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Original Article

Salmonellosis Surveillance and Epidemiological Trend in Taiwan

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Abstract

Nontyphoidal Salmonella is a prevalent foodborne pathogen in Taiwan. A national Salmonella reference laboratory was established in 2004 in Centers for Disease Control, Ministry of Health and Welfare, for performing serotyping, PFGE genotyping, and antimicrobial susceptibility testing for isolates collected from hospitals across the country to investigate the epidemiological trend and to build a Salmonella fingerprint database for disease surveillance. In 2004-2013, a total of 20,370 Salmonella isolates were characterized. The isolates belonged to 100 serovars and Enteritidis (accounting for 28.1%), Typhimurium (23.8%), Stanley (7.8%), Newport (6.8%), and Albany (3.7%) were the first 5 most commonly isolated serovars. The profile of serovar distribution suggested that human salmonellosis in Taiwan was caused by Salmonella from numerous host reservoirs. A total of 3,087 PFGE patterns were identified in the 20,370 isolates. A database with the PFGE patterns is an important information platform for the use in predicting Salmonella serotypes, tracing back animal reservoirs of Salmonella strains (multidrug resistant Salmonella strains in particular), performing real-time disease surveillance, and investigating domestic and international foodborne salmonellosis outbreaks. Source management is the most effective control measure for foodborne diseases. For the control of salmonellosis, the Centers for Disease Control, Food and Drug Administration, and Bureau of Animal and Plant Inspection and Quarantine have to work together on the disease surveillance and elimination of Salmonella contamination in food and agricultural products.

Keywords: Salmonella；disease surveillance；serotyping；genotyping；pulsed-field gel electrophoresis（PFGE）

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An Outbreak of Pertussis in a Junior High School in Taoyuan County, December 2013 – February 2014

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Abstract

During December 2013 – February 2014, an outbreak of pertussis occurred at a junior high school in Taoyuan County. The index case, a 12-year-old, 7th grade student, presented four-week symptoms of upper respiratory tract infection (cough and rhinorrhea) before the diagnosis of pertussis (confirmed by the isolation of *Bordetella pertussis*) made in December 2013. Subsequent investigation identified 237 contacts and 24 (22.8%) of them developed symptoms. Nasopharyngeal sampling from 23 ill contacts detected seven additional cases by laboratory; one of which was household contact (index case's younger sister) and the other six were contacts from same class or cram school. All of the pertussis cases have a prior history of four-dose diphtheria-tetanus-pertussis (DTP) vaccination. Public health officials implemented control measures to halt the spread of disease, including testing and providing antibiotic treatment for those contacts who developed symptoms, infected students or staff. They were asked not returning to school until completing 5 days of appropriate therapy for pertussis and initiating postexposure prophylactic antibiotics in asymptomatic contacts. The outbreak peaked in mid-December and lasted for 2 months. Prophylactic antibiotics were provided to 167 contacts. No more pertussis case has been reported in this school since February 2014

