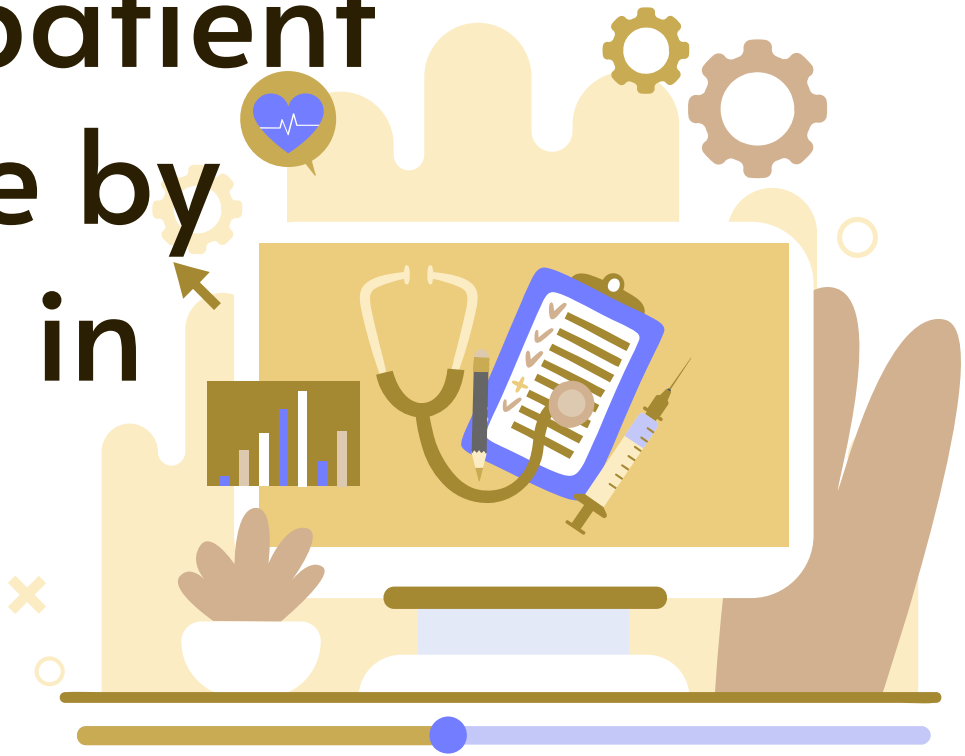
# Impact on Outpatient attendance rate by climate change in Singapore



29-Feb-2024

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# Introduction

Role:
A data Scientist focus on healthcare system in Singapore.

Problem statement:
This study aims to understand the **number people's visits to outpatient healthcare facilities affected by weather** (For example higher rainfall, is there increase number of people visit healthcare facilities). By looking at data on outpatient visits alongside rainfall records, we want to see if there's a connection between rainy days and more people seeking healthcare.

This research can help us figure out how to **plan healthcare services better, especially during rainy seasons**, and make sure everyone gets the care they need. There should be a direct correlation between the rainy days and frequency of outpatient healthcare facilities visits.

# Procedure and Methodology

01. Define the problem statement

02. Gather all climate data and outpatient data from data.gov.sg and singstat.gov.sg (Year 1982 – 2022)

03. Cleaning data and correlate the data

04. Exploratory Data Analysis

05. Provide insight from the result

# Outside Research

"Health problems caused by climate change, such as heat stress and mosquito-borne diseases, will continue to worsen unless countries do more to slash planet-warming emissions, a global group of researchers has warned."

Source: StraitsTimes

"Rainfall and humidity levels were associated with disease incidence in Singapore, where soil exposure is rare."

