NatEquity, Inc. Funding Aging in Place™

NatEquity Knowledge Base

Could knowing lifespan prompt altering behavior and interventions?

This question takes on new meaning with today's advancing technologies. What if a simple accurate test could predict lifespan? Would that alter bad behavior and prompt therapies for intervention? That is what two of us considered at the dawn of the pandemic. I had control of machine learning algorithms that could predict the trajectory of morbidity and mortality at an individual level with 96% accuracy in persons over age 65. A friend, Bernard Tyson, who was the CEO of Kaiser Permanente, held one of the largest DNA databases in the world. Neither of us knew what combining the knowledge of a person's DNA and information about the interdependent variables in that person's medical history, activities of daily living (ADLs), cognitive and lifestyle characteristics would tell us, but we thought it would be interesting to find out. Bernard died just before the pandemic and the endeavor was shelved.

Reading about longevity work being done at Stanford, I reached out and was told "docs don't like black boxes they can't understand". Today, AI black boxes are making discoveries and interpreting large clean databases at astounding speed. AI-inspired DNA editing is on the verge of curing diseases that kill millions annually. Would adding information about an individual's 30 million co-dependent variables speed up discovery? Could a simple 10-minute telephonic set of interview questions add insights to prompt altering behavior while directing therapies?

The multi-discipline question set was developed in the 1980s for the National Long-term Care Survey. A select group of gerontologists, internists, psychologists and applied math specialists were tasked with developing an unambiguous question set that could be administered to 32,000 persons age 65 and older. Each question set has 76 questions, many with 8 possible answers – thus 30 million plus co-dependent variables in each set. The patterns isolated in each individual snapshot data set then had to be reconciled as each person's morbidity characteristics changed in progressive 5-year intervals. In total 20,000 individuals were tracked until death in three or more consecutive data sets to validate the trajectory of those changes.

The demographer/actuary on the team, P.J. Eric Stallard, saw patterns in the data and decided to spend 10 years developing the algorithms to classify and interpret the data. Stallard's work was first published in 2007 and has since been revalidated in additional collaborative studies and Stallard's papers on Alzheimer's. The model's accuracy is accepted by actuaries worldwide. In 2011, the algorithms were incorporated in a valuation methodology peer reviewed publication, presented to the SEC and now part of GAAP and SEC pronouncements.

NatEquity has used this model in predicting longevity to price and value mortality dependent products and services. The valuation methodology relies on 250-year-old Bayesian Inference to predict the NPV of future portfolio cash flows. All of this is possible because consistent (clean) data was collected to calibrate the algorithms which have multiple applications. The strength of the algorithms is uncovering how different patterns of co-dependent variable interact. This is the time to utilize the black box for additional benefits.