The Reference Model for Chronic Disease Progression

In a Nutshell
Competitive Disease Forecast
A League of Disease Models/Consumers Report

- Prototype utilizing computing power to model chronic disease progression
- Built from literature references and hence the name
- Designed to serve as a reference for new equations and populations

Population Characteristics:
- Age, Male, Race, SBP, DBP, A1c, Smoke, BMI, HDL, LDL, Trig, TC, ACR, Lipid Ratio.
- Age At Diagnosis Of Diabetes, AF, Survive Stroke, Survive MI, MicroAlbuminuria, MacroAlbuminuria, Diabetes Type 2, Treated for Hypertension, Family History CHD, Rheumatoid Arthritis, Townsend Index, A1c Change, BMI Change, DBP Change, SBP Change, HDL Change, LDL Change, Trig Change, TC Change, Smoke Change, Year.

High Performance Computing

Outputs:
1. Clinical outcomes / Deaths
2. Costs / Quality of Life
3. Population / Equation / Hypothesis fitness

Equations represent observed phenomena and can be combined with hypothesis

Inputs are based on secondary data:
- Published Risk Equations
- Published Clinical Trials, i.e. no real individual data
- Other publications

Comparisons improve understanding of disease progression

Allow the model to access more populations and cover more phenomena

Discussion Points:
- Competition & High Performance Computing
- Open Source & Free Software
- Reproducibility and Code Sharing
- Test Driven Development of Models
- Quality Assurance
- Using Information from clinicaltrials.gov

Jacob Barhak Ph.D.
http://sites.google.com/site/jacobbarhak/
IMAG Multiscale Modeling (MSM) Consortium Meeting 2012
22-23 October 2012

References:
- You Tube Video - The Reference Model for Disease Progression: Online: http://www.youtube.com/watch?v=7ovP5gNaD8

Acknowledgments:
The GPL modeling framework was supported by the Biostatistics and Economic Modeling Core of the MDRTC (P60DK020572) and by the Methods and Measurement Core of the MCDTR (P30DK092936), both funded by the National Institute of Diabetes and Digestive and Kidney Diseases. The modeling framework was initially defined as GPL and was funded by Chronic Disease Modeling for Clinical Research Innovations grant (R21DK075077) from the same institute. The Reference Model was developed independently without financial support.