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ADULT AND CHILD CONSORTIUM FOR HEALTH OUTCOMES  
RESEARCH AND DELIVERY SCIENCE

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# **Public Health Monitoring and Research: Experience with Electronic Health Record Data**

**Rachel Zucker**  
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# Outline

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- What is CHORDS?
- What is PopMedNet?
- Data sharing governance



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# What is CHORDS?

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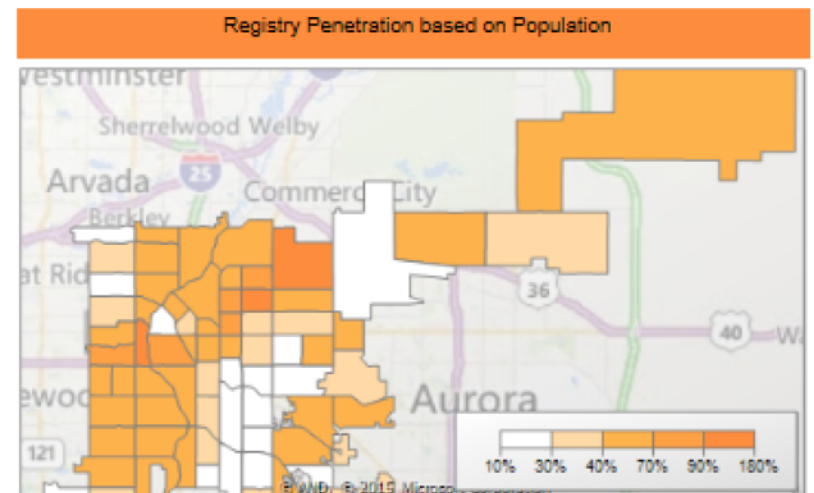
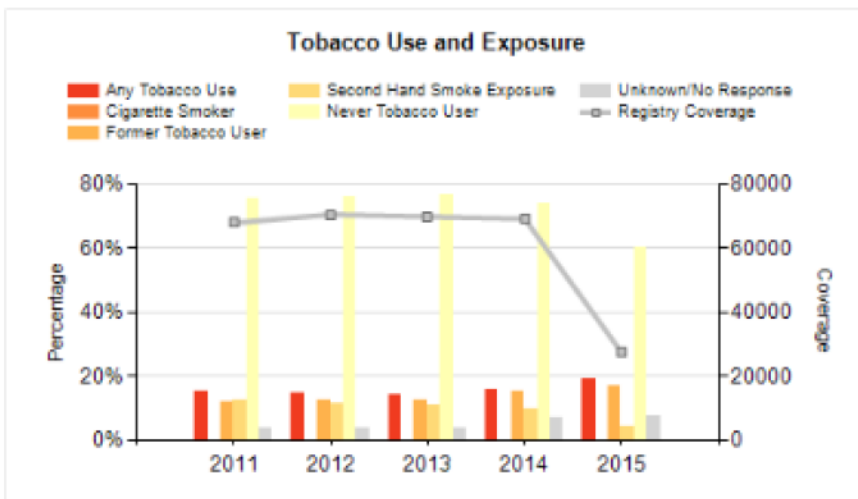
- The Colorado Health Observation Regional Data Service
- Facilitates electronic health record (EHR) data sharing and aggregation from 11 participating healthcare sites representing over 3 million registered patients in the Denver Metro region.
- Early projects have focused on public health
  - Tobacco use and exposure
  - Obesity
  - Cardiovascular risk



