

Summary of Accomplishments and Plans

The Triangle area has become known in academic as well as policy circles for its concentration of talented researchers of health economics issues. The Department of Economics at UNC is one of a small number of Economics departments across the country that offer health economics as a field of study. Our distinction as an educator in this field is enhanced by the recent addition of three assistant professors studying health economics. Below I describe my research interests in three different ways: by subject matter, by age of individuals studied, and by empirical methodology.

Interests by subject matter

As a health economist, I study the economic behavior of individuals as it relates to their health. The approach reflected in my work involves understanding decisionmaking over time. My work offers contributions in the following applied areas:

- **the effects of health insurance characteristics on medical care utilization and health behaviors** (e.g., to what extent does health insurance coverage of prescription drugs affect utilization of physician and hospital care both contemporaneously and dynamically through changes in health?). An example is my *Econometrica* (1998) paper that won the Kenneth J. Arrow Award for the best published paper on health economics worldwide. Other examples include my work in *Journal of Human Resources* (2009, 2012), *Journal of Health Economics* (2004), and *American Journal of Health Economics* (2015).
- **the effects of health and health insurance on employment/education behaviors and outcomes** (e.g., to what extent would employment decisions be altered by the introduction of mandatory retiree health insurance coverage by employers?). See, as examples, *Review of Economics and Statistics* (2001), *International Economic Review* (2008), *Review of Economic Dynamics* (2017), *Journal of Econometrics* (2010), *Journal of Applied Econometrics* (2006), *Journal of Human Resources* (2002), *Journal of Human Capital* (2014) and others.
- **the effects of medical and non-medical choices on health and health behaviors** (e.g., should policies to promote better health target medical care use or lifestyles?). My recent publications in *Review of Economics and Statistics* (2007) *International Economic Review* (2017) and *Journal of Human Resources* (2005) serve as examples, the latter having been featured in *Business Week*.

While I often describe my research interests using this categorization, I've found that it has become increasingly useful to characterize my research in two additional ways: by age of the individuals in my research sample and by empirical methodology.

Interests by age of individuals studied

A description of my work by age of the research subjects often allows me to position my work with regard to its policy relevance. Much of my early work focuses on behaviors of the **elderly and near elderly**. I have examined the effects of employer offerings (e.g., health insurance, pensions, wages) and state and federal policies (e.g., Medicare, Medicaid). The behaviors of interest in this age cohort include retirement decisions, asset and gifting behavior, long-term care utilization, and morbidity and mortality outcomes. My work on the elderly led to my appointment as Director of the Demography and Economics of Aging Research (DEAR) Center here on campus in August of 2008. The National Institute on Aging (NIA) has funded some of this research.

I have also studied health economic outcomes at the other end of the age spectrum. My recent work focuses on **children and adolescents**. I have examined the influence of cigarette prices and peer smoking behavior on childhood behaviors such as smoking, food consumption, and physical activity. Currently, I have broadened my interests to in-school misbehaviors and educational outcomes such as test scores and grades of elementary and college students. I was previously affiliated with the National Bureau of Economic Research (NBER) through their Health Care and Health Economics Programs and the Children's Program.

Lifelong health-related habits and self-management skills are often established in childhood. Because ingrained behaviors are difficult to change as people grow older, public health measures need to reach young people early, before health-damaging behaviors are adopted. Given the importance of healthful behaviors for healthy development, it is surprising how little rigorous, policy-related, large population research exists on the determinants of good and bad behaviors. Schools, teachers, care providers, and family are convenient resources for providing children with positive messages and for creating an environment for the enhancement of positive behaviors. Efforts to determine effective practices and policies at the school and community levels will enhance the behaviors we desire and reduce detrimental behaviors.

These childhood behaviors effect the transition to adulthood. Behaviors such as tobacco use, alcohol and drug use, poor eating habits, and inadequate physical activity have been proven to be detrimental to *long-term* health by numerous researchers. These health-related behaviors also influence the future well being of youths as young adults and productive members of society. Areas of influence include absenteeism, academic performance, criminal activity, college attendance, employment, work productivity, and wages.

