

### A Brief Review of Three Coronavirus Disease 2019 (COVID-19) Vaccines

Chia-ping Su<sup>1\*</sup>, Meng-Yu Chen<sup>2</sup>, Cha-Shien Yen<sup>1</sup>

#### Abstract

One of the possible ways to end the SARS-CoV-2 pandemic is to develop COVID-19 vaccine and effective vaccination strategies. Some COVID-19 vaccines have been authorized for emergency use in a number of countries, and are currently in use around the world. These include an adenovirus-based vaccine (Astra-Zeneca), and two messenger RNA (mRNA) vaccines (mRNA-1273, manufactured by Moderna; BNT162b2, manufactured by Pfizer-BioNTech). These vaccines have been shown to be adequate in preventing SARS-CoV-2 infection, minimizing disease incidence, severity and mortality, according to current pre-licensure vaccine efficacy research and post-licensure vaccine effectiveness evaluations. Specific local reactions are common adverse reactions after receiving these vaccinations, and serious adverse events occur infrequently. However, more data is required after global vaccination to estimate long-term efficacy and protection in real-world condition, as well as the effects of vaccine against virus variants. Currently, the majority of studies indicate that vaccination protects people from COVID-19 and the benefits outweigh the risks. To reduce COVID-19-related morbidity and mortality, we encourage people who are prioritized in the immunization program to get vaccines as soon as possible.

**Keywords:** COVID-19 vaccine, Pfizer-BioNTech vaccine, Moderna vaccine, AstraZeneca vaccine, vaccine efficacy, vaccine effectiveness

<sup>1</sup>Office of Preventive Medicine, Centers for Disease Control, Ministry of Health and Welfare, Taiwan

<sup>2</sup>Taipei Regional Center, Centers for Disease Control, Ministry of Health and Welfare, Taiwan

DOI: 10.6525/TEB.202104\_37(7).0001

Corresponding author: Chia-ping Su<sup>1\*</sup>

E-mail: cpsu@cdc.gov.tw

Received: Mar. 31, 2021

Accepted: Apr. 06, 2021

## An Outbreak of Echovirus 11 Infection in a Postpartum Nursing Care Center, 2018

Ching-Li Lin\*, Hsin-Chun Lee, Hui-Chen Lin,  
Min-Nan Hung, Chiou-Yue You

### Abstract

On 16 May, 2018, the health department was notified by a medical center of a neonatal enterovirus infection with severe complications, which was subsequently confirmed positive for echovirus 11. The case patient had been staying at the baby room in a postpartum nursing care center during April 27-May 5, before the onset of fever on May 5. Through contact investigation, fever surveillance and molecular diagnostic testing, we identified seven cases of echovirus 11 infections among 15 newborns at the same baby room during May 5-21 (attack rate: 47%). Active case finding, cohorting care, enhancing hand hygiene and contact precautions practices, environment disinfection, and suspending new admissions were implemented to control the outbreak. No further cases were identified during the 10-day period of observation since May 21. All cases recovered with good outcomes. This report revealed that reluctance of hand-hygiene practices and unawareness of manifestations of neonatal enteroviral infection among healthcare workers might have hindered the timely intervention for effective mitigation of the outbreak.

**Keywords:** Postpartum nursing home, Echovirus 11, outbreak of neonatal enteroviral infection

---

Kaohsiung-Pingtung Regional Center,  
Centers for Disease Control, Ministry  
of Health and Welfare, Taiwan  
DOI: 10.6525/TEB.202104\_37(7).0002

Corresponding author: Ching-Li Lin\*  
E-mail: mt0241@cdc.gov.tw  
Received: Dec. 10, 2019  
Accepted: Jun. 20, 2020

week 11–13(Mar.14–Apr.3, 2021)