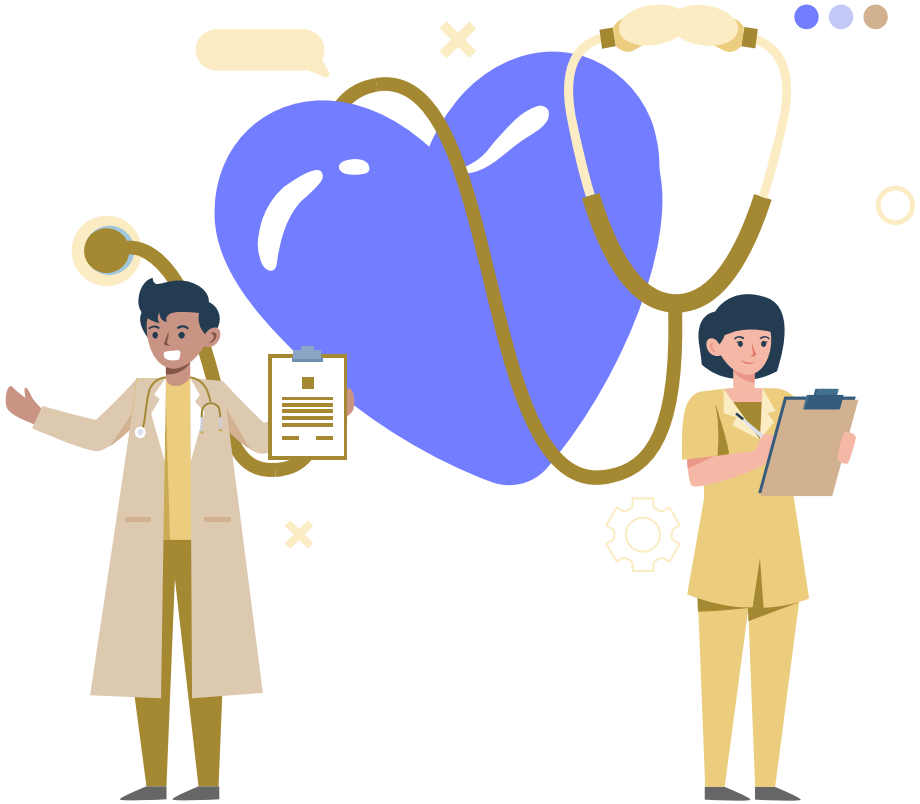
Source: ScienceDirect

# Study Aims

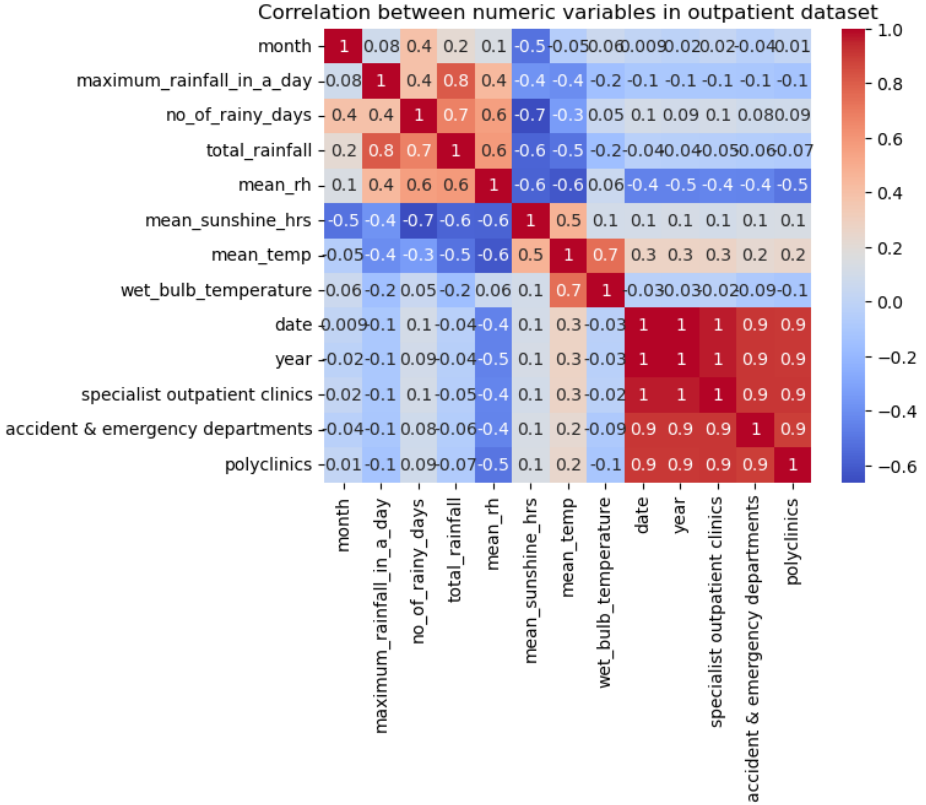
01. Find the correlation between attendance of healthcare facilities and climate situation

