

Epidemiology of *Vibrio cholerae*, Taiwan, 2016

Shu-Chun Chiu, Jih-Hui Lin, Kuang-Lo Chen, Chien-Shun Chiou *

Abstract

We analyzed the diagnostics, epidemiologic data, and DNA fingerprint patterns of *Vibrio cholerae* isolates in 2016, based on the National Notifiable Disease Surveillance System of Taiwan Centers for Disease Control. A total of 352 samples were collected, including 230 clinical samples (from 60 suspected cases and 170 contacts) and 122 isolates from different hospitals. Of these 352 samples, 11 isolates were tested positive for toxigenic *V. cholerae* O1 serotype Ogawa. Among the positive subjects, 7 were male and 4 were female, ranging from 13 to 82 years of age. Five of six (83.3%) patients over 65 years old had diabetes, hypertension or other chronic diseases. Case investigation showed that all confirmed cases had consumed raw seafood or cross-contaminated cooked food via unwashed cutting boards. The fingerprint patterns of isolates were submitted to the database of US Centers for Disease Control and Prevention, and we found that these isolates with VcN09.012: VcX01.015 pattern were similar to isolates from Guam, Philippines, and Korea. This finding revealed that this *V. cholerae* Ogawa group might have circulated in Pacific Rim. The public health systems were well established in Taiwan. Personal hygiene and good sanitation are keys to cholera prevention.

Keywords: *Vibrio cholerae*, O1-Ogawa

An Outbreak Investigation of Cross-County Norovirus Gastroenteritis Linked to Imported Oysters, Taiwan, 2015

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Abstract

In August 2015, the Public Health Bureau of Changhua County received notification of a foodborne outbreak (outbreak A) associated with consumption of undercooked oysters. The norovirus genotype GI.5 was detected in the stool sample from one of the six consumers, and GI.1, GI.4, GI.5, and GII.17 were detected in oyster samples. The trace-back investigation of the oyster supply chain revealed that one foodborne outbreak occurred a week ago in Hsinchu County (outbreak B), in which the sequences of the norovirus GI.4 and GII.17 strains detected in stool samples were highly similar to those detected in oyster samples of outbreak A. The oyster batches found or suspected contaminated were subsequently recalled to halt the outbreak. The investigation benefited from excellent collaboration among public health departments of the mentioned counties and the successful traceability through the established food supply chain system. It also highlighted the importance of risk communication to the general public and catering sectors, regarding preparation of oysters and other shellfish which biologically tend to accumulate noroviruses.

Keywords: Oysters, Foodborne outbreak, Norovirus

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

Case diagnosis year		Week 42★		Week 1-42				
Classification	Disease Diagnosed	2017	2016	2017		2016		
				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	
	Acute Flaccid Paralysis	0	1	26	0	33	0	
Category II	Acute Viral Hepatitis type A	2	18	344	44	911	71	
	Amoebiasis	5	6	290	158	258	131	
	Anthrax	0	0	0	0	0	0	
	Chikungunya Fever	0	0	11	11	8	8	
	Cholera	0	0	1	0	8	0	
	Dengue Fever	11	11	281	271	735	295	
	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	3	0	
	Malaria	0	2	7	7	13	13	
	Measles	0	0	5	5	13	7	
	Meningococcal Meningitis	0	1	11	0	6	0	
	Paratyphoid Fever	0	0	5	3	5	2	
	Poliomyelitis	0	0	0	0	0	0	
	Rubella	0	0	3	2	4	3	
	Shigellosis	1	8	132	47	176	88	
	Typhoid fever	1	2	17	14	6	3	
	West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	3	0	125	7	87	4	
	Acute Viral Hepatitis type C	9	4	244	1	169	2	
	Acute Viral Hepatitis type D	0	0	1	0	1	0	
	Acute Viral Hepatitis type E	0	1	13	3	15	5	
	Acute Viral Hepatitis untype	0	0	0	0	0	0	
	Congenital Rubella Syndrome	0	0	1	1	0	0	
	Enteroviruses Infection with Severe Complications	0	2	9	0	25	0	
	Haemophilus Influenza type b Infection	0	1	5	0	14	0	
	Japanese Encephalitis	1	0	25	0	23	0	
	Legionellosis	1	2	125	12	86	1	
	Mumps	14	21	537	8	498	7	
	Neonatal Tetanus	0	0	0	0	0	0	
	Pertussis	2	0	31	0	17	0	
	Tetanus	1	1	9	0	10	0	
	Category IV	Botulism	0	0	0	0	5	0
		Brucellosis	0	0	0	0	0	0
Complicated Influenza		4	7	1264	5	1890	2	
Complicated Varicella		2	0	24	1	31	0	
Endemic Typhus Fever		0	0	33	1	13	0	
Herpesvirus B Infection		0	0	0	0	0	0	
Invasive Pneumococcal Disease		5	6	372	4	467	0	
Leptospirosis		0	11	76	1	94	2	
Lyme Disease		0	0	1	1	2	2	
Melioidosis		0	3	21	0	36	1	
Q Fever		2	0	16	0	40	3	
Scrub Typhus		14	22	364	0	381	3	
Toxoplasmosis		0	0	16	0	8	0	
Tularremia		0	0	0	0	0	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	1	1	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	0	0	
	Yellow Fever	0	0	0	0	0	0	
Zika Virus Infection	0	1	4	4	13	13		

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
2. The following 8 chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
3. Numbers of mumps 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.

Suspected Clusters

- Twenty clusters were reported, including 8 tuberculosis clusters, 4 diarrhea clusters, 5 upper respiratory tract infection clusters, 1 influenza-like illness clusters and 2 varicella clusters.

