

## Personalized Medicine, Optimal Treatment Strategies, and First Do No Harm: Time Varying Treatments and Big Data

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Enormous computerized data bases are available that contain medical information on millions of Americans. The hope is that these data bases can be mined to discover new causes of disease, to determine the efficacy and safety of numerous existing medical treatments and procedures, and, to discover individualized treatment strategies that dominate the current standard of care. In this talk I will consider the degree to which this hope is realistic., I will first discuss why big data may not be good data,. and why, even with good data, many standard analytic methods that are not explicitly causal methods may fail to produce reliable conclusions. I will then consider how one might validate the success of the enterprise of mining big data to improve health by comparing the discoveries made by mining of observational data bases with the results of randomized clinical trials. .