THE VISION AND EYE HEALTH SURVEILLANCE SYSTEM

A national data system for vision and eye health

Understanding and using VEHSS to access vision and eye health prevalence information

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The Vision And Eye Health Surveillance System

A national data system for vision and eye health

- CDC – NORC cooperative agreement

- Partner organizations

What is in VEHSS?

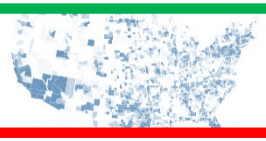
- Summary prevalence estimates of vision and eye health indicators
  - Percentage of persons in a dataset with a condition, divided by the population of people in the data source
- Indicators
  - The outcome measures selected or defined by the VEHSS team that are measured in each data source
- Data Sources
  - Surveys, claims databases and registries selected for analysis
- Composite Estimates
  - Model-based predictions of the total prevalence of conditions the VEHSS team creates by combining prevalence estimates from multiple datasets

What is not in VEHSS

- Person level or micro data
  - National survey micro-data files are available from the government agencies that administers each survey
  - Person-level administrative data (claims and registries) cannot be publicly released
- Highly detailed data, programmatic data, incidence, other outcomes
  - VEHSS is a public health surveillance system with limited scope and resources

VEHSS Indicator Topics

1. Visual function
   - Measured visual acuity, including best corrected, presenting, or uncorrected refractive error
   - Functional limitations
   - Other vision disorders
2. Eye health conditions
   - Eye diseases such as glaucoma, cataract, diabetic retinopathy, age related macular degeneration and others
3. Service utilization
   - Eye exams, imaging/tests
   - Medical procedures, surgeries and drugs
   - Glasses, contacts
   - Screenings



Data Sources Types

- National telephone surveys
  - National surveys ask questions about vision, eye health conditions and service utilization, like…
    - “Are you blind or do you have serious difficulty seeing even when wearing glasses?”
    - “Do you currently wear eyeglasses or contact lenses? Does [NAME] wear eyeglasses or contact lenses?”
    - “Have you EVER been told by a doctor or other health professional that you had Diabetic retinopathy?”
  - Nationally representative samples with variable recruitment methods, response rates, sample sizes
  - Unknown validity/accuracy of self-report measures

Data Sources Types

- Administrative claims databases
  - Claims contain diagnosis and procedure codes
    - Can identify detailed eye diseases and specific treatments
  - Claims databases are convenience samples
  - Claims are filed by healthcare providers for billing purposes, and may miss
    - Undiagnosed conditions
    - Untreated conditions
    - Conditions treated by other payers, or out of pocket
    - Any person who is not a member, customer or beneficiary of that insurer
    - All uninsured persons

Data Sources Types

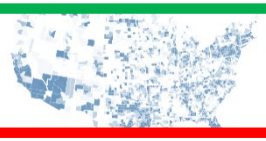
- Electronic health records registries
  - EHR systems and registries have detailed records of diagnoses, procedures and best corrected acuity
  - VEHSS includes the IRIS Registry that includes >95% of US ophthalmology practices
    - IRIS Registry captures more detailed diagnosis history than claims:
      - Untreated conditions
      - Prior diagnoses
    - IRIS Registry will miss:
      - Undiagnosed conditions
      - Conditions or services provided by emergency depts, general practitioners and most optometrists
  - Denominator includes only patients with visits to an IRIS-participating ophthalmology practice

Data Sources Types

- Examination studies
  - Gold-standard eye examinations to measure vision and identify eye diseases
  - Examinations provided to as many people as possible within a defined population
    - Town, zip code, healthcare facility, mobile clinic
  - Studies may not be representative
    - Small, locally-derived samples
    - Most studies are now old, predating major changes in eye care

Current Data Sources in VEHSS

National surveys	
ACS	American Community Survey (National, state, county)
BRFSS	Behavioral Risk Factors Surveillance System (National, state)
NHIS	National Health Interview Survey (National)
NHANES	National Health and Nutrition Examination Survey (National)
NSCH	National Survey of Children's Health (National, state).
Administrative claims	
Commercial Medical Insurance	MarketScan private commercial medical insurance (National, state; ~50% private insurance market coverage)
Medicaid	Medicaid MAX, TMSIS coming soon (National, state, county coming soon; 100% coverage)
Medicare	Medicare Fee-For-Service (National, state, county; 100% coverage)
Managed Vision Care	VSP Global managed vision plan insurance (National, state, ~60% vision insurance market coverage)
EHR/Registry	
IRIS Registry	IRIS Registry (National, state, county coming 2022; 95%+ ophthalmology practice coverage)
Examination Studies	
Published examination studies	Literature review of published studies, meta-analyses of selected studies for composite estimates



