



# The Linkage of Covid-19 Cases and real-time data





**Covid-19 has taken thousands of lives worldwide & threatening public health, food systems, and the workplace**



**This pandemic devastated the economy and society which the tens millions of people are at risk of extreme poverty.**



**COVID-19 affects countries dealing with humanitarian crises or emergencies.**





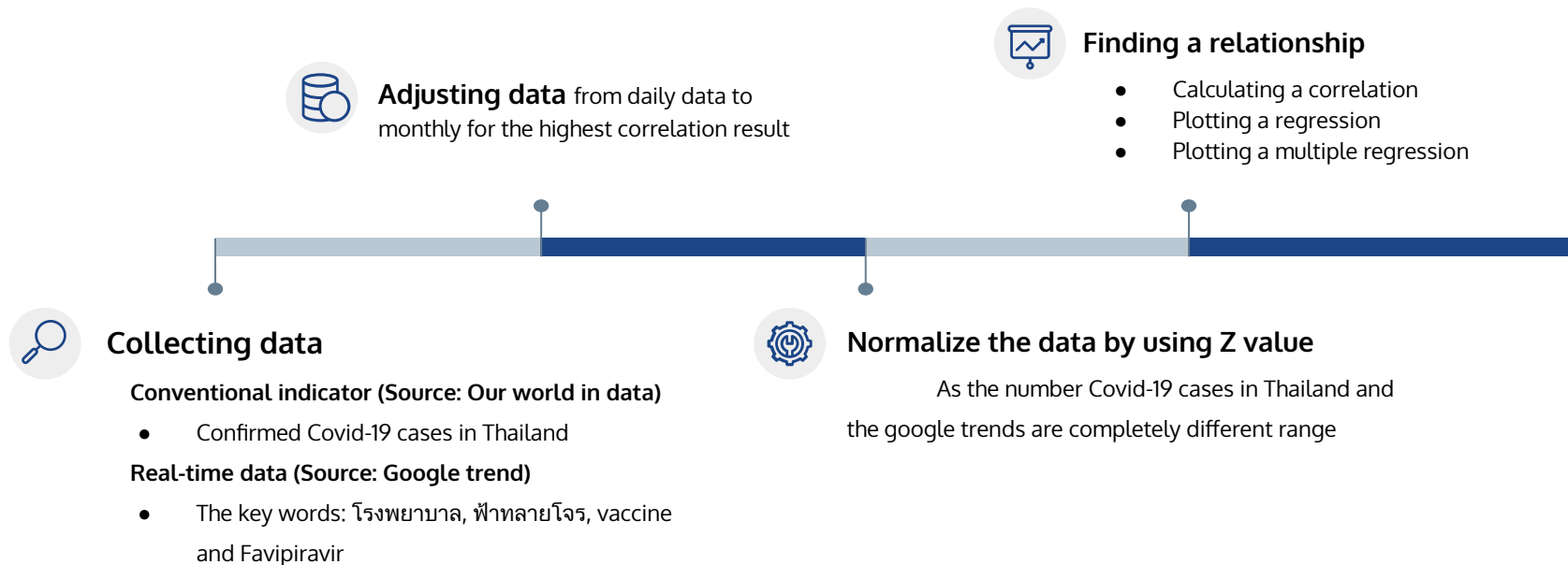
Respond to crises and achieve the SDGs due to people need the long-term sustainable strategies to address the health and agri-food challenges.



Rapid pandemic response is critical to ensuring humanitarian and recovery assistance reaches those in need. Now is the time for global solidarity and support, including for the most vulner .



Priority should be given to addressing underlying food security and malnutrition issues, rural poverty, extending social protection to all, facilitating safe migration pathways, and formalizing the informal economy.



