

Investigation And Response to A Nosocomial COVID-19 Outbreak, Northern Region, Taiwan, February 2020

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Abstract

Nosocomial transmission has been recognized as an important amplifier in epidemic of coronavirus disease-2019 (COVID-19). Infection of healthcare workers (HCWs) and patients will further overwhelm the healthcare system. On February 27, 2020, a patient at a tertiary hospital without foreign travel history was diagnosed as COVID-19 infection 12 days after admission. The Taiwan Centers for Disease Control, local health bureau and the hospital immediately conducted epidemiological investigation, contact tracing, and control measures in collaboration. From the close contacts of the index case, four COVID-19 cases were identified on February 28, of whom three were nurses working in the same ward as the index case (the index ward). Since more than one COVID-19 confirmed case was detected in the same unit, multiple transmission modes and infection chains were possible. Following the guidance of "Recommendations on contingency operations for hospitals in response to COVID-19 cases identified in inpatients", we stepwise expanded the management and COVID-19 screening of person at-risk, closure of ward, environmental cleaning and disinfection, and enhanced symptoms surveillance of the hospital. By the end of monitoring period on March 27, we identified 153 HCWs and 303 non-HCWs as contacts. Among the 456 contacts, 409 were tested for COVID-19 and 8 were positive.

The infection source of index case was unknown, and the epidemiological and environmental investigations indicated that both droplet and fomite transmissions were involved in the nosocomial infection.

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Through prompt investigation and stepwise intervention, including strict infection control, thorough contact tracing and symptoms monitoring during mandatory 14-day quarantine for the contacts, as well as rapid COVID-19 testing for person at-risk and symptomatic contacts, we successfully blocked the infection chain and preventing from further spread in the hospital or to the community.

Now the global COVID-19 epidemic is still developing, this document provides our implemented experience as a reference for hospitals and health authorities encounter the similar outbreak in the future.

Keywords: SARS-CoV-2, COVID-19, nosocomial infection, infection control

week 40–41(Oct. 3–Oct. 16, 2021)

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

Case diagnosis year		Week 40★		Week 1–40			
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	26	0	21	0
	Acute Viral Hepatitis type A	1	2	54	0	68	8
	Amoebiasis	4	7	156	55	194	109
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	1	1	3	3
	Cholera	0	0	0	0	1	0
	Dengue Fever	0	24	9	9	118	64
	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	9	0	9	0
	Malaria	0	0	1	1	1	1
	Measles	0	0	0	0	2	2
	Meningococcal Meningitis	0	0	3	0	5	0
	Paratyphoid Fever	0	0	2	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
Shigellosis	1	7	98	0	119	21	
Typhoid fever	0	1	1	0	7	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	0	3	100	2	83	2
	Acute Viral Hepatitis type C	3	6	417	0	464	4
	Acute Viral Hepatitis type D	0	0	1	0	0	0
	Acute Viral Hepatitis type E	0	0	5	0	8	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	1	0	3	0
	Japanese Encephalitis	0	0	26	0	21	0
	Legionnaires' Disease	16	6	283	0	218	8
	Mumps	7	11	333	1	387	6
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	8	0
Tetanus	0	0	3	0	7	0	
Category IV	Botulism	0	0	0	0	1	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	1	0	43	0	31	0
	Endemic Typhus Fever	1	0	27	0	16	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	0	1	0	548	6
	Invasive Pneumococcal Disease	1	5	169	0	193	0
	Leptospirosis	13	3	67	0	61	0
	Listeriosis	5	3	137	0	107	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	0	16	0	15	1
	Q Fever	0	0	8	0	12	0
	Scrub Typhus	16	4	217	0	299	1
Toxoplasmosis	0	0	11	0	7	0	
Tularemia	0	0	1	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	1	0	0	0
	Rift Valley Fever	0	0	0	0	0	0
Severe Pneumonia with Novel Pathogens	44	7	15486	960	517	462	
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-two clusters related to diarrhea (16), tuberculosis (5) and varicella (1) were reported during week 40.