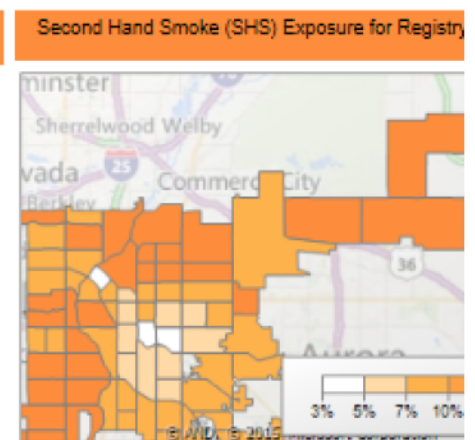
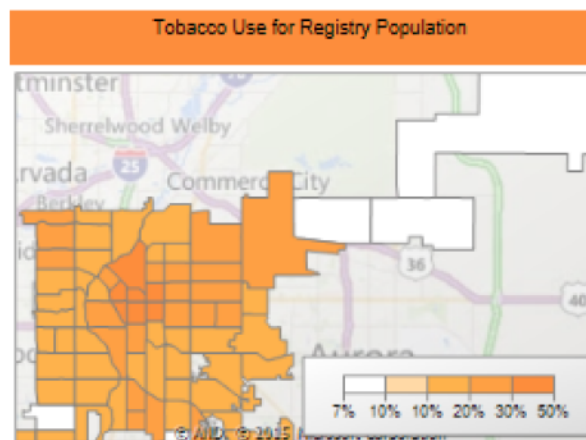


# 2T1: Tobacco Surveillance Summary

Tobacco, a leading cause of disease and preventable, premature death, is a public health surveillance priority. Using compiled clinical data from local healthcare providers, a regional tobacco registry performs surveillance for tobacco use and exposure. Clinic data does not represent the entire jurisdiction; those neither engaged in primary care nor seeking care during the selected date range are excluded. Clinic data may be subject to bias when analyzed for limited time periods (e.g., less than 1 year) thus, the minimal timeframe for tobacco dashboard analyses is annual summaries.



Total Population	125,027	
Tobacco Status	Number of Residents	
	Contributing to Registry	With this Tobacco Status
Any Current Tobacco Use	297,223	46,485
Cigarette Smoker	297,223	0
Former Tobacco User	297,223	40,280
SHS Exposure	297,223	31,619
Never Used Tobacco	297,223	225,216
Unknown	297,223	14,051





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# What is CHORDS?

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- A collaboration between several Colorado research and health care organizations
  - Technical and policy infrastructure to support regional data sharing for research, patient care, and surveillance





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# What is PopMedNet?

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- Open source software for distributed (“federated”) data sharing networks
  - For institutions that want to share information and analytics but not the underlying data
- Developed by software development company Lincoln Peak Partners on behalf of the Department of Population Medicine at Harvard Pilgrim Health Care Institute
- Originally developed for Mini-Sentinel project; now adopted by multiple national initiatives