### Conventional indicator



Confirmed Covid-19 cases Thailand

### Google trend keywords



โรงพยาบาล



Vaccine



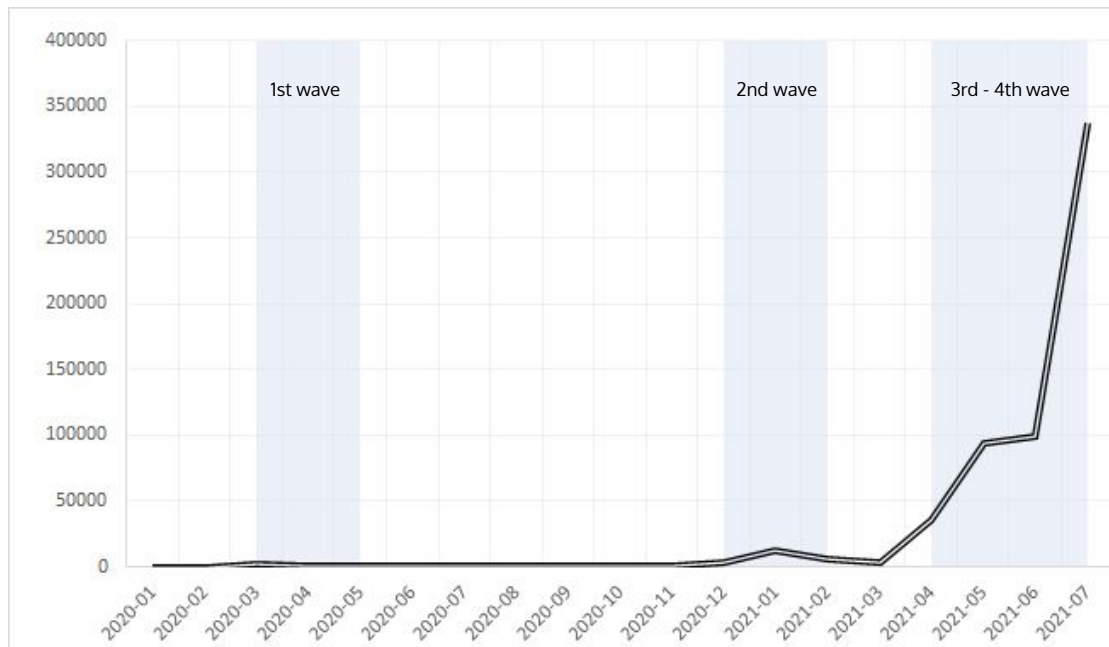
ฟ้าทลายโจร



Favipiravir

Even though it's the fourth wave, Thailand is still struggling to cope with the devastating wave of COVID-19, and the number of infected people continues to increase.

## Confirmed Covid-19 cases in Thailand



On 13 January, First confirmed case in Thailand.

### 1st wave

On March 6, huge clusters occurred at the military-run Lumpinee Boxing Stadium.

### 2nd wave

A more serious wave occurred in April 2021, following the emergence of clusters in Bangkok's entertainment areas.

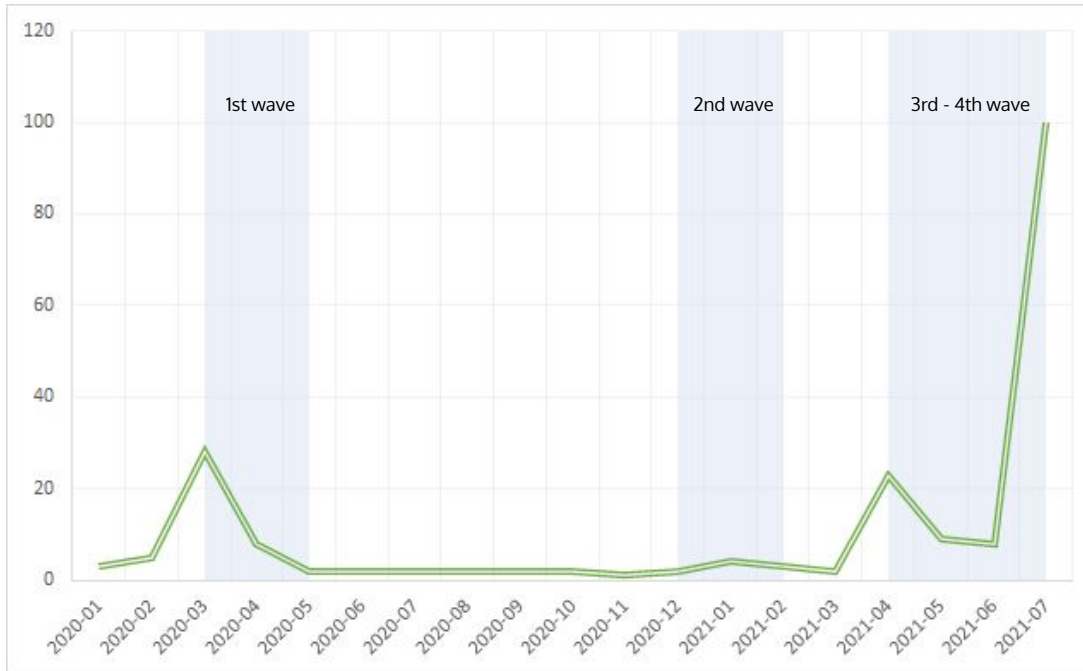
### 3rd - 4th wave

December 19, a new cluster outbreak in Samut Sakhon, which is mainly migrant workers from Burma. Over 1,300 cases were traced to a seafood market.

Data as of July 2 showed that the construction worker cluster camp outbreak at the end of June has spread to 73 provinces throughout the country, and there are 113 cluster outbreaks in Bangkok.

## During this pandemic, There are many questions about *Andrographis paniculata* whether it can prevent Covid-19 or not.

