

The Impact of Car Color on Vehicle Lifespan in the UK

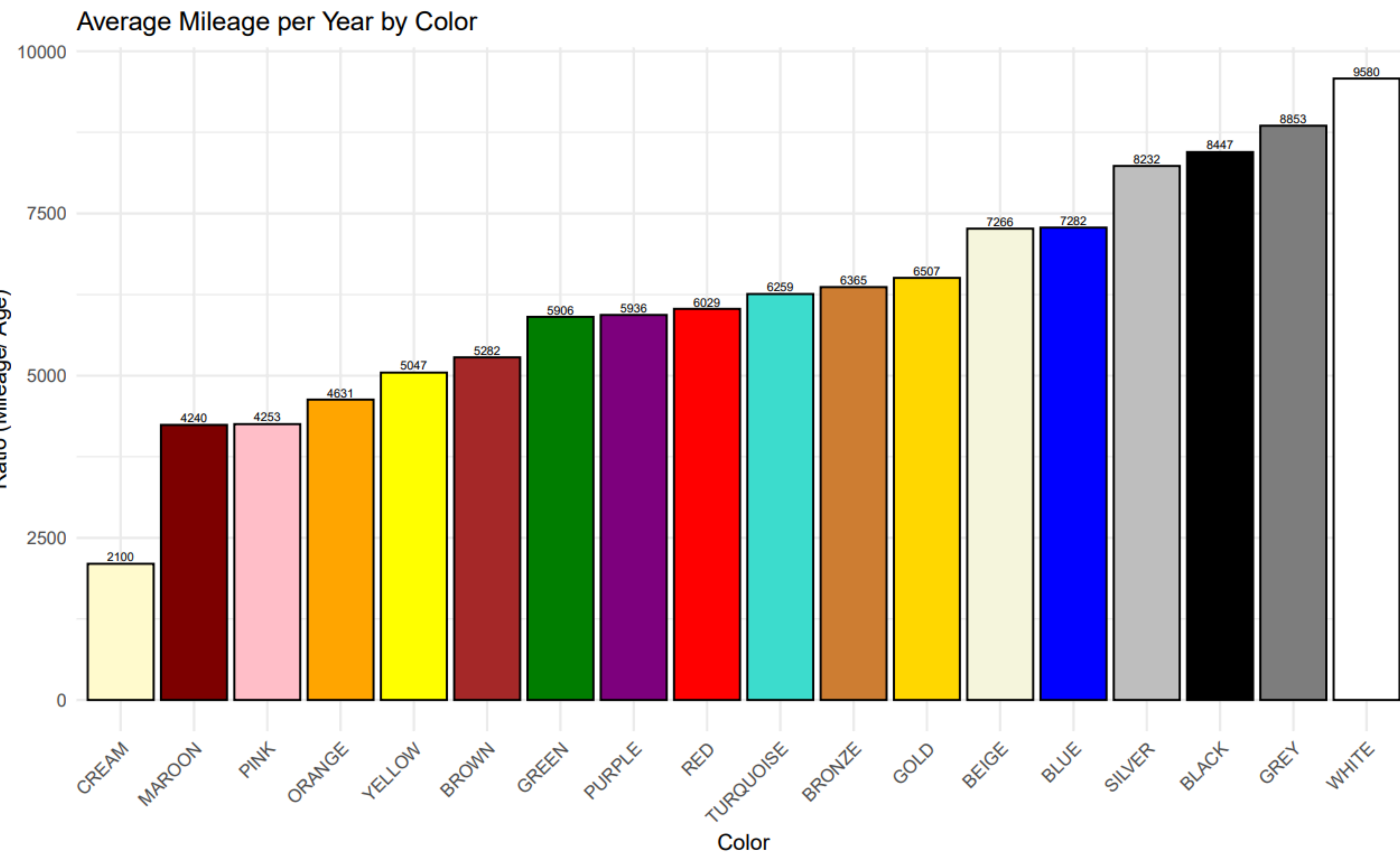
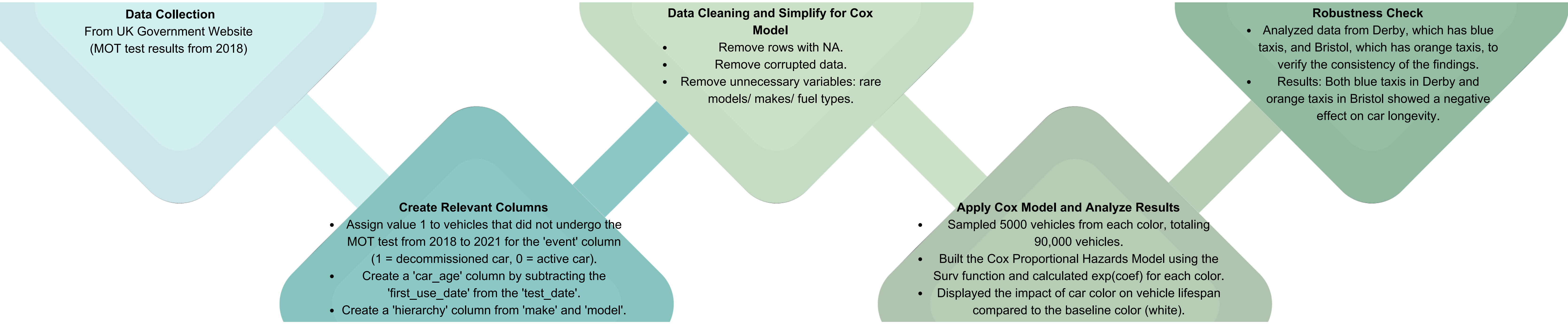
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INTRODUCTION

