



Use and Misuse of Statistics in Management and Social Science Research

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ABSTRACT

Scientific forecasting plays a vital role in research and management of a large number of fields. Scientific forecasting is based on mathematical and statistical modeling. Mathematical models are deterministic. A deterministic model is one in which every set of variable states is uniquely determined by parameters in the model and by sets of previous states of these variables. Deterministic models are not associated with any randomness; conversely statistical models are associated with the randomness. As such, statistical models have become more prominent in prediction, control and optimization in the fields of; Agriculture, Medicine and Healthcare, Meteorology, Engineering, Biological Sciences, Management, Economics, Finance and Social Sciences. Statistics is a science concerned with uncertainty in real life. It involves in developing and studying methods for; collecting, analyzing, evaluating, interpreting and presenting information. Yet, most of the studies are not really benefited from statistics due to misuse. A misuse of statistics is a pattern of unsound statistical analysis. It can be a result of; mistakes or negligence, lack of statistics knowledge or purposive. Statistics is divided into two main parts; Descriptive Statistics and Inferential Statistics. In descriptive statistics, sample data are analyzed by measures of location and measures of dispersion. This part of the analysis leads to inferential Statistics, which generalizes statistical findings to population. Hence, reliability of inferences highly depends on the sample statistics. In other words, poorly estimated sample statistics leads to unreliable inferences. As such, using proper techniques in data collection and data analysis are equally important. For example, if the data are not from a random sample, then the descriptive statistics become biased estimates for population parameters; probability estimates become unrealistic and so on. Unfortunately, this is the mostly reported misuse in Management and Social Science studies. Misinterpretation of measurement scales of data is another common practice among researchers. For instance, if the measurement scale is ordinal, then the sample mean and the sample standard deviation are not appropriate measurements, yet they are the blindly used techniques. Testing model assumptions, validation and verification are a must in model based analysis, but are ignored. Amidst all, “P-Value hacking” is the most crucial. Whether the root cause for misusing statistics is negligence, lack of knowledge or any other, the outcome of it is not different. Hence the possible damage to the society is same. Therefore, it is essential to pay attention on stopping misuse of statistics.

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