Pattern Analysis for the future Medicaid

Team: DataRanger

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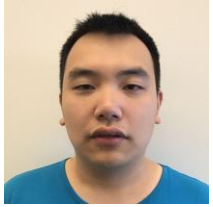

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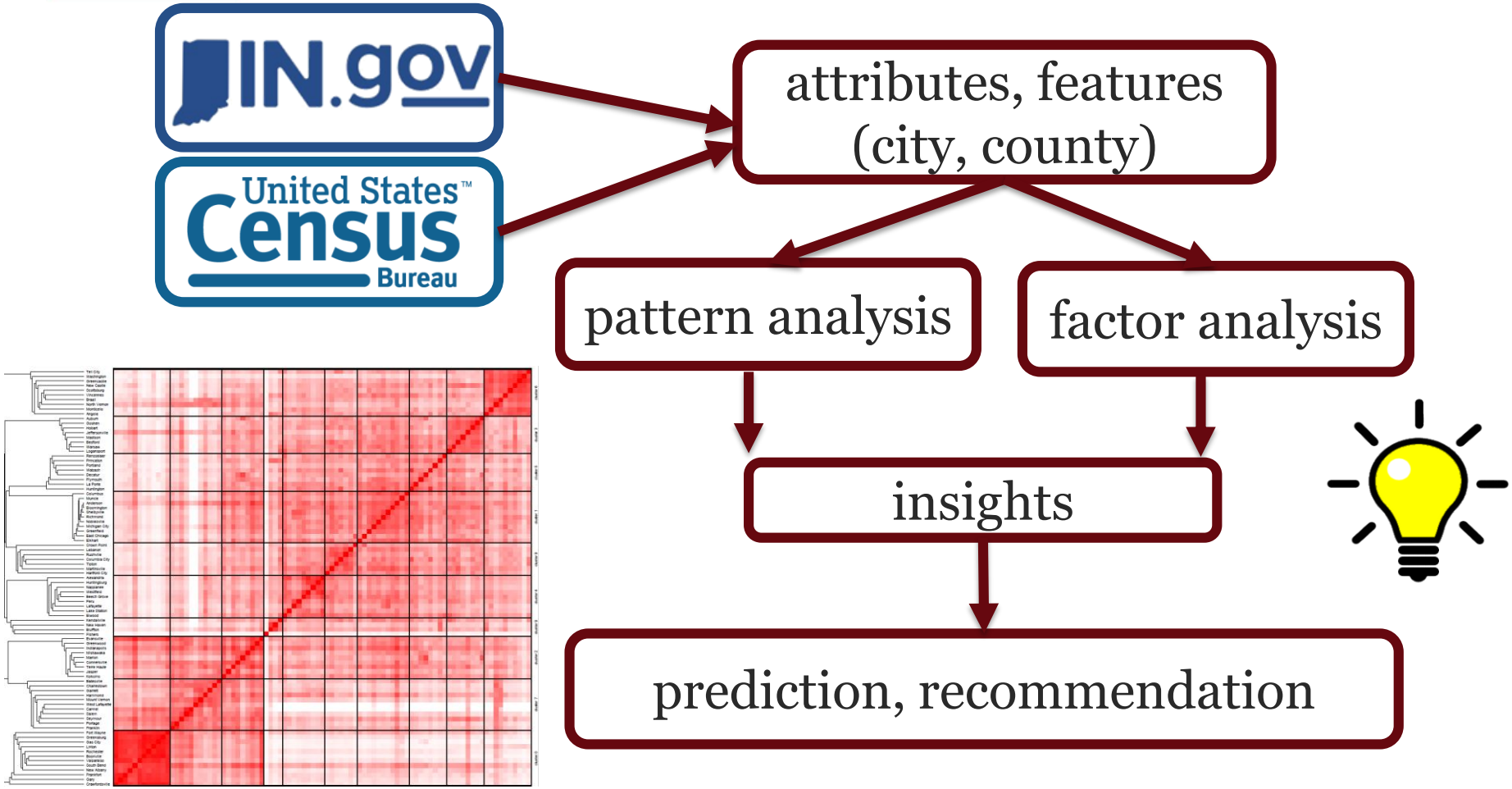
About Us

