

# Exploration on the effectivity of government interventions against Covid in Malaysia through visualisation

Objectives:

1. Visualize Covid-19 transmission trend in Malaysia
2. Derive insights for the preparation of possible future pandemic

# Introduction:

Over the previous years (2020 to present), the world has been plagued and heavily impacted by the pandemic caused by COVID-19. Due to its incredibly high infectivity rate and the lack of treatment methods, COVID-19 had imposed an almost crushing toll many countries and resulted in tremendous loss. Unfortunately, this is not the first, nor the last time human kind will face disastrous pandemic.

Therefore, it is of utmost importance for all countries to brace themselves and prepare for future pandemic. Malaysia is of no exception. In this project, we will visualize Covid-19 transmission trend in Malaysia, and derive insights that might be useful for future pandemic preparedness.

# Data Sample Illustration:

|       | iso_code | continent | location    | date       | total_cases | new_cases | new_cases_smoothed | total_deaths | new_deaths | new_deaths_smoothed | to |
|-------|----------|-----------|-------------|------------|-------------|-----------|--------------------|--------------|------------|---------------------|----|
| 0     | AFG      | Asia      | Afghanistan | 2020-02-24 | 1.0         | 1.0       | NaN                | NaN          | NaN        | NaN                 |    |
| 1     | AFG      | Asia      | Afghanistan | 2020-02-25 | 1.0         | 0.0       | NaN                | NaN          | NaN        | NaN                 |    |
| 2     | AFG      | Asia      | Afghanistan | 2020-02-26 | 1.0         | 0.0       | NaN                | NaN          | NaN        | NaN                 |    |
| 3     | AFG      | Asia      | Afghanistan | 2020-02-27 | 1.0         | 0.0       | NaN                | NaN          | NaN        | NaN                 |    |
| 4     | AFG      | Asia      | Afghanistan | 2020-02-28 | 1.0         | 0.0       | NaN                | NaN          | NaN        | NaN                 |    |
| ...   | ...      | ...       | ...         | ...        | ...         | ...       | ...                | ...          | ...        | ...                 |    |
| 85575 | ZWE      | Africa    | Zimbabwe    | 2021-04-28 | 38191.0     | 27.0      | 30.143             | 1565.0       | 0.0        | 1.429               |    |
| 85576 | ZWE      | Africa    | Zimbabwe    | 2021-04-29 | 38235.0     | 44.0      | 31.000             | 1567.0       | 2.0        | 1.714               |    |
| 85577 | ZWE      | Africa    | Zimbabwe    | 2021-04-30 | 38257.0     | 22.0      | 30.286             | 1567.0       | 0.0        | 1.571               |    |
| 85578 | ZWE      | Africa    | Zimbabwe    | 2021-05-01 | 38260.0     | 3.0       | 28.000             | 1568.0       | 1.0        | 1.714               |    |
| 85579 | ZWE      | Africa    | Zimbabwe    | 2021-05-02 | 38281.0     | 21.0      | 27.857             | 1570.0       | 2.0        | 1.857               |    |

85580 rows × 59 columns

# Presenting Covid-19 trend in Malaysia

Attributes included:

- New\_daily\_cases\_smoothed
- New\_daily\_cases
- Total\_cases
- Reproduction\_rate (of virus)
- Date\_by\_month

