
Climate Trends and its Impact on Workplace Safety Insurance

Eden Ng
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Problem Statement

Presenter:

- Data analyst at an insurance company who is concerned about the climate impact on workplace safety insurance

Audience:

- Actuarial and Marketing team
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Background Research

Studies have explored the relationship between weather and workplace safety and found that climate trends can have an adverse impact on workplace safety and actuarial models.

Example:

- "Hotter temperature increases workplace injuries significantly, causing approximately 20,000 additional injuries per year" (Park et al., 2021)
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Datasets

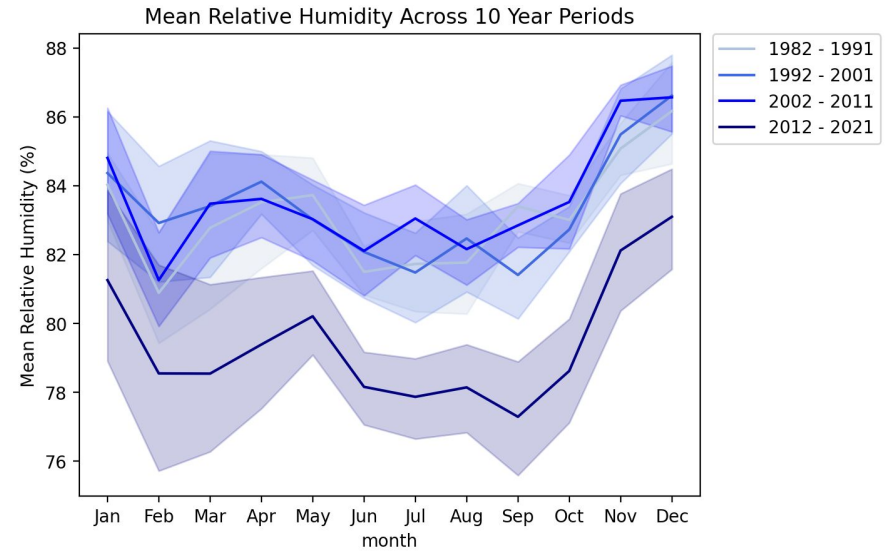
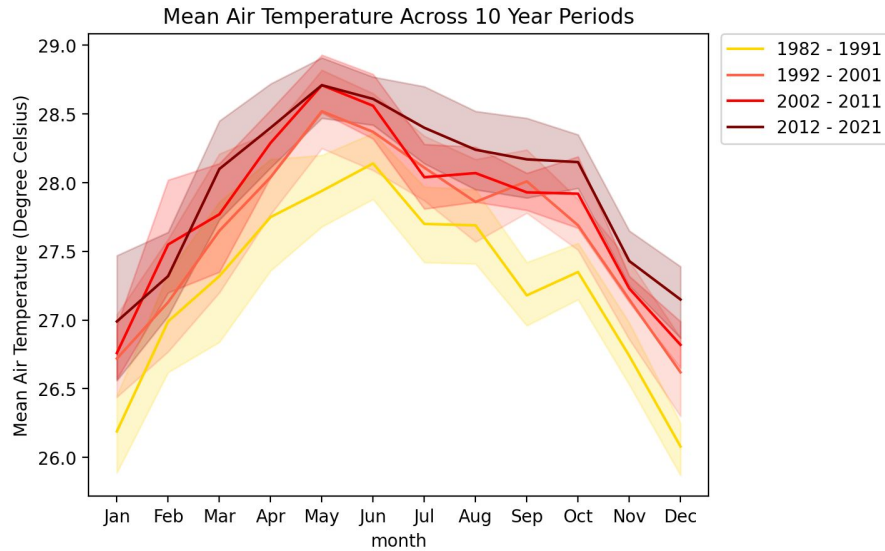
Weather Datasets:

- Data.gov.sg
- 1982 - 2022

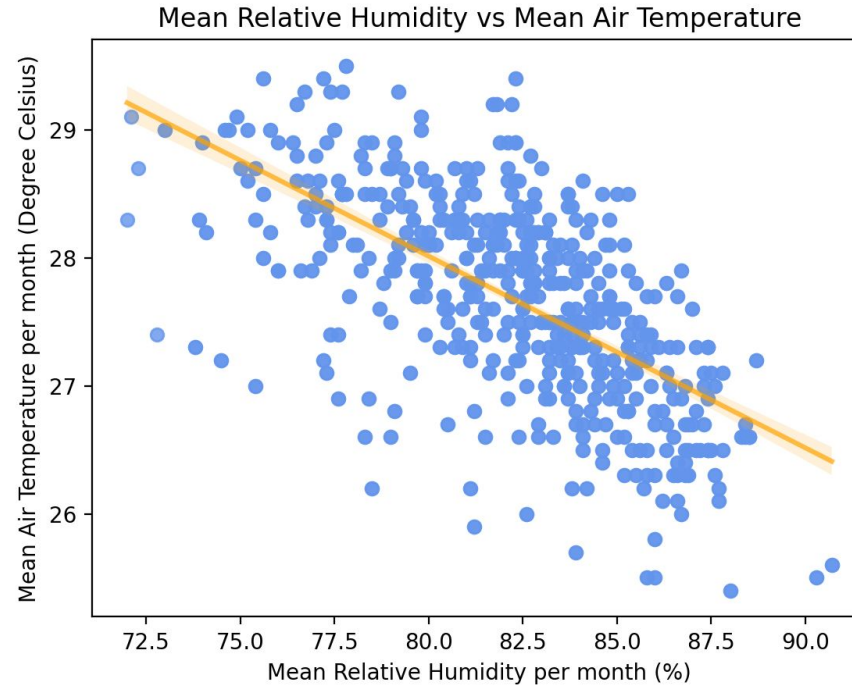
Workplace Accidents Dataset:

