This dissertation comprises three essays in applied microeconomics. While they have a central theme in healthcare economics each explores a topic relevant to current health policy debates. The first essay focuses on pharmaceutical economics; the second relates to population health and development economics; and the third explores the economics of treatment adherence. The abstracts of the papers follow.

**Box-Cox model of prescription drug utilization using data of US counties: Cross-sectional v/s panel estimates**

While the rise in US healthcare expenditure slowed recently, prescription drug spending and utilization are growing due to fewer expiring patents and increased use of specialty drugs for chronic conditions (e.g. cancers and diabetes). Due to changing health policy landscapes, this timely study uses the flexible Box-Cox transformation model and more recent data of the US counties to probe the correlates of prescription drug utilization. Separate cross-sectional and pooled regression models were fitted to data of low and high utilization counties to account for heterogeneities. The empirical econometric results confirm that the optimal functional form model depends on the data structure (cross-sectional v/s pooled) and the intensity (low v/s high) of utilization. Finding primary care physician density as positive and significant across the models highlights the important gate-keeping role of physicians as prescribers. The estimated income elasticities of utilization (not expenditures) in 2011, are -0.61 (high-use counties) and -0.13 (low-use counties); in 2012, are -2.22 (high-use) and -0.31 (low-use); and for the pooled data, is -0.2 (high- and low-use counties). These negative income elasticities of utilization are not surprising since 90% of US prescriptions filled are generics. Our results signal the need for policies to consider differences in utilization intensities.

**Household socioeconomic status and health: estimating the social gradient in child health in Nigeria**

Studies estimating the effects of socioeconomic factors on population health conditions have largely been conducted on the developed world with disproportionately far fewer studies on developing countries including especially, African. Specifically, there are currently few econometric studies on health status inequalities across socioeconomic bands focusing on Nigeria. This investigation, using the latest available pooled data from three waves (1999-2003, 2004-2008, and 2009-2013) of the National Demographic and Health Surveys in Nigeria, estimates econometric models of the socioeconomic gradient in child health. Departing from the norm in most of the published studies on high income countries that used subjective self-reported health status, we use objective measures of child health status used for growth monitoring in children, e.g., height-for-age (HAZ), weight-for-height (WHZ), and weight-for-age (WAZ). Using these metrics reduces endogeneity due to measurement error in the dependent variable. The use of child health to proxy population health status further reduces endogeneity of wealth or income in a health production model. A third strategy for reducing endogeneity is implicit in using wealth index factor scores data partitioned into wealth groups.
(above and below the median wealth factor score for each survey) and then estimating separate models for each wealth band. Results based on the OLS regression estimation method reveal positive and statistically significant effects of maternal education in all models except for the poorer group of the WHZ model. Surprisingly, paternal education has no significant effect on any of the measures of child health status. Third, depending on the model and wealth group, child (e.g., gender, age, birth-weight and birth interval) and environmental (e.g., rural residence, geopolitical zone of residence and household size) factors play important roles in child health production. Fourth, variations exist across the core correlates of child health depending on the measure. Finally, our study findings could inform future policy interventions (e.g. under the sustainable development goals) targeting improved health status of Nigerians.

Modelling the effect of treatment adherence on the health stock of Chronic Obstructive Pulmonary Disease patients in the US.

Chronic Obstructive Pulmonary Disease (COPD), the third leading cause of mortality and morbidity in the US, exerts significant economic burden on the healthcare system. With no current cure, treatment strategies include slowing down disease progression, relief of symptoms, and increasing exercise tolerance. Smoking is the most important risk factor for COPD and smoking cessation is known to slow disease progression and improve symptoms. Annual influenza vaccination helps to prevent chest infections while medications which reduce or abolish symptoms complement these. Smoking cessation and regular annual influenza vaccination are known to be efficacious but their effectiveness depends the patient’s adherence to treatment. Moreover, about 5-40% of COPD hospital admissions is associated with non-adherence; therefore, improving adherence is important for reducing associated hospital costs. This study tests hypothesis that adherence has an effect on the health stock and on the number of days of good health in COPD patients. Consequently, this paper aims to determine the probability of adherence having an effect on the health stock and the number of healthy days conditional upon an effect. Unlike previous studies, this paper adds to the treatment adherence literature by, first focussing on the impact of treatment adherence on an economic outcome; second, modelling adherence to treatment as a two-stage decision process by fitting a double hurdle regression model to 2011-2013 data of the Behavioral Risk Factor Surveillance System (BRFSS) of the Centers for Disease Control and Prevention (CDC); and third, by analyzing a large and nationally representative data set to make the research finding broadly applicable.