

Geographical Accessibility of Interventional Radiology Clinical Trials

Nathan Ji, BS; Dany Alkurdi, AB; Josh Kim, BS; Arvind Sommi, BS; Ezdean Alkurdi, BS; Kirema Garcia-Reyes, MD

Introduction

- Interventional radiology (IR) is rapidly expanding, yet equitable participation in clinical trials remains limited
- Geographic and demographic disparities in access may undermine representation and trial validity. This study evaluates trends in accessibility of IR clinical trials across urban–rural settings and racial groups in the United States

Objective: To evaluate trends in accessibility of IR clinical trials across urban–rural settings and racial groups in the United States

Methods

- Retrospective analysis of U.S.-based IR clinical trials registered on ClinicalTrials.gov (2005–2024).
- Trial site ZIP codes were linked to U.S. Census Bureau demographic and geographic data
- Distances from census ZIP codes to the nearest trial site were calculated using geospatial methods.
- Accessibility was compared across Rural–Urban Commuting Area (RUCA) categories and racial groups using regression models and independent t-tests

Figure 1: Trend Analysis of Number of Trials and Distance to Trials

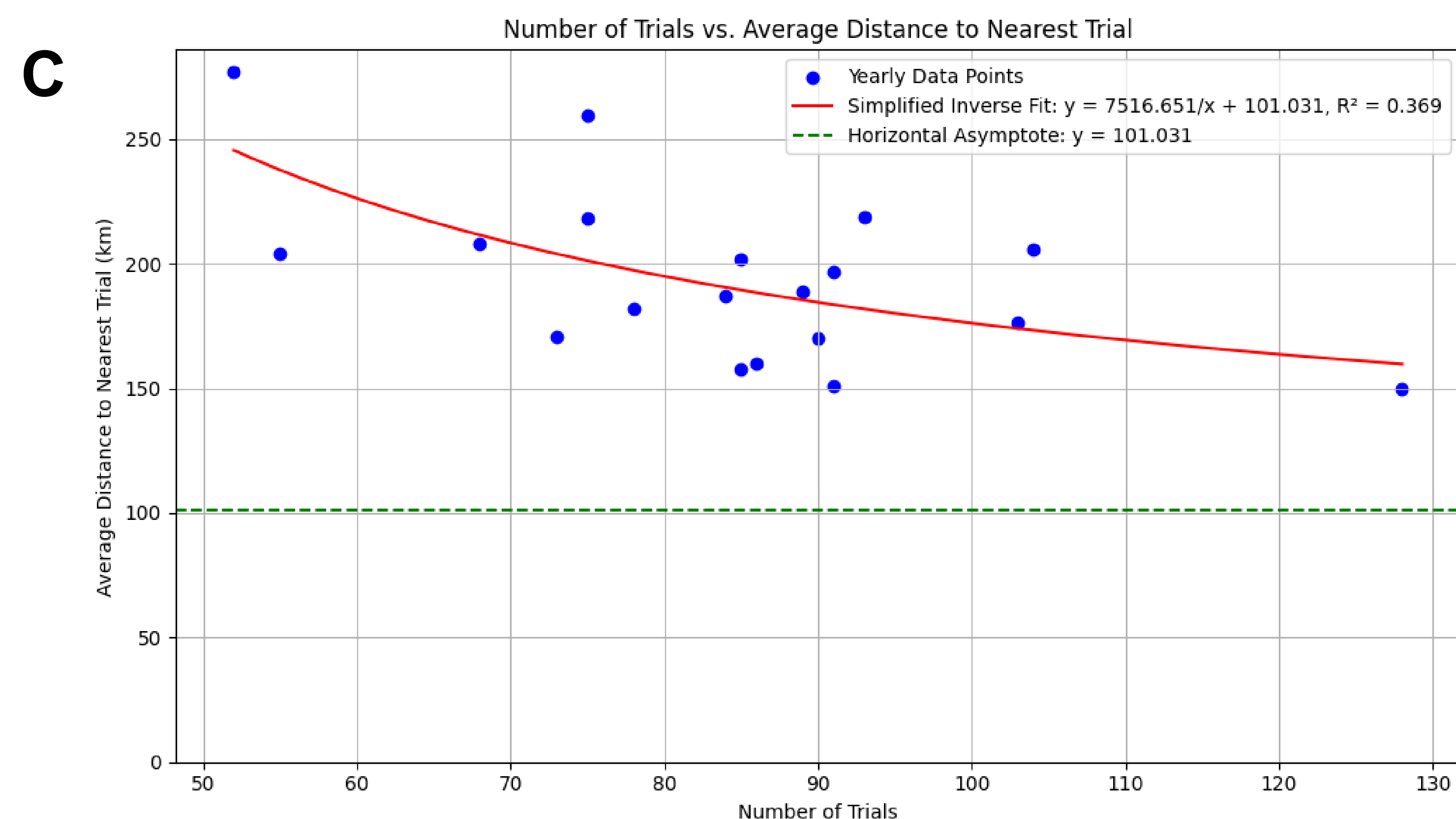
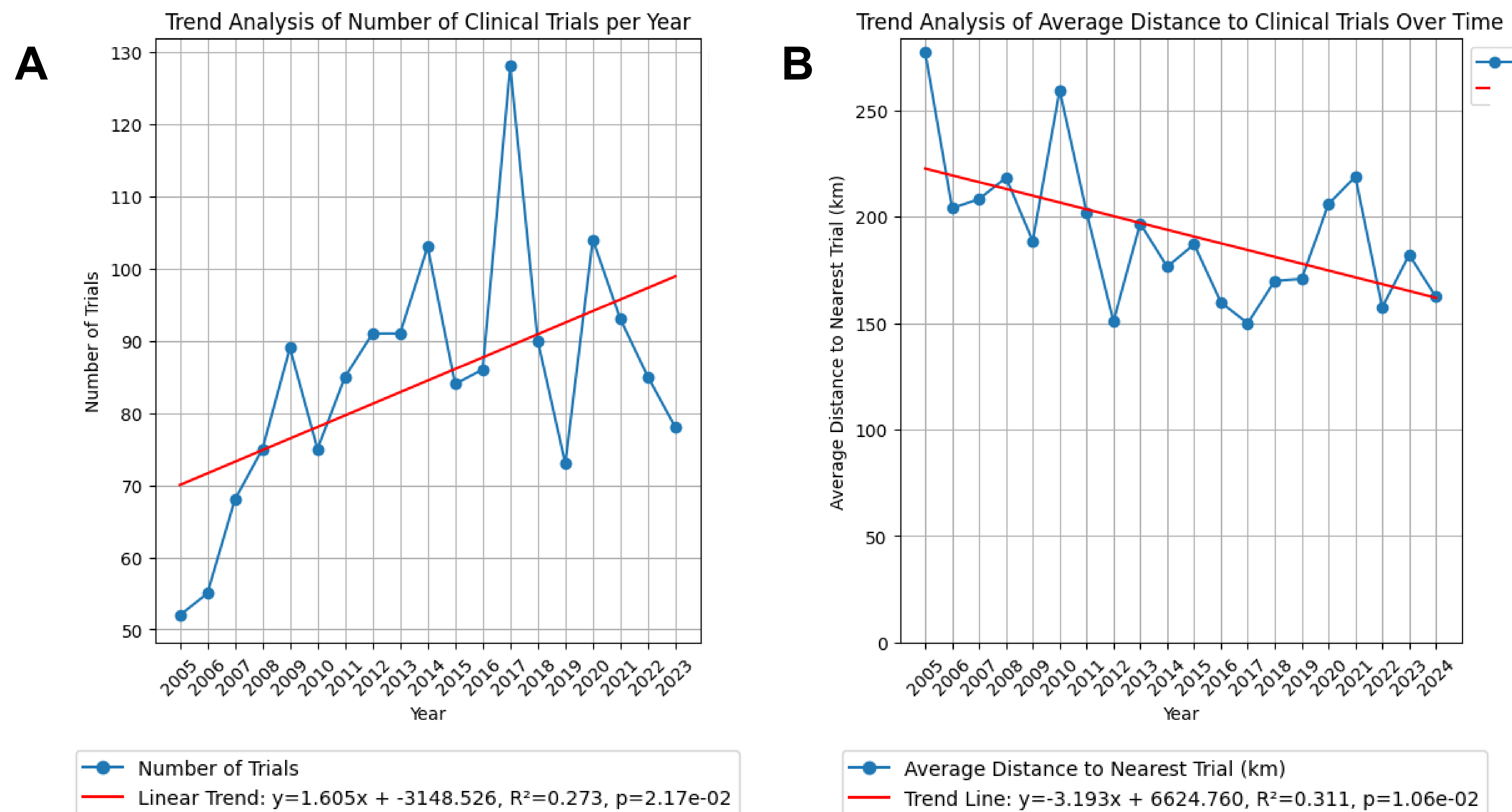