Keywords：Pertussis；Campus outbreak；Vaccination

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

Case diagnosis week		Week 18		Week 1—18	
Classification	Disease Diagnosed[1]	**2015**	**2014**	**2015**	**2014**
Category I	Plague	0	0	0	0
	Rabies	0	0	0	0
	SARS	0	0	0	0
	Smallpox	0	0	0	0
Category II	Acute Flaccid Paralysis	1	1	7	12
	Acute Viral Hepatitis type A	1	3	27	52
	Amoebiasis	5	8	115	85
	Anthrax	0	0	0	0
	Chikungunya Fever	0	0	3	5
	Cholera	3	0	3	0
	Dengue Fever	6	7	196	121
	Dengue Hemorrhagic Fever/Dengue Shock Syndrome	0	0	0	4
	Diphtheria	0	0	0	0
	Enterohemorrhagic E. coli Infection	0	0	0	0
	Epidemic Typhus Fever	0	0	0	0
	Hantavirus Pulmonary Syndrome	0	0	0	0
	Hemorrhagic Fever with Renal Syndrome	0	0	0	1
	Malaria	1	0	4	6
	Measles	1	3	2	12
	Meningococcal Meningitis	0	0	1	2
	Paratyphoid Fever	0	0	1	6
	Poliomyelitis	0	0	0	0
	Rubella	1	0	5	3
	Shigellosis	3	3	71	55
	Typhoid fever	0	0	12	8
	West Nile Fever	0	0	0	0
Category III	Acute Viral Hepatitis type B	3	6	39	33
	Acute Viral Hepatitis type C[5]	8	3	75	53
	Acute Viral Hepatitis type D	0	0	1	0
	Acute Viral Hepatitis type E	0	0	1	5
	Acute Viral Hepatitis untype	0	0	1	1
	Congential Rubella Syndrome	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	1	1	2
	Haemophilus Influenza type b Infection	0	0	1	2
	Japanese Encephalitis	0	0	0	0
	Legionellosis	3	0	48	38
	Mumps[2]	19	14	272	268
	Neonatal Tetanus	0	0	0	0
	Pertussis	2	0	40	11
	Tetanus[2]	1	0	2	1
Category IV	Botulism	0	0	1	0
	Brucellosis	0	0	0	0
	Complicated Influenza	26	23	372	1472
	Complicated Varicella[4]	2	2	23	27
	Endemic Typhus Fever	1	0	2	6
	Herpesvirus B Infection	0	0	0	0
	Invasive Pneumococcal Disease	13	11	240	300
	Leptospirosis	0	1	13	14
	Lyme Disease	0	0	0	0
	Melioidosis	0	0	7	7
	Q Fever	0	2	12	20
	Scrub Typhus	2	2	68	72
	Toxoplasmosis	0	0	3	5
	Tularremia	0	0	0	0
Category V	Ebola Virus Disease	0	0	0	0
	Ebola-Marburg Hemorrhagic Fever	0	0	0	0
	Novel Influenza A Virus Infections[6]	0	0	0	0
	Lassa Fever	0	0	0	0
	Rift Valley Fever	0	0	0	0
	Middle East Respiratory Syndrome Coronavirus	0	0	0	0
	Yellow Fever	0	0	0	0

1. The following 8 chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
2. Reported cases.
3. The epidemiological week calendar established by the World Health Organization is adopted for calculating each week's cumulative total.
4. Since 2014/1/1, "Varicella" was modified to "Complicated Varicella".
5. Since 2014/3/6, the case definition for confirmed Acute hepatitis C was changed from "meet the clinical **and** laboratory conditions" to "meet the clinical **or** laboratory conditions".
6. Since 2014/7/1, various subtypes of human cases of avian influenza are reported as "novel influenza A virus infections", a Category V Notifiable Infectious Disease. The original "H5N1 flu" and "H7N9 flu", which were respectively listed as a Category I Notifiable Infectious Disease and a Category V Notifiable Infectious Disease were removed from the list on the same day.

Suspected Clusters

●Seventeen clusters were reported, including 11 diarrhea clusters, 3 upper respiratory tract infection clusters, 2 influenza-like illness clusters, and 1 tuberculosis cluster.

Imported Infectious Diseases

●13 confirmed cases were imported from 3 countries during week 18 of 2015.

Country / Disease	Indonesia	China	Congo	Total
Dengue Fever	4	1		5
Amoebiasis	2	1		3
Shigellosis	3			3
Malaria			1	1
IPD		1		1
Total	9	3	1	13

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

●A total of 230 confirmed cases were imported from 25 countries in 2015.

●Top 3 imported diseases：Dengue fever (80), Amoebiasis (69), Shigellosis (40).

●Top 3 countries responsible for most imported cases：Indonesia (153), Vietnam (11), Philippines (11).

Summary of Epidemic

●**Dengue Fever**：Although no new case was confirmed during Week 18, the number of imported cases reported was higher than that during the same period in the past years. In addition, a flat trend has been observed in the number of cases reported. Thus, the public is urged to seek medical attention immediately when suspected symptoms develop. Doctors are advised to stay vigilant for suspected cases to ensure prompt case reporting.

●**Enterovirus**：The peak of enterovirus season is fast approaching and the numbers of visits to outpatient services and ER for enterovirus infection have recently increased. At the moment, the ER consultation rate for enterovirus infection is above the epidemic threshold. In addition, coxsackie A virus is currently the dominant strain circulating in the community, accounting for approximately 64% of all cases. So far, one severe case of enterovirus infection has been confirmed.