### The key word “ฟ้าทลายโจร”



25 Feb 2020, there was a press conference on cooperation in the study of the possibility of bringing "Andrographis" to test whether it can resist the Covid-19 virus or not.

On December 30, the Ministry of Health issued a statement recognizing *Andrographis Paniculata* as an alternative treatment to reduce the epidemic's severity and reduce the cost of treatment

20 April 2021, in a press release at the Ministry of Public Health, said that there are many questions about *Andrographis* whether it can effectively preventing Covid-19 infection. It turns out that *Andrographis* can't prevent Covid-19, so vaccination is essential

On 27 July 2021, there was a statement after the Cabinet meeting that the Cabinet approved the principle of promoting the use of *Andrographis* in treating Covid-19 patients with Asymptomatic symptoms as an alternative to treatment and to reduce the burden on the public health system.

## Increasing in confirmed cases result in lack of isolation facilities

### The key word “โรงพยาบาล”



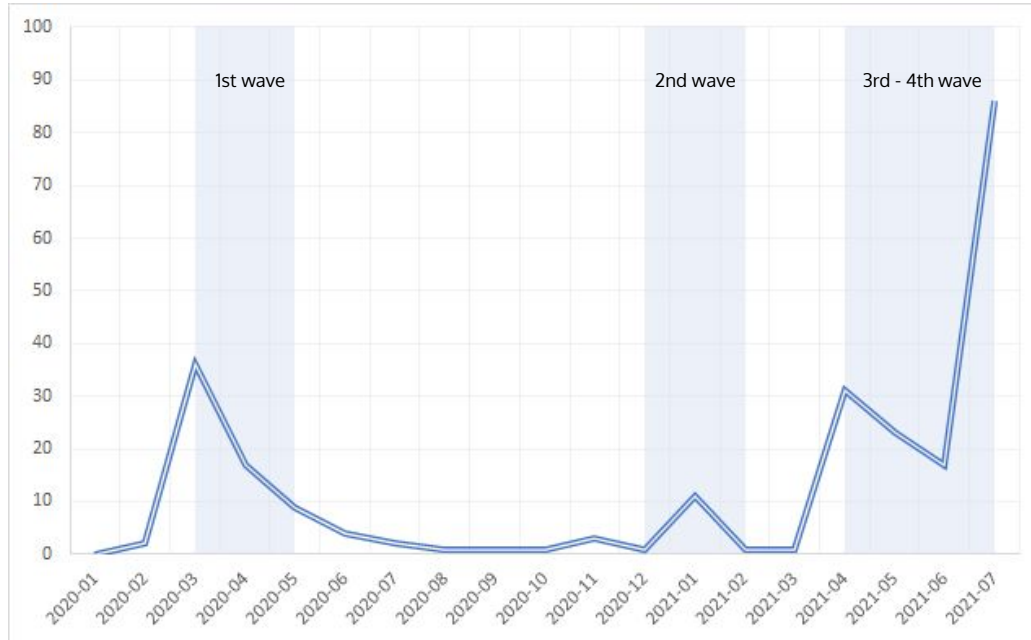
On March 2020, first cluster occurred at the Lumpinee Boxing Stadium so people under the risk area need to test for COVID-19.

People consistently test for COVID-19 after the first cluster happened but not many since people usually don't aware of actual confirmed cases because the price of testing COVID is higher than minimum wage. So, people in the working class cannot afford it.

The 3rd cluster occurred, COVID confirmed cases increase drastically. The case fatalities increase continually to more than 1000 cases. Hence, people check up their health condition more and their COVID test gets confirmed. So, demand for isolation facilities increases. This results in a lack of isolation facilities and hospital beds.

# Shortage of Favipiravir during the 3rd cluster. Fortunately, GPO successfully synthesized Favipiravir so it can be produce domestically

