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"Decision Support for Biosurveillance"

The U.S. Department of Health and Human Services is interested in developing and implementing a Minimum Data Set (MDS) for national biosurveillance. The MDS would enable simultaneous data access to local, state and federal public health entities. Currently there is no formal method for selecting data elements for inclusion in the MDS. In addition, it is unclear how to evaluate the value of the MDS once it is identified or to support modifications to it once it is implemented. In this talk, we propose a multi-attribute utility model for prioritization of data elements contained in health information systems for use in the MDS. When applied, the model is capable of prescribing an MDS to maximizes value, evaluating value once implemented and prescribing changes to the data set. The focus of the model is on time-critical public health biosurveillance, where the objectives are to acquire *relevant* data, that have *integrity* (are not missing and are free from coding error), and that are *timely*, maximize time to prevent or limit disease spread. We show that if two preference conditions are satisfied, then simple tradeoff exercises may be used to value data elements. These preference conditions are: 1) risk neutrality - the public health practitioner seeks to maximize the aforementioned objectives in the context of risk and 2) the 'Zero Condition' – preferences are equal between acquiring any two data elements for surveillance when a single objective is not met for both elements (e.g., elements have no relevance to task). Models that relax the risk neutrality assumption are also illustrated. Finally, we report results of a study employing as respondents 23 public health practitioners drawn from health jurisdictions throughout the State of Washington. We elicit utilities for common data elements and evaluate practitioner attitude toward risk in an outbreak management scenario.

Dr. Jason Doctor is Associate Professor of Pharmaceutical Economics and Policy at the University of Southern California's (USC) School of Pharmacy. Dr. Doctor received his Ph.D. in clinical psychology from the University of California at San Diego. He served as a research fellow at the University of Washington. Prior to coming to USC this year, Dr. Doctor was an Associate Professor of Medical Education & Biomedical Informatics, Health Services and Rehabilitation Medicine at the University of Washington. His primary research interests is the application of decision theory to medicine and health policy. He has conducted research on a wide variety of topics including how best to represent preferences for health outcomes in pharmaceutical and health economic studies, application of Bayesian belief networks for evaluation of treatment selection, prognosis and error detection in clinical medicine. And application of decision support strategies in public health disease surveillance.

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