

Current Status of Crimean-Congo Hemorrhagic Fever on Epidemiology, Laboratory Diagnosis, Treatment And Vaccine Development

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Abstract

Crimean-Congo hemorrhagic fever (CCHF) is a tick-borne zoonotic infection caused by Crimean-Congo hemorrhagic fever virus (CCHFV). CCHF is the most widely distributed of all tick-borne human diseases, the second widest infection caused by arboviruses only after Dengue virus. In the past decade, the incidence of disease has increased in many countries, and it has gradually spread, causing a great burden of disease in most CCHF endemic countries. Therefore, CCHFV is considered a high-priority pathogen according to the WHO R&D Blueprint. WHO R&D Blueprint focuses and catalyzes the international effort to ensure the coordinated development of medical countermeasures, including diagnostics, therapeutics and vaccine development. This article summarizes relevant information on CCHF international epidemic, diagnosis, treatment drugs and vaccines, and identifies knowledge gaps in the challenges of preventing and controlling CCHF, and the risk of introducing into Taiwan; which can provide for future reference on epidemic prevention policies.

Keywords: Crimean-Congo hemorrhagic fever, tick-borne virus, zoonotic infectious disease

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

Case diagnosis year		Week 5★		Week 1-5			
Classification	Disease Diagnosed	2021	2020	2021		2020	
				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	4	0	2	0
	Acute Viral Hepatitis type A	0	2	8	0	11	2
	Amoebiasis	1	3	16	7	22	10
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	1	0	0	1	1
	Cholera	0	0	0	0	0	0
	Dengue Fever	0	2	2	2	28	28
	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	2	0	2	0
	Malaria	0	0	1	1	1	1
	Measles	0	0	0	0	2	2
	Meningococcal Meningitis	0	1	0	0	3	0
	Paratyphoid Fever	0	0	0	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
Shigellosis	2	1	19	0	14	5	
Typhoid fever	0	0	0	0	0	0	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	3	1	11	0	9	1
	Acute Viral Hepatitis type C	22	8	76	0	60	0
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	2	0	0	3	0
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	1	1	0	3	0
	Haemophilus Influenza type b Infection	0	0	0	0	0	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	6	6	48	0	30	5
	Mumps	5	7	43	0	46	2
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	4	0
Tetanus	0	0	1	0	0	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	0	6	0	6	0
	Endemic Typhus Fever	0	0	2	0	0	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	81	0	0	432	6
	Invasive Pneumococcal Disease	6	15	35	0	76	0
	Leptospirosis	0	3	6	0	5	0
	Listeriosis	0	0	10	0	6	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	0	2	0	1	1
	Q Fever	0	0	0	0	0	0
	Scrub Typhus	8	0	38	0	23	1
Toxoplasmosis	1	0	2	0	0	0	
Tularemia	0	0	0	0	0	0	
Category V	Ebola Virus Disease	0	0	0	0	0	0
	Lassa Fever	0	0	0	0	0	0
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome	0	0	0	0	0	0
	Coronavirus Infections	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	0	0	0	0
	Rift Valley Fever	0	0	0	0	0	0
Severe Pneumonia with Novel Pathogens	15	7	116	96	10	8	
Yellow Fever	0	0	0	0	0	0	

- ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
- MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, HIV Infection, AIDS, Hansen's Disease and Creutzfeldt-Jakob Disease are excluded from the table.
- Numbers of mumps and tetanus cases are summed up by the week of report.
- Since 2020/1/15, "Severe Pneumonia with Novel Pathogens" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Twenty-six clusters related to diarrhea (14), tuberculosis (8), enterovirus (2), upper respiratory tract infection (1) and varicella (1) were reported during week 5.

Imported Infectious Diseases

- There were 15 imported cases from 6 countries during week 5.

Diseases \ Countries	Countries						Total
	Indonesia	USA	Philippines	Japan	Netherlands	UAE	
Severe Pneumonia with Novel Pathogens	3	4	3	2	1	1	14
Amoebiasis	1						1
Total	4	4	3	2	1	1	15

- As of week 5, there were 106 imported cases from 24 countries. The top three countries are Indonesia (28), Philippines (21), and USA (21).
- The three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (96), Amoebiasis (7), and Dengue Fever (2).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : The epidemic status of the hospital COVID-19 cluster decrease. The situation of global COVID-19 pandemic continues to be critical. The risk of imported cases continue.
- **Influenza-like illness** : Because some outpatient services are closed for Lunar New Year holiday, the number of emergency visits for ILI is expected to increase.