## The key word "Favipiravir"



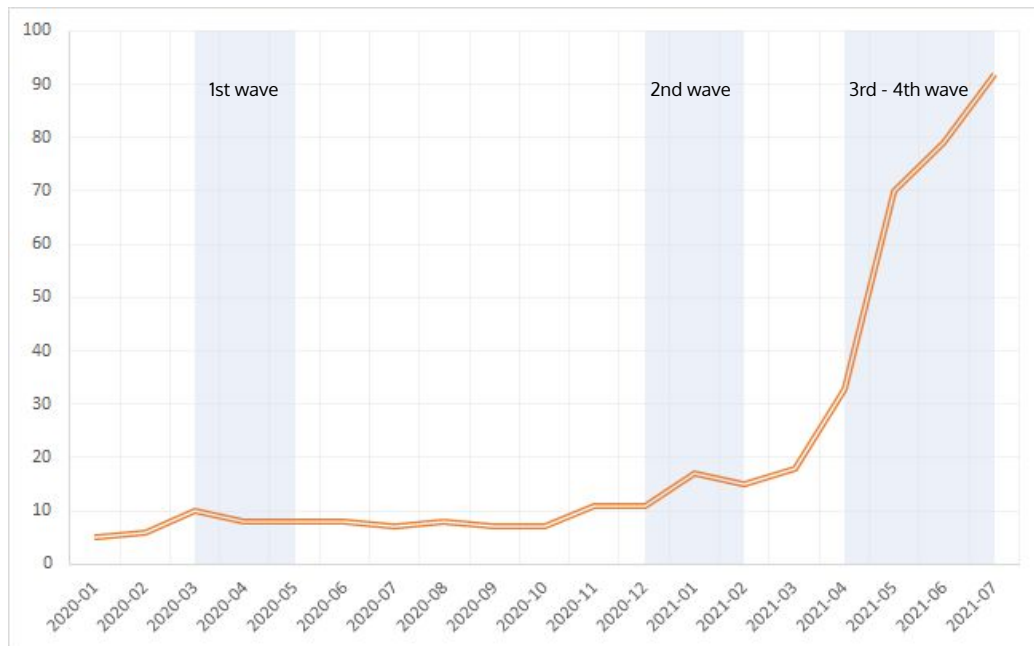
On March 19, the Guardian reported that China's Ministry of Science and Technology revealed that favipiravir, an antiviral drug for the treatment of new influenza from japan, give satisfactory results in a clinical trial of 340 patients infected with COVID-19 in Wuhan and Shenzhen city.

19 may 2021, GOP confirmed there is enough Favipiravir to treat patient during 2nd cluster. They also declared to synthesize Favipiravir in order to produce in domestic country.

During 3rd cluster, The Pharmacy Council of Thailand has issued a warning letter to the Public Health Ministry about a possible shortage of Favipiravir as the number of Covid-19 patient rise continually.

In early august, the GPO successfully developed its own version of Favipiravir and registered by Thailand's food and drug administration, aiming to expand capacity of production

### The key word “Vaccine”



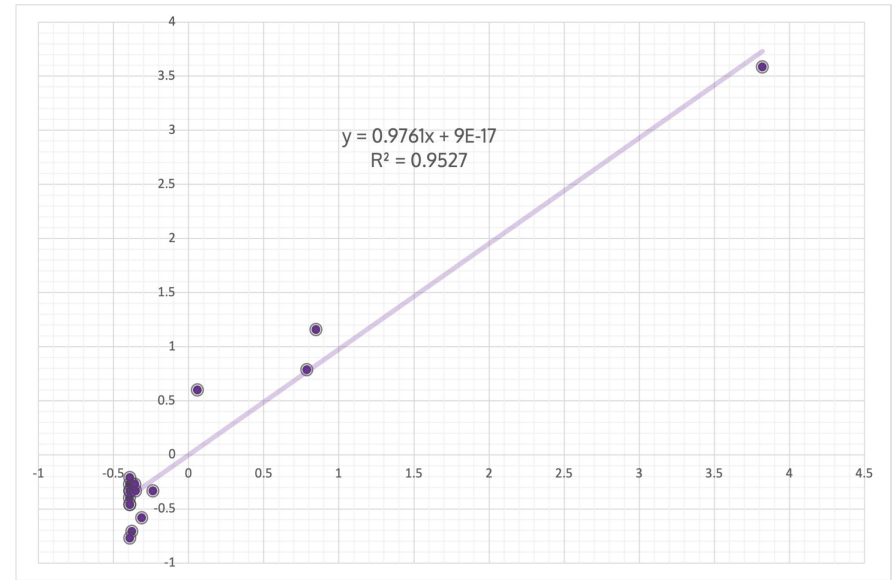
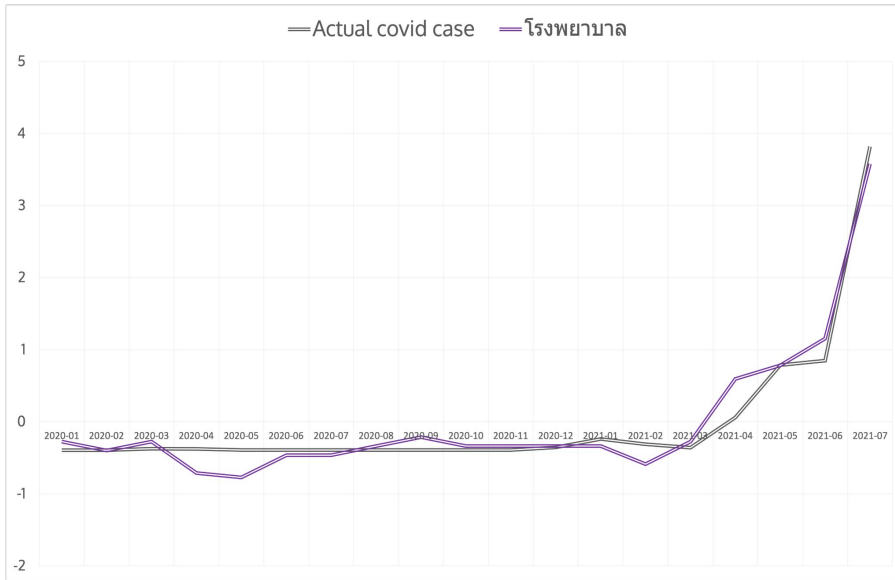
Firstly, corona virus was introduced in the start of year 2020. researchers start to developed preventive covid19 vaccine immediately

