Investigating Dengue Outbreaks in Singapore

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How do Google search trends correlate with various measures of weather and dengue cases in Singapore? ❌

🔍 RQ1: What is the relationship between trends of Google search terms for dengue and the number of reported dengue cases in Singapore?

🔍 RQ2: What is the relationship between various weather measures and dengue cases in Singapore?

🔍 RQ3: What is the relationship between various weather measures and trends of Google search terms for dengue in Singapore?

WORK IN PROGRESS

1 Data Collection/Scraping:
- data.gov (open source, official)
- keywords on Google trends
- unofficial weather records

2 Data Cleaning:
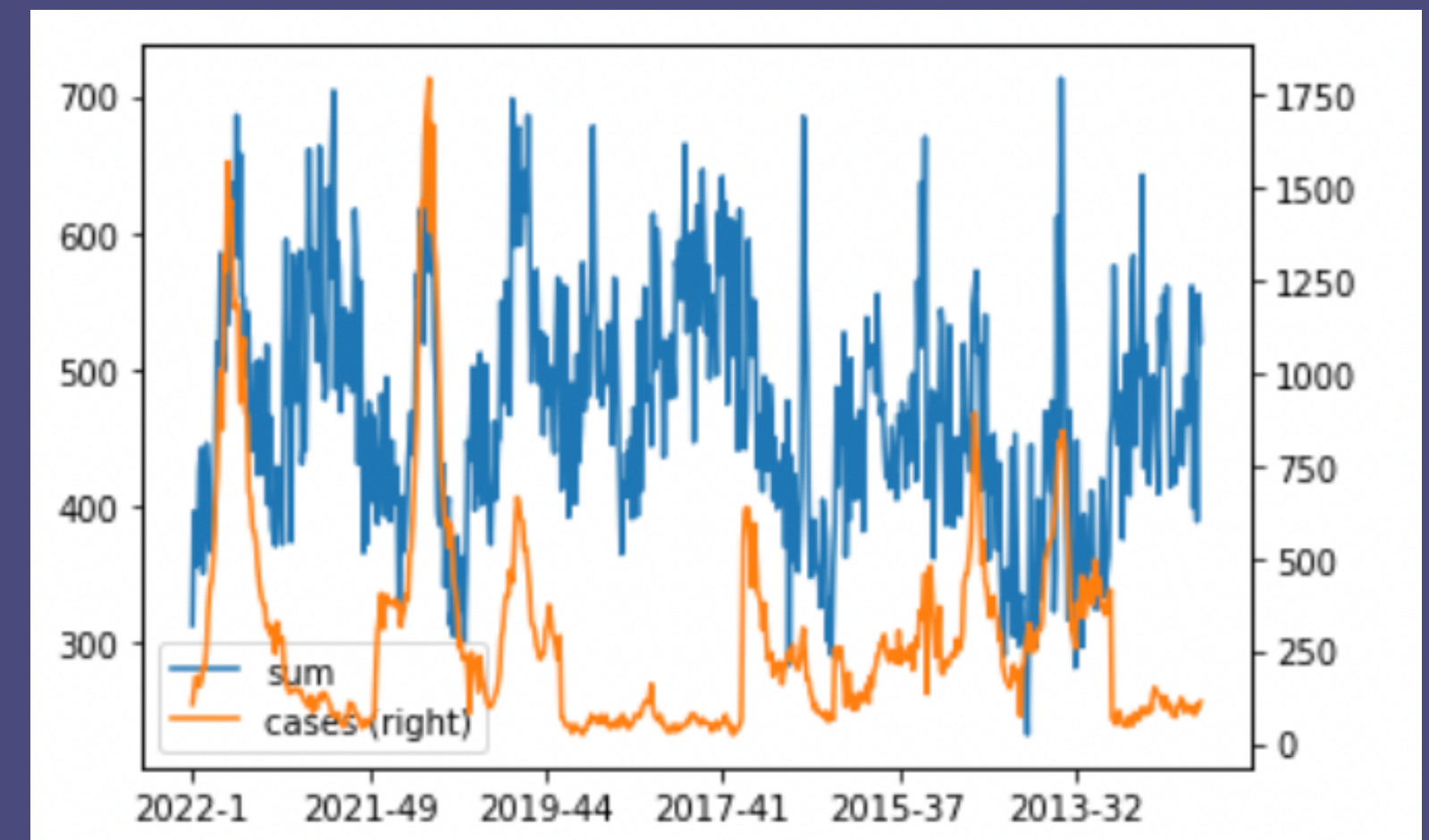- done for Google & dengue data
- in progress for weather data

3 Data Analysis:
- done with RQ1
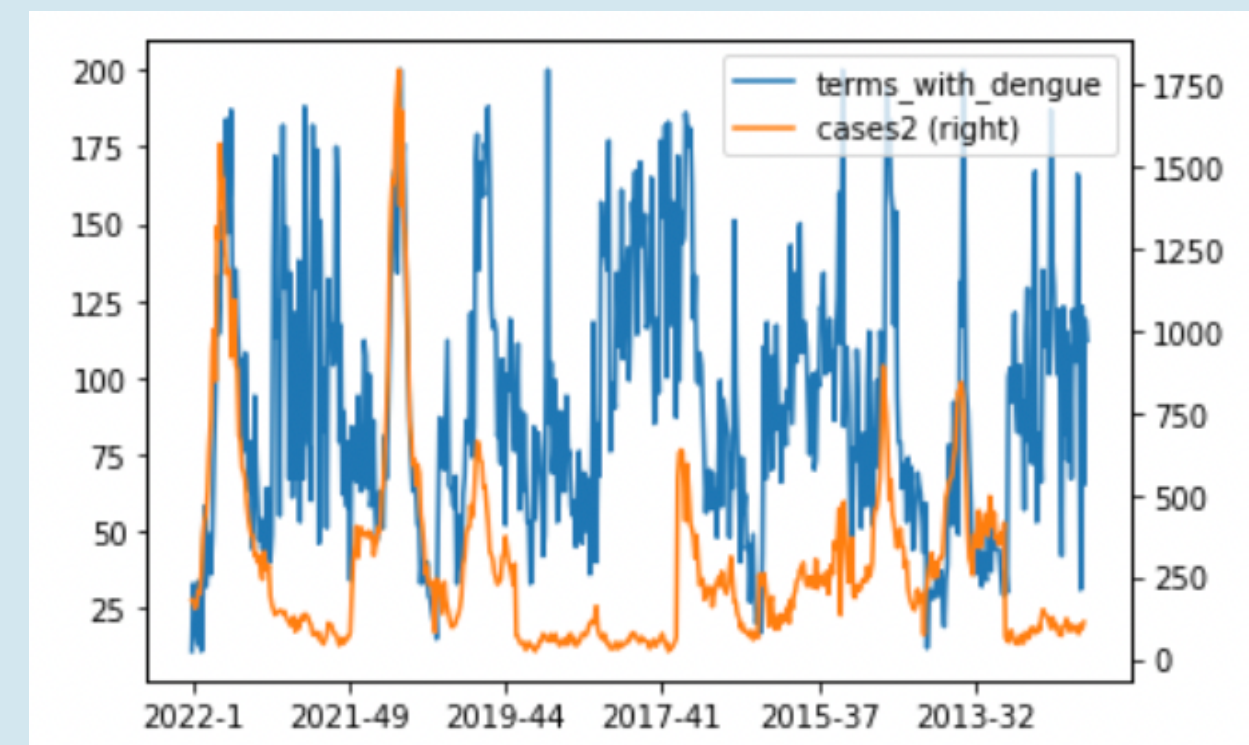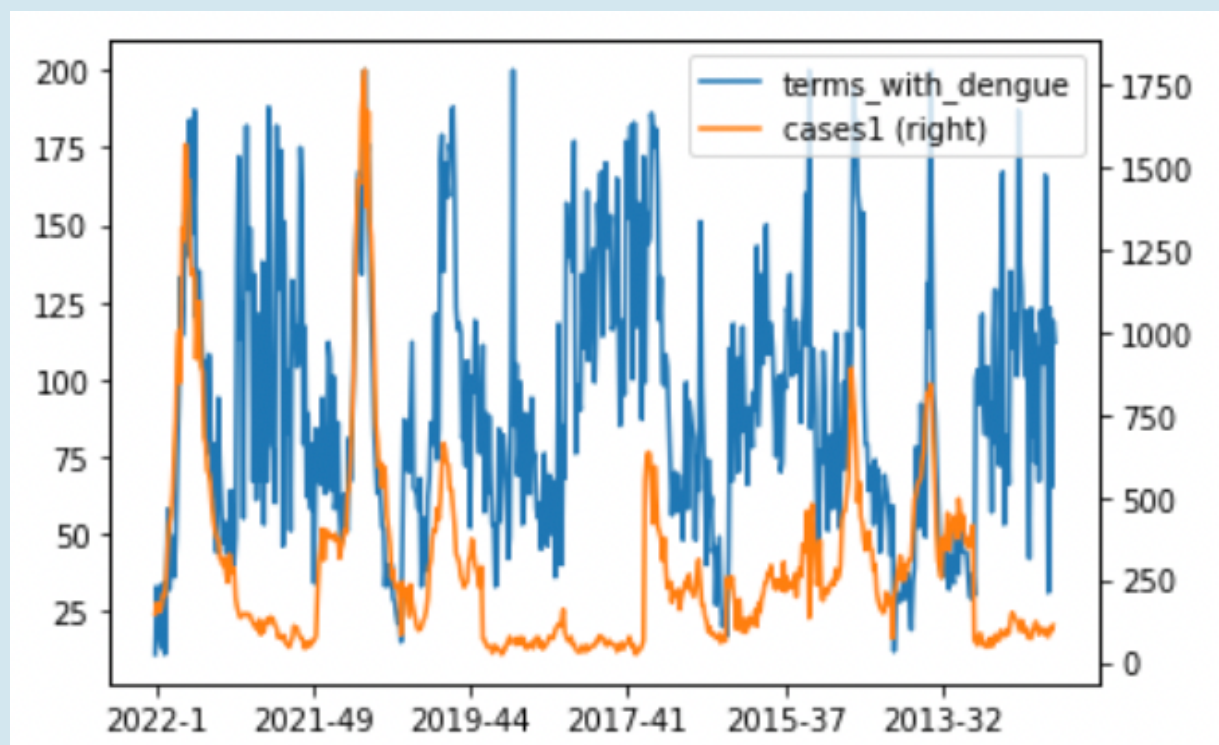- changes in previous RQs

