Coleman, C. J., Yeager, R. A., Pond, Z. A., Riggs, D. W., Bhatnagar, A., & Pope, C. A. (2022). Mortality risk associated with greenness, air pollution, and physical activity in a representative U.S. cohort. *Environmental Health Perspectives*, *130*(8), 085001. https://doi.org/10.1289/EHP9408

Definitions

- **Greenness (NDVI):** A measure of the amount of green vegetation in an area.
- **PM2.5:** Tiny particles in the air that are 2.5 micrometers or smaller, which can be harmful when inhaled.
- **Physical Activity:** Any movement that requires energy, including exercise and everyday activities.
- **Mortality Risk:** The risk of death from any cause.
- **Cox Proportional Hazard Models:** A statistical method used to examine the association between the risk of an event (e.g., death) and various factors.

Key Findings

- High levels of PM2.5 air pollution are linked to an increased risk of death.
- Physical inactivity significantly increases the risk of death.
- Greenness (NDVI) did not show a strong direct association with mortality risk.
- The harmful effects of PM2.5 are lessened in areas with high levels of greenness.
- High physical activity modifies the effects of both PM2.5 and greenness on mortality risk.

Introduction

The study investigates how living in green areas, exposure to air pollution, and physical activity affect the risk of death. It aims to understand if being in greener environments can reduce the negative impacts of air pollution and physical inactivity on health.

Main Content

Background

Living in areas with more green spaces is believed to improve health by encouraging physical activity and reducing stress. Air pollution, on the other hand, is known to harm health. This study looks at how these factors together influence the risk of death in a large group of U.S. adults.

Objectives

The study's main goals were to assess how greenness, air pollution, and physical activity independently and together affect mortality risk and investigate if there is any confounding or modification of these effects by the other factors.

Methods

- **Participants:** Data were collected from 403,748 U.S. adults surveyed between 1997 and 2014.
- **Data Collection:** Greenness was measured using NDVI, and air pollution was measured using PM2.5 levels. Participants' physical activity levels were also recorded.
- **Analysis:** Cox proportional hazard models were used to analyze the data and calculate the risk of death associated with greenness, air pollution, and physical activity.

Results

- **Greenness:** No strong direct link was found between greenness and mortality risk. However, greenness helped reduce the harmful effects of PM2.5.
- **PM2.5:** Higher levels of PM2.5 were associated with a higher risk of death. This association was lessened in areas with more greenness.
- **Physical Activity:** Physical inactivity was linked to a higher risk of death. High levels of physical activity reduced the risk associated with PM2.5 and were beneficial regardless of greenness levels.

Conclusion

The study concludes that living in greener areas can help mitigate the negative health effects of air pollution. Physical activity also plays a crucial role in reducing mortality risk. Public health strategies should promote both greener living environments and increased physical activity to improve overall health and reduce mortality risk.

Word Count: 459