Harvard Pilgrim  
Health Care Institute

LINCOLNPEAK   
» Interoperable Innovation «

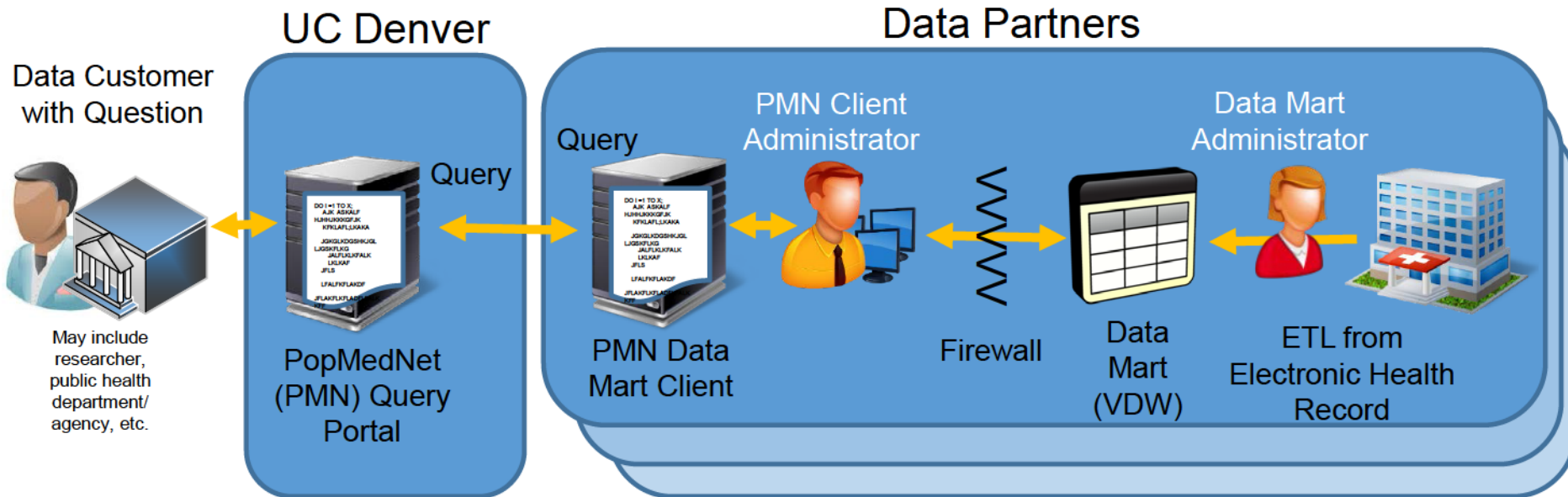