In December 2020, first vaccine was successfully developed. MHRA approve for Pfizer vaccine, becoming the first country to approve covid19 vaccine. Later, FDA granted EUA for the Pfizer–BioNTech COVID-19 vaccine

24 February 2021, AstraZeneca and Sinovac vaccine arrive in Thailand. People who vaccinated by Sinovac tested for antibody, the result was very low and the young people who vaccinated by AstraZeneca tend to have higher side effect than elders.

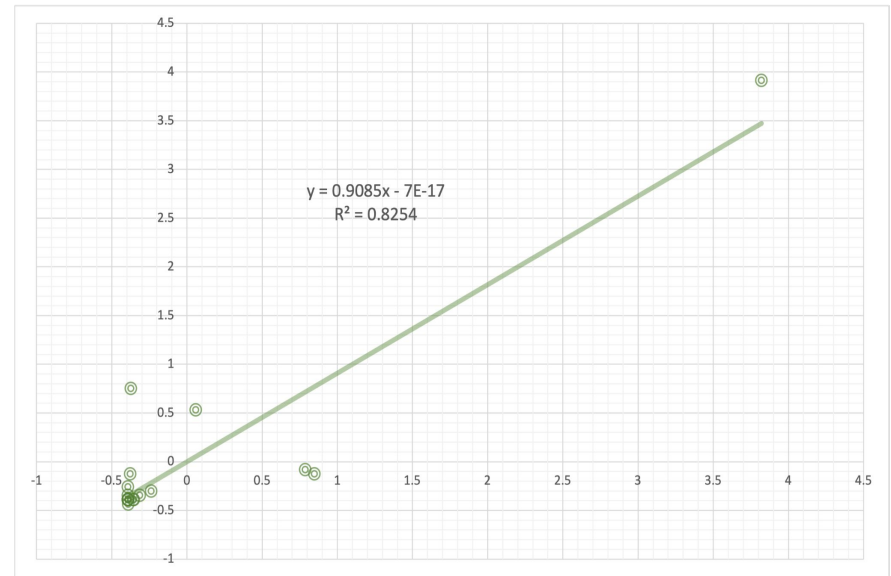
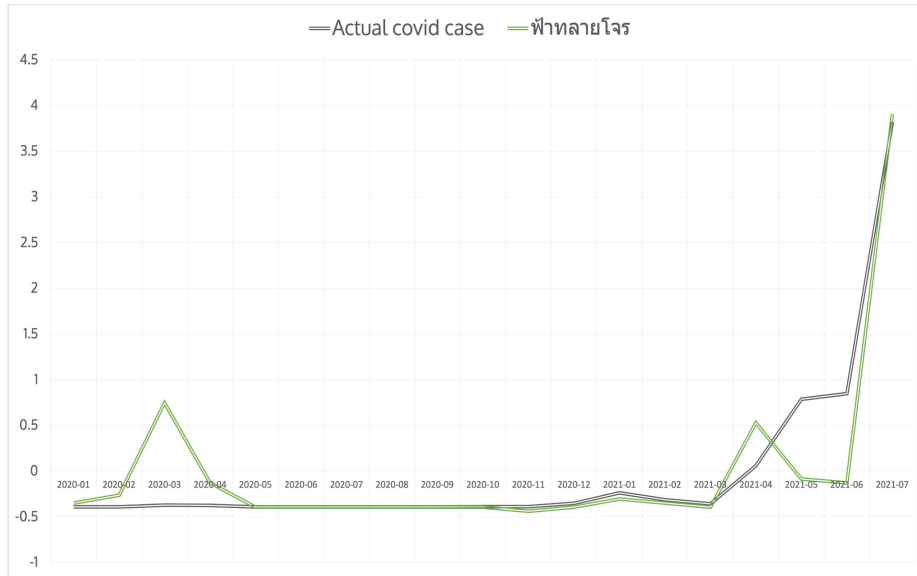
Hence, after the 3rd cluster, people called out government to provide more options of vaccine. nonetheless, since covid case increase rapidly, people also called them out to provide efficient vaccine for medical staff to confirm their safety


