

An Outbreak of Foodborne Gastroenteritis in an Environmental Education Activity, Taoyuan, 2020

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Abstract

On August 13, 2020, around 120 people in an inspection team in Taoyuan City developed gastrointestinal illnesses after an environmental education activity in Hualien. The Field Epidemiology Training Program of the Taiwan Centers for Disease Control conducted an epidemiological investigation to clarify the scale, source, transmission route, and causative agent of this outbreak.

We conducted a case-control study. The case was defined as those who participated in this activity and had any two of the following symptoms: diarrhea, abdominal pain, vomiting, or nausea after lunch on August 13th. We collected 249 valid questionnaires, of which 128 (52%) met the case definition. The most prevalent symptoms were diarrhea (94%), abdominal pain (69%), vomiting (66%), and nausea (63%). The distribution of onset time indicated a single source of infection, with a median incubation period of 32 hours (range: 8–72 hours). We interviewed other customers in Restaurant A and found

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that they also had gastrointestinal illnesses, so the lunch at Restaurant A was suspected as the infection source. The patients and food handlers from restaurant A were all tested positive for norovirus. After comparing the viral gene sequences, we found the similarity of nine specimens was 100%. The univariate analysis of the dishes showed that "Two-in-one seafood cold plate" (OR 3.73, 95% CI 1.62–8.59), "Trotters with bamboo shoots" (OR 2.62, 95% CI 1.16– 5.90), and "Seafood with sesame oil" (OR 2.76, 95% CI 1.29– 5.91) were associated with illness.

We concluded that it was a foodborne outbreak caused by norovirus transmitted through the lunch provided by Restaurant A. We recommend that food handlers maintain hand hygiene and suspend working in the kitchen if gastrointestinal symptoms develop. Health authorities can actively collect information from other customers who have dined in the same restaurant, not only the restaurant of the last meal, to early identify the suspected meals.

Keywords: Diarrhea, food poisoning, norovirus, epidemiological investigation

week 48–week 49, 2023 (Nov.26, 2023–Dec.9, 2023)

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Weekly Data of Notifiable Inases (by week of diagnosis)

Case diagnosis year		Week 48★		Week 1–48			
Classification	Disease Diagnosed	2023	2022	2023		2022	
				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	Cholera	0	1	1	0	2	0
	Typhoid fever	0	0	9	7	4	2
	Paratyphoid Fever	1	0	24	1	6	0
	Epidemic Typhus Fever	0	0	0	0	0	0
	Shigellosis	1	3	61	12	80	8
	Amoebiasis	5	3	259	104	186	63
	Enterohemorrhagic E.coli Infection	0	0	0	0	2	0
	Anthrax	0	0	0	0	0	0
	Diphtheria	0	0	0	0	0	0
	Meningococcal Meningitis	0	0	5	0	1	0
	Poliomyelitis	0	0	0	0	0	0
	Acute Flaccid Paralysis	1	0	57	0	29	0
	Measles	0	0	2	2	1	0
	Rubella	0	0	0	0	0	0
	Dengue Fever	448	1	25,637	255	80	60
	West Nile Fever	0	0	0	0	0	0
	Acute Viral Hepatitis type A	0	1	80	6	117	1
	Malaria	2	0	4	4	2	2
	Chikungunya Fever	0	0	9	9	1	1
Hantavirus syndrome	0	1	6	0	5	0	
Zika virus infection	0	0	3	3	0	0	
Mpox	0	0	355	15	4	4	
Category III	Acute Viral Hepatitis type B	2	2	130	6	98	0
	Acute Viral Hepatitis type C	5	12	466	1	456	2
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	12	5	11	0
	Acute Viral Hepatitis, untyped	0	0	9	2	0	0
	Congenital Syphilis	0	0	3	0	2	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	14	0	0	0
	Haemophilus Influenza type b Infection	0	0	1	0	2	0
	Japanese Encephalitis	0	0	26	0	19	0
	Legionnaires' Disease	11	13	363	10	328	2
	Mumps	5	8	269	7	282	0
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	1	0
Tetanus	0	0	5	0	8	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	1	1	44	0	31	0
	Endemic Typhus Fever	0	0	24	0	15	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	17	3	962	13	13	1
	Invasive Pneumococcal Disease	5	8	254	1	170	0
	Leptospirosis	0	1	74	0	63	0
	Listeriosis	6	8	177	2	136	0
	Lyme Disease	0	0	0	0	1	1
	Melioidosis	0	0	27	2	23	2
	Q Fever	0	0	3	0	3	0
	Scrub Typhus	5	4	193	0	258	0
	Toxoplasmosis	0	1	23	2	27	0
	Tularemia	0	0	0	0	0	0
Severe Fever with Thrombocytopenia Syndrome	0	0	0	0	1	0	
Severe Pneumonia with Novel Pathogens	271	101,498	1,395,218	18,146	8,352,171	35,521	
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 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
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 are based on reported cases and summed up by week of report.
 4. "Mpox" has been listed as a Notifiable Infectious Disease since June 23, 2022.
 5. "Severe Pneumonia with Novel Pathogens": The case definition has been revised to include patients who have both a positive test for SARS-CoV-2 and associated complications since March 20, 2023. Additionally, it has been modified from Category V to Category IV since May 1, 2023.

Suspected Clusters

- Forty-five clusters related to Upper respiratory tract infection (20), Diarrhea (19), TB (3), Varicella (2) and Enterovirus (1) were reported during week 48.