DOI: 10.6525/TEB.202104\_37(7).0003

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

Case diagnosis year		Week 11★		Week 1–11			
Classification	Disease Diagnosed	2021	2020	2021		2020	
				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	6	0	4	0
	Acute Viral Hepatitis type A	1	2	16	0	24	5
	Amoebiasis	6	9	43	19	56	32
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	1	1	1	1	2	2
	Cholera	0	0	0	0	0	0
	Dengue Fever	0	3	3	3	48	48
	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	3	0	3	0
	Malaria	0	0	1	1	1	1
	Measles	0	0	0	0	2	2
	Meningococcal Meningitis	0	0	0	0	3	0
	Paratyphoid Fever	1	0	1	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
Shigellosis	9	6	41	0	42	18	
Typhoid fever	0	1	1	0	5	3	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	1	0	0	2	2	
Category III	Acute Viral Hepatitis type B	6	1	23	0	22	2
	Acute Viral Hepatitis type C	17	17	143	0	151	1
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	3	0	4	0
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	1	0	7	0
	Haemophilus Influenza type b Infection	0	1	0	0	1	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	7	3	75	0	59	7
	Mumps	6	9	103	0	99	5
	Neonatal Tetanus	0	0	0	0	0	0
Pertussis	0	0	0	0	8	0	
Tetanus	0	0	1	0	0	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	1	11	0	13	0
	Endemic Typhus Fever	0	1	5	0	1	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	0	0	0	545	6
	Invasive Pneumococcal Disease	6	3	78	0	112	0
	Leptospirosis	0	1	9	0	8	0
	Listeriosis	0	3	31	0	24	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	1	5	0	3	1
	Q Fever	0	1	0	0	1	0
	Scrub Typhus	1	4	48	0	49	1
Toxoplasmosis	0	0	2	0	0	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	21	8	197	176	53	26	
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-nine clusters related to diarrhea (17), tuberculosis (5), enterovirus (5), upper respiratory tract infection (1), and varicella (1) were reported during week 11.

## Imported Infectious Diseases

- There were 29 imported cases from 10 countries during week 11.

Diseases \ Countries	Philippines	Indonesia	Egypt	Vietnam	USA	France	Paraguay	South Africa	Oman	Thailand	Total
Severe Pneumonia with Novel Pathogens	10	2	2	2	1	1	1	1	1		21
Amoebiasis	1	5								1	7
Chikungunya Fever		1									1
Total	11	8	2	2	1	1	1	1	1	1	29

- During week 1-11, there were 200 imported cases from 33 countries. The top three countries are the Philippines (52), Indonesia (48), and USA (32).
- During week 1-11, the three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (176), Amoebiasis (19), and Dengue Fever (3).

## Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : Because the number of global COVID-19 new cases reported and Taiwan entry persons increased in the past few weeks, the imported cases continue to occur.
- **Diarrhea** : The epidemic status of diarrhea is expected to decrease.

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

Case diagnosis year		Week 12★		Week 1–12			
Classification	Disease Diagnosed	2021	2020	2021		2020	
				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	1	6	0	5	0
	Acute Viral Hepatitis type A	1	1	17	0	25	6
	Amoebiasis	6	7	49	22	63	36
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	1	1	2	2
	Cholera	0	0	0	0	0	0
	Dengue Fever	1	3	4	4	51	51
	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	3	0	3	0
	Malaria	0	0	1	1	1	1
	Measles	0	0	0	0	2	2
	Meningococcal Meningitis	0	0	0	0	3	0
	Paratyphoid Fever	0	0	1	0	0	0
	Poliomyelitis	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	
Shigellosis	4	3	45	0	45	18	
Typhoid fever	0	0	1	0	5	3	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	2	2	
Category III	Acute Viral Hepatitis type B	4	3	27	0	25	2
	Acute Viral Hepatitis type C	16	11	159	0	162	2
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	3	0	4	0
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	1	0	7	0
	Haemophilus Influenza type b Infection	0	0	0	0	1	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	10	1	85	0	60	7
	Mumps	10	11	113	0	110	5
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	8	0
Tetanus	1	1	2	0	1	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	3	11	0	16	0
	Endemic Typhus Fever	0	0	5	0	1	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	1	0	1	0	545	6
	Invasive Pneumococcal Disease	5	5	83	0	117	0
	Leptospirosis	1	1	10	0	9	0
	Listeriosis	9	0	40	0	24	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	0	5	0	3	1
	Q Fever	0	0	0	0	1	0
	Scrub Typhus	0	3	48	0	52	1
Toxoplasmosis	1	0	3	0	0	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	15	100	212	191	153	120	
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

- Thirty-five clusters related to diarrhea (24), tuberculosis (5), varicella (4), and enterovirus (2) were reported during week 12.

