



california
health
interview
survey



THE CALIFORNIA HEALTH INTERVIEW SURVEY (CHIS)

AskCHIS Neighborhood Edition (NE) © : Using ACS Data to Construct and Visualize Small Area Estimates for The California Health Interview Survey

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May 14-15, 2019

California Health Interview Survey (CHIS)

Main Objectives

- California's assessment tool to meet state and local needs for population-based health data
- Provide Health and Health-related Estimates
 - 1) at local-level for counties, cities with health departments, and statewide
 - 2) for adults, teens, and children
 - 3) for California's major race/ethnic groups and (if possible) some smaller ethnic groups
 - 4) to wide audiences

CHIS Content

- Rich demographic data
- Health behaviors
- Health conditions
- Access to and use of health care services
- Health insurance coverage
- Social determinants of health
- ... *and numerous other topics*

See *CHIS Questionnaire Topics*

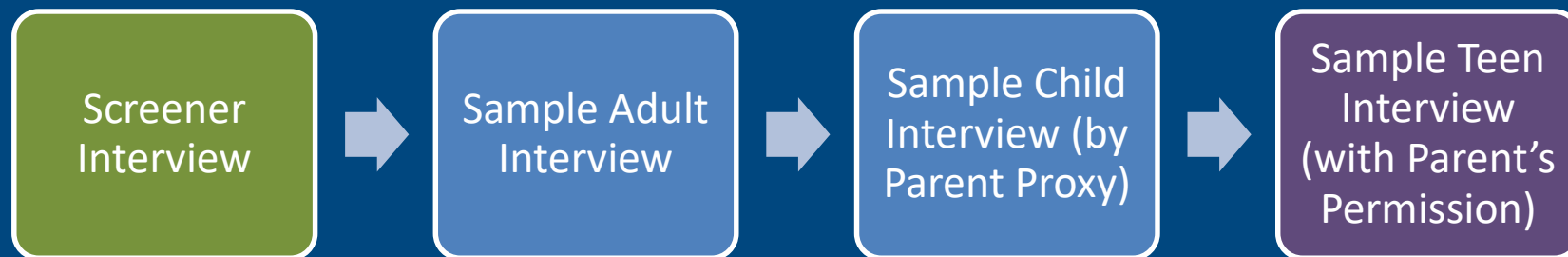
<http://healthpolicy.ucla.edu/chis/design/Pages/survey-topics.aspx>



How is CHIS conducted?

- Through 2018 used RDD sampling (landline and cell) and Computer-Assisted Telephone Interview (CATI), switching to an ABS, push-to-Web + CATI design starting in 2019
- CHIS collects detailed information for:

One adult (age 18+) in the household,
One adolescent (age 12-17) if present, and
One child (age 0-11) if present (by parent proxy)