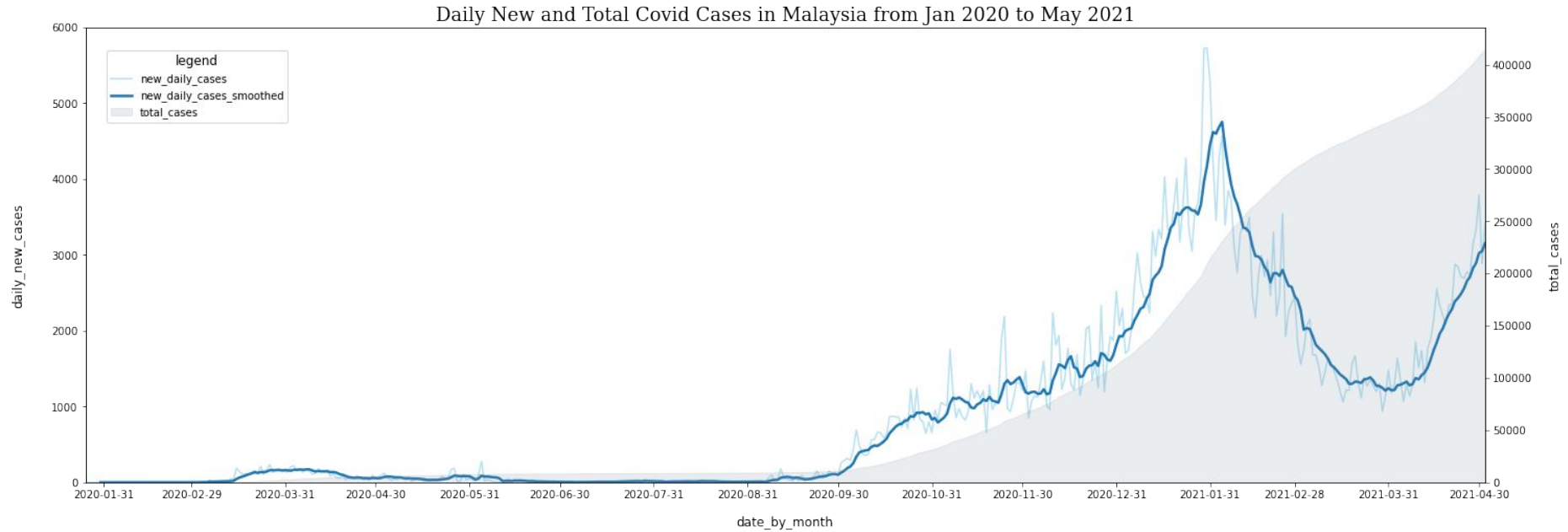


Fig. 1 Daily new cases and daily new cases smoothed are superimposed on the total cases to present the trend of Covid-19.

- The **daily new cases (smoothed)** rise starkly from September 2020, coming to its peak on 31 Jan 2021 at 4800 daily new cases. It then proceed to drop to 1300 daily new cases on 31 March 2021 and increased again.
- The unsmoothed **daily new cases** are superimposed to display the raw number of cases.
- Up till the last day of record, Malaysia has accumulated more than **400000 Covid cases in total.**

