6	0	6	2
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	1	7	0	8	1
	Haemophilus Influenza type b Infection	1	0	3	0	0	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	4	4	90	7	96	8
	Mumps	12	16	167	6	237	1
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	8	0	19	0
Tetanus	0	0	5	0	0	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	1	0	17	0	25	1
	Endemic Typhus Fever	0	0	3	0	2	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	30	546	6	832	5
	Invasive Pneumococcal Disease	5	5	139	0	198	2
	Leptospirosis	0	0	16	0	16	0
	Listeriosis	1	6	42	0	72	0
	Lyme Disease	0	0	0	0	1	1
	Melioidosis	1	0	6	1	4	0
	Q Fever	1	0	3	0	7	1
	Scrub Typhus	11	7	80	1	96	0
	Toxoplasmosis	0	0	0	0	6	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	8	-	440	385	-	-	
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

- Twenty-three clusters were reported during week 19, including 13 tuberculosis clusters, 6 diarrhea clusters, 2 upper respiratory tract infection clusters, 1 influenza-like illness cluster, 1 varicella cluster.

Imported Infectious Diseases

- There were 13 imported cases from 5 countries and Panshi fast combat support ship during week 19 of 2020.

Countries / Places \ Diseases	Panshi fast combat support ship	Indonesia	China	Qatar	USA	UK	Total
Severe Pneumonia with Novel Pathogens	5			1	1	1	8
Amoebiasis		3					3
Legionnaires' Disease			2				2
Total	5	3	2	1	1	1	13

- As of week 19 in 2020, there were 544 imported cases from 44 different countries / places. The top 3 countries are USA (91), Indonesia (88), UK (72).
- The three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (385), Dengue Fever (56), Amoebiasis (47).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : The risk of acquiring SARS-CoV-2 infection in Taiwan is low.

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

Case diagnosis year		Week 20★		Week 1-20			
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	0	0	12	0	20	0
	Acute Viral Hepatitis type A	1	0	31	7	36	10
	Amoebiasis	7	15	100	55	133	70
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	1	2	2	4	4
	Cholera	0	0	0	0	0	0
	Dengue Fever	1	5	57	57	151	150
	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	6	0	0	0
	Malaria	0	0	1	1	1	1
	Measles	0	2	2	2	94	31
	Meningococcal Meningitis	0	0	4	0	2	0
	Paratyphoid Fever	0	0	0	0	2	1
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	13	11
	Shigellosis	1	2	71	20	55	17
Typhoid fever	0	1	5	3	9	9	
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	1	1	37	2	42	1
	Acute Viral Hepatitis type C	10	18	244	2	228	2
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	6	0	6	2
	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	10	1
	Haemophilus Influenza type b Infection	0	0	3	0	0	0
	Japanese Encephalitis	0	1	0	0	1	0
	Legionnaires' Disease	7	6	97	7	102	8
	Mumps	14	10	181	6	247	2
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	8	0	19	0
Tetanus	0	0	5	0	0	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	1	17	0	26	1
	Endemic Typhus Fever	0	1	3	0	3	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	23	546	6	855	5
	Invasive Pneumococcal Disease	2	8	141	0	206	2
	Leptospirosis	0	2	16	0	18	0
	Listeriosis	2	1	44	0	73	0
	Lyme Disease	0	0	0	0	1	1
	Melioidosis	0	0	6	1	4	0
	Q Fever	1	0	4	0	7	1
	Scrub Typhus	6	16	86	1	112	1
Toxoplasmosis	1	1	1	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	0	-	440	385	-	-	
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

- Sixteen clusters were reported during week 20, including 8 tuberculosis clusters, 4 diarrhea clusters, 4 varicella clusters.

Imported Infectious Diseases

- There were 9 imported cases from 2 countries during week 20 of 2020.

Diseases	Countries		
	Indonesia	Philippines	Total
Amoebiasis	6	2	8
Dengue Fever	1		1
Total	7	2	9

- As of week 20 in 2020, there were 553 imported cases from 44 different countries. The top 3 countries are Indonesia (95), USA (91), UK (72).
- The three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (385), Dengue Fever (57), Amoebiasis (55).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : The risk of acquiring SARS-CoV-2 infection in Taiwan is low.

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