TRANSFORMING ZIP CODE AREAL DATA TO A UNIFORM GRID STRUCTURE: THE CASE OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN CALIFORNIA

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We examine the geographic distribution of chronic obstructive pulmonary disease (COPD) in California for the years 1993 and 1999 using a novel method of spatial modeling that takes typical zip code data and transforms such data into a uniform geographic grid, improving comparability and consistency. Using this method we analyze the relationship (comparing 1993 and 1999 data) between COPD, hospitalization charges and SES and smoking measures across geographic areas while controlling for spatial confounding. 2260 areal units analogous to zip code areas in California were examined for COPD charges (from 1993 and 1999 hospital discharge data). Population characteristics were assessed using 1990 and 2000 Census data. After controlling for spatial auto-correlation positive relationships were found (for both 1993 and 1999) for age, Hispanic ethnicity, tobacco outlets and smoking. Negative relationships were found for percentage with bachelor degrees and income. When comparing hotspot zip codes (those with higher than expected model based COPD hospitalization charges) to all other zip codes, we found higher percentage African American, percentage Hispanic, percentage foreign born and percentage female head of household, lower income and lower number of tobacco outlets. Corresponding maps will also be presented. Conclusion: The high levels of COPD hospitalization counts in zip codes with relatively lower income and education as well as higher percentages of people of color and immigrants is cause for concern. The uniform grid approach allowed for relatively simple comparison across time and was found to efficiently handle spatial autocorrelation.