**What?**

**In:** table

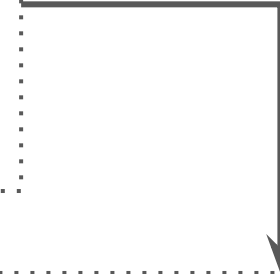
**Out:** Table

**Why?**

Lookup for  
attributes

**How?**

Filter



**What?**

**In:** table

**Out:** Superimposed  
attributes plot

**Why?**

Presents  
the  
correlation

**How?**

1. Express the data
2. Map Colors to differentiate  
different attributes
3. Superimpose

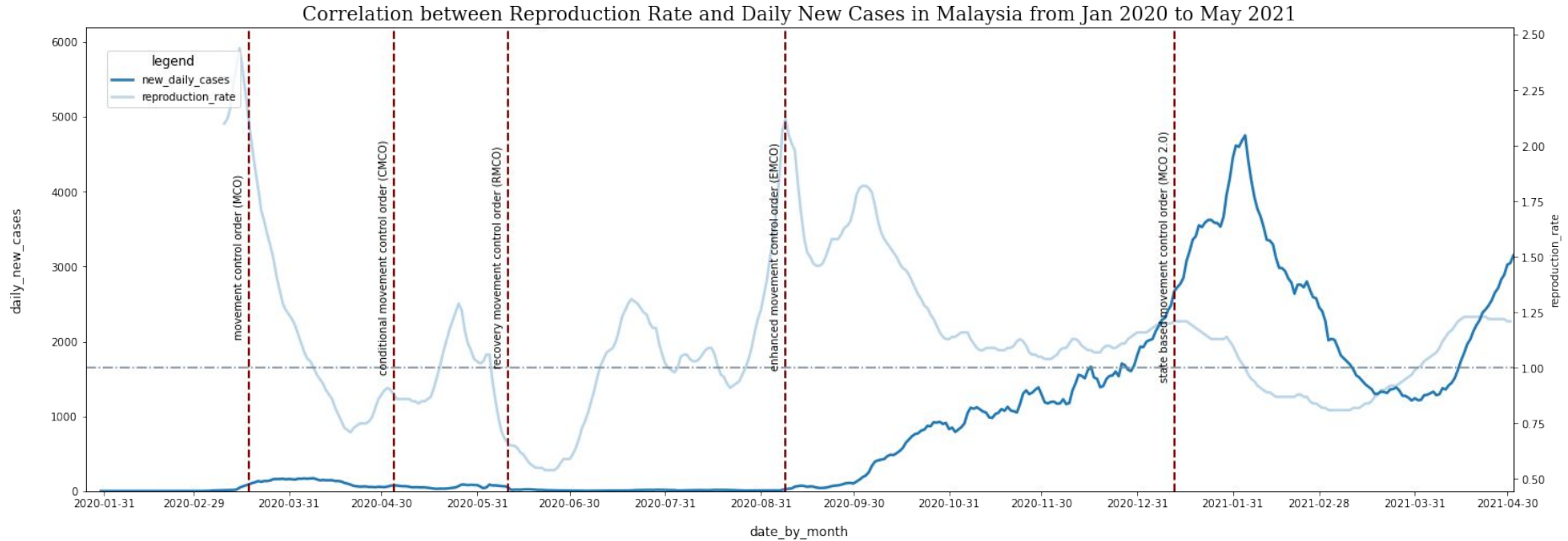


Fig. 2 Daily new cases and daily new cases smoothed are superimposed on the reproduction rate of Covid-19 to present the correlation between reproduction rate and daily new cases. MCO phases are marked out by red dashed lines.

- Due to the exponential nature of Covid-19 cases growth, reproduction rate instead of daily new cases should be used as the standard to measure effectivity of any control measures.
- While reproduction rate  $> 1$ , the number of daily new cases increases exponentially.
- When reproduction rate  $< 1$ , the number of daily new cases decreases significantly. Therefore it is important to keep reproduction rate below 1.

**What?**

**In:** table

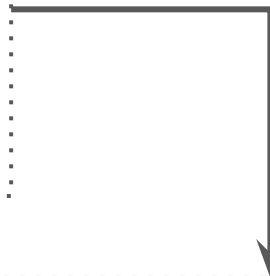
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# Discovering effects of movement control order (MCO) and mass testing

Attributes:

- `Reproduction_rate` (of virus)
- `Stringency_values` (of the MCO)
- `New_cases_smoothed`
- `New_tests_per_thousand`
- `Date_by_month`