Ning Lab

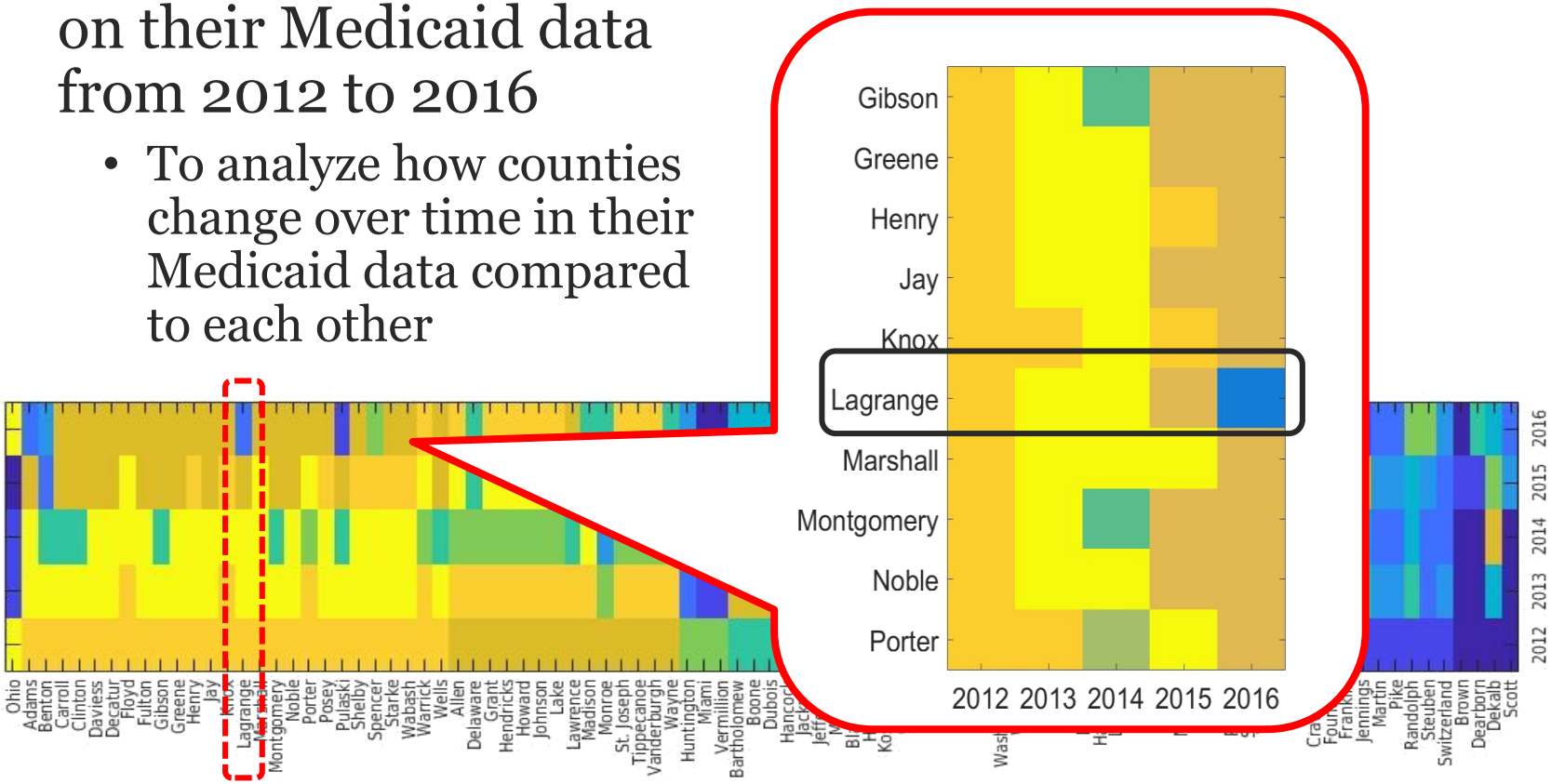
- Research:
  - Data Mining, Machine Learning and Big Data Analytics
- Applications:
  - Drug discovery, pharmacology, Health IT, AI for mortality, e-commerce
- Collaboration:
  - IUSM, Regenstrief, IU Health

Work Flow


IN.gov
United States Census Bureau
attributes, features (city, county)
pattern analysis
factor analysis
insights
prediction, recommendation

Clustering Analysis on Counties

- Cluster counties based on their Medicaid data from 2012 to 2016
  - To analyze how counties change over time in their Medicaid data compared to each other