02. Spot the healthcare facilities peak period

# Climate and Outpatient Data

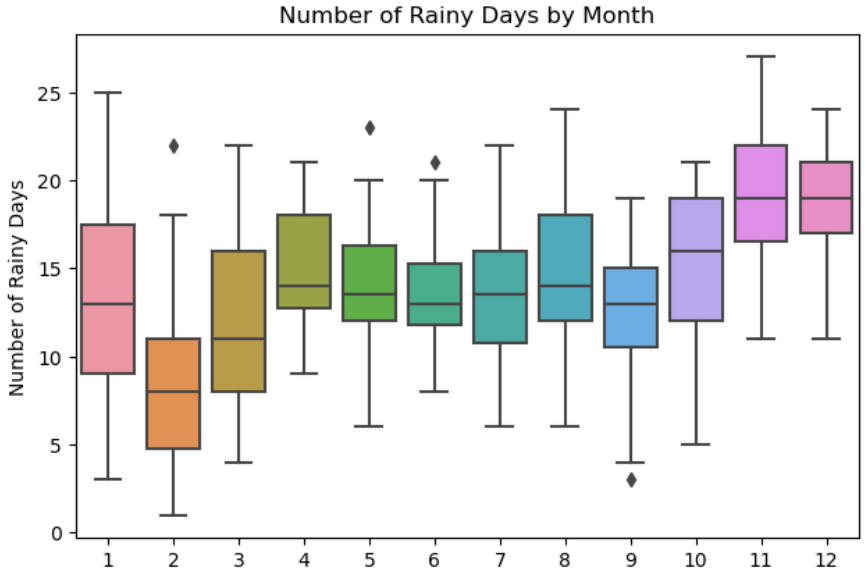


# Overview of HeatMap




1. Quick grasp of the correlation of climate data and healthcare facilities.
2. Air surface temperature (mean_temp) shows the highest correlation among other climate data.
3. Number of rainy day is also the target of interests to see how it affects the attendance of healthcare facilities.