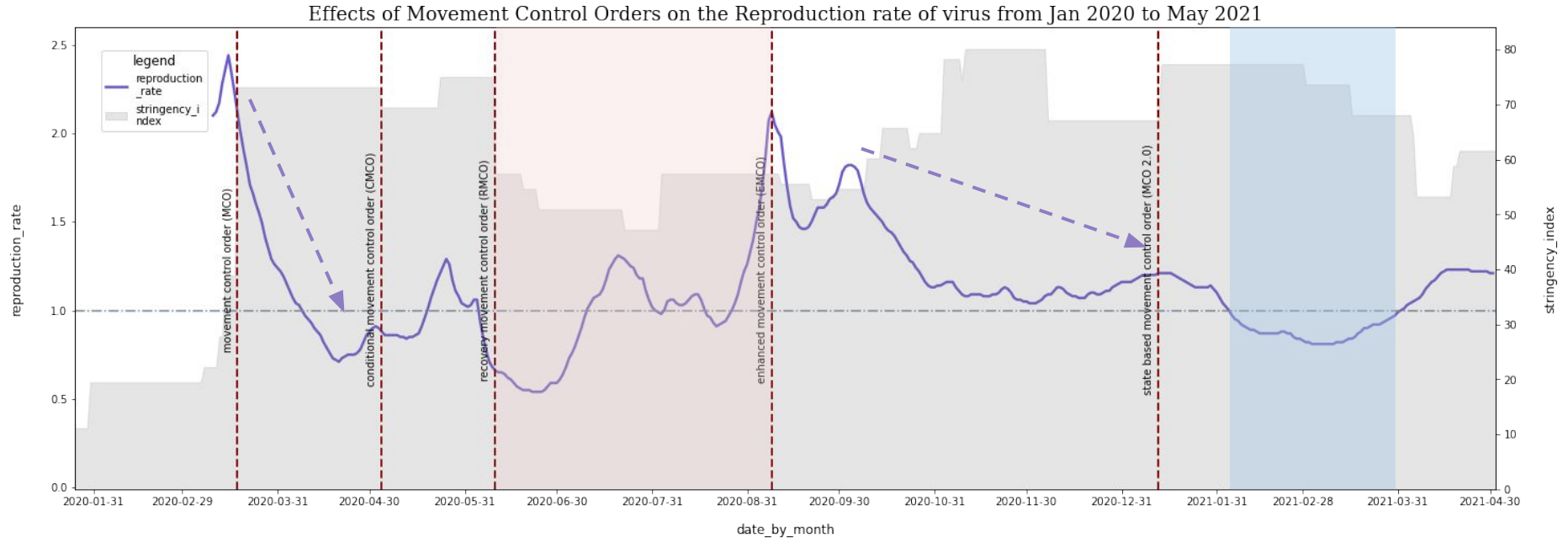


Fig. 3 Reproduction value of Covid-19 is superimposed on the stringency value of MCO, while different phases of MCO are marked with red dashed lines.

- Generally, tringency value of MCO is negatively correlated with the reproduction rate of Covid-19, e.g. when stringency value decreases in the RMCO (**highlighted in red**), reproduction value rises significantly.
- As the days move forward, the increase in stringency values have a reducing effectivity on the reduction of Covid-19 reproduction rate, making it harder to keep reproduction rate under control (**see purple dashed arrows**).
- In Feb 2021 to March 2021 after MCO 2.0, reproduction rate of COVID-19 drops below 1.0 with lowering stringency index (**highlighted in blue**). What might be the reason?

