

An Outbreak Investigation of Acute Hepatitis A in Northern Taiwan, 2016

Ju-Hui Lin^{1*}, Yu-Ju Chou¹, Chen-Huang Yang¹, Yu-Hsin Liao²,
Jyh-Yuan Yang², Tzu-Chun Chen¹, Jhy-Wen Wu¹, Kun-Bin Wu¹

Abstract

The Northern Regional Center of Taiwan Centers for Disease Control detected and investigated a workplace cluster of acute hepatitis A in 2016. Three cases, including 2 male and 1 female, were diagnosed as acute hepatitis A infection. The genotypes of the virus isolated were all IA cluster 1, and were 100% identical. In addition to the traditional transmission route of food and environment, the 2 male cases might be transmitted through unprotected sex. An MSM-related hepatitis A cluster extending to workplace setting was highly suspected. Because of medical staffs' timely report and public health staffs' aggressive intervention, such as health education and vaccination for the contacts, the cluster was soon under control. Effective preventive and control measures rely on cooperation between public health bureaus and healthcare institutions, early intervention, encouragement of hepatitis A vaccination, and robust disease reporting system.

Keywords: Hepatitis A, workplace cluster

¹Northern Regional Center, Centers for Disease Control, Ministry of health and Welfare, Taiwan

²Center for Diagnostics and Vaccine Development, Centers for Disease Control, Ministry of Health and Welfare, Taiwan

Corresponding author: Ju-Hui Lin^{1*}

E-mail: Lin1204@cdc.gov.tw

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Investigation of the Two *Vibrio cholerae* Cases in Southern Taiwan, 2016

Chin-Yu Chang*, Mei-Man Hsu, Hui-Chen Lin, Min-Nan Hung,
Chiou-Yueh You, Chao-Ching Chang

Abstract

In July 2016, two indigenous cholera cases were identified in southern Taiwan. These two cases went to the different restaurants of the same franchise, and they both ate uncooked seafood. They were hospitalized due to vomiting, diarrhea and watery stools. *Vibrio cholerae* was isolated from the stool specimens. Toxigenic strains, serogroup O1 serotype Ogawa, were confirmed by Taiwan Centers for Disease Control. The health bureau conducted prevention measures and investigated the source of infection. All specimens from contacts and surroundings were negative for pathogens. The PFGE patterns of strains from two cases were indistinguishable, revealing the possibility of co-infection. The household environmental investigation and food exposure history are important for cholera outbreak investigation. The cooperation between various government departments promotes prevention works efficiently.

Keywords: *Vibrio cholerae*, PFGE

Kaohsiung Pingtung Regional Center,
Centers for Disease Control, Ministry
of Health and Welfare, Taiwan
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Corresponding author: Chin-Yu Chang*
E-mail: m313k@cdc.gov.tw
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Weekly Data of Notifiable Infectious Diseases (by week of diagnosis)