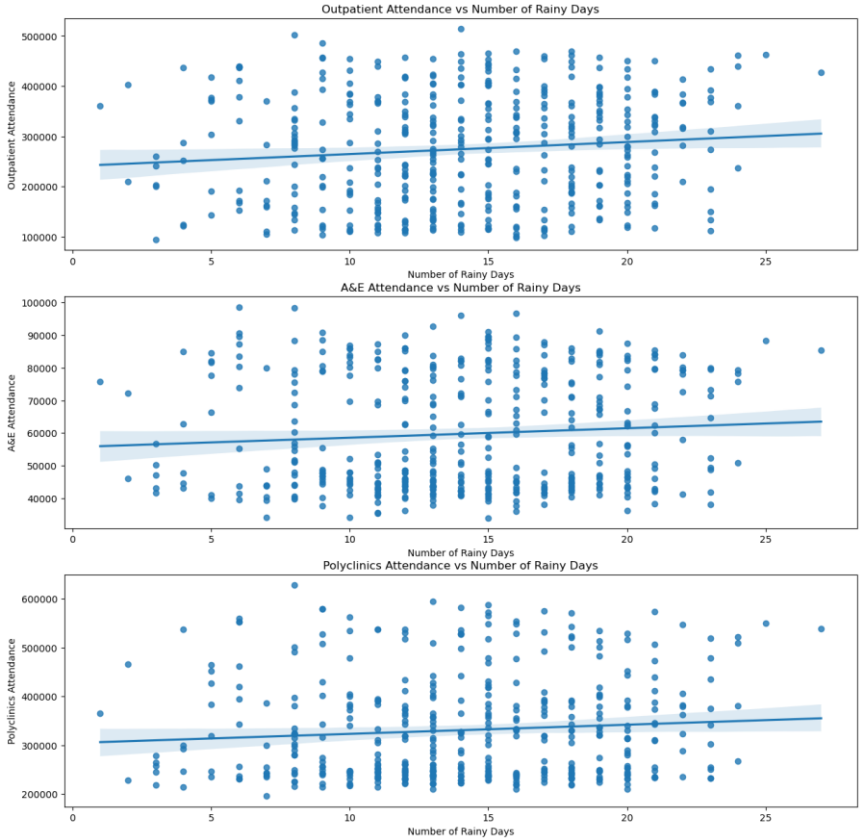
# Number of Rainy Day




1. November and December have the highest number of rainy days.
2. February has the lowest number of rainy days.

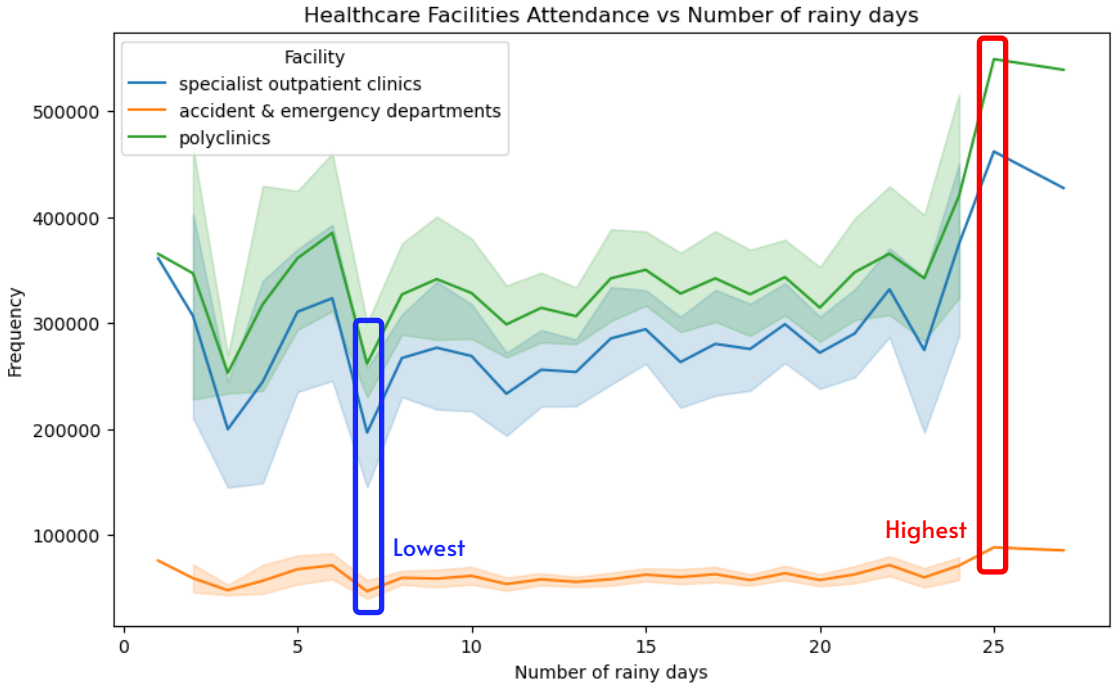
Data estimation based on year 1982 to 2022.

