Programmatically Linking Air Quality Indicator with Clinical Data

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Air Quality Clinical Research Question

• Can I find an air quality measure at a particular location and time or duration to assess its effect to people resident at that location?
Closest Air Monitoring Station
Air Quality Data Modeling

- Quality of air at the University Guest House
- Rough Estimate: Closest Monitor and at the time recording.
- Better estimate: Modelled data.
- Current standard: Environment Protection Agency’s data model
Problem Space

- Multiple Air Quality Indicators
- Different types of readings
- How can I combine it with clinical data?
- How reliable is the data?
- Clinical Research Need: Data with high spatial & temporal resolution
- Need for diverse expertise
Air Quality Integration Architecture

Query Tool

Air Quality Data Modeling Unit

Counts & Data

Security

EPA Air Quality Web Service

Satellite-derived Aerosol Optical Depth Measurements

Clinical Data Sources

Security
Air Quality Integration Architecture (Detailed)
Asthma in January 2014

- 615 patient with a diagnosis of asthma in Salt Lake County and average PM$_{2.5}$ 28 micrograms
Asthma in January 20\textsuperscript{th} 2014

- 25 patient with a diagnosis of asthma in Salt Lake County and average PM\textsubscript{2.5} 50 micrograms
- Worst Inversion Day
Demo
Thanks

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• OpenFurther team

• University air quality and clinical researchers
References

- Gouripeddi R, Facelli J, AMIA 2014 Proceedings, Federating Air Quality Indicators with Clinical Data (Under Review)
- OpenFurther: openfurther.org