Case diagnosis year		Week 24★		Week 1–24			
Classification	Disease Diagnosed	2018	2017	2018		2017	
				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	44	0	17	0
	Acute Viral Hepatitis type A	2	6	44	20	277	29
	Amoebiasis	7	12	145	57	164	94
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	1	1	5	5
	Cholera	0	0	0	0	0	0
	Dengue Fever	6	4	78	78	101	101
	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	1	0	1	0
	Malaria	0	0	0	0	2	2
	Measles	0	0	27	9	5	5
	Meningococcal Meningitis	0	0	5	1	6	0
	Paratyphoid Fever	0	0	2	1	3	3
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	5	4	1	1
Shigellosis	7	2	79	22	90	33	
Typhoid fever	0	0	7	5	11	10	
West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	0	1	57	3	70	3
	Acute Viral Hepatitis type C	5	9	209	2	120	1
	Acute Viral Hepatitis type D	0	0	0	0	1	0
	Acute Viral Hepatitis type E	0	0	4	0	9	3
	Acute Viral Hepatitis untype	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	5	0	19	0	2	0
	Haemophilus Influenza type b Infection	0	0	3	0	2	0
	Japanese Encephalitis	7	1	16	0	3	0
	Legionellosis	2	8	69	1	70	9
	Mumps	8	12	269	3	313	4
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	1	2	12	0	16	0
	Tetanus	0	0	4	0	5	0
	Category IV	Botulism	0	0	0	0	0
Brucellosis		0	0	0	0	0	0
Complicated Influenza		1	1	24	0	10	1
Complicated Varicella		2	1	9	0	16	1
Endemic Typhus Fever		0	0	0	0	0	0
Herpesvirus B Infection		4	7	256	0	250	2
Invasive Pneumococcal Disease		0	2	18	0	30	1
Leptospirosis		7	0	76	0	0	0
Lyme Disease		0	0	0	0	0	0
Melioidosis		0	0	6	0	9	0
Q Fever		2	1	8	1	9	0
Scrub Typhus		12	12	135	0	147	0
Toxoplasmosis		10	66	699	5	433	5
Tularremia		0	0	7	0	7	0
Category V	Ebola Virus Disease	0	0	0	0	0	0
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	0	0	0	0
	Lassa Fever	0	0	0	0	0	0
	Rift Valley Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome Coronavirus	0	0	0	0	1	1
	Yellow Fever	0	0	0	0	0	0
	Zika Virus Infection	0	0	0	0	0	0

- ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
- The following chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
- Numbers of mumps, neonatal tetanus and tetanus cases are summed up by the week of report.
- Since 2016/1/22, "Zika Virus Infection" was listed as a Notifiable Infectious Disease.
- Since 2018/1/1, "Listeriosis" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Twenty-two clusters were reported, including 7 tuberculosis clusters, 4 diarrhea clusters, 3 upper respiratory tract infection clusters, 5 influenza-like illness clusters, and 3 varicella clusters.

Imported Infectious Diseases

- There were 12 confirmed imported cases from 8 countries during week 24 of 2018.

Country Disease	Indonesia	Philippines	Cambodia	Myanmar	Vietnam	Thailand	China	Sri Lanka	Total
DF	1	2	1			1		1	6
Amoebiasis	1		1		1		1		4
Shigellosis	1			1					2
Total	3	2	2	1	1	1	1	1	12

Note: The table summarized the number of imported cases that were either **confirmed** or **updated** in the given week.

- There are 210 confirmed imported cases from 22 different countries in 2018. The top 3 countries are Indonesia (69), Philippines (27), and Thailand (20).
- Top 3 imported diseases are Dengue Fever (78), Amoebiasis (57), and Shigellosis (22).

Summary of Epidemic

- **Enterovirus:** The epidemic season has begun. Most reported cases experienced mild symptoms. However, cases with severe complications are likely to occur. In addition, Echo11 and EV71 are still circulating in the community.
- **Japanese Encephalitis:** The Japanese encephalitis epidemic season has begun. New cases are primarily in central and southern Taiwan. However, cases are also likely to occur in other counties.
- **Scrub Typhus :** The scrub typhus epidemic season has begun. The current primarily affected areas include Hualien County and Taitung County.

