

Policy Commentary: Regulatory Science Measurement Issues of Skewness, Dichotomization of Data, and Nominal versus Ordinal Data Measurement

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The purpose of this policy commentary is to provide some context for regulatory scientists in pursuing regulatory policy analysis, especially as it relates to regulatory compliance and human service licensing data. Regulatory scientists have dealt with non-parametric data in the past but in dealing with regulatory compliance and human service licensing data are just so different from previously measured data in that the nature of the data is nominal and extremely skewed to the point that several adjustments need to be made in order to analyze the data.

Although the examples being referred to in this policy commentary are from the human services field and discipline, I am certain that many of the basic concepts presented will pertain to other disciplines and fields of study that are impacted by regulatory science. These concepts are not unique to a particular discipline but rather are unique to regulatory science which has particular parameters, concepts, and truths which are pertinent to how regulations/rules/standards are formulated and then implemented in various jurisdictions or disciplines.

There are very logical reasons why regulatory compliance and licensing data are so extremely skewed. These data represent compliance with basic health and safety rules and regulations

which provide the basic safeguards for children, youth, and adults while being cared for in a form of human services, such as child care, youth residential, or adult assisted living care.

Very honestly a state agency would not want to find their regulatory compliance data being normally distributed because this would be an indication that the facilities were in low compliance with the state's rules and regulations. Having the regulatory compliance data be highly negatively skewed is actually a good result from a public policy standpoint but not from a statistical analytical standpoint. Having 50-60% of your scores within a three-to-five-point range when there may be as many as 300-400 data points leaves very little variance in the data. It also leads to being very difficult to distinguish between the high performers and the mediocre performers. This finding has led to a theory of regulatory compliance in which substantial compliance but not full compliance with all rules and regulations is in the best interests of the clients being served (Fiene, 2019).

In the regulatory science field, this has led to public policies emphasizing substantial compliance in order to be a licensed human service facility, such as a child care center, youth residential program, or an adult assisted living center. The other aspect of regulatory compliance and licensing data for regulatory scientists to consider is that the data are nominal in measurement, either a facility is in compliance or out of compliance with a specific rule or regulation. There are no gray areas, no measurement on an ordinal scale.

There has been some discussion in the regulatory science field for the use of weighted risk assessment methodologies which could introduce more variance in the data based upon the assumption that all rules or regulations are not created equal nor are they administered equally

(Stevens & Fiene, 2019). Another discussion revolves around the introduction of more program quality into the basic health and safety rules and regulations that could extend the nominal compliance determination to an ordinal scale that goes beyond the basic compliance level (Fiene, 2018).

These measurement idiosyncrasies of regulatory compliance and licensing data are presented for regulatory scientists to consider if they begin to analyze public policies that involve basic health and safety rules and regulations which are very different from other public policies being promulgated by state and national governments. For the interested reader, an international data base for regulatory compliance and human services licensing data has been established and maintained by the Research Institute for Key Indicators and Penn State University over the past 40 years at the following URL - (<http://RIKinstitute.com>)

However, the hope is that other disciplines will begin to look at their data more closely to determine the natural data distributions and ascertain if they are equally as skewed as has been found in human service regulatory data. Are you measuring the data at a nominal level? Could they be measured at an ordinal level based upon a Likert scale? The data being referred to are regulatory compliance data which are pegged to specific rules/regulations/standards. It is not based upon other types of data collected within a regulatory frame of reference, such as basic demographic or descriptive data.

References

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Stevens & Fiene (2019). *Risk Assessment and Licensing Decision Making Matrices: Taking into Consideration Rule Severity and Regulatory Compliance Prevalence Data*. Seattle, Washington: Department of Children, Youth, and Families. (doi: 10.13140/RG.2.2.22811.11046)