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

Case diagnosis year		Week 6★		Week 1-6			
Classification	Disease Diagnosed	2021	2020	2021		2020	
				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	4	0	2	0
	Acute Viral Hepatitis type A	3	3	11	0	14	2
	Amoebiasis	5	3	21	8	25	12
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	0	0	1	1
	Cholera	0	0	0	0	0	0
	Dengue Fever	0	5	2	2	33	33
	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	2	0	2	0
	Malaria	0	0	1	1	1	1
	Measles	0	0	0	0	2	2
	Meningococcal Meningitis	0	0	0	0	3	0
	Paratyphoid Fever	0	0	0	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
Shigellosis	1	9	20	0	23	9	
Typhoid fever	0	1	0	0	1	1	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	0	0	
Category III	Acute Viral Hepatitis type B	4	3	15	0	12	1
	Acute Viral Hepatitis type C	9	8	85	0	68	0
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	0	0	3	0
	Congenital Syphilis	0	0	0	0	0	0
	Congenital Rubella Syndrome	0	0	0	0	0	0
	Enteroviruses Infection with Severe Complications	0	0	1	0	3	0
	Haemophilus Influenza type b Infection	0	0	0	0	0	0
	Japanese Encephalitis	0	0	0	0	0	0
	Legionnaires' Disease	6	9	52	0	39	5
	Mumps	12	9	55	0	55	2
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	4	0
Tetanus	0	0	1	0	0	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	3	1	9	0	7	0
	Endemic Typhus Fever	0	0	2	0	0	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	62	0	0	494	6
	Invasive Pneumococcal Disease	6	7	41	0	83	0
	Leptospirosis	0	0	6	0	5	0
	Listeriosis	5	6	15	0	12	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	0	2	0	1	1
	Q Fever	0	0	0	0	0	0
	Scrub Typhus	5	10	43	0	33	1
Toxoplasmosis	0	0	2	0	0	0	
Tularemia	0	0	0	0	0	0	
Category V	Ebola Virus Disease	0	0	0	0	0	0
	Lassa Fever	0	0	0	0	0	0
	Marburg Hemorrhagic Fever	0	0	0	0	0	0
	Middle East Respiratory Syndrome	0	0	0	0	0	0
	Coronavirus Infections	0	0	0	0	0	0
	Novel Influenza A Virus Infections	0	0	0	0	0	0
	Rift Valley Fever	0	0	0	0	0	0
Severe Pneumonia with Novel Pathogens	13	7	129	108	17	15	
Yellow Fever	0	0	0	0	0	0	

1. ★The weekly and cumulative total numbers include indigenous and imported cases of notifiable infectious diseases.
2. MDR-TB, Tuberculosis, Syphilis, Gonorrhoea, 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. Since 2020/1/15, "Severe Pneumonia with Novel Pathogens" was listed as a Notifiable Infectious Disease.

Suspected Clusters

- Twenty-three clusters related to diarrhea (15), tuberculosis (6), and upper respiratory tract infection (2) were reported during week 6.

Imported Infectious Diseases

- There were 13 imported cases from 6 countries during week 6.

Diseases	Countries						Total
	USA	France	Indonesia	UK	Ghana	Myanmar	
Severe Pneumonia with Novel Pathogens	4	3	2	1	1	1	12
Amoebiasis			1				1
Total	4	3	3	1	1	1	13

- During week 1–6, there were 119 imported cases from 25 countries. The top three countries are Indonesia (31), USA (25), and Philippines (21).
- During week 1–6, the three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (108), Amoebiasis (8), and Dengue Fever (2).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : The hospital COVID-19 cluster has ended. The situation of global COVID-19 pandemic continues to be critical. The risk of imported cases continue.
- **Influenza-like illness** : The outpatient services are resumed after Lunar New Year holiday, the number of outpatient visits for ILI is expected to increase.

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