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

Case diagnosis year		Week 25★		Week 1-25			
Classification	Disease Diagnosed	2018	2017	2018		2017	
				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	45	0	17	0
	Acute Viral Hepatitis type A	0	6	44	20	283	29
	Amoebiasis	2	11	147	60	175	100
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	1	1	5	5
	Cholera	0	0	0	0	0	0
	Dengue Fever	6	5	84	84	106	106
	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	1	0	1	0
	Malaria	0	0	0	0	2	2
	Measles	2	0	29	11	5	5
	Meningococcal Meningitis	0	0	5	1	6	0
	Paratyphoid Fever	0	0	2	1	3	3
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	5	4	1	1
	Shigellosis	1	6	80	22	96	35
	Typhoid fever	0	0	7	5	11	10
West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	1	5	58	3	75	3
	Acute Viral Hepatitis type C	6	10	215	2	130	1
	Acute Viral Hepatitis type D	0	0	0	0	1	0
	Acute Viral Hepatitis type E	0	0	4	0	9	3
	Acute Viral Hepatitis untype	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	1	0	20	0	2	0
	Haemophilus Influenza type b Infection	0	0	3	0	2	0
	Japanese Encephalitis	1	3	17	0	6	0
	Legionellosis	1	5	70	1	75	10
	Mumps	15	14	284	3	327	4
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	1	1	13	0	17	0
	Tetanus	0	1	4	0	6	0
	Category IV	Botulism	0	0	0	0	0
Brucellosis		0	0	0	0	0	0
Complicated Influenza		0	1	24	0	11	1
Complicated Varicella		2	4	11	0	20	1
Endemic Typhus Fever		0	0	0	0	0	0
Herpesvirus B Infection		8	2	264	0	252	2
Invasive Pneumococcal Disease		2	2	20	0	32	1
Leptospirosis		5	0	81	0	0	0
Lyme Disease		0	0	0	0	0	0
Melioidosis		0	0	6	0	9	0
Q Fever		0	0	8	1	9	0
Scrub Typhus		7	20	142	0	167	0
Toxoplasmosis		11	81	710	5	514	5
Tularremia		0	1	7	0	8	0
Category V	Ebola Virus Disease	0	0	0	0	0	0
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	0	0	0	0
	Lassa Fever	0	0	0	0	0	0
	Rift Valley Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome Coronavirus	0	0	0	0	1	1
	Yellow Fever	0	0	0	0	0	0
Zika Virus Infection	0	0	0	0	0	0	

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
2. The following chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
3. Numbers of mumps, neonatal tetanus and tetanus cases are summed up by the week of report.
4. Since 2016/1/22, "Zika Virus Infection" was listed as a Notifiable Infectious Disease.
5. Since 2018/1/1, "Listeriosis" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Eleven clusters were reported, including 4 tuberculosis clusters, 4 diarrhea clusters, 2 influenza-like illness clusters, and 1 varicella cluster.

Imported Infectious Diseases

- There were 10 confirmed imported cases from 6 countries during week 25 of 2018.

Disease \ Country	Indonesia	Malaysia	Philippines	Cambodia	Japan	Thailand	Total
DF	1	3		1			5
Amoebiasis	1		1		1		3
Measles	1					1	2
Total	3	3	1	1	1	1	10

Note: The table summarized the number of imported cases that were either **confirmed** or **updated** in the given week.

- There are 221 confirmed imported cases from 23 different countries in 2018. The top 3 countries are Indonesia (72), Philippines (29), and Thailand (21).
- Top 3 imported diseases are Dengue Fever (84), Amoebiasis (60), and Shigellosis (22).

Summary of Epidemic

- **Enterovirus:** The epidemic season has begun. Most reported cases experienced mild symptoms. The epidemic activity is increasing slowly as schools usually start summer break in July. In addition, Echo11 and EV71 are still circulating in the community.
- **Japanese Encephalitis:** The Japanese encephalitis epidemic season has begun. New cases are primarily in central and southern Taiwan. However, cases are also likely to occur in other counties.
- **Scrub Typhus :** The scrub typhus epidemic season has begun. The current primarily affected areas include Hualien County and Taitung County.