**What?**

**In:** table

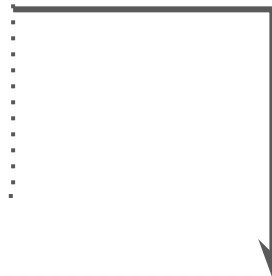
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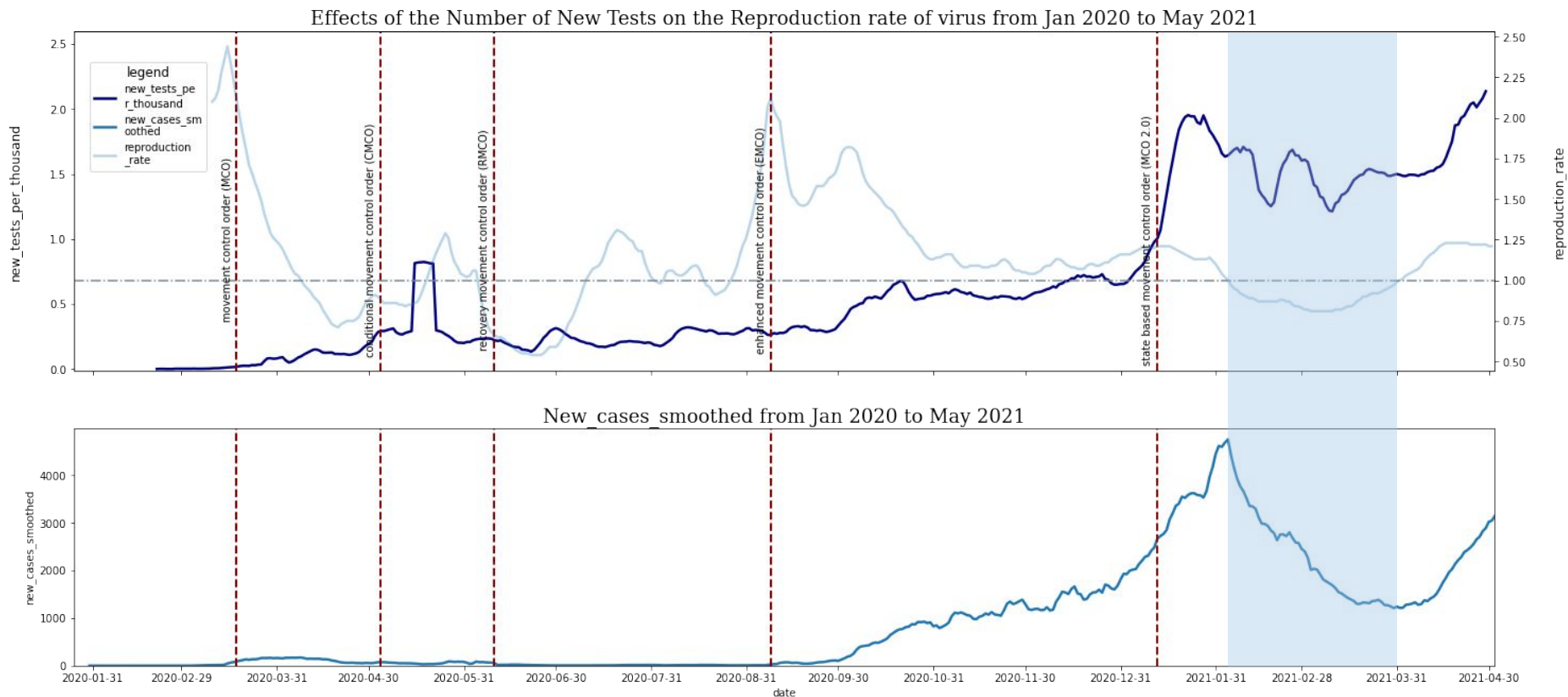


Fig. 4 Discover the effect of increasing rate of testing on the pandemic control.

On 12 Jan 2021, the Malaysian government announced MCO2.0 due to the ever increasing number of new cases. The number of new testing per day was increased significantly, after which followed by a drop in reproduction rate and the number of new cases. It is suggested that the increased testing had weed out hidden COVID clusters successfully and thus reduce its spread albeit the decreasing stringency value.

