



THE UNIVERSITY OF CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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Disease Mapping US Mortality

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Jones 304, 5747 S. Ellis Avenue

ABSTRACT

In a spatial analysis of mortality in the US, this paper examines county-level, demographic-specific mortality rates from 1968 to 1978. A key goal is to create maps of the US wherein counties are colored according to the value of some mortality index. The analysis constructs a mortality index in two stages. First, standardized mortality ratios (SMR) are calculated to remove the influence of county demographic composition from observed rates. Next, the analysis develops a linear model with spatially autocorrelated random effects for the SMR. The final index is taken to be the empirical Bayes estimates for the spatial random effects, which improve upon the SMR by decreasing variance in low-population areas. Each step includes exploratory procedures to check assumptions and prevent the introduction of statistical artifacts. Finally, the paper discusses spatial patterns in the final disease map and their interpretation.