Figure 2: Average Distance to Nearest Trial by RUCA Category

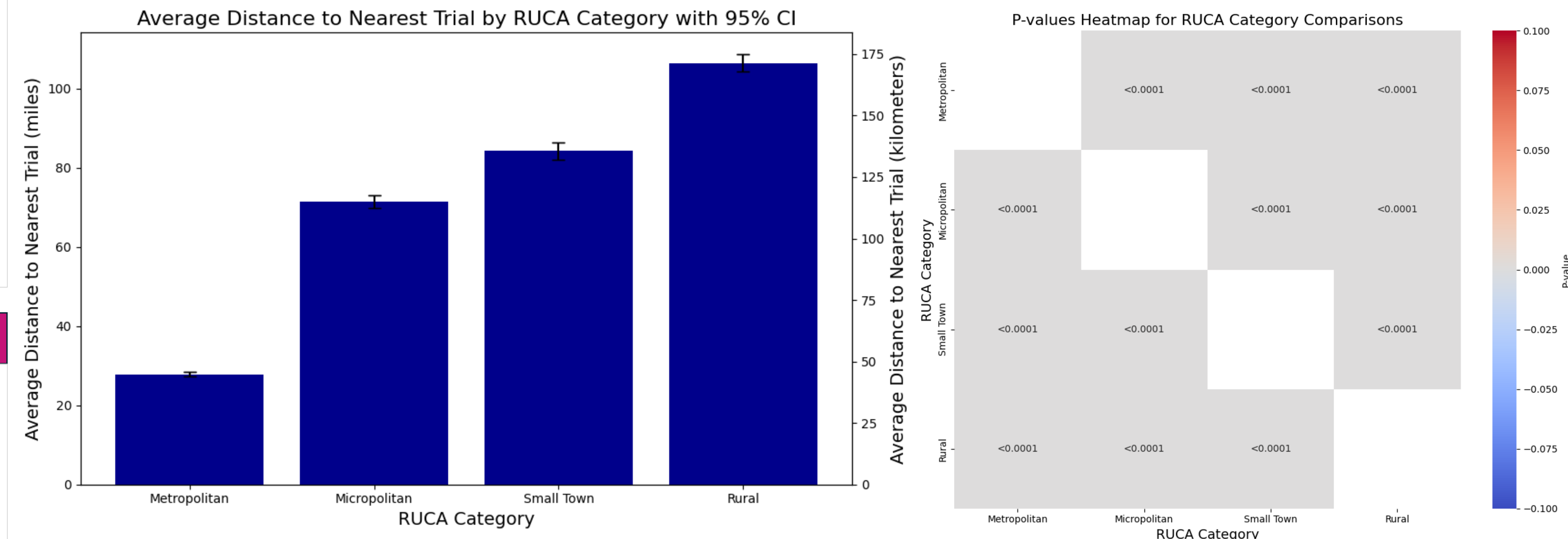
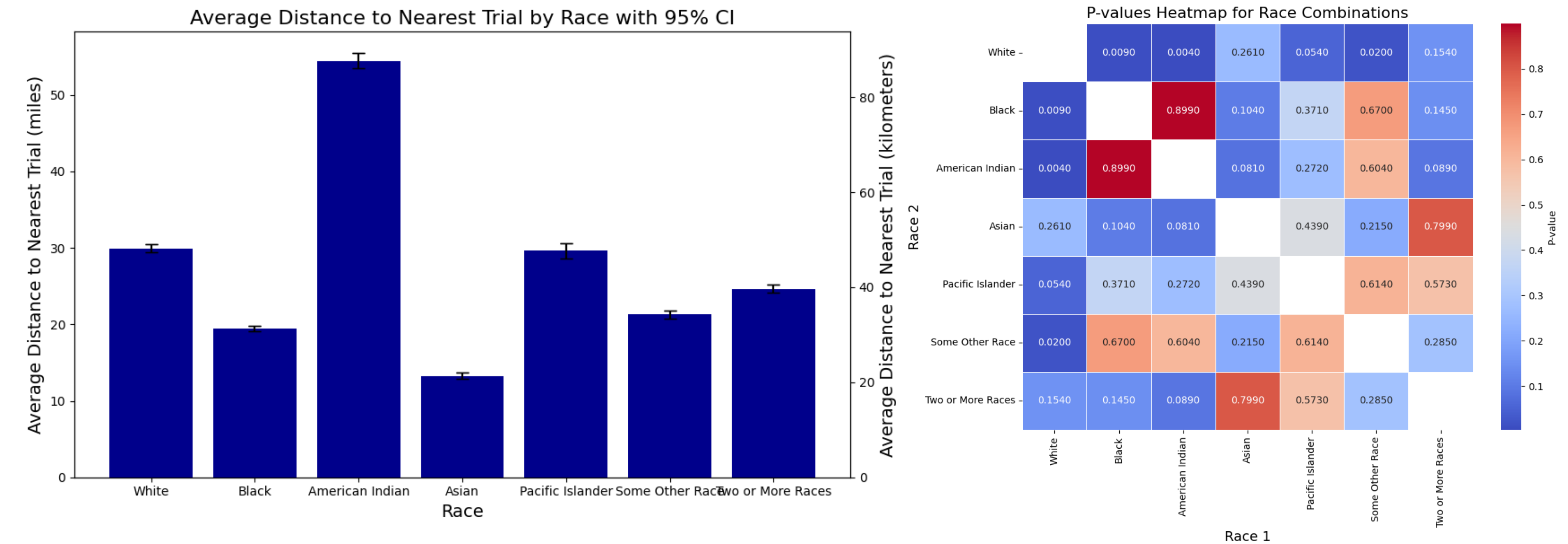


Figure 3: Average Distance to Nearest Trial by Race



Results

- A total of 1,828 trials across 542 ZIP codes were included
- Trial availability increased modestly over time (slope = 1.6 trials/year, $p = 0.022$, Figure 1A)
- Average distance to the nearest trial decreased by 3.19 km/year (slope = -3.2 km/year, $p = 0.011$, Figure 1B)
- Number of trials correlated weakly with average distance to nearest trial (Figure 1C)
- Metropolitan residents lived within ~50 km of a trial site, compared with >110 km for rural residents (all RUCA comparisons, $p < 0.0001$, Figure 2)
- Asian race was associated with the shortest distances (16 km in metropolitan areas), while American Indians race was associated with the greatest (>160 km across all RUCA categories). Pairwise comparisons showed significance for White vs. Black ($p = 0.0090$), Whites vs. American Indian ($p = 0.0040$), and whites vs. other races ($p = 0.0200$). (Figure 3)

Conclusions

- While the number of clinical trials and overall accessibility have improved, inequities persist for rural residents and American Indian populations
- Race and geography jointly influence access burdens, underscoring the need for trial expansion beyond academic centers into community and private practice settings
- Strategic trial placement is essential to ensure equitable participation and representation in IR research