



Towards Expressing Statistical Uncertainty in Rankings Based on Sample Survey Data from Six National Statistical Agencies

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National statistical agencies release estimates of various quantities (e.g., average income) for sub-national governmental units (e.g., states, provinces,...) based on probability sample surveys, often showing uncertainty in each estimate using standard errors, coefficients of variation, or confidence intervals. Few national statistical agencies release “explicit” rankings of their governmental units (e.g., from smallest to largest) based on values of the estimates. Some agencies do two-sample tests to determine statistical differences between units in the rankings by appealing to normal theory. When units are not ranked but rather listed alphabetically or geographically in a table along with estimates, the data user will frequently do an “implicit” ranking by ordering based on the values of the estimates. In fact, by putting these estimates in the same table, the national statistical agency is encouraging comparisons that lead to these implicit rankings which often have no accompanying statistical measures of uncertainty for these comparisons performed by the users. In this talk, we present some methods (Wright, Klein, and Wiecek, ISI-2013) based on comparing pairs of units using normal theory and using the bootstrap in an attempt to convey uncertainty in the rankings. These methods are applied to data from six nations (Australia, Brazil, Israel, Korea, Sweden, and United States). Discussants from most of these nations will comment on the concepts, the theory, and the appropriateness of applying the methods to their data.

Keywords: Bootstrap; Comparisons; Normal Theory; Ranks; Visualizations.