Health Care Needs of Underserved Populations in the City of Indianapolis

INDIANA UNIVERSITY

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Abstract

Meeting the health care needs for underserved populations is crucial. We used EMR data to investigate the relationship between diagnoses and patient characteristics to help providers redesign healthcare systems that can meet the needs of underserved patients.

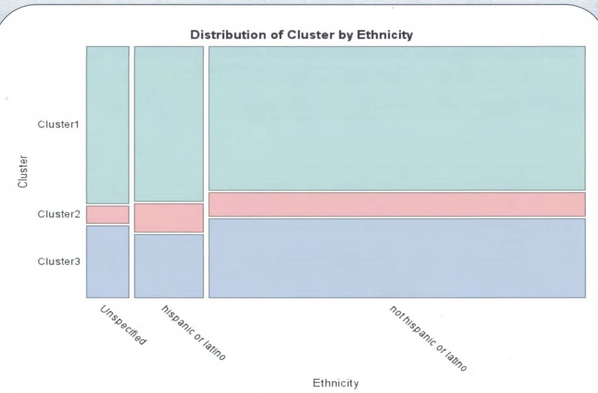
Motivation

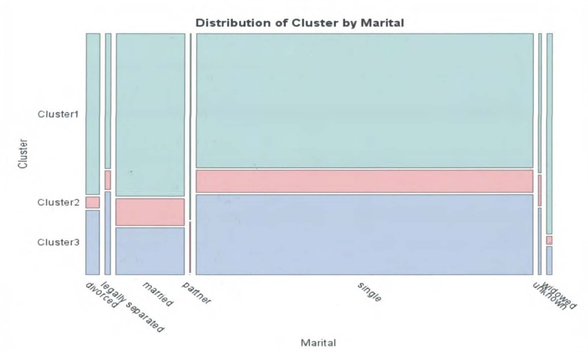
- According to World Health Organization (WHO), the determinants of health, which are factors that affect individual's health, may include income and social status, health services, education, physical environment, genetics, and gender.
- In our ongoing study to improve access to care, we are partnering with seven CHCs across the state of Indiana.
- Electronic health records (EHRs) provide essential information and data to better understand the characteristics of the patient population and health care utilization at CHCs. EHRs include information about diagnoses, medical history, medication and allergies, immunization status, laboratory test results, vital signs, demographic, and billing data.
- What is the relationship between diagnoses and patient characteristics in underserved populations?

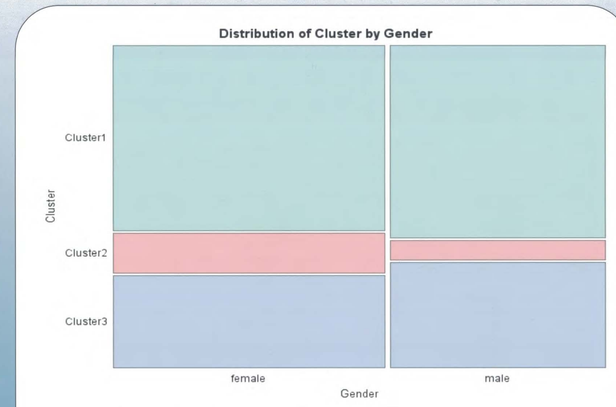
Methods

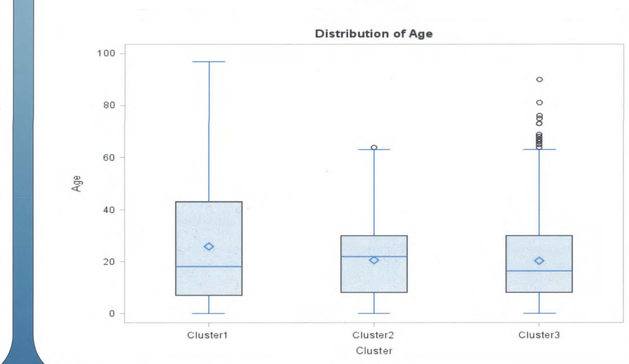
- The semi- structured EMR data were extracted using SQL queries.
- HIPAA rules for data de-identification.
- The dataset included appointment data (>700k appointments) for more than 85000 patients from Jan 1st, 2014 to April 30th, 2016.
- Data fields used in this project were pseudo patient ID, encounter date, age, ethnicity, race, sex, zip code, marital status, primary insurance type, income, tobacco use, and ICD-9 codes.
- We grouped ICD codes based on the "2015 ICD-9-CM Diagnosis Codes" chapters.
- In order to find the associations between chapters in the population, we used consensus clustering to visualize the association using a heat map.
- We tested the association between patient demographics and clusters (t-test and ANOVA)

Results









Discussions

- In this project, we presented preliminary result of an exploratory work to identify the health care needs of underserved patients.
- Factors such as age, ethnicity, gender and marital status in underserved populations are related to specific group patient types and diagnoses.
- This information may help clinics define how to cluster appointments for patients to improve access to care.
- It may help CHCs improve utilization of resources.
- For example, results from our preliminary work could help clinics design culturally appropriate intervention aimed at Hispanic patients targeting diagnoses in cluster 2.
- While income was not found to be a significant factor to cluster diagnoses, we believe this could due to the fact that more than 80% of the patients in the population have income less than 100% federal poverty level, therefore patients have similar income level.

Future Work

The future work for this project will be to more deeply investigate the diagnoses and their association with not only patient characteristics but also visit characteristics such as vital signs, lab results, and time aspect of appointments.

Acknowledgement

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