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Individualized medicine: Some of the ways biostatisticians can help

There is a growing trend toward more individualized treatment in clinical practice. This talk will focus on three advanced research technologies which biostatisticians can apply to support physicians' individual patient treatment decisions based on each patient's attributes such as age, sex, questionnaire responses, blood pressure, lab values, and genotypes: (1) Models which quantify the benefit each patient can be expected to receive from a particular therapy. For example, models quantifying the expected benefit from lipid-lowering statin treatment can identify younger lower-risk individuals who would meaningfully benefit as much as higher-risk older individuals and thus enable earlier initiation of therapy before the "horse is out of the barn". (2) Comparative effectiveness research using benefit models to identify the best of multiple therapeutic options for each patient based on his or her particular attributes. An example of this is research aimed at distinguishing between patients would receive a net benefit from statin treatment despite increased risk of diabetes and those expected to have a greater net benefit from some alternative therapy. (3) Cautious use of meta-analysis across multiple studies using an individual-level pooled dataset to estimate parameters estimates based on identically designed models fit within each study. A good example of this approach is the Cholesterol Treatment Trialists collaboration which used meta-analysis combining 22 different clinical trials to find that within trial relative risk reduction from statin treatment was lower for patients with higher baseline risk than for lower risk patients. Their findings were applied in the benefit model mentioned in (1) above. I'll also give a bad example during the talk.

Biography

Ken Williams received a BS in Applied Math from Georgia Tech in 1971 and an MS in Operations Research from the Air Force Institute of Technology in 1980. He served in the US Air Force for 22 years in Computer Systems and Scientific Analysis. He also served 10 years as a Biostatistician at the University of Texas Health Science Center at San Antonio where he remains an Adjunct Faculty Member. He has been a Freelance Biostatistician with KenAnCo Biostatistics since 2007. Designated a Professional Statistician (PStat) in the inaugural 2011 litter, he has published more than 100 papers in peer-reviewed journals.

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