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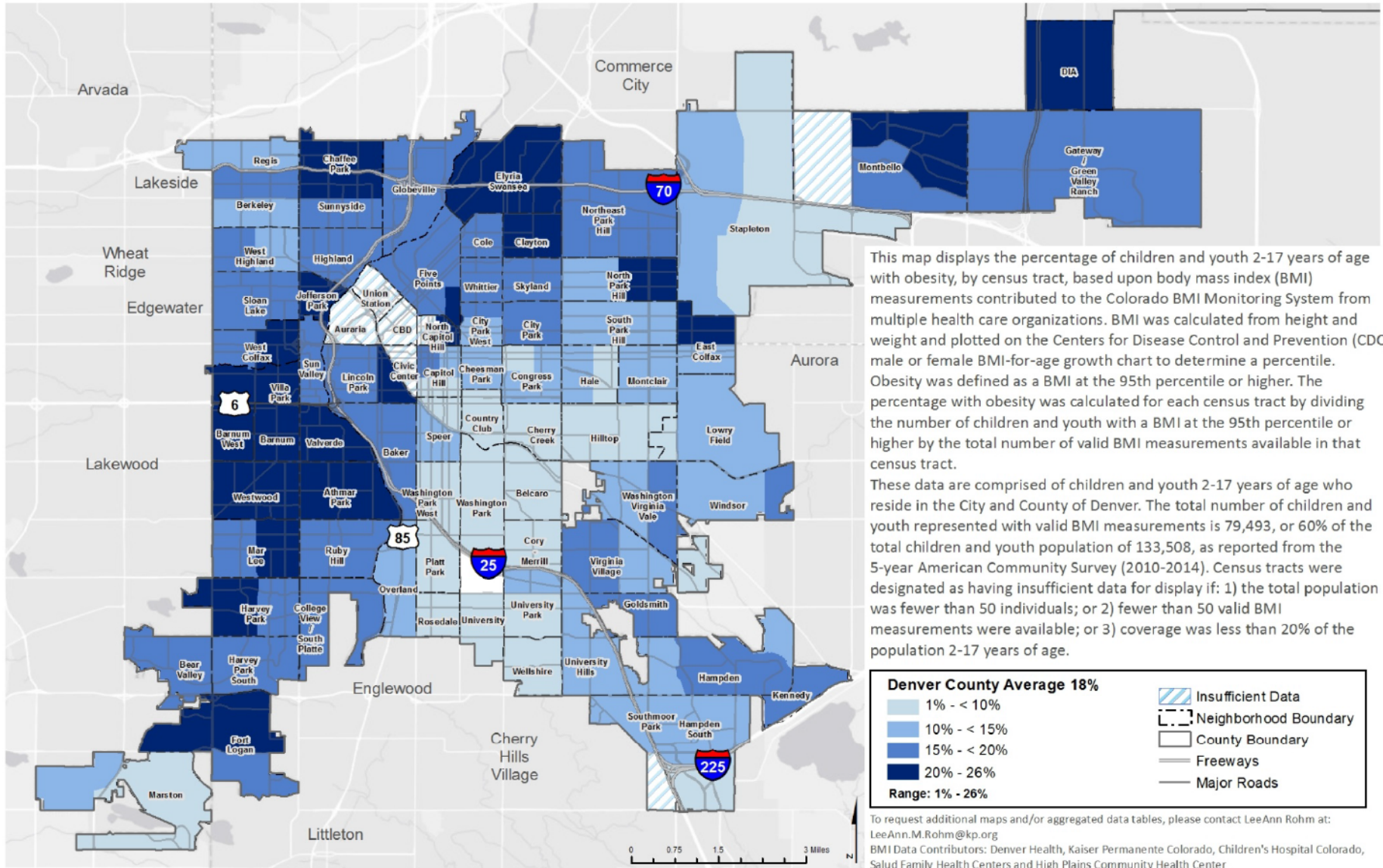
# CHORDS Federated Query Overview