## High correlation between confirmed covid cases in Thailand and the word “โรงพยาบาล”



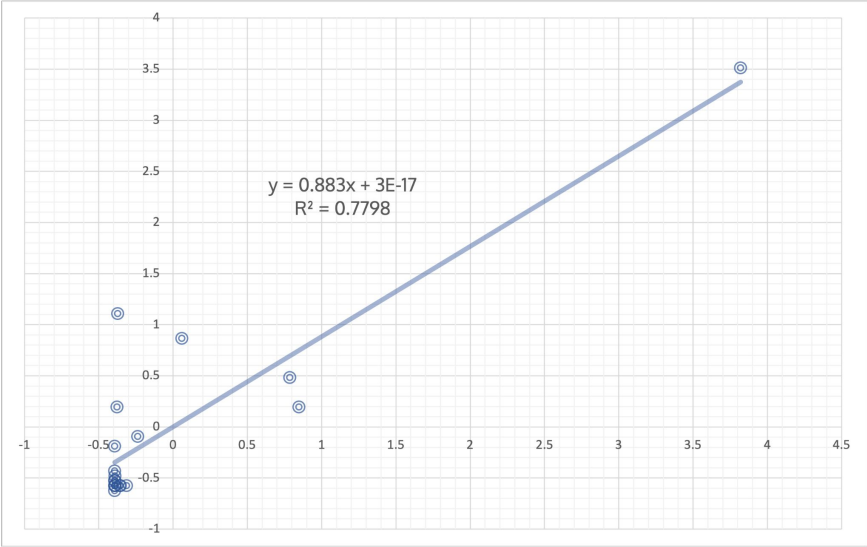
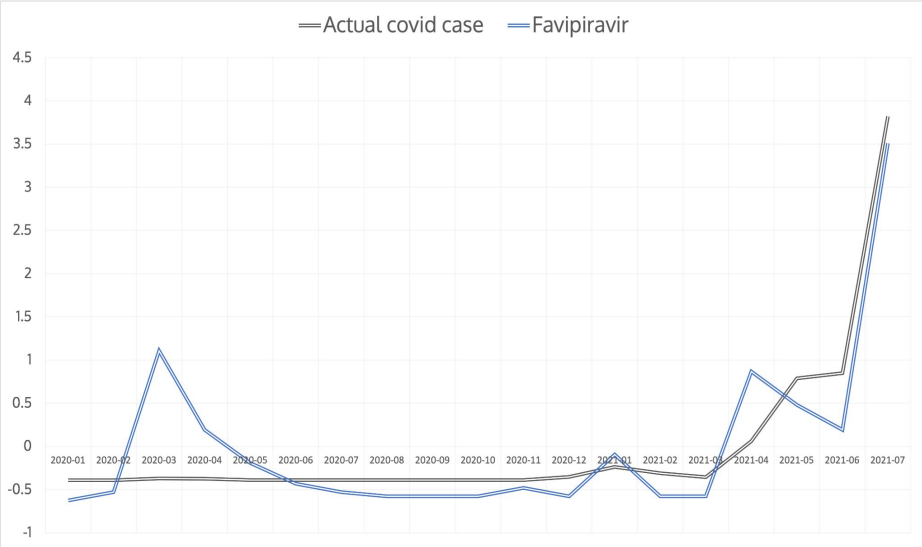
The correlation is approximately **97.6%**


