

The Effects of COVID-19 Vaccination Campaign on SARS-CoV-2 Pandemic Worldwide

Cheng-Yi Lee*, Hung-Wei Kuo, Chien-Bang Hsu

Abstract

Coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has spread from China to countries worldwide. The WHO declared that the outbreak constitutes a Public Health Emergency of International Concern (PHEIC) in January 2020. COVID-19 is spreading worldwide, with more than 140 million confirmed cases and three million deaths across over 193 countries. COVID-19 vaccination is considered one of the best strategies to control the pandemic worldwide. As of Apr 19, 2021, the Oxford-AstraZeneca was the most widely used COVID-19 vaccine worldwide, followed by the Pfizer-BioNTech and Sputnik V.

Since the global first COVID-19 vaccine program has launched in the United Kingdom, more than 156 countries have initiated mass COVID-19 vaccination programs, and 6.4% of the worldwide population have received at least one dose of the vaccine. Israel has the highest COVID-19 vaccination rate globally; around 61.8% population had received at least one dose of the COVID-19 vaccine, and 57.5% were fully vaccinated. Comparing to its highest epidemic rates in January, the Israeli health authorities revealed the incidence had dropped 97%, and mortality had decreased 91.5% among the population. According to our observation, the incidence and mortality rates in UK and United States have also declined as the vaccination rates increasing.

However, vaccination is not the only critical factor to control the epidemic. Chile's COVID-19 vaccination program rollout was fast and broad, with 40.5% population had received at least one dose of vaccine, and 28.4% were fully vaccinated. While Chile has

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reached one of the highest COVID-19 vaccination rates worldwide, the most recent incidence rate increased 230%, and the mortality rate also surged 170% among the population. A similar situation of increasing vaccination but more case and death rates occurred in France, Germany, and many countries.

Nevertheless, the global rollout of vaccines is no longer a guarantee of victory over COVID-19. The WHO indicates that cases surging might be fueled by highly contagious variants, increasing social interactions, easing public health control measures, anti-epidemic fatigue, vaccine hesitate, and low coverage and unfair distributions of vaccination. This study concludes that vaccines alone might not end the current epidemics but conduct public health and social measures to control the COVID-19.

Keywords: COVID-19, COVID-19 vaccine, Variants of SARS-CoV-2, Vaccination hesitancy, Government stringency index

Prevention And Control of Dengue Fever at The Vegetable Orchards in Metropolitan Areas, 2018

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Abstract

The vegetable orchard is considered to be a high-risk area for dengue fever since people using various types of water containers for irrigation. In view of this, the National Mosquito-borne Diseases Control Research Center and the South Regional Center, Centers for Disease Control, Taiwan (TCDC), followed the resolution of the 26th meeting of the Executive Yuan Committee on the Prevention and Control of Important Mosquito Infectious Diseases in 2018, developed a full process with high efficiency and feasible management system, including surveillance, investigation, risk assessment, data filing and geographical distribution, and drafted a guideline for the prevention and control of dengue fever in vegetable orchards. After the meeting with the Public Health Bureau of Tainan City, Chiayi City, Chiayi County and Yunlin County governments, they jointly held a discussion on the management and guidance to classify the risks of the vegetable orchards in accordance with actual situation of each county and city, enlisted the high-risk vegetable orchards, established a geographic information (GIS) epidemic map, planned management rules, and simultaneously updated a county/city work plan in prevention of dengue fever. Based on the project of the vegetable orchards, each county and city government assigned the authority and management unit, conducted education trainings, ensured proper maintenance of the water containers in high-risk fields, and provided patient instructions. In addition, the South Regional Center of TCDC conducted a spot check on the high-risk vegetable orchards. Among the 167 high-risk areas in four counties/cities, the number of water tanks decreased and tanks were properly covered to reduce mosquitoes breeding. Although current implementation time is too limited to assess the overall benefits, the basic framework should be helpful as a reference in prevention of dengue fever at the vegetable orchards for other counties and cities.

Keywords: Dengue fever, water storage container management, metropolitan vegetable orchard, geographic information

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

Case diagnosis year		Week 20★		Week 1–20			
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	1	0	12	0	12	0
	Acute Viral Hepatitis type A	1	1	31	0	31	7
	Amoebiasis	1	7	87	31	100	57
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	1	1	2	2
	Cholera	0	0	0	0	0	0
	Dengue Fever	0	1	5	5	57	57
	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	5	0	6	0
	Malaria	0	0	1	1	1	1
	Measles	0	0	0	0	2	2
	Meningococcal Meningitis	0	0	2	0	4	0
	Paratyphoid Fever	0	0	2	0	0	0
	Poliomyelitis	0	0	0	0	0	0
Rubella	0	0	0	0	0	0	
Shigellosis	1	1	72	0	71	21	
Typhoid fever	0	0	1	0	5	3	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	2	2	
Category III	Acute Viral Hepatitis type B	3	1	59	2	37	2
	Acute Viral Hepatitis type C	5	8	239	0	241	2
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	1	0	5	0	6	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	7	0
	Haemophilus Influenza type b Infection	0	0	1	0	3	0
	Japanese Encephalitis	0	0	1	0	0	0
	Legionnaires' Disease	5	7	128	0	97	7
	Mumps	3	14	186	1	181	6
	Neonatal Tetanus	0	0	0	0	0	0
Pertussis	0	0	0	0	8	0	
Tetanus	0	0	2	0	5	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	0	25	0	17	0
	Endemic Typhus Fever	0	0	11	0	3	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	0	1	0	546	6
	Invasive Pneumococcal Disease	6	2	123	0	141	0
	Leptospirosis	0	0	14	0	16	0
	Listeriosis	2	2	77	0	44	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	1	0	7	0	6	1
	Q Fever	0	1	5	0	4	0
	Scrub Typhus	4	6	78	0	86	1
Toxoplasmosis	0	1	7	0	1	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	2387	0	3054	409	440	385	
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