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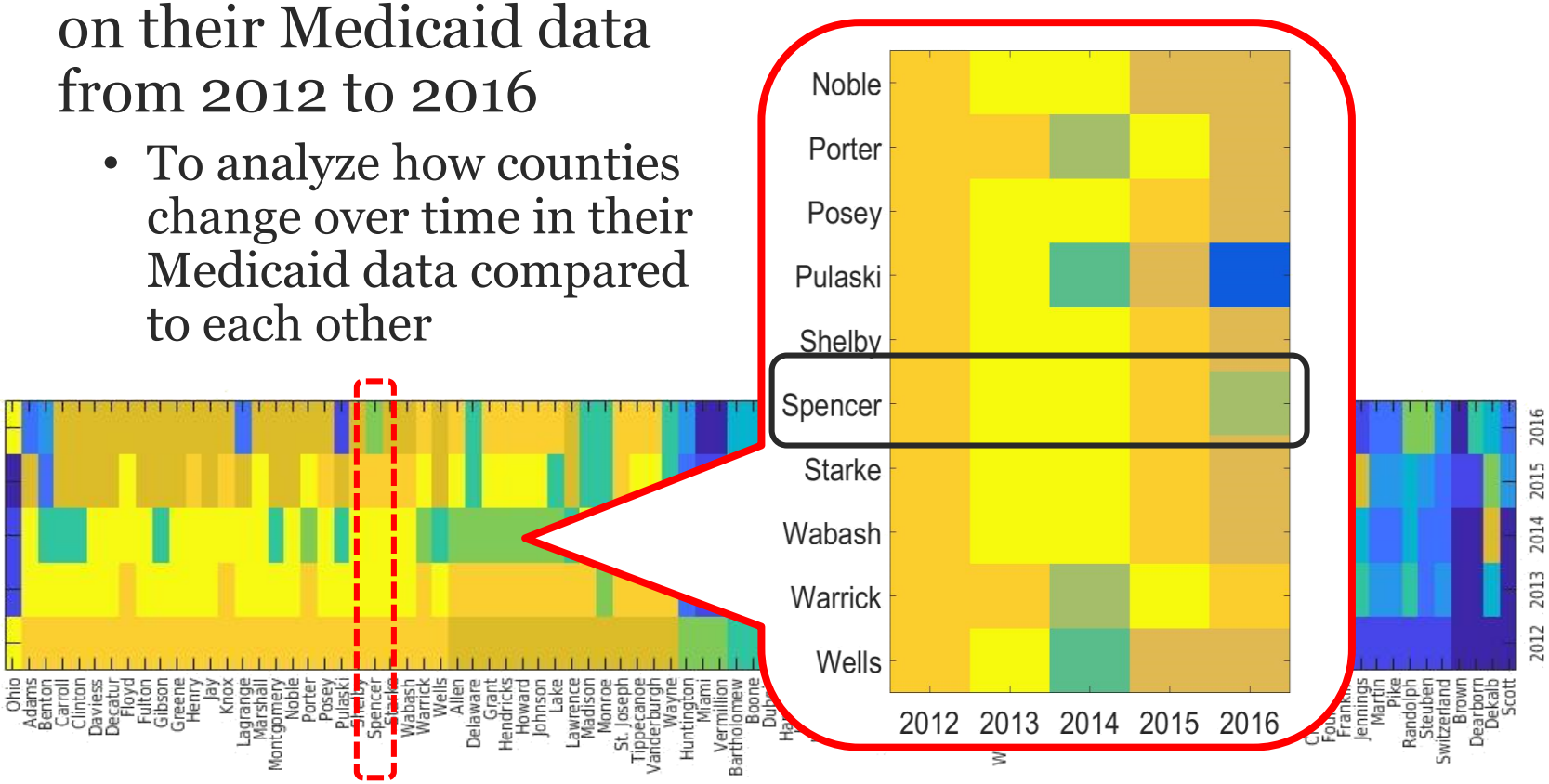
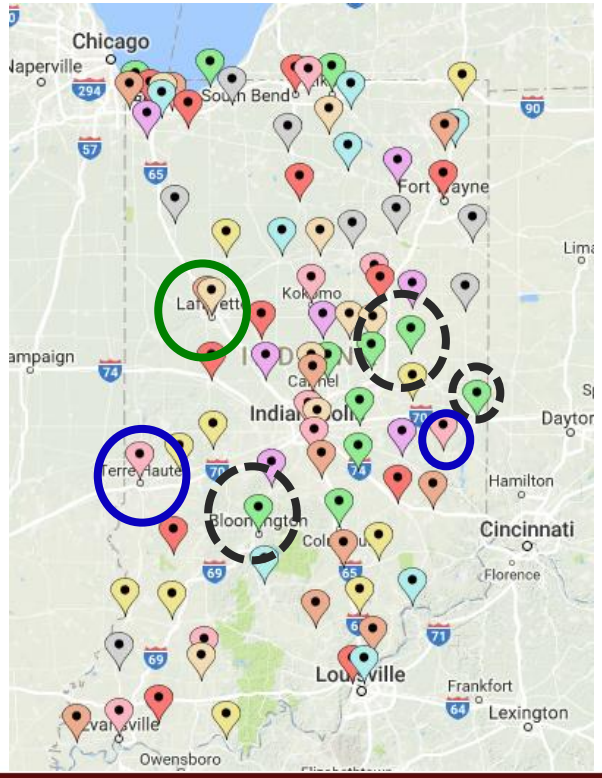
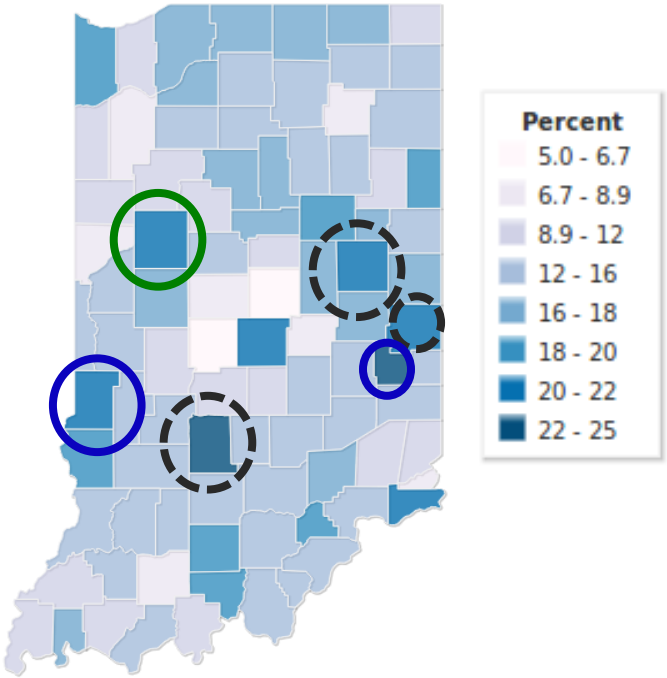


