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Implications of big data analytics on population health management

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As healthcare providers transition to outcome-based reimbursements, it is imperative that they make the transition to population health management to stay viable. Providers already have data assets in the form of electronic health records and financial billing systems. Integrating these disparate sources together in patient-centered datasets provides the foundation for the application of probabilistic clustering (mixture modeling) to better understand their patient populations. These models are the core technology to compute and track the health and financial risk status of the patient population being served. We show how the probabilistic formulation allows for straightforward, early identification of a change in health and risk status. Knowing when the patient is likely to shift to a less healthy, higher risk category allows the provider to intervene to avert or delay the shift. These automated, proactive alerts are critical in maintaining and improving the health of a population of patients. We discuss results of leveraging these models with an urban healthcare provider to track and monitor type 2 diabetes patients. When intervention outcome data are available, data mining and predictive modeling technology are primed to recommend the best type of intervention (prescriptions, physical therapy, discharge protocols, etc.) with the best likely outcome.

Biography

Paul Bradley is currently working as a Chief Data Scientist, ZirMed, Chicago, IL. He has completed his PhD in Computer Sciences from the University of Wisconsin in 1998 on Mathematical Programming Approaches to Machine Learning and Data Mining. His research work centers upon applying mathematical programming techniques to clustering, classification and regression problems; and issues involved when scaling these methods to large databases. His recent work focuses on application of statistical and predictive modeling technology to business problems, delivering results to business decision makers, and integrating predictive modeling technology with database systems. He has worked with MethodCare, Inc., Apollo Data Technologies, LLC, Seattle, WA, digiMine, Inc., Bellevue, WA Microsoft Research. He is a peer reviewer for many Journals related to Big Data and also served as an Organizing Committee Member for international conferences related to Big Data.

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