An analysis by state on the effect of Movement Control Order (MCO) 3.0 due to COVID-19 on Malaysians' anxiety: Evidence from Google Trends

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Introduction

- depression, anxiety and stress has worsened during this pandemic, both in general adult, and child and adolescent groups.
- evidence is limited by the inability to capture larger population findings
- convenience sampling techniques that may infer unwarranted conclusions from unrepresentative groups.

Google Trends as a source of auxiliary data

Advantages
- no issue of data being self-reported by a sub-sample of respondents
- impact of lockdown on the behaviours of all Google Search users within a particular jurisdiction captured
- Less susceptible to the observer-expectation effect or interviewer bias.
- Less vulnerable to small-sample bias

Methods

- downloaded daily data between March 6th and May 31st in both 2019 and 2021.
- Scaling was performed to allow both sets to be comparable
- Provides an index for search intensity by topic over the time period requested in a geographical area
- This is the number of daily searches for the specified topic divided by the maximum number of daily searches for this topic over the time period in question in that geographical area.
- Scaled from 0-100
  - 100 is the day with the most searches for that topic,
  - 0: suggests that a given day did not have sufficient search volume for the specific term
- 4 psychopathology-related topic search terms to Google Trends: Sleep, 'Tidur' (the Malay language equivalent of Sleep), Stress, and 'Tekanan' (Malay Language of Stress).
- sleep is a common denominator of all psychological disorders, whereas stress is a common pathway that underlied psychopathology.

Difference in Difference (DiD) analysis

frequently used methods in impact evaluation studies (from econs)
compared searches pre- and post-MCO 3.0 in 2021 to searches pre- and post- the same date in 2019
ensuring that seasonal changes within states are not behind our findings
The lockdown date in our analysis is the date at which the MCO 3.0 was implemented which is on May 12th 2021.

We write the difference-in-differences regression model for a topic Y as:
$$Y_{it} = \alpha + \beta_1 Treat_i + \beta_2 Post_t + \beta_3 (Treat * Post)_{it} + \epsilon_{it}$$

where $Treat_i$ equals one for days in 2021 (i.e., the treatment group) and is zero otherwise, and $Post_t$ equals one for the post-treatment period (i.e., May 12th until May 31st 2019, and May 12th until May 31st 2021) and is zero otherwise. The parameter β_3 then estimates the DiD.

Results

- raw data searches pre and post-MCO 3.0 in 2021 to those pre- and post- the same date in 2019 compared
- As shown in Table 1, all DiD estimates, β_3 for topic Sleep and Stress were not significantly different from zero
- MCO 3.0 had no effect on psychological distress in Malaysians (i.e., Sleep and Stress) in all states.
- Johor was the only state where the DiD estimates, β_3 were significantly different from zero for the search topic 'Tidur'.
- For the topic 'Tekanan', there were two states with significant DiD estimates, β_3, namely Penang and Sarawak.

Discussion

- Our results are similar to other existing studies in which they are able to identify drops in searches of 'stress'.
- Emergence of multiple mental health care services that have been initiated and expanded widely
- NGO sector and other community-run mental health hotlines
- Our results for 'sleep', on the other hand, shows disparity with current studies (except with Europe).
- More companies implementing a 'Work From Home' approach for their workers as employers gain experience in employee management across multiple lockdowns.
- large disturbances of sleep-wake cycles due to concurrent childcare requirements at home and large shifts in education online leaving parents unable to work during standard hours
- This results in disrupted productivity, potentially exacerbating the search figures for stress or "tekanan".

Conclusion

- innovative methodology in looking at Google Trends as a proxy measure of the psychological distress in Malaysia.
- It also stratifies data by state, allowing us to capture regional changes in temperature of the population
- allows more geographically focused interventions to take place
- Google Trends as a powerful tool for population-level behaviour prediction.