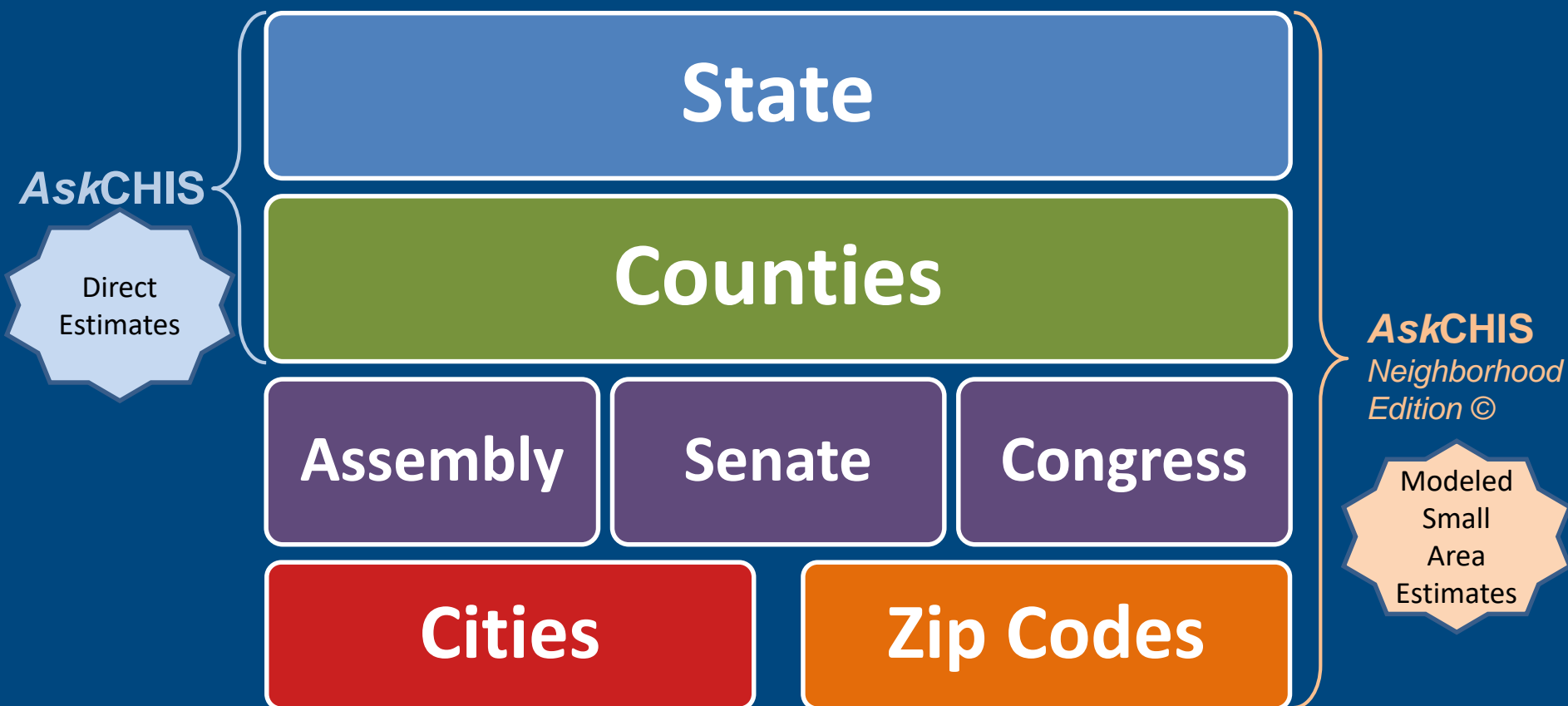


Sample Design of the CHIS

- Geographic stratification allows for direct estimates for 56 strata:
 - 8 Service Planning Areas in Los Angeles County
 - 6 Health Regions in San Diego County
 - 39 County strata (excluding LA and San Diego)
 - 3 County-group strata with the 17 smallest counties (by population)
- In total, ~20,000 adults per year are included in the sample
- Our challenge: *How do we generate health estimates for lower geographic levels—ideally down to the ZIP code level?*



CHIS Data Across Geographies



Approach for CHIS SAEs

Build models for CHIS data “borrowing strength” from other sources

Survey Data: CHIS

- CHIS outcome variable and covariates of interest

Auxiliary Data: American Community Survey

- ACS 5-year summary tables, especially sociodemographic variables at the neighborhood level. We initially included 236 variables, condensed through a 2-step principal component analysis (PCA), ending with two principal components.

Population Data: Nielsen-Claritas

- Nielsen-Claritas data, including same covariates of interest as in CHIS. We augmented this with modeled income-to-poverty ratios from CHIS, and adjusted to CHIS weighting dimensions through iterative proportional fitting.

Approach for CHIS SAEs

Modeling Indicators

- Begin with unit-level generalized linear mixed model
- Add a non-parametric function of census tract level auxiliary variables
- Apply model parameters to population dataset
- Aggregate predicted values into area level estimates

Calibration and Validation

- Include a random intercept from each stratum to account for sample design and soft-calibrate to direct estimates
- When predicted values fell outside limits, hard-calibrate by applying proportions of direct estimates to modeled estimates
- Validate by checking against larger areas and external information

Stability and Pooling

- Calculate coefficients of variation (CVs)
- Suppress point estimates with $CV \geq 30\%$, or areas with a population universe $< 1,000$
- Geographic estimates may be combined to pass stability criteria (pooled estimates are population-weighted averages of originals)

Detailed Description of the Methodology

- “Generating Health Estimates by Zip Code: A Semiparametric Small Area Estimation Approach Using the California Health Interview Survey”
 - Yueyan Wang, et al. American Journal of Public Health. December 2015, Vol 105, No. 12
- “A design-based approach to small area estimation using a semiparametric generalized linear mixed model”
 - Hongjian Yu, et al. Journal of the Royal Statistical Society, Series A. 2018, Vol 181, Part 4.