This research investigates how car color affects vehicle lifespan in the UK, using data from 24 million vehicles' MOT (Ministry of Transport) test results. By employing a Cox proportional hazards model, a type of survival analysis model, the study isolates the impact of car color, finding that unusual colors often lead to longer lifespans, likely due to better maintenance from sentimental value.

WORK-FLOW CHART



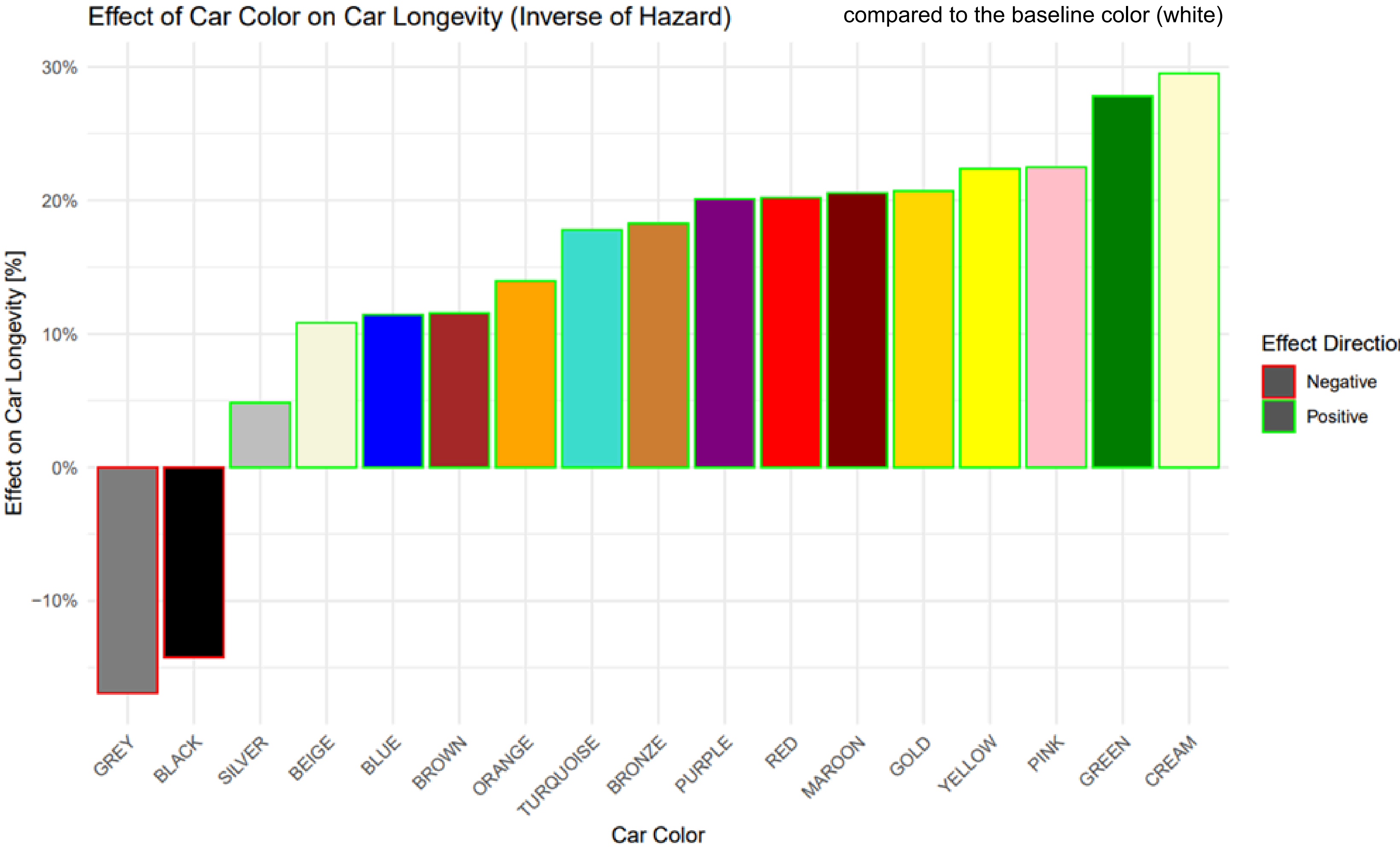
ANALYSIS

- Statistical Results:
 - Cox Proportional Hazards Model:
 - The hazard ratio (HR) is a measure used in survival analysis to compare the risk of an event occurring (in this case, vehicle decommissioning) between different groups (car colors). An HR less than 1 indicates a lower risk (better longevity), while an HR greater than 1 indicates a higher risk (shorter longevity).
 - The impact on car longevity is calculated as 1-HR.
 - Significant findings include:
 - Cream (HR = 0.71), Green (HR = 0.73), Pink and Yellow (HR = 0.75) – indicating a **positive** effect on car longevity of 29%, 27%, 25% respectively.
 - Black (HR = 1.17), Grey (HR = 1.14) – indicating a **negative** effect on car longevity of 17%, 14% respectively.
- Visual Analysis:
 - Effect of Car Color on Car Longevity:
 - Graph showing the effect of different car colors on vehicle longevity (inverse of hazard).
 - Highlight: Cream, Green, Pink, and Yellow colors show the highest positive effect on car longevity, whereas Grey and Black show negative effects.
 - Average Mileage per Year by Car Color:
 - The graph shows the average mileage per year for each car color.