## Imported Infectious Diseases

- There were 19 imported cases from 5 countries during week 12.

Diseases \ Countries	Countries					Total
	Indonesia	Philippines	USA	Netherlands	Poland	
Severe Pneumonia with Novel Pathogens	6	5	2	1	1	15
Amoebiasis	3					3
Dengue Fever		1				1
Total	9	6	2	1	1	19

- During week 1-12, there were 219 imported cases from 33 countries. The top three countries are the Philippines (58), Indonesia (57), and USA (34).
- During week 1-12, the three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (191), Amoebiasis (22), and Dengue Fever (4).

## Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : Because the number of global COVID-19 new cases reported increased markedly in the past few weeks, the imported cases continue to occur.

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

Case diagnosis year		Week 13★		Week 1–13			
Classification	Disease Diagnosed	2021	2020	2021		2020	
				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	1	7	0	6	0
	Acute Viral Hepatitis type A	0	2	17	0	27	7
	Amoebiasis	5	5	54	24	68	38
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	1	1	2	2
	Cholera	0	0	0	0	0	0
	Dengue Fever	0	3	4	4	54	54
	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	3	0	3	0
	Malaria	0	0	1	1	1	1
	Measles	0	0	0	0	2	2
	Meningococcal Meningitis	0	0	0	0	3	0
	Paratyphoid Fever	0	0	1	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
	Shigellosis	4	1	49	0	46	19
Typhoid fever	0	0	1	0	5	3	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	2	2	
Category III	Acute Viral Hepatitis type B	5	1	32	1	26	2
	Acute Viral Hepatitis type C	9	6	168	0	168	2
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	1	1	4	0	5	0
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	1	0	7	0
	Haemophilus Influenza type b Infection	0	0	0	0	1	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	5	3	90	0	63	7
	Mumps	9	11	122	0	121	6
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	8	0
Tetanus	0	1	2	0	2	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	0	11	0	16	0
	Endemic Typhus Fever	0	1	5	0	2	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	1	1	0	546	6
	Invasive Pneumococcal Disease	5	5	88	0	122	0
	Leptospirosis	1	0	11	0	9	0
	Listeriosis	3	5	43	0	29	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	0	5	0	3	1
	Q Fever	0	0	0	0	1	0
	Scrub Typhus	0	6	48	0	58	1
	Toxoplasmosis	1	0	4	0	0	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	25	130	237	216	283	241
Yellow Fever	0	0	0	0	0	0	

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

## Suspected Clusters

- Twenty-four clusters related to diarrhea (13), tuberculosis (6), varicella (3), upper respiratory tract infection (1), and enterovirus (1) were reported during week 13.

## Imported Infectious Diseases

- There were 28 imported cases from 12 countries during week 13.

Countries \ Diseases	Philippines	Indonesia	Bangladesh	Ethiopia	USA	Myanmar	UK	Switzerland	UAE	Ireland	Paraguay	Vietnam	Total
Severe Pneumonia with Novel Pathogens	8	8	1	1	1	1	1	1	1	1	1		25
Amoebiasis	1	1											2
Acute Hepatitis B												1	1
Total	9	9	1	1	1	1	1	1	1	1	1	1	28

- During week 1-13, there were 247 imported cases from 37 countries. The top three countries are the Philippines (67), Indonesia (66), and USA (35).
- During week 1-13, the three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (216), Amoebiasis (24), and Dengue Fever (4).

## Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : Because the number of global COVID-19 new cases reported and Taiwan entry persons increased markedly in the past few weeks, the imported cases continue to occur.
- **Diarrhea** : The outpatient services are resumed after national holiday, the number of visits for diarrhea is expected to increase.

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

**Telephone No:** +886-2-2395-9825

**Website:** <https://www.cdc.gov.tw/En>

**Suggested Citation:**

[Author].[Article title].Taiwan Epidemiol Bull 2021;37:[inclusive page numbers]. [DOI]