

December 19, 2023 Vol.39 No.24

Original Article

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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Received: Sep. 15, 2021
Accepted: Dec. 20, 2021

DOI: 10.6525/TEB.202312_39(24).0001

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)

DOI: 10.6525/TEB.202312_39(24).0002

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Category II A A R D W A C C C C H H	Meningococcal Meningitis Poliomyelitis Acute Flaccid Paralysis Measles Rubella Dengue Fever Nest Nile Fever Acute Viral Hepatitis type A Malaria Chikungunya Fever Jantavirus syndrome Tika virus infection	0 0 1 0 448 0 0 2 0 0 0	0 0 0 1 0 1 0	5 0 57 2 0 25,637 0 80 4	0 0 2 0 255 0 6	1 0 29 1 0 80 0	0 0 0 0 60 0
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R R D A C I H	Acute Flactic Paralysis Vleasles Lubella Dengue Fever Nest Nile Fever Acute Viral Hepatitis type A Alalaria Chikungunya Fever Jantavirus syndrome Tika virus infection	1 0 448 0 0 2 0 0 0	0 0 1 0 1 0	2 0 25,637 0 80 4	0 2 255 0 6	1 0 80 0	0 0 60 0
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I IH	Hantavirus syndrome /ika virus infection	0		9	9	1	1
	Zika virus infection	0	1	6	0	5	0
Z1	A	ŏ	0	3	3	0	0
Δ	VIPOX Acute Viral Henatitis tyne R	2	2	355 130	12	4	4
A	Acute Viral Hepatitis type D	5	12	466	1	456	2
A	Acute Viral Hepatitis type D	0	0	0	Ō	0	0
A	Acute Viral Hepatitis type E	0	0	12	5	11	0
A	Acute Viral Hepatitis, untyped	0	0	9	2	0	0
	Congenital Syphilis	0	0	5 0	U	2	U
Category III E	Congenital Rubella Synarome	0	0	14	0	0	ŏ
Н	laemophilus Influenza type b Infection	ō	õ	1	õ	2	ō
si	apanese Encephalitis	0	0	26	0	19	0
Le	egionnaires' Disease	11	13	363	10	328	2
IV N	Numps	5	ð n	269	/	282 0	U 0
P	Veolidiai ielaiius Pertiissis	ő	0	0	0	1	0
Te	Tetanus	ō	Õ	5	Õ	8	Ō
B	Jotulism	0	0	0	0	0	0
B	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	1	1	44	0	31	0
	Indemic Typnus rever Ternesvirus R Infection		0	24 0	0	15	0
In	nfluenza Case with Severe Complications	17	3	962	13	13	1
In	nvasive Pneumococcal Disease	5	8	254	1	170	0
Le	eptospirosis	0	1	74	0	63	0
Category IV LI	isteriosis	6	8	177	2	136	0
	yme Disease Malioidosis		0	0 27	2	⊥ 23	1 2
Q) Fever	ŏ	õ	3	Ō	3	ō
S	Scrub Typhus	5	4	193	Ō	258	0
Te	oxoplasmosis	0	1	23	2	27	0
Tu S	iularemia	0	0	0	0	0	0
5	evere Fever with Infombocytopenia syndrome	271	U 101 <u>4</u> 98	U 1 205 218	U 19 146	1 9 252 171	25 521
E	-hola Virus Disease	0	01,	0	0	0,352,17 -	0
La	Lassa Fever	Ō	Õ	Ō	Õ	Õ	Ō
N	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Aiddle East Respiratory Syndrome Coronavirus	0	0	0	0	0	0
	nfections		0	1	0	0	ŏ
	Vovel Influenza A Virus infections		0	1	0	0	0
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Numbers of Mumps and Tetanus are based on reported cases and summed up by week of report.
 "Mpox" has been listed as a Notifiable Infectious Disease since June 23, 2022.
 "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.

	Case diagnosis year	We	eek 49		Week	1–49	
Classification	Disease Diagnosed	2023	2022	202 Total	23 Imported	202 Total	Importe
	Plague	0	0		0	0	0 Cases
Category I	Rabies	0	0	0	0	0	0
0,	SARS Smallpox	0	0	0	0	0	0
	Cholera	0	0	1	0	2	0
	Typhoid fever	0	0	9	7	4	2
	Paratyphoid Fever	1	0	25	1	6	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 Diphtheria	0	0	0	0	0	0
	Meningococcal Meningitis	0	0	5	0	1	0
Category II	Poliomyelitis	0	0	0	0	0	0
category	Acute Flaccid Paralysis	2	1	59	0	30	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 5	6 5	118	1
	Chikungunya Fever	Ō	Ő	9	9	1	1
	Hantavirus syndrome	0	0	6	0	5	0
	Zika virus infection	0	0	3	3	0	0
	Acute Viral Hepatitis type B	3	2	133	7	100	0
	Acute Viral Hepatitis type C	11	14	476	1	470	2
Category III	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis Lype E Acute Viral Hepatitis Luntyped	0	0	12 9	5	11	0
	Congenital Syphilis	1	Ö	4	0	2	Ö
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	14	0	0	0
	Japanese Encephalitis	0	0	26	0	19	0
	Legionnaires' Disease	9	9	372	10	337	2
	Mumps	9	3	278	7	285	0
	Neonatai letanus Pertussis	0	0	0	0	0	0
	Tetanus	Ő	Ö	5	0	7	Ö
	Botulism	0	0	0	0	0	0
Category IV	Brucellosis Complicated Varicella	0	0	0	0	0 21	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
		0	3	74	0	66	0
	Listeriosis	2	4	179	2	140	0
	Lyme Disease	0	0	0	0	1	1
	Ω Fever	0	0	27	2	23	2
	Scrub Typhus	3	3	196	Õ	261	Ő
	Toxoplasmosis	0	0	23	2	27	0
	Iularemia Severe Fever with Thrombocytonenia Syndrome	0	0	0	0	0	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
	Iviarburg Hemorrhagic Fever Middle Fast Respiratory Syndrome Coronavirus	0	U	U	U	U	U
	Infections	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	1	1	0	1	0
	KITT VAILEY FEVER Vellow Fever	0	0	0	0	0	0
-		0	0	5	0	5	0

Weekly Data of Notifiable Inases (by week of diagnosis)

★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
 MDR-TB, Tuberculosis, Syphilis, Gonorrhea, 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. "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

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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