UMD Data Challenge 2021: DC21006 Executive Summary

Study objective: To explore the Behavioral Changes During COVID-19 dataset provided by the UMD National Center for Smart Growth in order to identify demographic factors affecting changes in everyday routines and present opportunities to promote and sustain positive health behaviors.

Methods: We used R as our analytics software to build three logistic models, regressing variables such as sex, age, employment type, household size, household type, and marital status on whether respondents changed their commute status, method of transportation, or exercise levels as a result of COVID-19 lockdown measures. Backward elimination was conducted to improve the logistic models by removing less significant variables. We also used data visualization for deeper analysis of the relevant variables we identified with those models. The models also incorporate location data from the Smart Location Database to add more context to behavioral changes during the pandemic.

Results: We found that household type and employment status were both significant factors influencing people's transportation mode changes before and during the lockdown; of the 84% of full-time workers who switched to telework, 14.5% reported an increased workload and of the 74% of part-time workers who switched to telework, 28% reported an increased workload. Men, people with some college or associate's degrees, and persons living in multi-family homes were more likely to go out for reasons besides grocery shopping or exercise.

Policy Recommendations: Cities and more densely populated areas might consider implementing policies like dedicated park times for different age groups, or developing IoT linked/enabled applications to facilitate crowd safety and monitoring. Arranging and promoting public park areas for outdoor socially-distanced exercises would benefit those without access to gyms or fitness centers. Employers who prioritize work-life balance, allowing for flexible work hours and scheduling, would likely see positive impacts in the well-being and mental health of their workforce.

Limitations: The demographics of those who responded to our survey were for the most part female, college-educated, childless, employed full-time, and living in single-family homes. We did not have any data on race/ethnicity, employment industry, or socioeconomic levels, which would have been more representative of the general population. In fact, most of our respondents indicated they were telework-ready, so our dataset did not appear to appropriately include the perspective of frontline and/or essential workers. The brief World Health Organization Quality of Life Instrument (WHOQOL-BREF) would have been an especially beneficial tool, providing a more valuable layer of understanding into how the pandemic has impacted quality of life — especially emotionally and psychologically.

Conclusion: As we are facing the short-term and long-term impacts of the continuingCOVID-19 pandemic on the health, economic, and social needs of the public, we should all strive to be guided by quality and inclusive data – seeking to apply it equitably, creatively, and responsibly.

COVID-19 BEHAVIORAL CHANGES DATASET

- **Methodology**:
  - R tidyverse library for data cleaning
  - Logistic models incorporating SLD location dataset
  - Bar charts (stacked & non-stacked)
- **Findings**:
  - Transportation mode changes by employment status
  - Exercise changes by household type, road density, kids
  - Non-essential travel changes by sex and household type
- **Takeaways**:
  - Innovative policies to promote and sustain positive health behaviors
  - Strive for quality data and inclusive representation