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

Case diagnosis year		Week 26★		Week 1-26			
Classification	Disease Diagnosed	2018	2017	2018		2017	
				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	0	45	0	17	0
	Acute Viral Hepatitis type A	3	7	47	21	290	29
	Amoebiasis	3	5	150	60	180	103
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	1	1	2	2	6	6
	Cholera	0	0	0	0	0	0
	Dengue Fever	10	8	94	94	114	114
	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	1	0	1	0
	Malaria	0	0	0	0	2	2
	Measles	1	0	30	12	5	5
	Meningococcal Meningitis	0	0	5	1	6	0
	Paratyphoid Fever	0	0	2	1	3	3
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	5	4	1	1
	Shigellosis	0	2	80	22	98	36
Typhoid fever	0	0	7	5	11	10	
West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	1	3	59	4	78	3
	Acute Viral Hepatitis type C	10	7	225	2	137	1
	Acute Viral Hepatitis type D	0	0	0	0	1	0
	Acute Viral Hepatitis type E	0	0	4	0	9	3
	Acute Viral Hepatitis untype	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	2	2	22	0	4	0
	Haemophilus Influenza type b Infection	1	0	4	0	2	0
	Japanese Encephalitis	1	1	18	0	7	0
	Legionellosis	6	3	76	1	78	10
	Mumps	12	12	296	3	339	4
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	13	0	17	0
	Tetanus	0	0	4	0	6	0
	Category IV	Botulism	0	0	0	0	0
Brucellosis		0	0	0	0	0	0
Complicated Influenza		0	0	24	0	11	1
Complicated Varicella		3	1	14	0	21	1
Endemic Typhus Fever		0	0	0	0	0	0
Herpesvirus B Infection		10	7	274	0	259	2
Invasive Pneumococcal Disease		1	3	21	0	35	1
Leptospirosis		2	0	83	0	0	0
Lyme Disease		0	0	0	0	0	0
Melioidosis		0	0	6	0	9	0
Q Fever		0	0	8	1	9	0
Scrub Typhus		5	14	147	0	181	0
Toxoplasmosis		10	101	720	5	615	5
Tularremia		3	0	10	1	8	0
Category V	Ebola Virus Disease	0	0	0	0	0	0
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	0	0	0	0
	Lassa Fever	0	0	0	0	0	0
	Rift Valley Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome Coronavirus	0	0	0	0	1	1
	Yellow Fever	0	0	0	0	0	0
	Zika Virus Infection	0	0	0	0	0	0

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
2. The following chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
3. Numbers of mumps, neonatal tetanus and tetanus cases are summed up by the week of report.
4. Since 2016/1/22, "Zika Virus Infection" was listed as a Notifiable Infectious Disease.
5. Since 2018/1/1, "Listeriosis" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Twenty-four clusters were reported, including 8 tuberculosis clusters, 6 diarrhea clusters, 7 upper respiratory tract infection clusters, 1 influenza-like illness cluster, and 2 varicella clusters.

Imported Infectious Diseases

- There were 15 confirmed imported cases from 8 countries during week 26 of 2018.

Country Disease	Cambodia	Thailand	Philippines	Maldives	Malaysia	UK	Vietnam	Singapore	Total
DF	5	2	1	1	1				10
Measles						1			1
Acute Hepatitis B							1		1
Chikungunya Fever			1						1
Toxoplasmosis								1	1
Acute Hepatitis A		1							1
Total	5	3	2	1	1	1	1	1	15

Note: The table summarized the number of imported cases that were either **confirmed** or **updated** in the given week.

- There are 236 confirmed imported cases from 24 different countries in 2018. The top 3 countries are Indonesia (72), Philippines (31), and Thailand (24).
- Top 3 imported diseases are Dengue Fever (94), Amoebiasis (60), and Shigellosis (22).

Summary of Epidemic

- **Enterovirus:** Taiwan is in the midst of enterovirus season. Most reported cases experienced mild symptoms. The epidemic activity is expected to slowly decrease as schools started their summer break. However, Taiwan CDC urges the public to still need to stay alert against enterovirus infection. In addition, Echo11 and EV71 are still circulating in the community.
- **Japanese Encephalitis:** Taiwan is in the midst of Japanese encephalitis season. New cases are primarily in central and southern Taiwan.

- **Dengue Fever:** The epidemics of Dengue in Southeast Asia are increasing gradually. There has been one confirmed indigenous dengue case in Southern Taiwan. As the increased temperature and rainfall, the risk of dengue fever for both imported and indigenous cases is expected to increase.
- **Scrub Typhus:** Taiwan is in the midst of scrub typhus season. The current primarily affected areas include Hualien County and Taitung County.

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Address: No.6, Linsen S. Rd, Zhongzheng District, Taipei City 10050, Taiwan (R.O.C.)

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Website: <http://www.cdc.gov.tw/rwd/english>

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