

Laboratory Biosafety for Testing of Ebola Virus Disease in Taiwan

Wen-Chao Wu*、Wei-Shi Tsai、Shu-Hui Tseng

Abstract

Since the first case of Ebola virus disease (EVD) was found in Guinea in West Africa in December 2013, it spread rapidly to neighboring countries in Africa. Until July 2014, it extended more severe. The Taiwan Centers for Disease Control (Taiwan CDC) has been concerning for international Ebola outbreak and prepared for responding to the cross-border suspected case. In September 2014, Taiwan CDC announced the "Guidance on laboratory biosafety for handling specimens from patients under investigation for Ebola virus disease (EVD) and pathogens" and required the Health department in each county to inspect preparedness status of the laboratory department in the hospitals and to report the preparation results by October 2014. Unfortunately, a nurse from Spain and two from U.S. were infected with Ebola virus when caring for patients in October 2014. The incidence has prompted many countries to review and modify the personnel protection measures when managing EVD patients. Taiwan CDC also accorded the latest international guidelines to revise the guidance for laboratory biosafety, and required laboratories and hospitals that are authorized to test of EVD infection by law to practice drill exercises in case of infection incidents or accidents in laboratory. Taiwan CDC has now prepared well in laboratory biosafety to respond to the international Ebola outbreak. Ensure that laboratory personnel and healthcare workers are well protected to provide strong support when testing of infectious diseases.

Keywords: Ebola virus disease infection ; test ; laboratory biosafety

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Introduction of Infectious Diseases Biobank in Taiwan CDC

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Abstract

Taiwan Centers for Disease Control (Taiwan CDC) Biobank manages and preserves specimens from infectious diseases. Biobank was established in 1992. The biobank preserves and manages biological materials and shares specimen with other research institutions. The biobank also collaborates with biotechnology companies in developing diagnostic reagents, and has obtained preliminary results. In the near future, key features of the maintenances and expansion are: establish well-designed biobank information system, improving capacity of infectious biomaterials collection, international certification for the biobank repository, and training of biomaterials manager for biosafety regulation and expansion of biobank.

Keywords: Biobank ; certification

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Investigation of Community Multidrug-Resistant Tuberculosis Outbreak in Taipei Region, 2014

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Abstract

Multidrug-resistant tuberculosis (MDR-TB) is a key issue in the tuberculosis prevention control. There are two cases in this MDR-TB outbreak. The contact information of the index case was not provided to the public health staff. As a result, the contacts are not recorded in the tracking list of the second case. This MDR-TB outbreak has been aggressively followed up by public health authorities according to Communicable Disease Control Act. Five contacts are subsequently found. One of them is confirmed to be a TB case.

The two confirmed MDR-TB cases are with the same restricted fragment length polymorphism (RFLP) genotype in this outbreak. From this MDR-TB outbreak, we learn a lot on the MDR-TB control which can provide public health staff for improving investigation and contacts tracking about MDR-TB outbreak: 1) Building a good relationship with patients, 2) Strengthening professional abilities of investigation and contacts tracking for public health staff, 3) Using multi-channel mechanism to obtain TB cases and contacts information in time, and 4) Implementing public authority.

Keywords: Community ; outbreak ; Multidrug-resistant tuberculosis (MDR-TB) ; investigation.

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

Case diagnosis week		Week 22		Week 1–22	
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	0	8	12
	Acute Viral Hepatitis type A	1	1	36	60
	Amoebiasis	8	6	149	101
	Anthrax	0	0	0	0
	Chikungunya Fever	0	0	3	5
	Cholera	0	1	4	1
	Dengue Fever	16	9	235	134
	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	7
	Measles	8	2	21	14
	Meningococcal Meningitis	0	0	2	2
	Paratyphoid Fever	0	0	1	6
	Poliomyelitis	0	0	0	0
	Rubella	0	0	6	4
	Shigellosis	2	5	80	70
Typhoid fever	0	0	14	9	
West Nile Fever	0	0	0	0	
Category III	Acute Viral Hepatitis type B	2	2	50	38
	Acute Viral Hepatitis type C ³	1	5	91	70
	Acute Viral Hepatitis type D	0	0	1	0
	Acute Viral Hepatitis type E	0	0	1	6
	Acute Viral Hepatitis untype	0	0	1	3
	Congenital Rubella Syndrome	0	0	0	0
	Enteroviruses Infection with Severe Complications	1	1	2	4
	Haemophilus Influenza type b Infection	0	0	1	2
	Japanese Encephalitis	0	0	0	0
	Legionellosis	6	10	60	55
	Mumps ²	16	22	329	364
	Neonatal Tetanus	0	0	0	0
	Pertussis	2	7	43	20
	Tetanus ²	1	0	5	1
	Category IV	Botulism	0	0	1
Brucellosis		0	0	0	0
Complicated Influenza		35	18	489	1556
Complicated Varicella ⁴		3	0	29	31
Endemic Typhus Fever		1	0	8	10
Herpesvirus B Infection		0	0	0	0
Invasive Pneumococcal Disease		11	12	277	333
Leptospirosis		2	0	19	14
Lyme Disease		0	0	0	0
Melioidosis		1	0	8	8
Q Fever		1	1	14	25
Scrub Typhus		4	12	88	93
Toxoplasmosis		1	0	6	6
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	

- The following 8 chronic diseases are excluded from the table: MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen Disease and Creutzfeldt-Jakob Disease.
- Reported cases.
- The epidemiological week calendar established by the World Health Organization is adopted for calculating each week's cumulative total.
- Since 2014/1/1, "Varicella" was modified to "Complicated Varicella".
- 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".
- 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-seven clusters were reported, including 12 upper respiratory tract infection clusters, 5 diarrhea clusters, 4 influenza-like illness clusters, 3 tuberculosis clusters, 2 varicella clusters, and 1 pertussis cluster.