# High correlation between confirmed covid cases in Thailand and the word “ฟ้าทลายโจร”



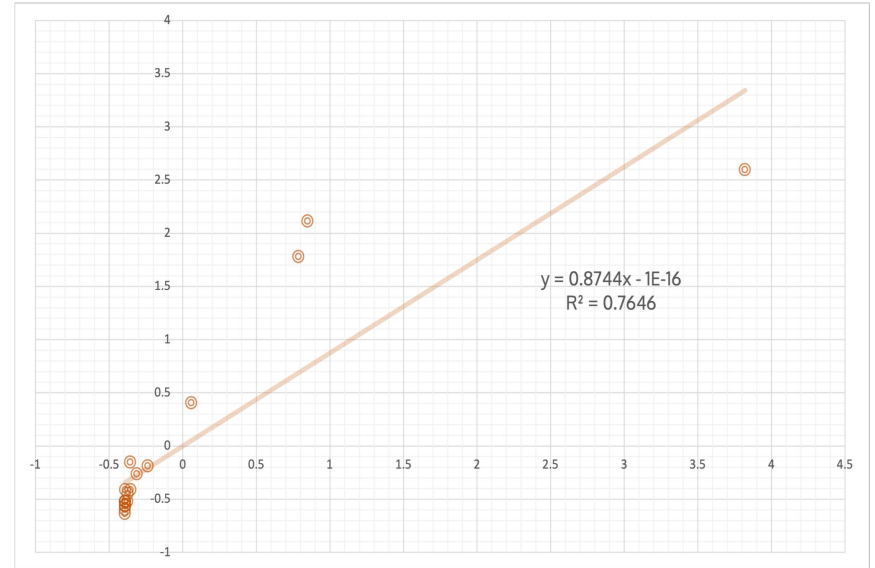
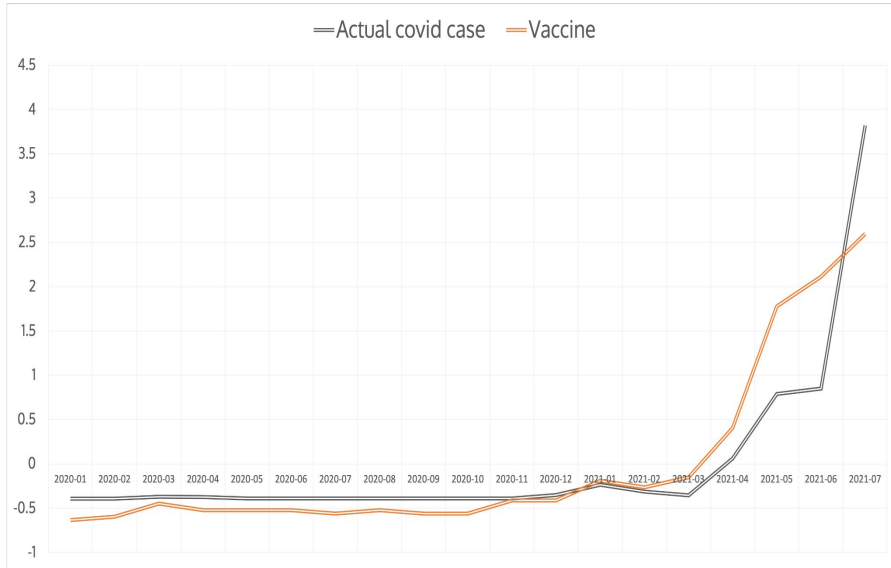
 The correlation is approximately **90.85%**


# High correlation between confirmed covid cases in Thailand and the word "Favipiravir"



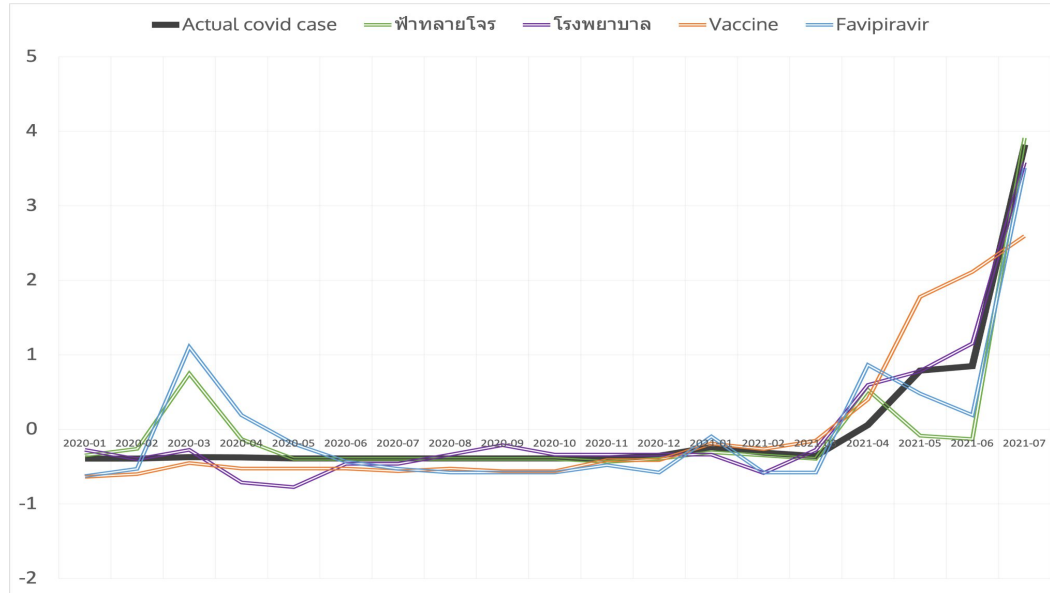
 The correlation is approximately **88.3%**

