Context: Electronic Medical Records (EMRs) linked to community data create an exciting opportunity to improve public health chronic disease surveillance. Exchanging data between clinical care and public health creates population level feedback for clinicians to improve outcomes, disparities, quality, and performance.

Objectives: Creation of an EMR exchange infrastructure that statistically represents all elements of the chronic care model (self care, health care, community assets). Linkage of EMR data to community level data bases. Provide a platform for multivariate and data mining to ascertain disease risk, disease control, and health care performance. Demonstrate approach with asthma and diabetes outcomes.

Design: Cross sectional analysis of UW EMR data.

Setting: UW Pediatrics, Family Medicine, Applied Population Laboratory, Biostatistics, and the WI Division of Public Health have collaborated to create de-identified UW EMR extracts and link community data at the census block group.
Patients: Approximately 192,000 patients seen at UW Family Medicine clinics between 2007-2009, including 18,000 persons with asthma, and 9,000 with type 2 diabetes.

Outcome Measures: Frequency tables and multivariate logistic (and mixed effects) regression models were developed and compared to Behavioral Risk Factor Surveillance System (BRFSS) data. Predictors of A1c control were examined for people with diabetes. Spatial analyses mapped areas of disease disparity.

Results: The UW MED-PHINEX infrastructure has been successfully created. It provides a number of advanced statistical tools to visualize EMR and community-level data. Disease risk multivariate models for asthma and diabetes compared favorably between EMR and BRFSS data sources. In many instances, EMR data have much greater statistical power to detect associations. Community factors (i.e., economic hardship index) predicted diabetes risk and A1c control performance. GIS analyses identified neighborhoods with increased asthma prevalence.

Conclusions: UW MED-PHINEX is an important new resource to improve public health surveillance, clinical care, and train clinical and allied health students.