Imported Infectious Diseases

- 16 confirmed cases were imported from 8 countries during Week 42 of 2017.

Country Disease	Indonesia	Vietnam	Myanmar	Cambodia	Kenya	Bangladesh	India	Singapore	Total
DF		4	1	2		1	1	1	10
Amoebiasis	5								5
Shigellosis					1				1
Total	5	4	1	2	1	1	1	1	16

Note: The statistics listed in this table include imported cases that were either **confirmed** or **updated** in the previous week.

- A total of 604 confirmed cases were imported from 34 countries in 2017.
- Top 3 imported diseases : Dengue fever (271), Amoebiasis (158), Shigellosis (47).
- Top 3 countries responsible for most imported cases : Indonesia (198), Vietnam (96), Philippines (75).

Summary of Epidemic

- **Enterovirus** : The enterovirus epidemic season has begun. Most reported cases experience mild symptoms. EV71 virus is still circulating in the community.
- **Scrub Typhus** : The scrub typhus epidemic season has begun. The high risk areas include Hualien County, Taitung County, Kaohsiung City, Kinmen County and Penghu County.
- **Dengue Fever** : The epidemic has continuously increased in Southeast Asian countries. New indigenous dengue cases related to the previously reported cluster in New Taipei City were confirmed. As a result of recent heavy downpours, the number of containers with standing rain water has increased, which facilitates the breeding of vector mosquitoes; the risk of imported and indigenous epidemics remains elevated.

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

Case diagnosis year		Week 43★		Week 1-43			
Classification	Disease Diagnosed	2017	2016	2017		2016	
				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	28	0	35	0	28	0
	Acute Viral Hepatitis type A	347	46	935	72	347	46
	Amoebiasis	295	161	265	135	295	161
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	11	11	8	8	11	11
	Cholera	1	0	8	0	1	0
	Dengue Fever	291	281	747	307	291	281
	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	1	0	3	0	1	0
	Malaria	7	7	13	13	7	7
	Measles	5	5	13	7	5	5
	Meningococcal Meningitis	11	0	6	0	11	0
	Paratyphoid Fever	5	3	5	2	5	3
	Poliomyelitis	0	0	0	0	0	0
	Rubella	3	2	4	3	3	2
Shigellosis	138	49	184	90	138	49	
Typhoid fever	17	14	7	3	17	14	
West Nile Fever	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	129	7	89	4	129	7
	Acute Viral Hepatitis type C	256	1	172	2	256	1
	Acute Viral Hepatitis type D	1	0	1	0	1	0
	Acute Viral Hepatitis type E	14	3	15	5	14	3
	Acute Viral Hepatitis untype	0	0	0	0	0	0
	Congenital Rubella Syndrome	1	1	0	0	1	1
	Enteroviruses Infection with Severe Complications	10	0	27	0	10	0
	Haemophilus Influenza type b Infection	5	0	14	0	5	0
	Japanese Encephalitis	25	0	23	0	25	0
	Legionellosis	136	12	91	2	136	12
	Mumps	547	8	518	7	547	8
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	31	0	17	0	31	0
	Tetanus	9	0	10	0	9	0
Category IV	Botulism	0	0	5	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Influenza	1271	6	1907	2	1271	6
	Complicated Varicella	24	1	35	0	24	1
	Endemic Typhus Fever	33	1	13	0	33	1
	Herpesvirus B Infection	0	0	0	0	0	0
	Invasive Pneumococcal Disease	381	4	475	0	381	4
	Leptospirosis	77	1	100	2	77	1
	Lyme Disease	1	1	2	2	1	1
	Melioidosis	22	0	37	1	22	0
	Q Fever	16	0	41	3	16	0
	Scrub Typhus	372	0	391	3	372	0
	Toxoplasmosis	17	0	8	0	17	0
Tularremia	0	0	0	0	0	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	1	1	0	0	1	1
	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	0	0
	Yellow Fever	0	0	0	0	0	0
Zika Virus Infection	4	4	13	13	4	4	

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
2. The following 8 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 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.

Suspected Clusters

- Twelve clusters were reported, including 3 tuberculosis clusters, 6 diarrhea clusters, 1 upper respiratory tract infection cluster, 1 influenza-like illness cluster and 1 varicella cluster.

Imported Infectious Diseases

- 18 confirmed cases were imported from 9 countries during Week 43 of 2017.

Country Disease	China	Indonesia	Thailand	Singapore	India	Myanmar	Malaysia	Vietnam	Sri Lanka	Total
DF		1	3	1	1	2	1	1		10
Amoebiasis		3								3
Hepatitis A	1								1	2
Shigellosis	2									2
FluSC	1									1
Total	4	4	3	1	1	2	1	1	1	18

Note: The statistics listed in this table include imported cases that were either **confirmed** or **updated** in the previous week.

- A total of 622 confirmed cases were imported from 34 countries in 2017.
- Top 3 imported diseases : Dengue fever (281), Amoebiasis (161), Shigellosis (49).
- Top 3 countries responsible for most imported cases : Indonesia (202), Vietnam (97), Philippines (75).

Summary of Epidemic

- **Enterovirus** : The enterovirus epidemic season has begun. Most reported cases experience mild symptoms. EV71 virus is still circulating in the community.
- **Scrub Typhus** : The scrub typhus epidemic season has begun. The high risk areas include Hualien County, Taitung County, Kaohsiung City, Kinmen County and Penghu County.
- **Dengue Fever** : The epidemic has continuously increased in Southeast Asian countries and imported cases have continued to be reported. Since an indigenous dengue cluster occurred in New Taipei City and the mosquito activity remains high in southern Taiwan, the risk of imported and indigenous epidemics remains elevated.

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