 - Contribution to Cox Model Results: The average mileage graph helps to explain the findings of the Cox model. Colors with higher longevity often have lower average mileage, suggesting that vehicles with unusual colors are used less frequently and maintained more diligently due to sentimental value. Conversely, common colors with higher average mileage are associated with shorter lifespans, likely due to higher usage and less meticulous upkeep.

OBJECTIVE

The aim of this research is to determine how different car colors affect vehicle lifespan. By identifying the correlation between car color and longevity, the study seeks to understand the role of maintenance and sentimental value in extending vehicle life, contributing to sustainability efforts by promoting reduced waste and resource consumption.

COX MODEL RESULTS



COX MODEL - CODE IN R

```
surv_obj <- Surv(time = dfSample$car_age, event = dfSample$event)
cox_model <- coxph(surv_obj ~ colour + hierarchy + fuel_type + postcode_area, data = dfSample)
summary(cox_model)
```



CONCLUSION

This study reveals that car color significantly affects vehicle lifespan. Cars with unusual colors tend to last longer due to better maintenance driven by sentimental value. Conversely, common colors are associated with shorter lifespans, likely due to higher usage and less meticulous upkeep.

These findings can guide consumers in choosing car colors for better durability, inform marketing strategies for manufacturers, and encourage policymakers to develop maintenance incentive programs. Further research should explore the psychological factors behind these maintenance behaviors to enhance vehicle longevity practices.

Key References

UK Government MOT Test Data (2018-2021)
Cox, D. R. (1972). Regression Models and Life-Tables. Journal of the Royal Statistical Society, Series B (Methodological), 34(2), 187-202.