# High correlation between confirmed covid cases in Thailand and the key word "Vaccine"



 The correlation is approximately **87.44%**

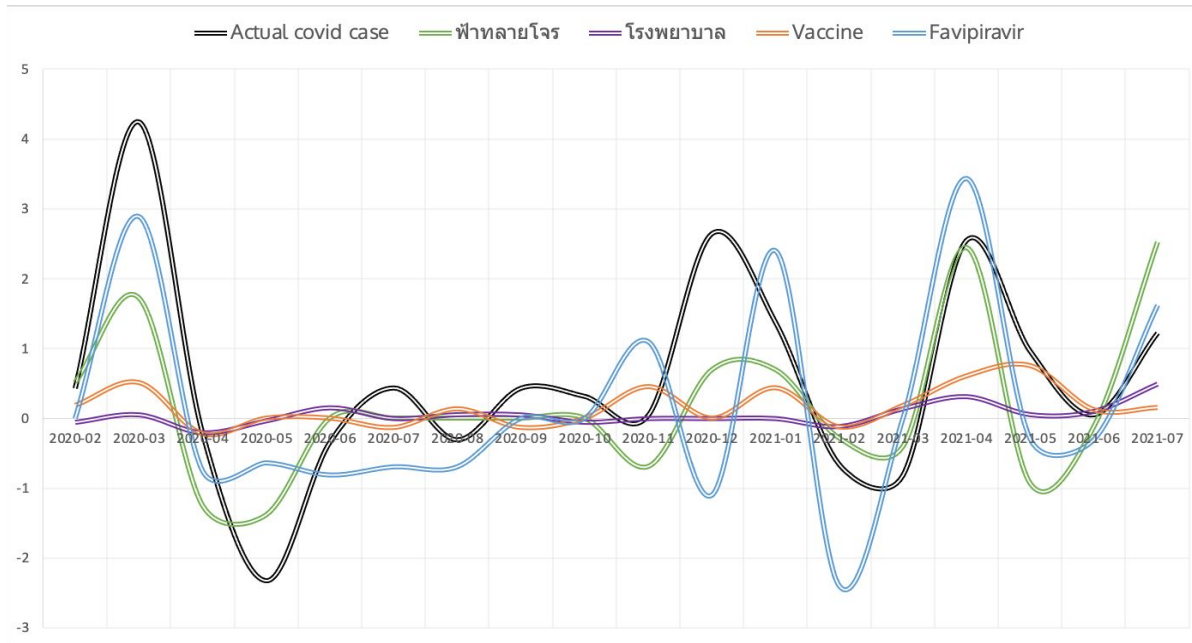
## Multiple regression yield a high correlation between each variable



Regression Statistics	
Multiple R	0.98388243
R Square	0.96802463
Adjusted R Square	0.96162956
Standard Error	0.19588375
Observations	19

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	6.47971E-18	0.044938815	1.4419E-16	1	-0.095784816	0.0957848	-0.078780005	0.07878001
ฟ้าทลายโจร	0.351770537	0.131706524	2.67086646	0.0174479	0.071044727	0.6324963	0.120882369	0.58265871
โรงพยาบาล	0.45987162	0.227504633	2.02137255	0.0614593	-0.025043027	0.9447863	0.061044542	0.8586987
Vaccine	0.228229419	0.141969529	1.6075944	0.1287649	-0.074371469	0.5308303	-0.020650314	0.47710915

## The percentage change of Covid-19 cases ally with the google trend keywords



The percentage change of Covid-19 cases and the percentage change of the keywords

# Google trends are useful indicators for forecasting however there are some limitations

## Data

### Conventional indicator



Covid-19 cases in Thailand

### Google trends



โรงพยาบาล



Favipiravir

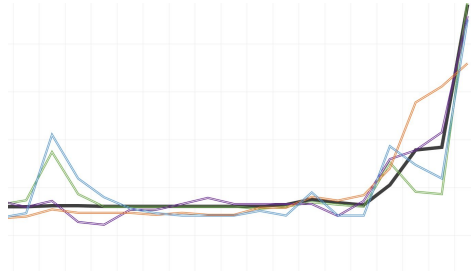


ฟ้าทลายโจร



Vaccine

## Results



- **Significant Connection** with the highest correlation over 97.6%
- The change in google trends **highly correlated** with the Covid-19 cases

## Limitations



**Small sample size** the data need further collection to reduce an error



**Keywords limitation** some keywords might not correlate with Covid19 cases in the long run



**More conventional data needed** there are some actions that are not shown on google trend e.g. emergency call

## The government could use this relationship for policies decisions



The data above might be used to **forecast the actual number of COVID-19 patients**. Use data comparisons to determine if there may be a drop in the investigation of the case



Government can use this information to help and **guide decision-making on Covid-19 policies** such as lockdowns or when to expedite assistance in relevant sectors



It can be used as a **warning signal of case volume**, bed demand, product demand, which knowing in advance can help prepare, handle and cope more effectively



It can **represent the misbelief, misunderstanding, or perplexity of people in society** towards communication that may result in negative consequences and should be corrected to be accurate and clear.

**Thank you**

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