AskCHIS Neighborhood Edition[©]

Available at askchisne.ucla.edu

- Online platform for CHIS SAE dissemination and visualization
- Design informed by data user surveys and focus groups
- Developed thanks to grants from Kaiser Permanente and The California Wellness Foundation



Granular Health Estimates

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ENVIRONMENTAL FACTORS

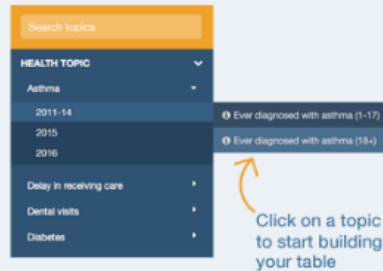
HEALTH TOPIC

[Asthma](#)[Delay in receiving care](#)[Dental visits](#)[Diabetes](#)[Flu vaccine](#)[Food insecurity](#)[Health status](#)[Heart disease](#)[Mental health](#)[Obese/Overweight](#)[Physical activity](#)[Smoking](#)[Sugar Drinks](#)[Uninsured](#)

SOCIO-DEMOGRAPHICS

1

Select a topic



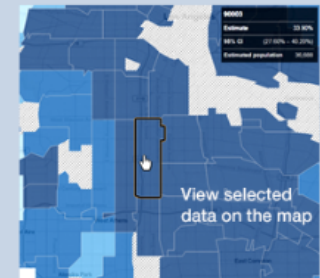
2

Add a location



3

Visualize your data



AskCHIS Neighborhood Edition



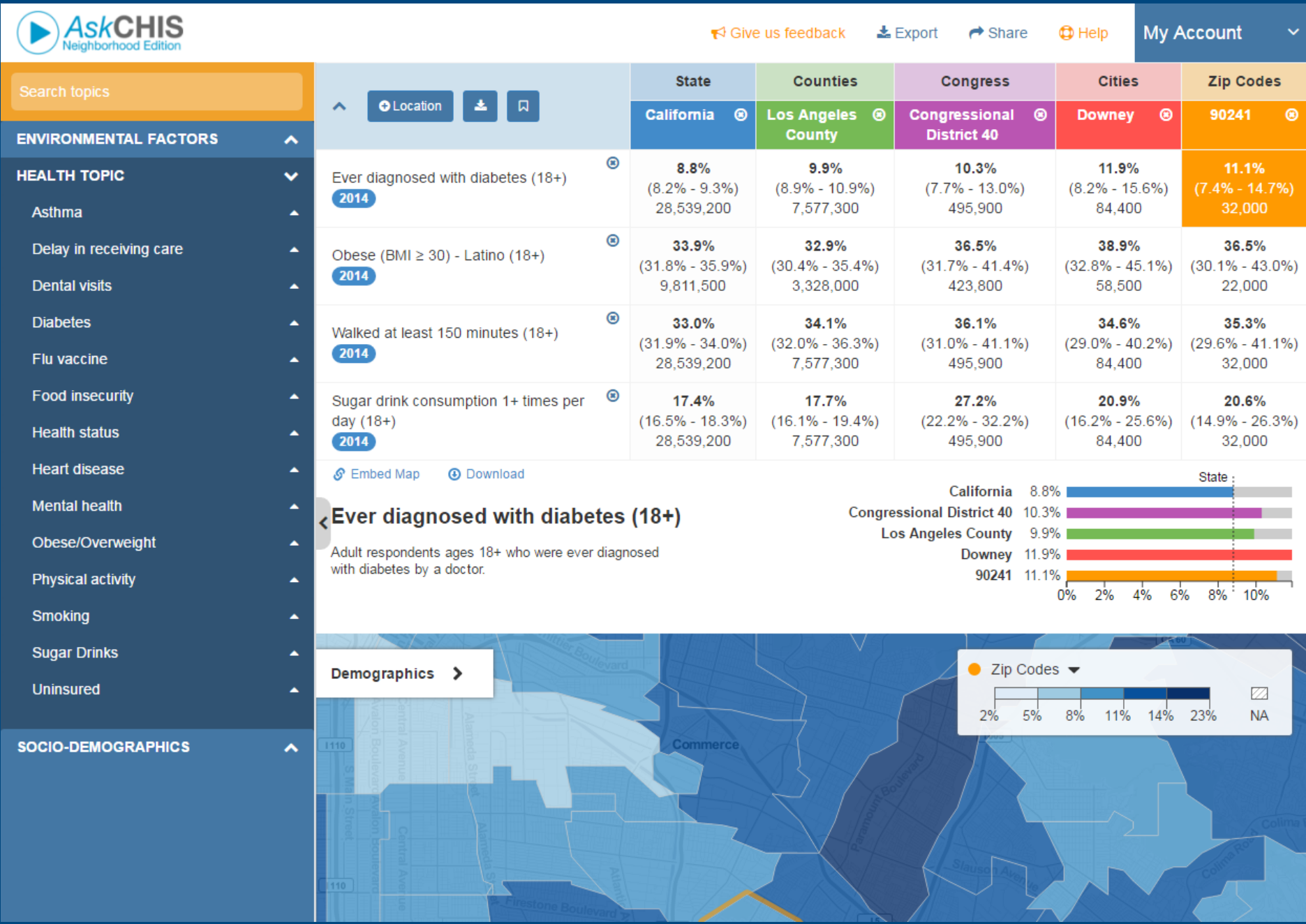
UCLA

AskCHIS Neighborhood Edition is an online data dissemination and visualization platform that provides health estimates at sub-county geographic regions. With *AskCHIS NE*, you can access and visualize authoritative health data at **zip code**, **city**, **county**, and **legislative district** levels.