Finally, a large bit of my research focuses on the behavior of **prime-age individuals** from young adulthood through middle age. While a third of my papers to date have used data on individuals from this age group to study medical care utilization and employment behavior, my current interests include expanding our understanding of the role of the employer in promoting healthy behaviors. As individuals, or as a nation when we think about health care reform, we often focus on the role of the physician to "make us healthier." However, how often do we see a doctor in a year? He may not have the "face time" that we need to motivate us to make healthy choices. My work with children suggests that families and educators have a prime opportunity to influence the health behavior of children. But what

about after we graduate from school, a time when we aren't that sick and therefore aren't visiting a physician regularly? This period in our lives is one in which we are likely to be spending five days a week at work. Are there incentives (e.g., smoking cessation and exercise programs, smoking bans) or disincentives (e.g., long hours, stress, lack of sleep) in the workplace that influence health behaviors and health outcomes?

My partnership with the Integrated Benefits Institute in 2007 fueled my long-held desire to understand the role of health in influencing work productivity (and vice versa). In several papers I examine the dynamic impact of body mass on wages over time and the role of promotions and performance evaluations on earnings. Extending this interest, I have assessed the relevant publicly-available nationally-representative data sets for their suitability for calculating health-related lost work time (e.g., absenteeism and presenteeism). Unfortunately, the lack of detail in the questionnaires does not allow for a comprehensive measure. I would like to embark on a large-scale data collection project that would make it possible to assess the role of health and employment incentives on productivity of employees. The Research Triangle Park industrial/manufacturing/ research area employs many individuals in a number of medium and large firms, which could be an excellent source of data.

Interests by empirical methodology

In an effort to further describe my contributions, one might categorize my work by the empirical methodology I use to understand individual behaviors. Without going into great detail in this summary, my approaches can be broken down into three groups. One approach involves parameterizing a theoretical model of dynamic, forward-looking optimization behavior that explains an individual's decisionmaking over time, using observed data to estimate the primitive parameters (e.g., those describing preferences, constraints, and expectations) of the model, and determining the optimal decisions under alternative policy scenarios by using the estimated parameters and re-solving the optimization problem. The **estimation of structural parameters** approach requires several skills including knowledge of economic theory, econometrics, data and institutions, and numerical methods and computer programming. The latter is necessary because solution of the optimization behavior is explicit. Derivation of closed-form demand equations is often impossible and hence does not lend itself to estimation via regressions or other standard statistical routines available in many popular statistical packages. Use of this approach also means that one will not be "turning out multiple papers per year". The high price a structural econometrician pays for developing a model that allows for evaluation of alternative policies that do not exist in the data is measured by units of time.

During the lengthy process of estimating the models described above, I have often taken another approach to understanding individual behavior. This second approach involves n th-order approximations of the values of different alternatives available to a decisionmaker (e.g., visit a physician's office or not). The resulting dynamic demand and production functions that describe behaviors and outcomes can then be estimated as structural equations that recover reduced form effects of observable (often endogenous) characteristics. These structural equations often represent many endogenous behaviors and outcomes of interest that depend on these behaviors. Since these behaviors and outcomes are potentially correlated through unobserved contributing factors (within a

time period and over time), the function approximations must be estimated jointly. I term this approach **joint estimation of approximated structural equations**.

I have also approached problems in health economics by augmenting common **reduced-form approaches**. Some of the ways I have extended the health economics literature include conditional density estimation (*Journal of Human Resources*, 2004), forward-looking price expectations formulations (*Review of Economics and Statistics*, 2007), social interactions (Gilleskie and Li, 2019) and bootstrapped aggregating (Gilleskie and Zhang, 2009).

I am a hybrid of health economist, labor economist, and applied econometrician. As such my research output and approaches do not fit solely into one bucket or the other. Although focused, my research attempts to bridge several fields and methodologies. My empirical style is more like that of a labor economist, but my research interests are generally considered health economics topics. My willingness to use rigorous empirical approaches to answer questions exploits my interests in applied econometrics. In general, I have chosen a research route that involves complex modeling coupled with complex data sets. This approach to research demonstrates my commitment to acquiring a deep understanding of behaviors based on solid economic reasoning. I've chosen this complexity in an effort to produce more meaningful predictions, to obtain a deeper understanding of behavior, and to evaluate a wider array of policy scenarios than can be obtained with quicker, straightforward methods and cross-sectional data.