Imported Infectious Diseases

- There were 44 imported cases from 10 countries during week 40.
Severe Pneumonia with Novel Pathogens: 42 (USA 13, Myanmar 9, Indonesia 6, Malaysia 5, UK 2, South Africa 2, the Philippines 1, Japan 1, Singapore 1, Vietnam 1, under investigation 1).
Amoebiasis: 2 (Indonesia 1, undetermined 1)
- During week 1–40, there were 1029 imported cases from 80 countries. The top three countries are the Philippines (194), Indonesia (181), and USA (149).
- During week 1–40, the three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (960), Amoebiasis (55), and Dengue Fever (9).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens:** The domestic epidemic of COVID-19 is in the low level. Due to the COVID-19 pandemic remains serious globally, imported cases continue to be confirmed. The risk of locally-acquired of SARS-CoV-2 infection in Taiwan is persistence.

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

Case diagnosis year		Week 41★		Week 1–41			
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	3	26	0	24	0
	Acute Viral Hepatitis type A	1	0	55	0	68	8
	Amoebiasis	2	3	158	55	197	110
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	1	1	3	3
	Cholera	0	0	0	0	1	0
	Dengue Fever	0	7	9	9	125	65
	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	9	0	9	0
	Malaria	0	0	1	1	1	1
	Measles	0	0	0	0	2	2
	Meningococcal Meningitis	0	0	3	0	5	0
	Paratyphoid Fever	0	0	2	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
Shigellosis	2	4	100	0	123	21	
Typhoid fever	0	0	1	0	7	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	0	3	100	2	86	2
	Acute Viral Hepatitis type C	8	9	425	0	473	4
	Acute Viral Hepatitis type D	0	0	1	0	0	0
	Acute Viral Hepatitis type E	0	0	5	0	8	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 influenzae type b Infection	0	0	1	0	3	0
	Japanese Encephalitis	0	0	26	0	21	0
	Legionnaires' Disease	7	9	290	0	227	8
	Mumps	8	8	341	1	395	6
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	8	0
Tetanus	0	0	3	0	7	0	
Category IV	Botulism	0	0	0	0	1	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	9	43	0	40	0
	Endemic Typhus Fever	1	0	28	0	16	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	0	1	0	548	6
	Invasive Pneumococcal Disease	1	3	170	0	196	0
	Leptospirosis	3	8	70	0	69	0
	Listeriosis	0	0	137	0	107	0
	Lyme Disease	1	0	1	1	0	0
	Melioidosis	0	1	16	0	16	1
	Q Fever	0	0	8	0	12	0
	Scrub Typhus	13	19	230	0	318	1
Toxoplasmosis	0	3	11	0	10	0	
Tularemia	0	0	1	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	1	0	0	0
	Rift Valley Fever	0	0	0	0	0	0
	Severe Pneumonia with Novel Pathogens	43	10	15529	1001	527	472
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

- Fifteen clusters related to diarrhea (7), tuberculosis (6) and varicella (2) were reported during week 41.

Imported Infectious Diseases

- There were 41 imported cases from 12 countries during week 41.
Severe Pneumonia with Novel Pathogens: 41 (USA 12, Indonesia 9, the Philippines 8, Mongolia 3, Malaysia 2, UAE 1, Cambodia 1, Ukraine 1, Japan 1, Bulgaria 1, Singapore 1, UK 1).
- During week 1–41, there were 1071 imported cases from 80 countries. The top three countries are Indonesia (204), the Philippines (190), and USA (162).
- During week 1–41, the three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (1001), Amoebiasis (55), and Dengue Fever (9).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens:** The domestic epidemic of COVID-19 is in the low level. Due to the COVID-19 pandemic remains serious globally, imported cases continue to be confirmed. The risk of locally-acquired of SARS-CoV-2 infection in Taiwan is persistence.

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