Health estimates are powered by data from the California Health Interview Survey (CHIS) and are created through a sophisticated modeling technique called small area estimation (SAE). For more information about the methodology behind our data, [click here](#).

[Learn about our methodology](#)

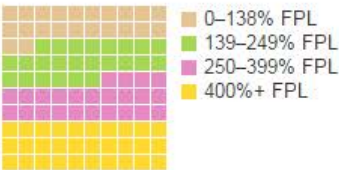
Estimates for Zip Codes, Cities, Counties, Legislative Districts



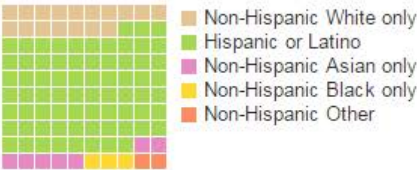
Powerful Visualization Tools

90241

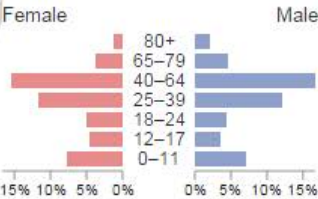
Federal Poverty Level



Race/Ethnicity



Population



Zip Codes

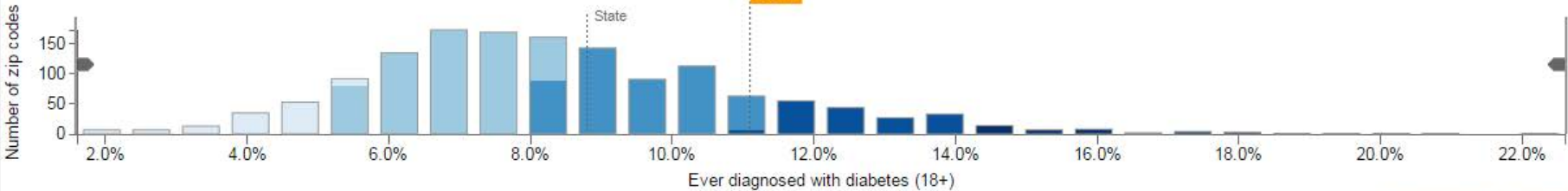
2% 5% 8% 11% 14% 23% NA

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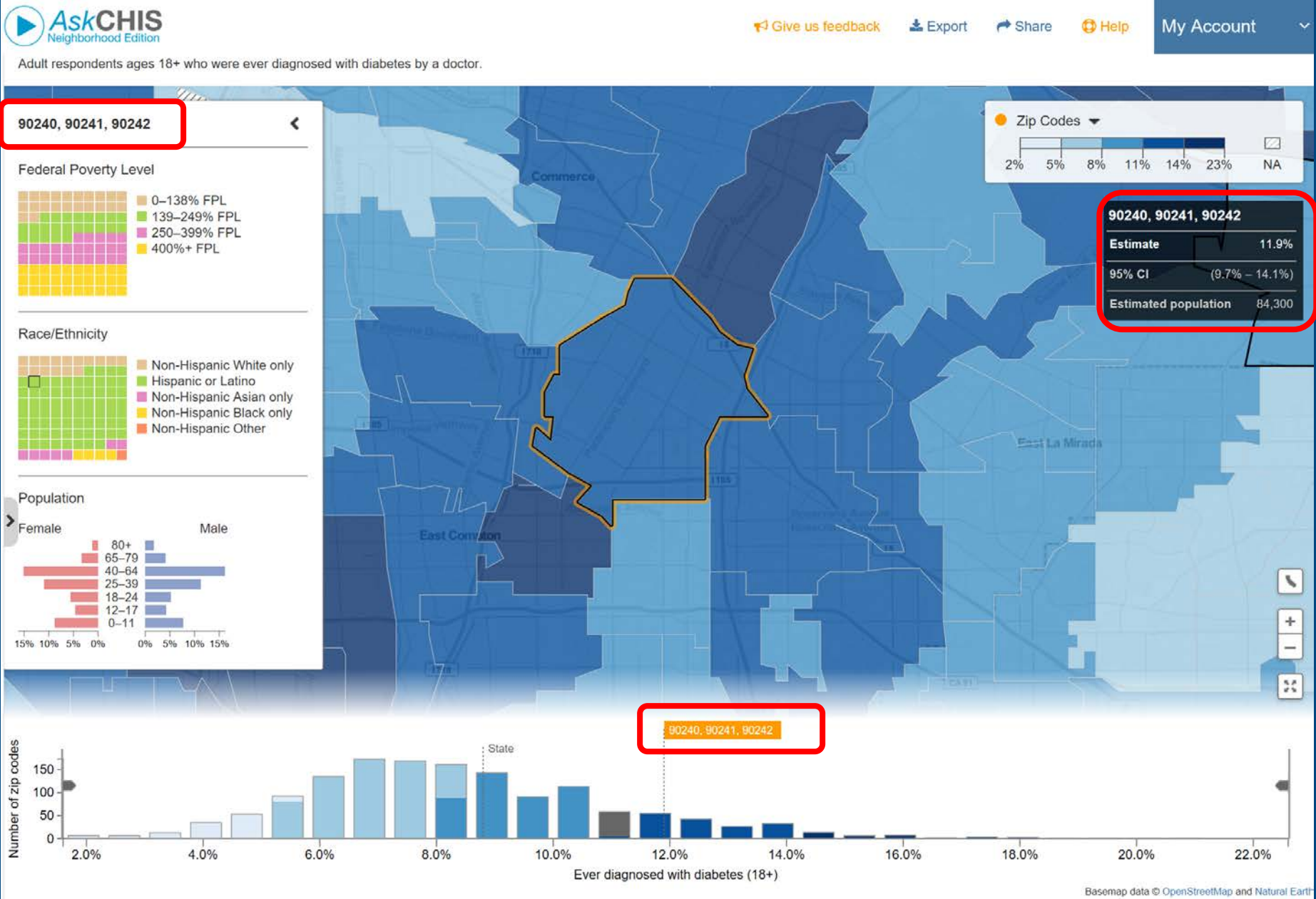
Estimate 11.1%

95% CI (7.4% - 14.7%)