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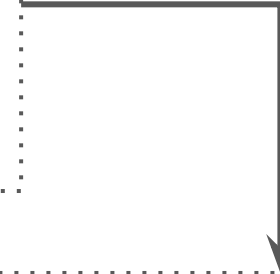
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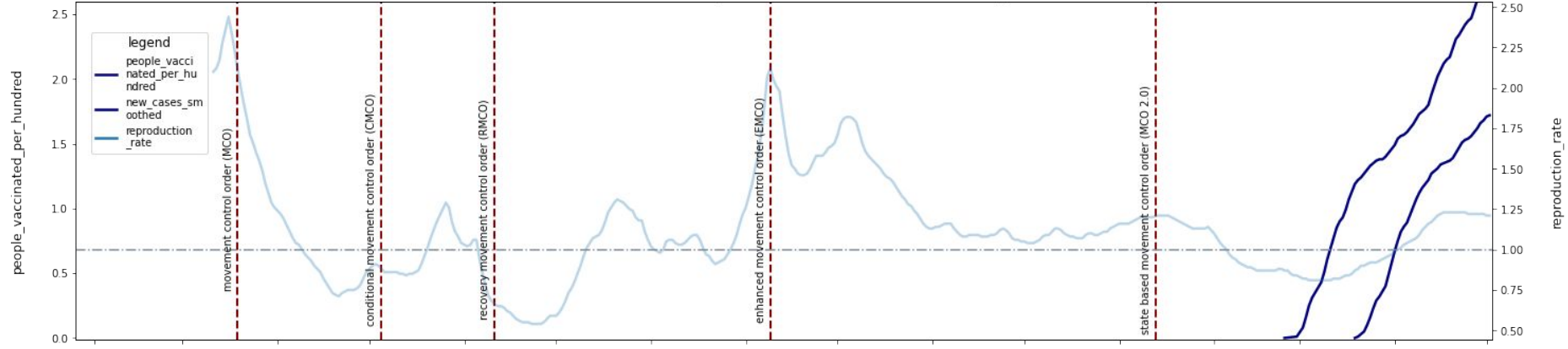
1. Express the data
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3. Superimpose
4. Juxtapose

# Discovering the role of vaccines

Attributes:

- People\_vaccinated\_per\_hundred
- reproduction\_rate
- New\_cases\_smoothed
- Date\_by\_month

Effects of Vaccination Rate on the Reproduction rate of virus from Jan 2020 to May 2021



New\_cases\_smoothed from Jan 2020 to May 2021

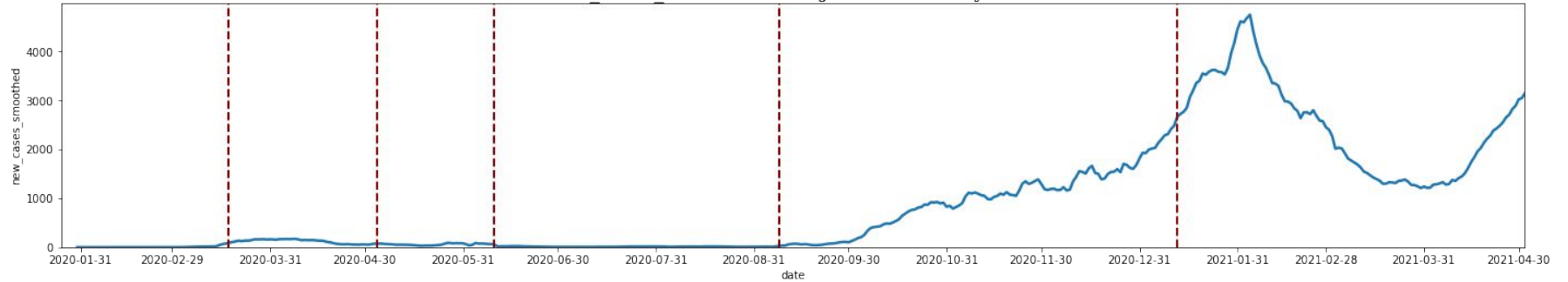


Fig. 5 Discover the effect of increasing rate of testing on the pandemic control.

Vaccination does not play any role within the studied period as the vaccination campaign in Malaysia started relatively late.

**What?**

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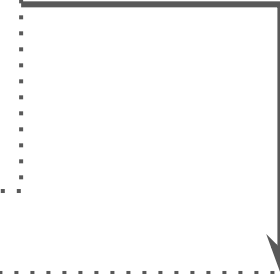
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