Imported Infectious Diseases

- 13 confirmed cases were imported from 6 countries during week 22 of 2015.

Country Disease	Indonesia	Myanmar	Philippines	China	Malaysia	Singapore	Total
Dengue Fever	3	2	2		2	1	10
Measles				1			1
Amoebiasis	1						1
Legionellosis				1			1
Total	4	2	2	2	2	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 276 confirmed cases were imported from 25 countries in 2015.
- Top 3 imported diseases : Dengue fever (99), Amoebiasis (87), Shigellosis (43).
- Top 3 countries responsible for most imported cases : Indonesia (185), Philippines (15), Malaysia (13).

Summary of Epidemic

- **Dengue Fever** : The clusters of dengue cases have continued to grow around the farmers market and Lungchang Village in Nanzih District, Kaohsiung City, indicating that affected area would be expanding to the surrounding Districts. In addition, one new case has been confirmed in Liujia Village, North District, Tainan City.
- **Enterovirus** : The enterovirus activity remained at its peak. During Week 22, the numbers of visits to outpatient services and ER for enterovirus infection have increased. In addition, coxsackie A virus is currently the dominant strain circulating in the community, accounting for approximately 69.7% of all cases. So far, two severe enterovirus cases infected by coxsackie B5 virus have been confirmed. Of these cases, one died.
- **MERS** : A total number of 95 cases of MERS, including 7 deaths, have been confirmed in South Korea. Travelers planning to visit South Korea are urged to stay vigilant and avoid unnecessary visits to healthcare facilities and hospitals.

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

Case diagnosis week		Week 23		Week 1—23	
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	8	12
	Acute Viral Hepatitis type A	1	1	36	61
	Amoebiasis	9	6	158	107
	Anthrax	0	0	0	0
	Chikungunya Fever	0	0	3	5
	Cholera	0	0	4	1
	Dengue Fever	22	17	257	151
	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	7
	Measles	3	1	24	15
	Meningococcal Meningitis	0	0	2	2
	Paratyphoid Fever	0	0	1	6
	Poliomyelitis	0	0	0	0
	Rubella	0	0	6	4
	Shigellosis	2	2	82	72
Typhoid fever	0	2	14	11	
West Nile Fever	0	0	0	0	
Category III	Acute Viral Hepatitis type B	6	5	56	43
	Acute Viral Hepatitis type C ⁵	4	1	95	71
	Acute Viral Hepatitis type D	0	0	1	0
	Acute Viral Hepatitis type E	0	0	1	6
	Acute Viral Hepatitis untype	0	0	1	3
	Congenital Rubella Syndrome	0	0	0	0
	Enteroviruses Infection with Severe Complications	1	0	3	4
	Haemophilus Influenza type b Infection	0	0	1	2
	Japanese Encephalitis	1	0	1	0
	Legionellosis	2	3	62	58
	Mumps ²	23	20	352	384
	Neonatal Tetanus	0	0	0	0
	Pertussis	6	2	49	22
	Tetanus ²	0	0	5	1
Category IV	Botulism	0	0	1	0
	Brucellosis	0	0	0	0
	Complicated Influenza	48	16	537	1572
	Complicated Varicella ⁴	0	0	29	31
	Endemic Typhus Fever	0	1	8	11
	Herpesvirus B Infection	0	0	0	0
	Invasive Pneumococcal Disease	10	4	286	337
	Leptospirosis	2	0	21	14
	Lyme Disease	0	0	0	0
	Melioidosis	2	0	10	8
	Q Fever	1	1	15	26
	Scrub Typhus	8	12	96	105
	Toxoplasmosis	0	0	6	6
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, Gonorrhoea, 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.
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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 9 upper respiratory tract infection clusters, 6 diarrhea clusters, 3 influenza-like illness clusters, 2 fever of unknown origin clusters, 1 tuberculosis cluster, and 1 varicella cluster.

Imported Infectious Diseases

- 15 confirmed cases were imported from 5 countries during week 23 of 2015.

Country Disease	Indonesia	Malaysia	Thailand	Myanmar	Vietnam	Total
Amoebiasis	4				1	5
Shigellosis	4					4
Dengue Fever		3	1			4
Hepatitis A	1			1		2
Total	9	3	1	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 291 confirmed cases were imported from 25 countries in 2015.
- Top 3 imported diseases : Dengue fever (103), Amoebiasis (92), Shigellosis (47).
- Top 3 countries responsible for most imported cases : Indonesia (194), Philippines (15), Malaysia (15).

Summary of Epidemic

- **Dengue Fever** : The cluster of dengue cases has continued to grow around the farmers market in Nanzih District, Kaohsiung City. In addition, new cases have been confirmed in North District, Tainan City. Furthermore, the Breteau Index in this area is more than 2, elevating the risk of an epidemic outbreak.
- **Enterovirus** : The enterovirus activity remained at its peak. During Week 23, the numbers of visits to outpatient services have increased. In addition, coxsackie A16 virus is currently the dominant strain circulating in the community, accounting for approximately 38.6% of all cases. So far, a total number of 3 cases of severe enterovirus have been confirmed, including 2 cases infected by coxsackie B5 virus and 1 case infected by coxsackie A16. Of these cases, two died.

- **MERS** : A total number of 154 cases of MERS, including 19 deaths, have been confirmed in South Korea. Travelers planning to visit South Korea are urged to stay vigilant and avoid unnecessary visits to healthcare facilities and hospitals.

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