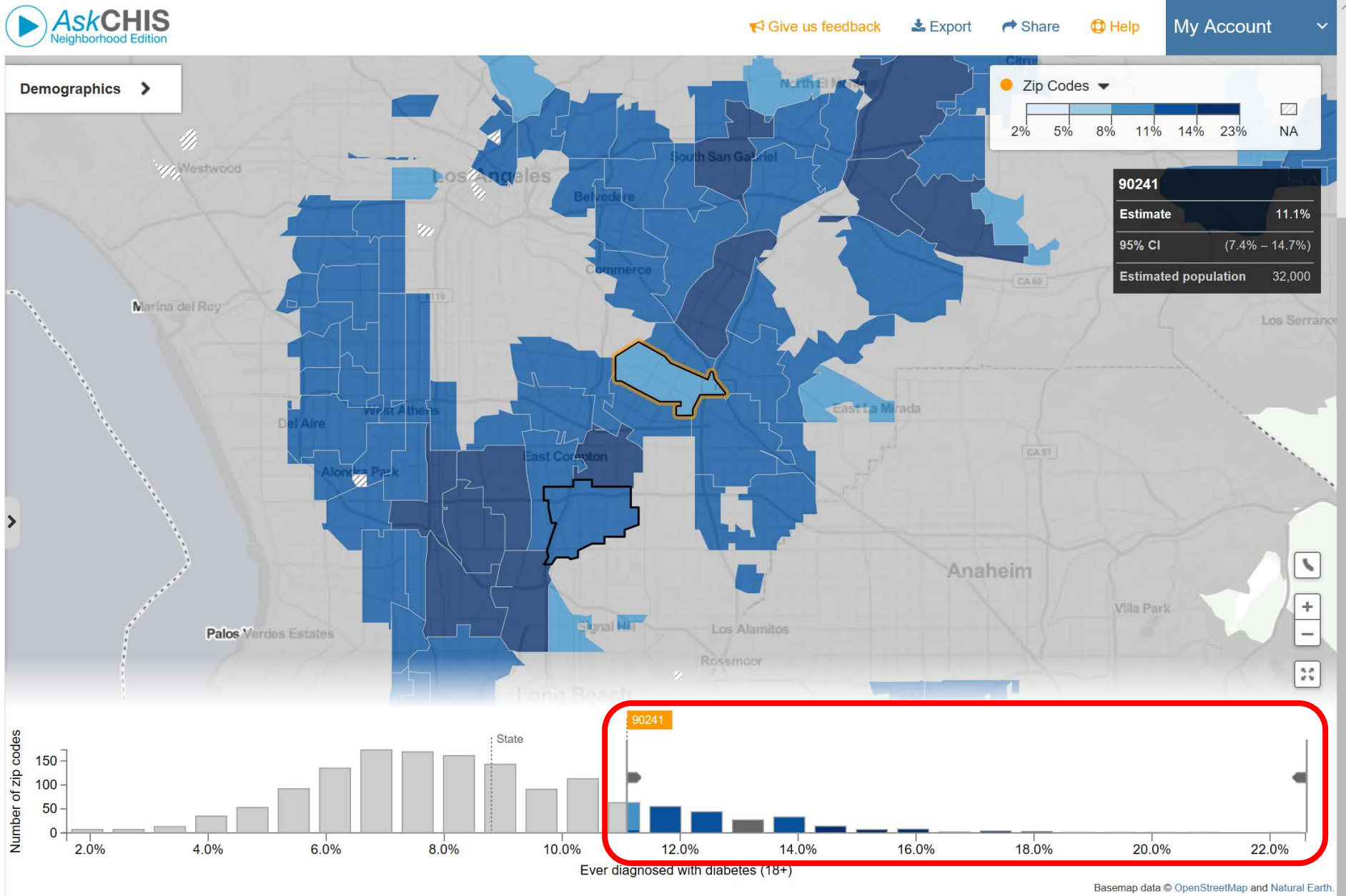
Estimated population 32,000



