

Investigation of The First Indigenous Enterohemorrhagic *E. coli* Infection, Taiwan, 2019

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Abstract

In April 2019, Taiwan Centers for Disease Control had confirmed an indigenous enterohemorrhagic *E. coli* (EHEC O104:H4) infected case. This was the first case since 2001, included one confirmed and two suspected cases. In this report, we investigated two self-service barbecue restaurants which were at high risk of infection. We collected specimens from contacts, food handlers, food samples and environmental samples for enteric pathogen testing. Specimens from contacts, food handlers and environmental samples were tested negative. Beef from one of the restaurants was tested positive for enteropathogenic *E. coli*, however, with different O antigen. Also, shiga-like toxin gene tests were all negative. Therefore, the beef from the restaurant was not the vehicle. Moreover, the food samples were not the same batches except that the restaurant was the only place served to the index case. We could not exclude the risk of EHEC contamination of beef. *E. coli* could be killed at 75°C for 1 minute. We recommend that self-service barbecue restaurants should remind consumers of the health risk with undercooked foods.

Keywords: Indigenous case, enterohemorrhagic *E. coli* infection, EHEC, foodborne disease, epidemiological investigation

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week 24–25 (Jun. 12–Jun. 25, 2022)

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Weekly Data of Notifiable Inases (by week of diagnosis)

Case diagnosis year		Week 24★		Week 1-24			
Classification	Disease Diagnosed	2022	2021	2022		2021	
				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	11	0	14	0
	Acute Viral Hepatitis type A	0	1	93	0	37	0
	Amoebiasis	0	0	0	23	0	40
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	0	0	1	1
	Cholera	0	0	0	0	0	0
	Dengue Fever	1	0	3	3	5	5
	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 syndrome	0	0	0	0	7	0
	Malaria	0	0	2	2	1	1
	Measles	0	0	0	0	0	0
	Meningococcal Meningitis	0	0	0	0	2	0
	Paratyphoid Fever	0	0	0	0	2	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
Shigellosis	2	1	40	0	76	0	
Typhoid fever	0	0	1	0	1	0	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	0	1	46	0	67	2
	Acute Viral Hepatitis type C	6	10	205	1	266	0
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	6	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	0	0	1	0
	Haemophilus Influenza type b Infection	0	0	1	0	1	0
	Japanese Encephalitis	0	0	0	0	4	0
	Legionnaires' Disease	10	9	167	1	149	0
	Mumps	4	10	92	0	212	1
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	0	0
Tetanus	0	0	1	0	2	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	0	13	0	27	0
	Endemic Typhus Fever	0	1	5	1	16	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	0	0	0	1	0
	Invasive Pneumococcal Disease	10	5	92	0	140	0
	Leptospirosis	0	0	1	0	14	0
	Listeriosis	4	3	64	0	89	0
	Lyme Disease	0	0	1	1	0	0
	Melioidosis	0	0	0	0	0	0
	Q Fever	0	0	0	0	0	0
	Scrub Typhus	9	5	75	0	110	0
Toxoplasmosis	0	0	12	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	1	0
	Rift Valley Fever	0	0	0	0	0	0
Severe Pneumonia with Novel Pathogens	402950	1152	3277966	11411	13081	464	
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.

Suspected Clusters

- Four clusters related to diarrhea (3), tuberculosis (1) were reported during week 24.

Imported Infectious Diseases

- There were 389 imported cases from 20 countries during week 24.
Severe Pneumonia with Novel Pathogens: 388 cases from USA 47, Vietnam 13, Thailand 10, and the remaining 17 countries have less than 10 cases, 272 unknowns.
Dengue Fever: 1 case from Indonesia.
- During week 1–24, there were 11443 imported cases from 115 countries. The top three countries are Vietnam (2321), USA (1318), Indonesia (1057).
- During week 1–24, the notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (11411).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens :** Taiwan is in the stage of widespread transmission of COVID-19, and the epidemic is slow down gradually. Global COVID-19 cases are similar to the previous week but maybe underestimated. The risk of COVID-19 transmission remains high. The proportions of BA2.12.1、BA.4 and BA.5 Omicron subvariants are steadily rising. The activity of the Omicron subvariants and their impact need continuous monitoring,

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

Case diagnosis year		Week 25★		Week 1-25			
Classification	Disease Diagnosed	2022	2021	2022		2021	
				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	13	0	15	0
	Acute Viral Hepatitis type A	2	0	95	0	37	0
	Amoebiasis	0	0	0	24	0	40
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	0	0	1	1
	Cholera	0	0	0	0	0	0
	Dengue Fever	2	0	5	5	5	5
	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 syndrome	0	0	0	0	7	0
	Malaria	0	0	2	2	1	1
	Measles	0	0	0	0	0	0
	Meningococcal Meningitis	0	0	0	0	2	0
	Paratyphoid Fever	0	0	0	0	2	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
Shigellosis	0	1	40	0	77	0	
Typhoid fever	0	0	1	0	1	0	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	2	6	48	0	73	2
	Acute Viral Hepatitis type C	11	11	216	1	277	0
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	1	0	7	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	0	0	1	0
	Haemophilus Influenza type b Infection	0	0	1	0	1	0
	Japanese Encephalitis	3	0	3	0	4	0
	Legionnaires' Disease	0	14	109	1	163	0
	Mumps	8	6	100	0	218	1
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	0	0
Tetanus	1	0	2	0	2	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	2	0	15	0	27	0
	Endemic Typhus Fever	0	4	5	1	20	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	0	0	0	1	0
	Invasive Pneumococcal Disease	3	2	95	0	142	0
	Leptospirosis	0	0	0	0	0	0
	Listeriosis	4	2	68	0	91	0
	Lyme Disease	0	0	1	1	0	0
	Melioidosis	0	0	0	0	0	0
	Q Fever	0	0	0	0	0	0
	Scrub Typhus	1	7	76	0	117	0
Toxoplasmosis	0	0	12	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	1	0
	Rift Valley Fever	0	0	0	0	0	0
Severe Pneumonia with Novel Pathogens	318358	651	3596265	11876	13732	470	
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.

Suspected Clusters

- Five clusters related to diarrhea (1), tuberculosis (4) were reported during week 25.

Imported Infectious Diseases

- There were 465 imported cases from 28 countries during week 25.
 - Severe Pneumonia with Novel Pathogens:** 462 cases from USA 39, France 14, Vietnam 11, and the remaining 25 countries have less than 10 cases, 325 unknowns.
 - Dengue Fever:** 2 cases from Vietnam.
 - Amoebiasis:** 1 case from Indonesia.
- During week 1–25, there were 11911 imported cases from 115 countries. The top three countries are Vietnam (2335), USA (1361), Indonesia (1060).
- During week 1–25, the notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (11876).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens :** Taiwan is in the stage of widespread transmission of COVID-19, and the epidemic is slow down gradually. Global COVID-19 cases are similar to the previous week but maybe underestimated. The risk of COVID-19 transmission remains high. The proportions of BA.2.12.1 · BA.4 and BA.5 Omicron subvariants are steadily rising. The activity of the Omicron subvariants and their impact need continuous monitoring.
- **Japanese Encephalitis:** Taiwan is in the midst of Japanese Encephalitis season, individuals living in all counties in Taiwan are at risk of infection.

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