Clustering Analysis on Cities

- Cluster cities based on their Medicaid data in 2016





Factor Analysis on Dollar Amount of Claims

- Identify the most related census information for Medicaid claims

2012	2013	2014	2015	2016
• B.R. M.A 25-29 • Unemployment Rate • B.R. Black • P.C. Income • B.R. White • B.R. Other • B.R. M.A. 15-17 • B.R. M.A. 40-44 • Pop. Age 18-24 • B.N. M.A. 10-14	• B.R. M.A. 25-29 • Unemployment Rate • B.R. Black • P.C. Income • B.R. White • B.R. Other • B.R. M.A. 15-17 • B.R. M.A. 40-44 • Pop. Age 18-24 • B.N. M.A. 10-14	• B.R. M.A. 30-34 • Pop. Age Median Age • B.R. M.A. 15-17 • B.R. White • B.R. Other • Pop. Age 18-24 • Unemployment Rate • B.R. M.A. 10-14 • P.C. Income • B.R. M.A. 45-49	• Pop. Age Median Age • B.R. M.A. 25-29 • B.R. Black • P.C. Income • B.R. M.A. 15-17 • Pop. Age 18-24 • B.N. M.A. 10-14 • B.N. M.A. 15-17 • B.N. M.A. 18-19 • B.N. M.A. 20-24	• P.C. Income • B.R. M.A. 25-29 • Pop. Age Median Age • B.R. M.A. 18-19 • B.R. Black • Pop. Age 18-24 • B.N. M.A. 10-14 • B.N. M.A. 15-17 • B.N. M.A. 18-19 • B.N. M.A. 20-24

Factor Analysis on High-Cost Claims

- Identify the most related Medicaid + census information for high-cost Medicaid claims

2012	2013	2014	2015	2016
• N. Rec. (Trans.) • N. Prvd. (Oral) • N. Prvd. (Trans.) • N. Clm. (Trans.) • N. Prvd. (Hsptl) • B.N. Black • Pop. Race Black • Total Pop. Black • Pop. Race 2+ • N. Clm. A49-64	• N. Rec. (Trans.) • Pop. Race Black • N. Clm. (H.Cost) • Total Pop. Black • N. Prvd. (Phys.) • N. Prvd. (Oral) • N. Rec./Prvd. (H.Cost) • B.N. Black • N. Prvd. (Hsptl) • N. Prvd. (Oncol.)	• N. Rec. (Trans.) • N. Clm. (H.Cost) • N. Rec. A65+ • Total Pop. Black • N. Prvd. (Oral) • N. Prvd. (Hsptl) • Pop. Race Black • N. Prvd. (Trans.) • N. Prvd. (Orthopedic) • N. Prvd. (G.I.)	• N. Prvd. (Oral) • N. Rec. (H.Cost) • N. Prvd. (Oncol.) • B.N. Black • N. Rec. Med. • N. Rec. (Trans.) • Pop. Race Black • N. Clm. Med. • N. Clm. (H.Cost) • Total Pop. Black	• N. Clm. (Trans.) • N. Rec. A17-32 • Total Pop. Black • Pop. Race Black • N. Rec. (Trans.) • B.N. Black • Pop. Race 2+ • N. Prvd. (Phys.) • N. Prvd. (Oral) • N. Prvd. A17-32

What else we can do?

- Prediction of the future Medicaid trend
  - Based on future census trend prediction
  - Based on time series analysis
- Recommendations for healthcare resource allocation
- Personalized predictions of healthcare needs for future strategic planning
- Prediction of transportation demands

Thank You!

Questions