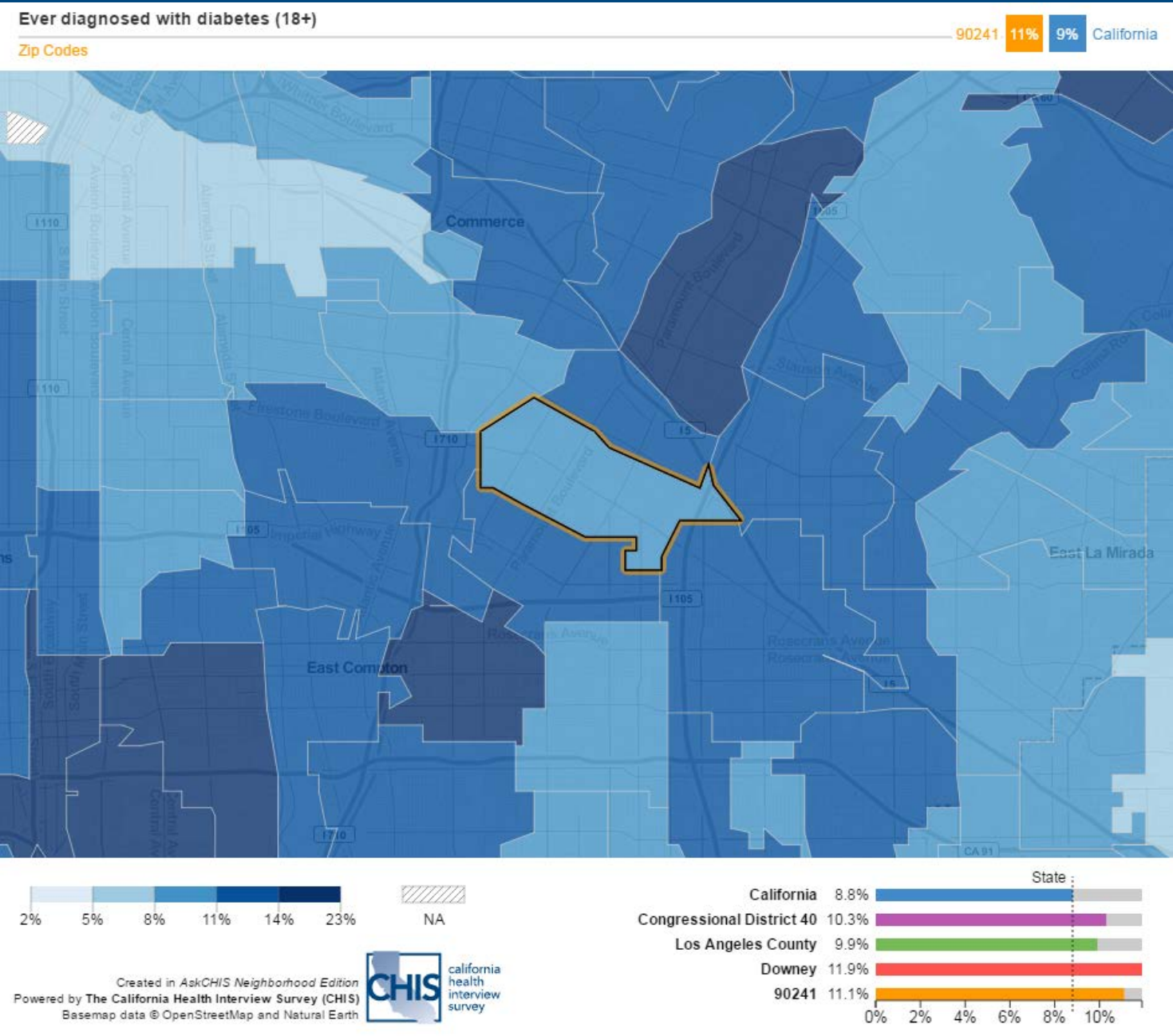
User-Defined Geographic Areas: Groups of Zip Codes