- Ten clusters related to tuberculosis (5), diarrhea (3) and varicella (2) were reported during week 20.

Imported Infectious Diseases

- There were 35 imported cases from 11 countries during week 20.

Diseases	Countries										Total	
	Philippines	India	Indonesia	USA	Nepal	Denmark	UK	Japan	Kyrgyz	Canada		South Africa
Severe Pneumonia with Novel Pathogens	14	8	4	2	1	1	1	1	1	1	1	35
Total	14	8	4	2	1	1	1	1	1	1	1	35

- During week 1-20, there were 443 imported cases from 48 countries. The top three countries are the Philippines (137), Indonesia (106), and USA (42).
- During week 1–20, the three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (403), Amoebiasis (31), and Dengue Fever (5).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens** : Taiwan has entered the community transmission stage of COVID-19, outbreak and epidemic is expected to increase in the community. Therefore, it is expected that the number of COVID-19 cases with severe complications and the risk of local transmission will raise.

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

Case diagnosis year		Week 21★		Week 1–21			
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	1	12	0	13	0
	Acute Viral Hepatitis type A	0	2	31	0	33	7
	Amoebiasis	4	5	91	32	105	58
	Anthrax	0	0	0	0	0	0
	Chikungunya Fever	0	0	1	1	2	2
	Cholera	0	0	0	0	0	0
	Dengue Fever	0	0	5	5	57	57
	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	6	0	6	0
	Malaria	0	0	1	1	1	1
	Measles	0	0	0	0	2	2
	Meningococcal Meningitis	0	1	2	0	5	0
	Paratyphoid Fever	0	0	2	0	0	0
	Poliomyelitis	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0
Shigellosis	1	2	73	0	73	21	
Typhoid fever	0	0	1	0	5	3	
West Nile Fever	0	0	0	0	0	0	
Zika virus infection	0	0	0	0	2	2	
Category III	Acute Viral Hepatitis type B	6	2	65	2	39	2
	Acute Viral Hepatitis type C	6	11	245	0	252	2
	Acute Viral Hepatitis type D	0	0	0	0	0	0
	Acute Viral Hepatitis type E	0	0	5	0	6	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	7	0
	Haemophilus Influenza type b Infection	0	0	1	0	3	0
	Japanese Encephalitis	1	0	2	0	0	0
	Legionnaires' Disease	4	2	132	0	99	7
	Mumps	4	12	190	1	193	6
	Neonatal Tetanus	0	0	0	0	0	0
	Pertussis	0	0	0	0	8	0
Tetanus	0	0	2	0	5	0	
Category IV	Botulism	0	0	0	0	0	0
	Brucellosis	0	0	0	0	0	0
	Complicated Varicella	0	6	25	0	23	0
	Endemic Typhus Fever	0	1	11	0	4	0
	Herpesvirus B Infection	0	0	0	0	0	0
	Influenza Case with Severe Complications	0	0	1	0	546	6
	Invasive Pneumococcal Disease	6	1	129	0	142	0
	Leptospirosis	0	1	14	0	17	0
	Listeriosis	1	3	78	0	47	0
	Lyme Disease	0	0	0	0	0	0
	Melioidosis	0	1	7	0	7	1
	Q Fever	0	0	5	0	4	0
	Scrub Typhus	4	5	82	0	91	1
Toxoplasmosis	0	0	7	0	1	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	3943	1	6994	434	441	386	
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

- Seven clusters related to tuberculosis (4), diarrhea (2) and upper respiratory tract infection (1) were reported during week 21.

Imported Infectious Diseases

- There were 26 imported cases from 7 countries during week 21.

Diseases	Countries							Total
	Philippines	India	Indonesia	China	South Africa	Thailand	Australia	
Severe Pneumonia with Novel Pathogens	13	7	1	1	1		1	24
Amobiasis			1			1		2
Total	13	7	2	1	1	1	1	26

- During week 1–21, there were 469 imported cases from 50 countries. The top three countries are the Philippines (150), Indonesia (108), and USA (44).
- During week 1–21, the three notifiable diseases with the highest number of imported cases are Severe Pneumonia with Novel Pathogens (427), Amoebiasis (33), and Dengue Fever (5).

Summary of Epidemic

- **Severe Pneumonia with Novel Pathogens**: Taiwan is in the community transmission stage of COVID-19. Widespread community outbreak occurred since early May, especially in Taipei and new Taipei city. The number of cases and those with severe illness might continue to increase.

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