# Healthcare Facilities vs No. of Rainy Day



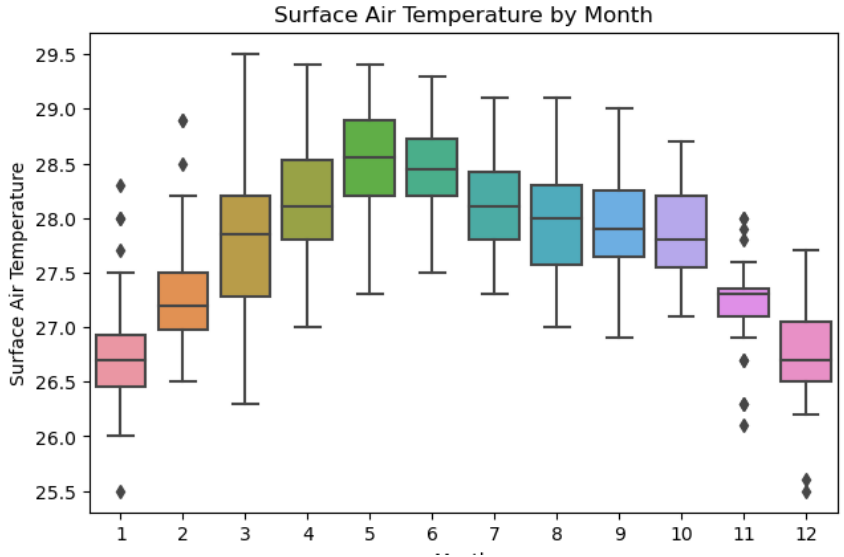

1. All 3 healthcare facilities have positive correlation with the number of rainy days.

# Healthcare Facilities vs No. of Rainy Day




1. Estimated 25 rainy days of the month have the highest attendance in all healthcare facilities.
2. Estimated 6-7 rainy days of the month have the lowest attendance in all healthcare facilities.