VDW = Virtual Data Warehouse  
ETL = extract transform and load



# Estimated Prevalence of Children and Youth with Obesity (2012-2014): City and County of Denver



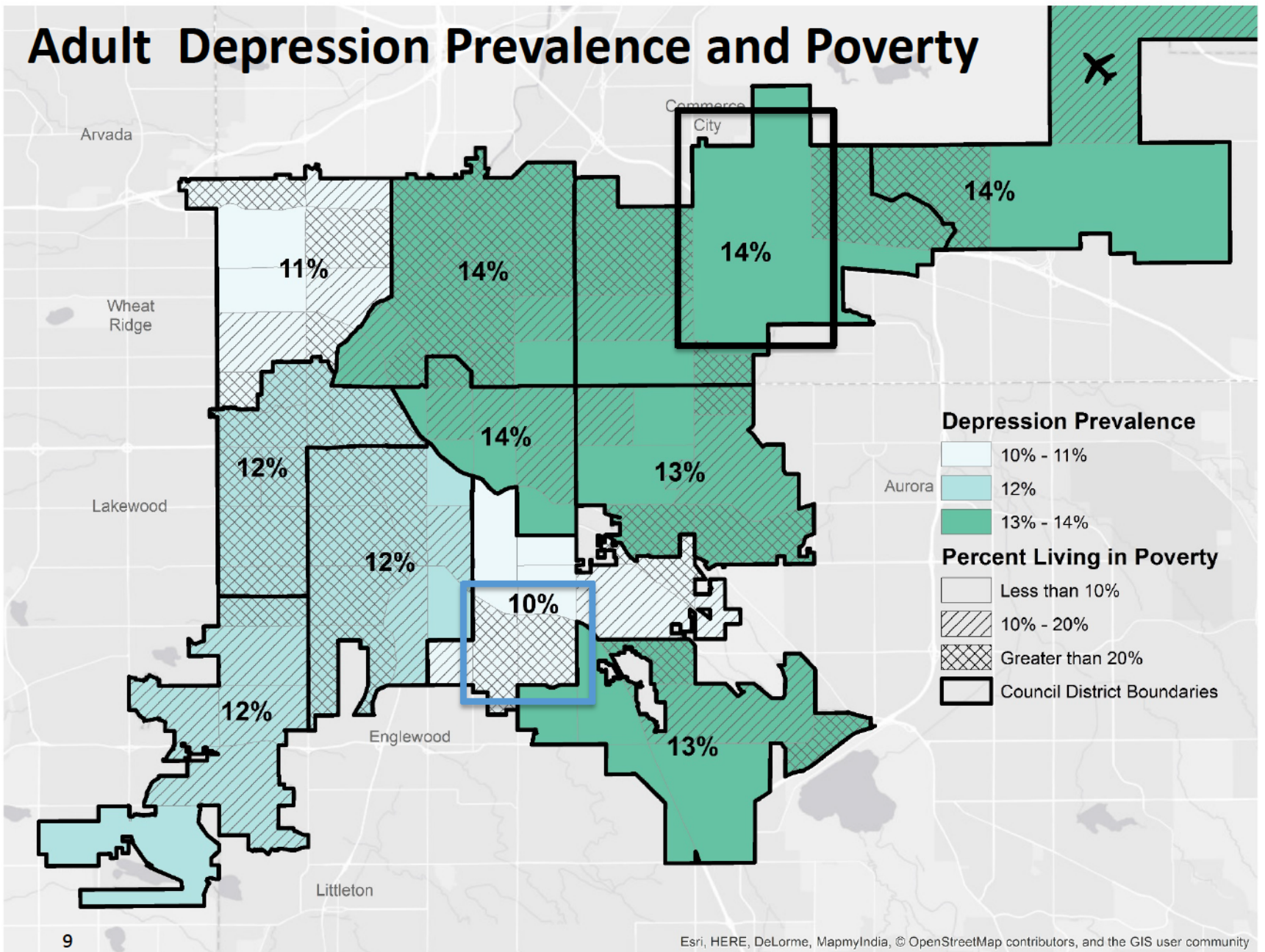
This map displays the percentage of children and youth 2-17 years of age with obesity, by census tract, based upon body mass index (BMI) measurements contributed to the Colorado BMI Monitoring System from multiple health care organizations. BMI was calculated from height and weight and plotted on the Centers for Disease Control and Prevention (CDC) male or female BMI-for-age growth chart to determine a percentile. Obesity was defined as a BMI at the 95th percentile or higher. The percentage with obesity was calculated for each census tract by dividing the number of children and youth with a BMI at the 95th percentile or higher by the total number of valid BMI measurements available in that census tract.