H1: The number of dengue-related Google searches is positively correlated with the number of reported dengue cases in Singapore

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- weak and positive correlation (r = +0.165) between reported dengue cases and sum of dengue-related searches
- stronger correlations were found for:
  - 'dengue fever': +0.269
  - 'dengue': +0.188
  - 'mosquito bite': +0.163
  - 'fever': -0.239
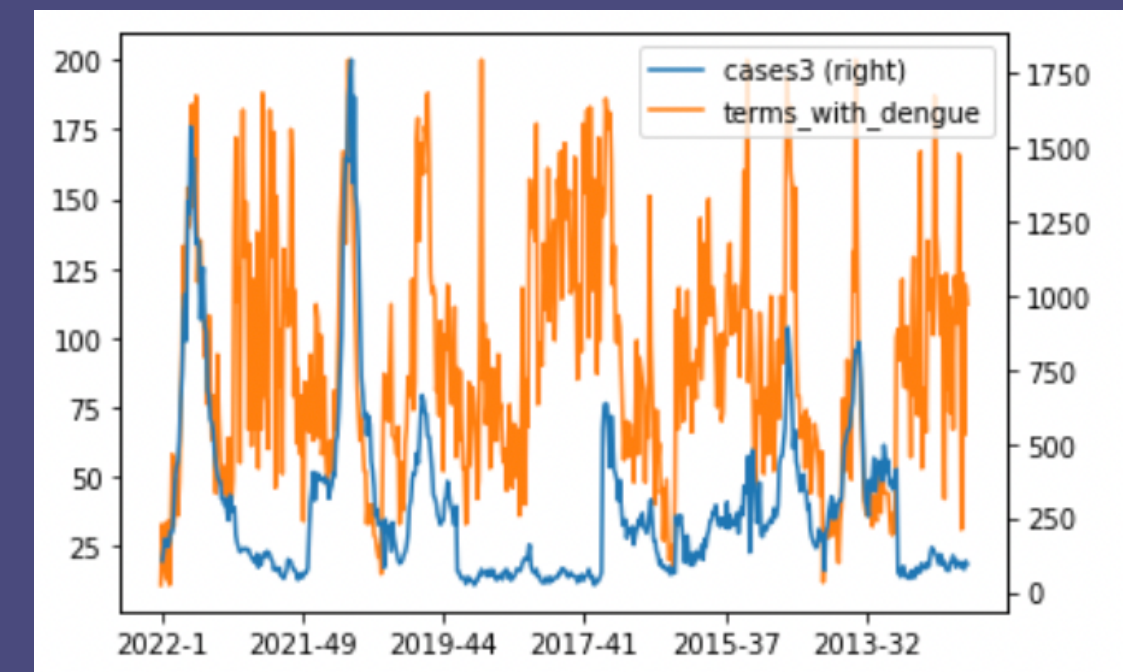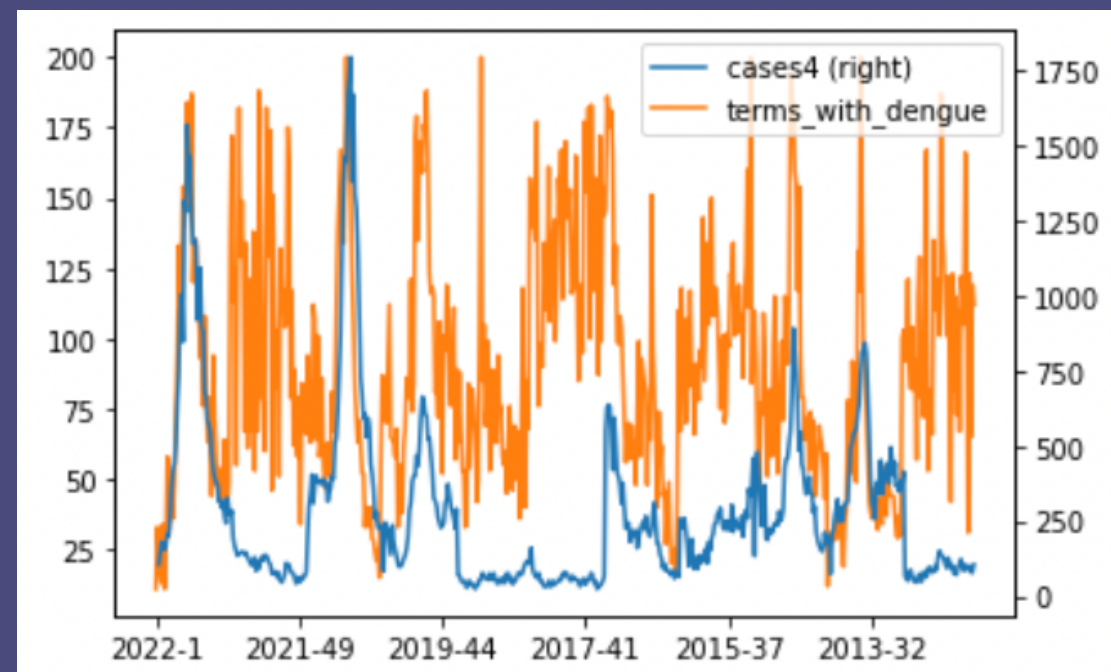- shifted focus to terms including 'dengue'

H2: An **increase** in dengue-related Google searches will be followed by a **slightly delayed increase** (within 0-2 weeks) in the number of reported dengue cases in Singapore.

- positive correlations:
  - 'dengue' terms + no delay: + 0.251
  - 'dengue' terms + 1 week delay: + 0.238
  - 'dengue' terms + 2 week delay: + 0.218
- decrease in magnitude of r value => reject H2, no lag

H3: An increase in the number of reported dengue cases in Singapore will be followed by a slightly delayed increase (within 0-2 weeks) in dengue-related Google searches

- positive but marginal change in correlation value:
  - 'dengue' terms - 0 weeks: +0.251
  - 'dengue' terms - 1 week : + 0.241
  - 'dengue' terms - 2 weeks: + 0.216
- invalid H3, data indicates people search less about dengue after there is an increase in reported cases

Up Next!

RQ2: What is the relationship between various weather measures and dengue cases in Singapore?

H4: Precipitation rate is positively correlated with the number of dengue cases in Singapore.

H5: Relative humidity is positively correlated with the number of dengue cases in Singapore.

H6: Hours of sunshine is positively correlated with the number of dengue cases in Singapore.

RQ3: What is the relationship between various weather measures and trends of Google search terms for dengue in Singapore?

H7: Precipitation is positively correlated with the number of dengue-related Google searches in Singapore.

H8: Humidity is positively correlated with the number of dengue-related Google searches in Singapore.

H9: Hours of sunshine is positively correlated with the number of dengue-related Google searches in Singapore.