We propose a Bayesian factor analysis model to rank the health of United States counties. Mortality and morbidity variables empirically contribute to the resulting rank, and population, spatial correlation, and missing data are incorporated into a measure of uncertainty. Our approach improves on the widely-applied County Health Rankings (CHRs) by using data-derived rather than assigned factor weights, and by quantifying uncertainty to allow for the assessment of whether differences in rankings are statistically meaningful. We illustrate our model's potential by applying it to the CHRs. data from two states, Texas and Wisconsin. The CHRs. methodology was originally designed for Wisconsin, a state with relatively comprehensive data for the underlying mortality and morbidity variables. We also examine Texas because it has the most counties of any state and a relatively high frequency of missing data. Our estimated rankings are much more similar to the CHRs for Wisconsin than Texas, as
the data-derived factor weights are closer to those assigned by the CHRs for Wisconsin. Sizeable uncertainty is evident for both states, but becomes quite severe in Texas once the model incorporates noise from imputing missing data. Indeed, it is not possible to reach clear conclusions for most of the counties in Texas because of the large amount of uncertainty. A few counties, generally in eastern Texas, can nonetheless still be precisely identi.ed as being among the least healthy in the state. These results suggest that computing comprehensive county health rankings for all 50 states might be overambitious given data limitations. States that rely heavily on imputed data might therefore be better served by focusing on the counties that can be classified as among the least healthy even after incorporating all sources of uncertainty.