Custom Visualizations Using Ranges Defined on Interactive Histogram



Export Maps, Charts, and Data



Supplemental Data Sources: CalEnviroScreen for Air Quality, Pollution

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ENVIRONMENTAL FACTORS

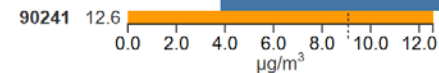
CalEnviroScreen

HEALTH TOPIC

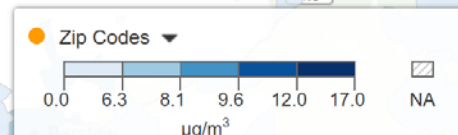
SOCIO-DEMOGRAPHICS

Particulate matter (PM2.5) (0+)

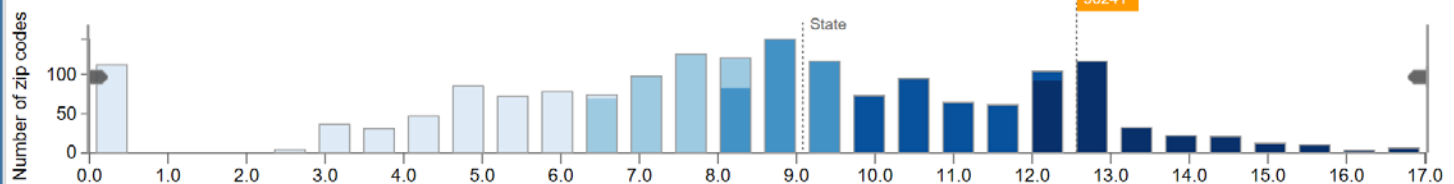
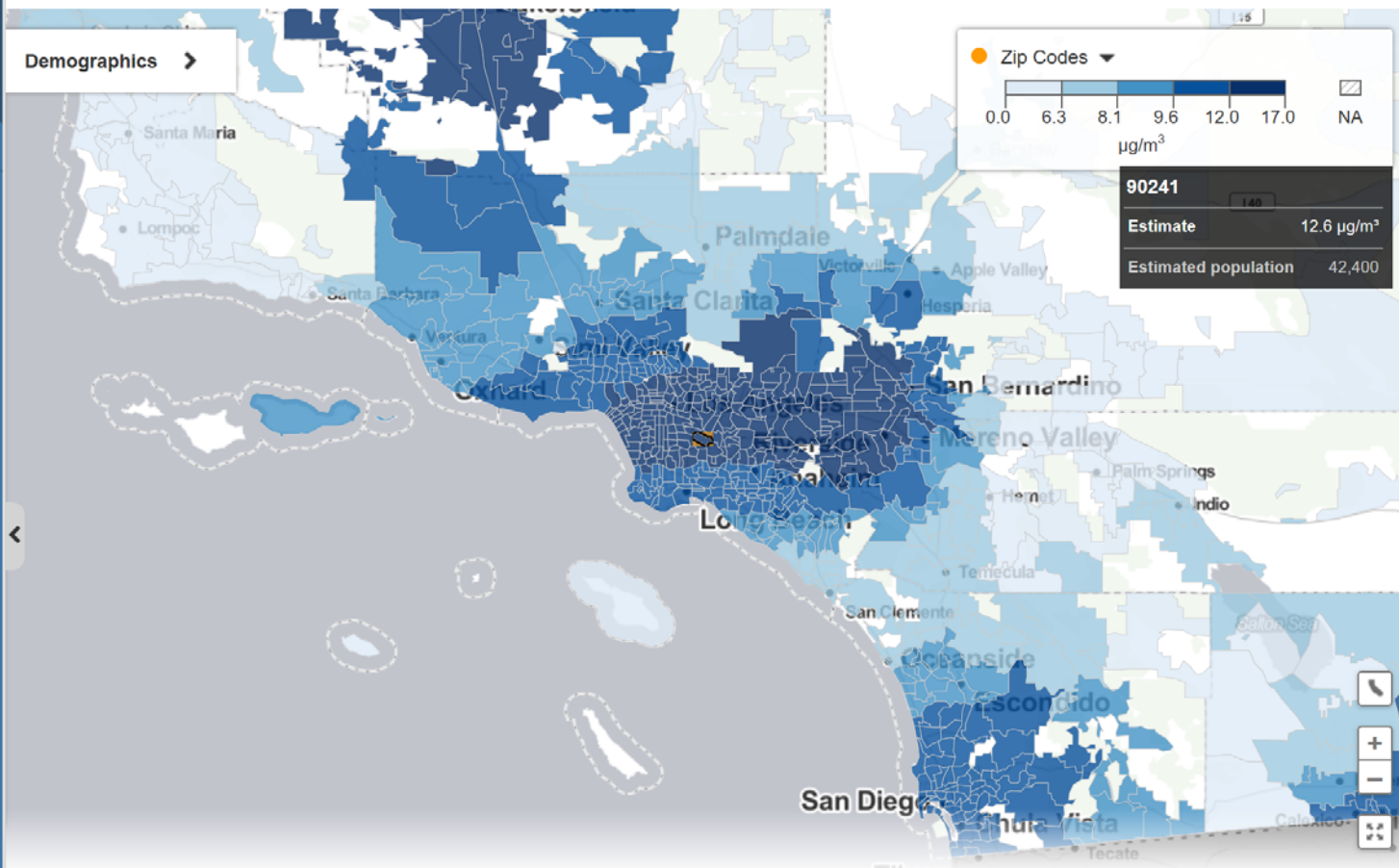
Annual mean PM 2.5 concentration, ug/m3