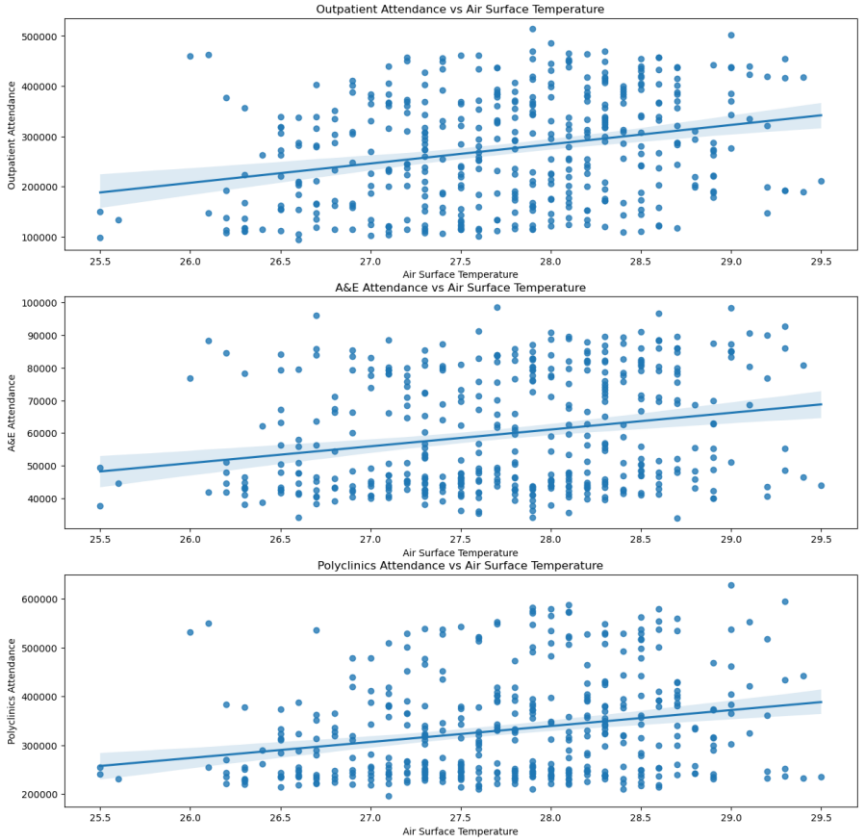
# Surface Air Temperature




1. January and December have the lowest surface air temperature.
2. May has the highest surface air temperature.

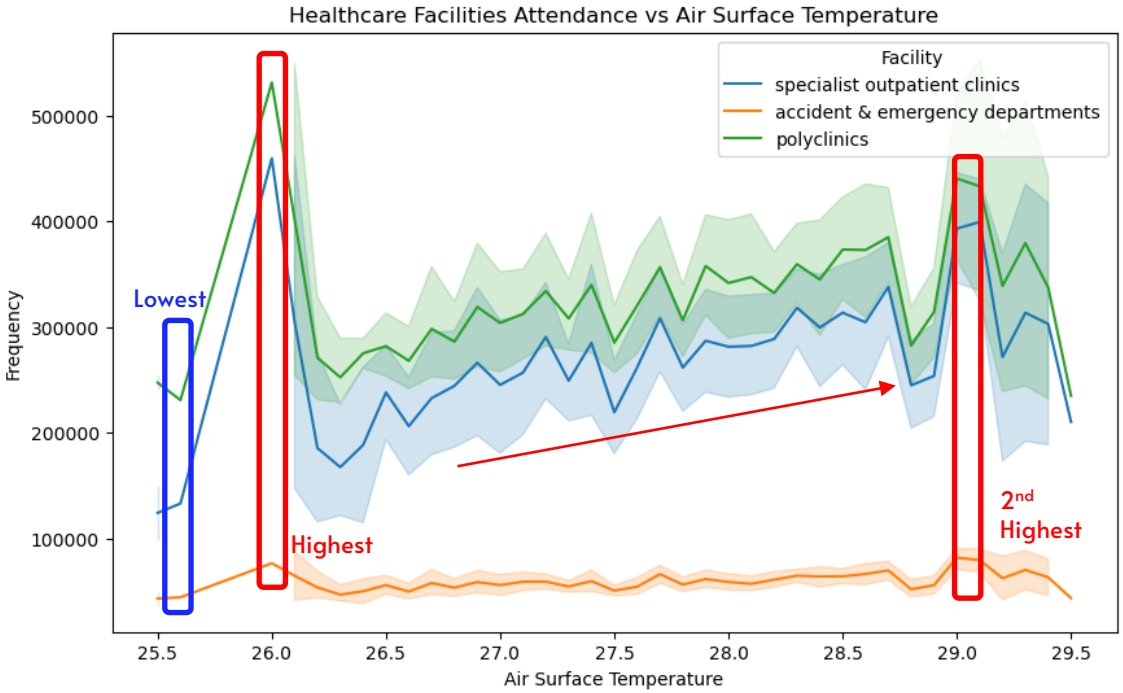
Data estimation based on year 1982 to 2022.

# Healthcare Facilities vs No. of Rainy Day




1. All 3 healthcare facilities have positive correlation with the air surface temperature.

# Healthcare Facilities vs No. of Air Surface Temp.




1. Estimated 25.5°C has the lowest attendance in all healthcare facilities.
2. Estimated 26°C has the highest attendance in all healthcare facilities, but its not considered high temperature.
3. Line trend is going higher from 26.5°C onwards.

# Conclusion

1. The correlation between number of rainy day and attendance of healthcare facilities are positive.
2. The correlation between air surface temperature and attendance of healthcare facilities are positive.
3. November and December have the highest number of rainy days.
4. May has the highest surface air temperature.
5. The months of May, November and December require more healthcare manpower and operating hour of the healthcare facilities