- Ministry of Manpower's annual workplace safety and health (WSH) reports.
 - 2015 - 2022
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Climate Trends



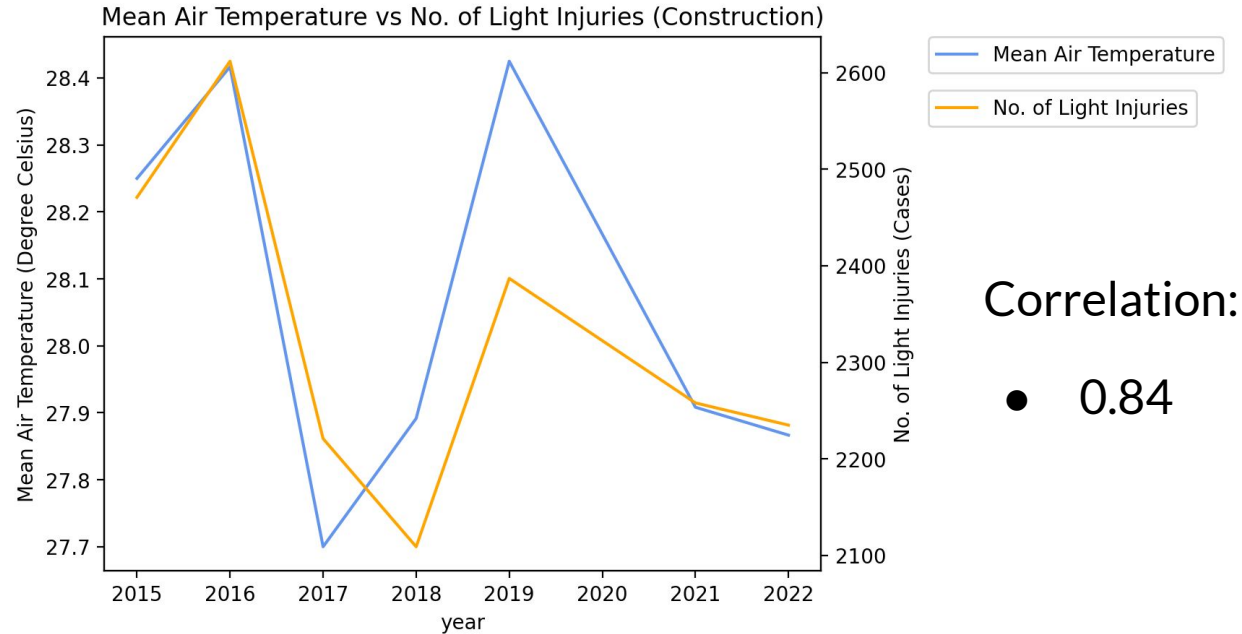
Climate Trends



Correlation:

● -0.63

Correlation between Mean Temperature and Light Injuries (Construction)

