In an observational study, adjustment for the differences in the study population characteristics is often done by controlling for all confounders. Comorbidities are important patient characteristics that are often confounders and must be controlled for better assessment of outcomes such as health service utilization and costs. Diagnosis-based comorbidities and prescription-based comorbidities have been developed and validated for predicting outcomes. However, these measures are frequently used to assess outcomes other than those that were used in validation studies. The Charlson Comorbidity Index (CCI) was developed based on its ability to predict mortality for hospital patients but has been commonly used in studies assessing outpatient health service utilization. The CCI is calculated based on International Classification of Diseases; Ninth Revision (ICD-9) diagnosis codes. For a patient, a set of ICD-9 codes gives the conditions being treated at that point in time. For many chronic conditions, an ICD-9 code may be included on a claim very infrequently.

The Rx Risk score is calculated from prescriptions claims. Prescription claims for managing chronic conditions appear gives the conditions being treated at that point in time. For many chronic conditions, an ICD-9 code may be included on a claim very infrequently.

This study found that there is an improvement in predictive ability for utilization and costs as compared to CCI as shown by the increase in $R^2$ for all outcomes analyzed i.e. outpatient visits, pharmacy visits, outpatient costs and pharmacy costs. The increase in $R^2$ was greater for Rx Risk than CCI for all outcomes studied and it almost doubled from the $R^2$ of base model.

RESULTS: Rx Risk adds more to the predictive ability of outcomes as compared to CCI as shown by the increase in $R^2$ for all outcomes analyzed i.e. outpatient visits, pharmacy visits, outpatient costs and pharmacy costs. The increase in $R^2$ was greater for Rx Risk than CCI for all outcomes studied and it almost doubled from the $R^2$ of base model.

DISCUSSION: CCI was first developed using medical records in an inpatient setting to predict the risk of mortality. However, it has been more extensively used for assessing other outcomes as compared to Rx Risk. Comparing the disease conditions that are covered by these two scores, Rx Risk score has a more comprehensive list as compared to CCI. Therefore, Rx Risk gives a more accurate measure of disease burden as compared to CCI.