These data are comprised of children and youth 2-17 years of age who reside in the City and County of Denver. The total number of children and youth represented with valid BMI measurements is 79,493, or 60% of the total children and youth population of 133,508, as reported from the 5-year American Community Survey (2010-2014). Census tracts were designated as having insufficient data for display if: 1) the total population was fewer than 50 individuals; or 2) fewer than 50 valid BMI measurements were available; or 3) coverage was less than 20% of the population 2-17 years of age.

To request additional maps and/or aggregated data tables, please contact LeeAnn Rohm at: [LeeAnn.M.Rohm@kp.org](mailto:LeeAnn.M.Rohm@kp.org)  
 BMI Data Contributors: Denver Health, Kaiser Permanente Colorado, Children's Hospital Colorado, Salud Family Health Centers and High Plains Community Health Center

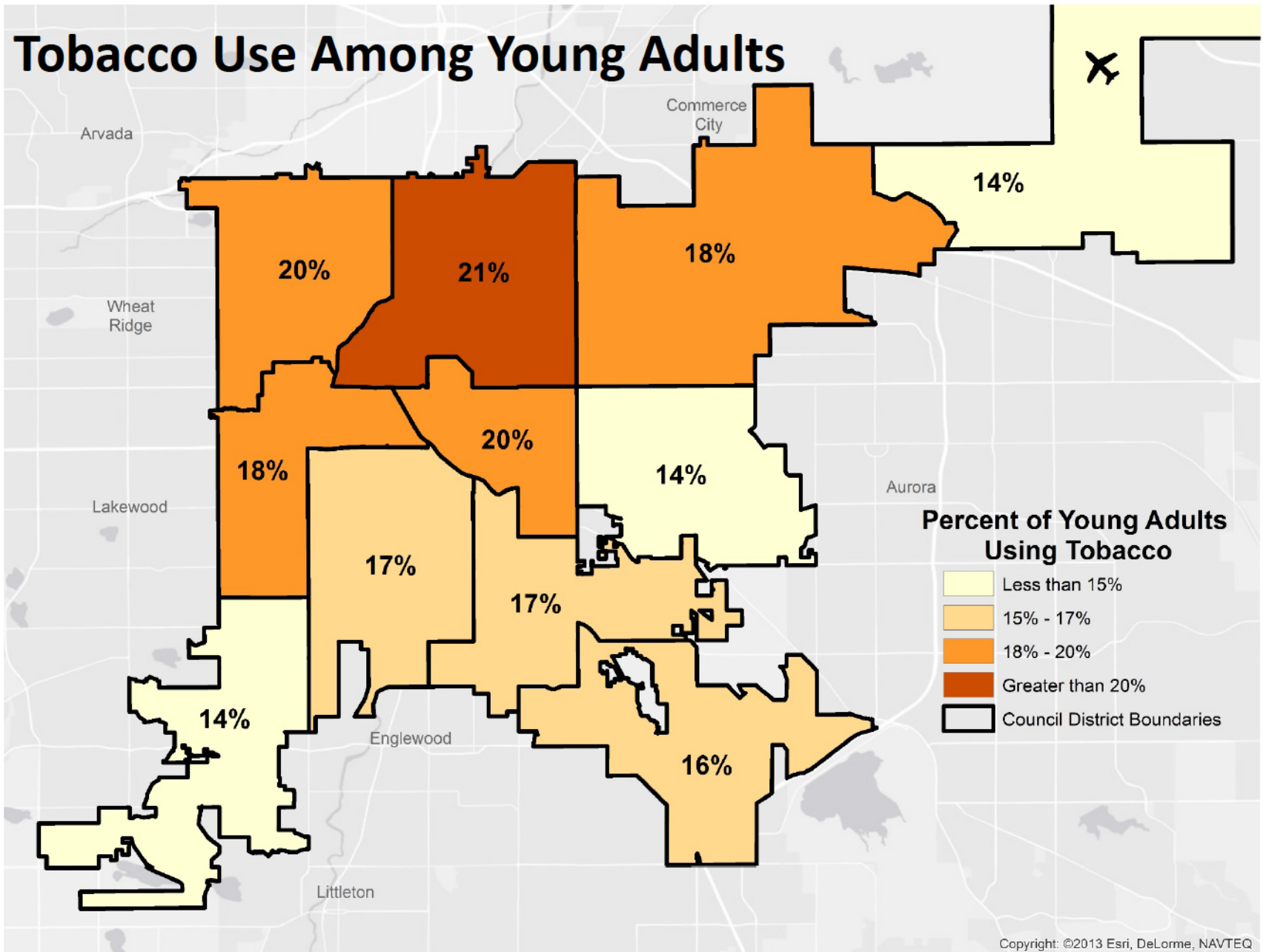


# Adult Depression Prevalence and Poverty





# Tobacco Use Among Young Adults





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# CHORDS Governance

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- Ensuring Data Security:
  - Partners retain full control over data
  - Proposed research is submitted for IRB review and adheres to HIPAA regulations
  - Each research study using CHORDS must obtain its own IRB approval and describe data safety and management procedures
  - All parties must execute any necessary Data Use Agreements, Business Associate Agreements, and/or other contracts and legal agreements in advance of data sharing



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# CHORDS Governance

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- Principles:
  - Requestors ask for the minimum data necessary to answer a question of interest
  - Queries yielding identifiable results are not permitted
  - CHORDS releases only aggregated data and will not identify partner-specific information
  - All partners are responsible for ensuring compliance with federal and state laws and regulations, including HIPAA
  - Data partners are responsible for compliance with institutional data use/sharing policies



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# Distributed Data Sharing Principles

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- Send the questions to the data
- Keep data in the hands of the original data holders
  - Decrease proprietary and liability issues
  - Decrease risk and severity of breaches
  - Data holders know their data; improve value and interpretation of findings
- Minimize data transfer
- Voluntary – data partner autonomy
- Reciprocity – value for participation
- Partnership
- Well-defined purpose

\* Jeff Brown, PopMedNet User Group Meeting 2012



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# Questions?

Thank you to the rest of the CHORDS team:  
Dr. Art Davidson and Emily McCormick at Denver Health  
and Jessica Bondy, Bryant Doyle and Dr. Lisa Schilling at  
Anschutz Medical Campus. We would like to thank the  
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