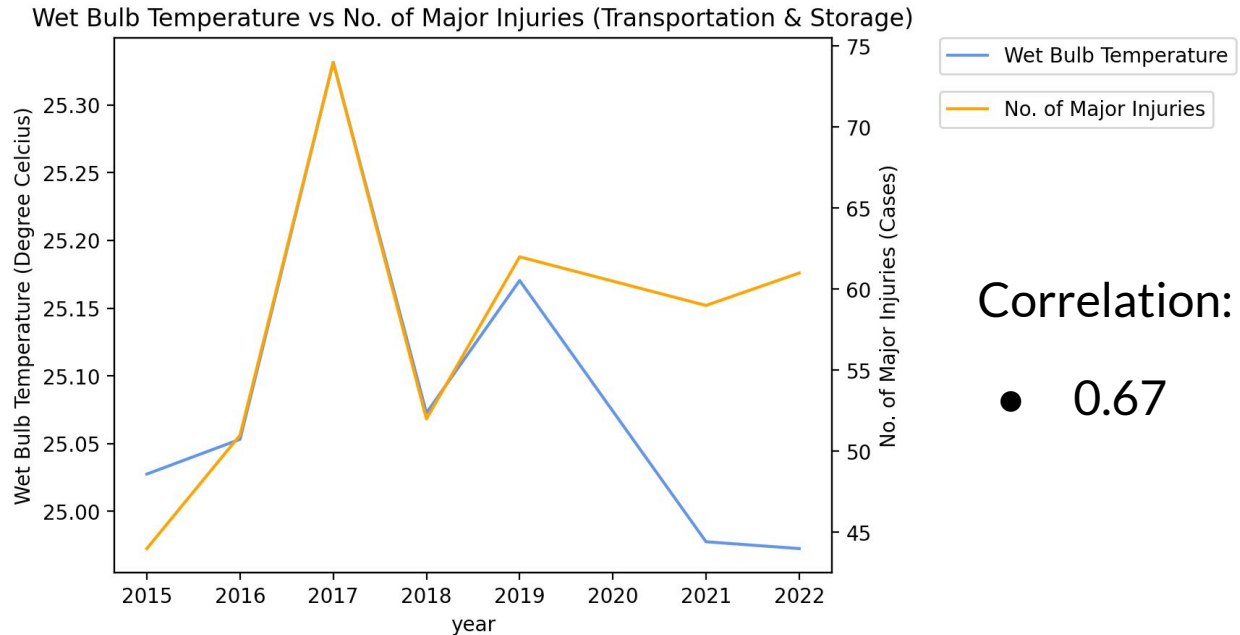


Recommendations

1. Actuarial team should look into adequately accounting for the increase in temperature to their long-term workplace safety pricing models and prevent adverse selection¹ by policyholders (Storey et al., 2019).
2. Develop an Actuaries Climate Index (ACI), which seeks to quantify changes in the climate.

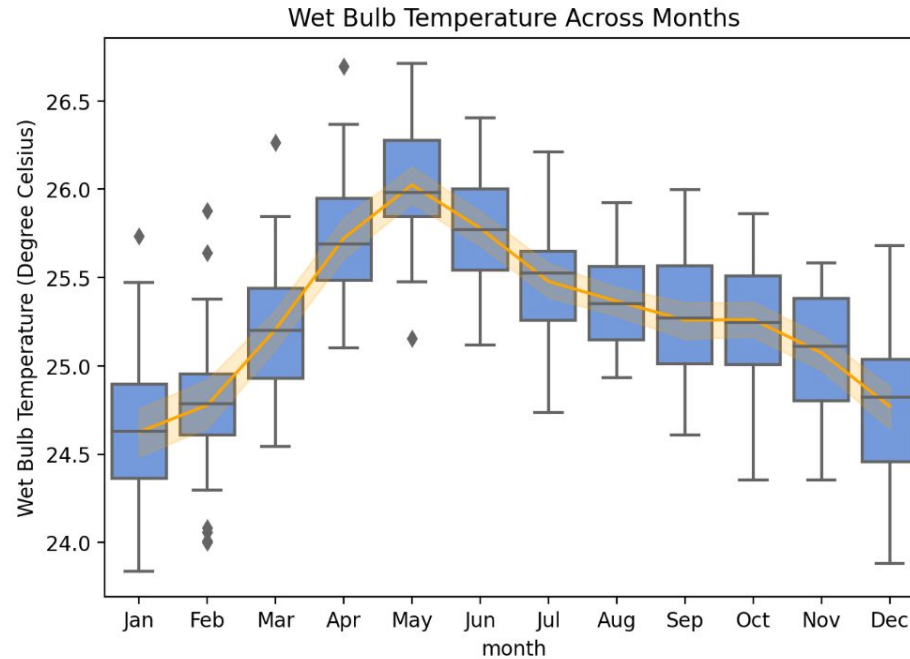
¹ Adverse selection refers to a scenario where either the buyer or the seller has information about an aspect of product quality that the other party does not have. Adverse selection is a common scenario in the insurance sector, where those who are high-risk are more likely to sign up for insurance. (CFI, 2022)

Correlation between Wet Bulb Temperature² and Major Injuries (Transportation & Storage)



² wet bulb temperature mirrors how the human body cools itself with sweat

Wet Bulb Temperature Across Months



Highest:

- Apr to Jul

Lowest:

- Dec to Jan

Recommendations

1. Actuarial team should look into increasing prices for Collision Damage Waiver³ for the months between April and July to prevent adverse selection by policyholders .
2. Marketing team should increase marketing efforts for the months between April and July.

³ a temporary vehicle insurance one can purchase on a monthly basis to cover a large portion of their insurance premiums, typically around 90%, should they get into an accident

Conclusion

Strong correlation between climate trends and workplace accidents

Proactively seek out implications of climate trends to:

- prevent adverse selection
 - improve pricing models
 - gather marketing insights
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Citations

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Park, RJ, Pankratz, N, Behrer, AP (2021) Temperature, workplace safety, and labor market inequality. Discussion Paper Series 14560, IZA Institute of Labor Economics. Retrieved May 25, 2023, from <https://ftp.iza.org/dp14560.pdf>

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Thank You