Demographics



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Estimate	12.6 $\mu\text{g}/\text{m}^3$
Estimated population	42,400



California Health Interview Survey (CHIS) API

GET Geography Search

GET Metadata

GET Pool Data by Geo IDs

GET Variable

AskCHIS Neighborhood Edition

 API definition

The AskCHIS Neighborhood Edition (AskCHIS NE) API provides access to all of the estimates available in the AskCHIS NE dashboard (<http://askchisne.ucla.edu>). The API can be used for both web development and research and makes it easy for users to build custom queries and extract estimates. Health indicators in AskCHIS NE are created using a sophisticated modeling technique called Small Area Estimation (SAE). For more information on data provenance, please visit the help section in AskCHIS NE.

Variable

Return data for a specific health indicator (e.g. variable) for specific geographic areas provided.

Note: The geoType or the geolds parameter is required. You can have both, or just one, but you cannot leave them both empty.

Free Tier Restriction: Only one geographic area can be queried at a time. If multiple geolds are provided, the first one will be used.

Try it

Request URL

`http://askchisne.azure-api.net/api/variable/{name}[?attributes][&geoType][&geolds][&year]`

Request parameters

name	string	Indicator name
attributes (optional)	string	Can be any of the following (case-sensitive): population, estimate, SE, CI_LB95, CI_UB95, CV , MSE To query for more than one attribute, provide a comma-separated list (e.g. attributes=population, estimate, SE
geoType (optional)	string	can be one of the following: cities, assembly, congress, senate, zcta (zip codes), state, counties



AskCHIS On-Demand Learning Center

<http://healthpolicy.ucla.edu/chis/Pages/CHISTraining.aspx>



Introduction to AskCHIS NE

AskCHIS Neighborhood Edition allows you to access hyper-local California health data, including ZIP code, legislative district, city and more!



1

Select a topic

2

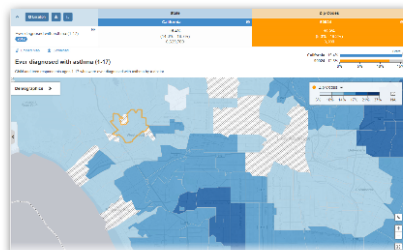
Add a location

3

Visualize your data

How to build a basic Community Profile

Learn how to select a health topic and up to five hyper-local geographical locations.



How to adjust and visualize your data

Learn how to adjust results, visualize your data, and more!

Fast, free tutorials
on how to use
AskCHIS and
AskCHIS
Neighborhood
Edition®

Thank you!

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