Imported Infectious Diseases

- There were 11 imported cases from at least 9 countries/areas during week 48.
 - Dengue Fever:** 4 cases from Thailand (2), the Philippines (1), and Vietnam (1).
 - Severe Pneumonia with Novel Pathogens:** 2 cases from Nepal (1), and Japan (1).
 - Malaria:** 2 cases from India (1), and Nigeria (1).
 - Legionnaires' Disease:** 2 cases from China (1), and Thailand (1).
 - Influenza Case with Severe Complications:** 1 case from Malaysia.
- During week 1–48, there were 18,615 the imported cases of notifiable diseases. The top three were Severe Pneumonia with Novel Pathogens (18,146), Dengue Fever (255), and Amoebiasis (104).
- During week 1–48, imported cases of notifiable diseases were from at least 50 countries/areas. The top three were China (3,181), Japan (731), and Thailand (215).

Summary of Epidemic

- **Influenza:** The total number of visits for influenza-like illness (ILI) has slight decreased, but higher than the same period of 2020 to 2022.
- **Dengue Fever:** The epidemic has decreased.

Weekly Data of Notifiable Inases (by week of diagnosis)

Case diagnosis year		Week 49		Week 1–49			
Classification	Disease Diagnosed	2023	2022	2023		2022	
				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
	Cholera	0	0	1	0	2	0
Category II	Typhoid fever	0	0	9	7	4	2
	Paratyphoid Fever	1	0	25	1	6	0
	Epidemic Typhus Fever	0	0	0	0	0	0
	Shigellosis	1	0	62	12	80	8
	Amoebiasis	1	3	260	106	189	65
	Enterohemorrhagic E.coli Infection	0	0	0	0	2	0
	Anthrax	0	0	0	0	0	0
	Diphtheria	0	0	0	0	0	0
	Meningococcal Meningitis	0	0	5	0	1	0
	Poliomyelitis	0	0	0	0	0	0
	Acute Flaccid Paralysis	2	1	59	0	30	0
	Measles	0	0	2	2	1	0
	Rubella	0	0	0	0	0	0
	Dengue Fever	380	0	26,017	260	80	60
	West Nile Fever	0	0	0	0	0	0
	Acute Viral Hepatitis type A	0	1	80	6	118	1
	Malaria	1	0	5	5	2	2
	Chikungunya Fever	0	0	9	9	1	1
	Hantavirus syndrome	0	0	6	0	5	0
	Zika virus infection	0	0	3	3	0	0
Mpox	0	0	355	15	4	4	
Category III	Acute Viral Hepatitis type B	3	2	133	7	100	0
	Acute Viral Hepatitis type C	11	14	476	1	470	2
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	12	5	11	0
	Acute Viral Hepatitis, untyped	0	0	9	2	0	0
	Congenital Syphilis	1	0	4	0	2	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	14	0	0	0
	Haemophilus Influenza type b Infection	0	0	1	0	2	0
	Japanese Encephalitis	0	0	26	0	19	0
	Legionnaires' Disease	9	9	372	10	337	2
	Mumps	9	3	278	7	285	0
	Neonatal Tetanus	0	0	0	0	0	0
Pertussis	0	0	0	0	1	0	
Tetanus	0	0	5	0	7	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	1	0	45	0	31	0
	Endemic Typhus Fever	0	1	24	0	16	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	16	1	978	16	14	1
	Invasive Pneumococcal Disease	8	8	262	1	178	0
	Leptospirosis	0	3	74	0	66	0
	Listeriosis	2	4	179	2	140	0
	Lyme Disease	0	0	0	0	1	1
	Melioidosis	0	0	27	2	23	2
	Q Fever	0	0	3	0	3	0
	Scrub Typhus	3	3	196	0	261	0
	Toxoplasmosis	0	0	23	2	27	0
	Tularemia	0	0	0	0	0	0
Severe Fever with Thrombocytopenia Syndrome	0	0	0	0	1	0	
Severe Pneumonia with Novel Pathogens	231	100,961	1,395,449	18,147	8,453,132	35,863	
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 Coronavirus Infections	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	1	1	0	1	0
	Rift Valley Fever	0	0	0	0	0	0
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.
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5. "Severe Pneumonia with Novel Pathogens": The case definition has been revised to include patients who have both a positive test for SARS-CoV-2 and associated complications since March 20, 2023. Additionally, it has been modified from Category V to Category IV since May 1, 2023.

Suspected Clusters

- Thirty-eight clusters related to Upper respiratory tract infection (25), Diarrhea (9), Enterovirus (2), Fever of unknown origin (1) and Varicella (1) were reported during week 49.

Imported Infectious Diseases

- There were 11 imported cases from at least 8 countries/areas during week 49.
 - Dengue Fever:** 5 cases from Vietnam (3), Thailand (1), and Malaysia (1).
 - Influenza Case with Severe Complications:** 3 cases from China (1), Thailand (1), and Macau (1).
 - Severe Pneumonia with Novel Pathogens:** 1 case from Turkey.
 - Acute Viral Hepatitis type B:** 1 case from USA.
 - Malaria:** 1 case from Ethiopia.
- During week 1–49, there were 18,628 the imported cases of notifiable diseases. The top three were Severe Pneumonia with Novel Pathogens (18,147), Dengue Fever (260), and Amoebiasis (106).
- During week 1–49, imported cases of notifiable diseases were from at least 51 countries/areas. The top three were China (3,182), Japan (731), and Thailand (217).

Summary of Epidemic

- **Influenza:** The total number of visits for influenza-like illness (ILI) has decreased, but higher than the same period of 2020 to 2022. Furthermore, the proportion of influenza B among influenza virus slightly increased in the community.
- **Dengue Fever:** The epidemic has decreased.

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