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

Case diagnosis week		Week 19		Week 1—19	
Classification	**Disease Diagnosed**[1]	**2015**	**2014**	**2015**	**2014**
Category I	Plague	0	0	0	0
	Rabies	0	0	0	0
	SARS	0	0	0	0
	Smallpox	0	0	0	0
Category II	Acute Flaccid Paralysis	0	0	7	12
	Acute Viral Hepatitis type A	1	2	28	54
	Amoebiasis	10	6	125	91
	Anthrax	0	0	0	0
	Chikungunya Fever	0	0	3	5
	Cholera	1	0	4	0
	Dengue Fever	8	2	204	123
	Diphtheria	0	0	0	0
	Enterohemorrhagic E. coli Infection	0	0	0	0
	Epidemic Typhus Fever	0	0	0	0
	Hantavirus Pulmonary Syndrome	0	0	0	0
	Hemorrhagic Fever with Renal Syndrome	0	0	0	1
	Malaria	0	0	4	6
	Measles	1	0	3	12
	Meningococcal Meningitis	0	0	1	2
	Paratyphoid Fever	0	0	1	6
	Poliomyelitis	0	0	0	0
	Rubella	1	0	6	3
	Shigellosis	4	4	75	59
	Typhoid fever	1	0	13	8
	West Nile Fever	0	0	0	0
Category III	Acute Viral Hepatitis type B	2	0	41	33
	Acute Viral Hepatitis type C[5]	3	1	78	54
	Acute Viral Hepatitis type D	0	0	1	0
	Acute Viral Hepatitis type E	0	0	1	5
	Acute Viral Hepatitis untype	0	2	1	3
	Congential Rubella Syndrome	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	1	2
	Haemophilus Influenza type b Infection	0	0	1	2
	Japanese Encephalitis	0	0	0	0
	Legionellosis	2	1	50	39
	Mumps[2]	11	21	283	289
	Neonatal Tetanus	0	0	0	0
	Pertussis	0	0	40	11
	Tetanus[2]	0	0	2	1
Category IV	Botulism	0	0	1	0
	Brucellosis	0	0	0	0
	Complicated Influenza	19	31	391	1503
	Complicated Varicella[4]	0	0	23	27
	Endemic Typhus Fever	1	0	3	6
	Herpesvirus B Infection	0	0	0	0
	Invasive Pneumococcal Disease	6	11	246	311
	Leptospirosis	3	0	16	14
	Lyme Disease	0	0	0	0
	Melioidosis	0	1	7	8
	Q Fever	0	1	12	21
	Scrub Typhus	3	2	71	74
	Toxoplasmosis	0	0	3	5
	Tularremia	0	0	0	0
Category V	Ebola Virus Disease	0	0	0	0
	Ebola-Marburg Hemorrhagic Fever	0	0	0	0
	Novel Influenza A Virus Infections[6]	0	0	0	0
	Lassa Fever	0	0	0	0
	Rift Valley Fever	0	0	0	0
	Middle East Respiratory Syndrome Coronavirus	0	0	0	0
	Yellow Fever	0	0	0	0

1. The following 8 chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
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6. Since 2014/7/1, various subtypes of human cases of avian influenza are reported as "novel influenza A virus infections", a Category V Notifiable Infectious Disease. The original "H5N1 flu" and "H7N9 flu", which were respectively listed as a Category I Notifiable Infectious Disease and a Category V Notifiable Infectious Disease were removed from the list on the same day.

Suspected Clusters

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

Imported Infectious Diseases

●15 confirmed cases were imported from 3 countries during week 19 of 2015.

Country / Disease	Indonesia	Vietnam	China	Total
Amoebiasis	9			9
Dengue Fever	2			2
Shigellosis	2			2
Rubella			1	1
Hepatitis A		1		1
Total	13	1	1	15

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

●A total of 244 confirmed cases were imported from 25 countries in 2015.

●Top 3 imported diseases：Dengue fever (81), Amoebiasis (78), Shigellosis (42).

●Top 3 countries responsible for most imported cases：Indonesia (166), Vietnam (12), Philippines (11).

Summary of Epidemic

●**Dengue Fever**：Six new cases were confirmed in Kaohsiung City. Among these cases, five cases were confirmed in Nanzih District and they had all visited the same market prior to disease onset, indicating the occurrence of a cluster in the community. In some cases, the interval between symptom onset and seeking medical treatment for the first time is up to five days and cases are reported after seeking to 2-3 times of medical assistance. As a result, the risk of an epidemic outbreak is thus increased. The public is urged to seek prompt medical attention when suspected symptoms develop. Doctors are advised to stay vigilant for suspected cases to ensure timely case reporting.

●**Enterovirus**：We are at the peak of the enterovirus season and the numbers of visits to outpatient services and ER for enterovirus infection have recently increased. In addition, coxsackie A virus is currently the dominant strain circulating in the community, accounting for approximately 76.5% of all cases. So far, one severe case of enterovirus infection has been confirmed.

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