Composite Estimates

- No single indicator can answer general questions like “how many people in the US are blind?”
- Integrating information from different indicators and data sources can produce more comprehensive estimates
  - Visual Acuity Loss released in May 2021
  - AMD, diabetic retinopathy and glaucoma in-progress

Data Sources vs. Composite Estimates

Data Sources (survey, claims, registry data)	Composite Estimates
VEHSS summarizes prevalence information from 10 data sources, including on:	VEHSS creates composite estimates by combining information from multiple datasets from different types of data
• 200+ indicators • More granularity and detail • More limitations and caveats to their interpretation	• The primary estimates available in VEHSS • Less detail • Fewer caveats or limitations to their interpretation

THE VISION AND EYE HEALTH SURVEILLANCE SYSTEM

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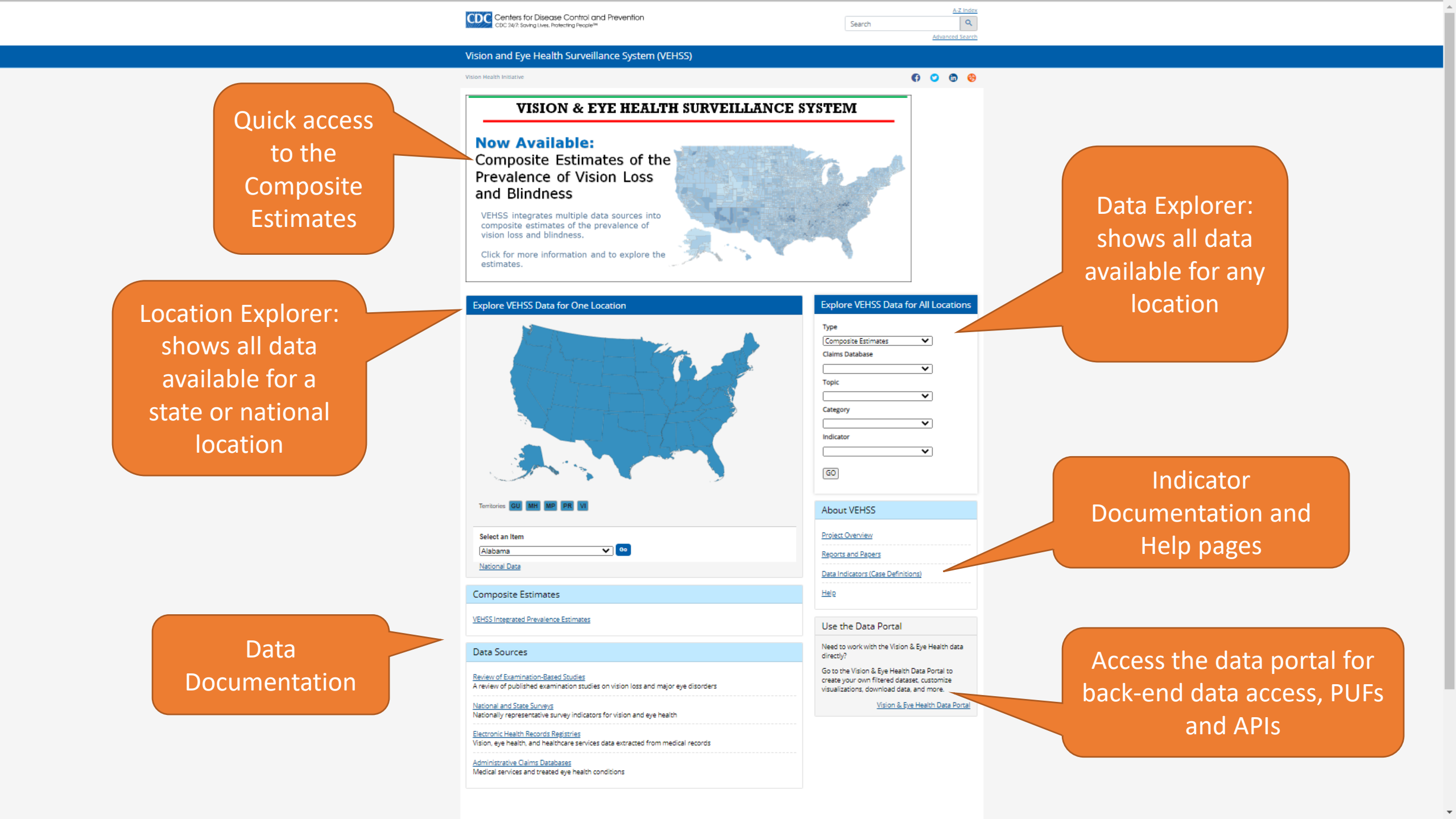
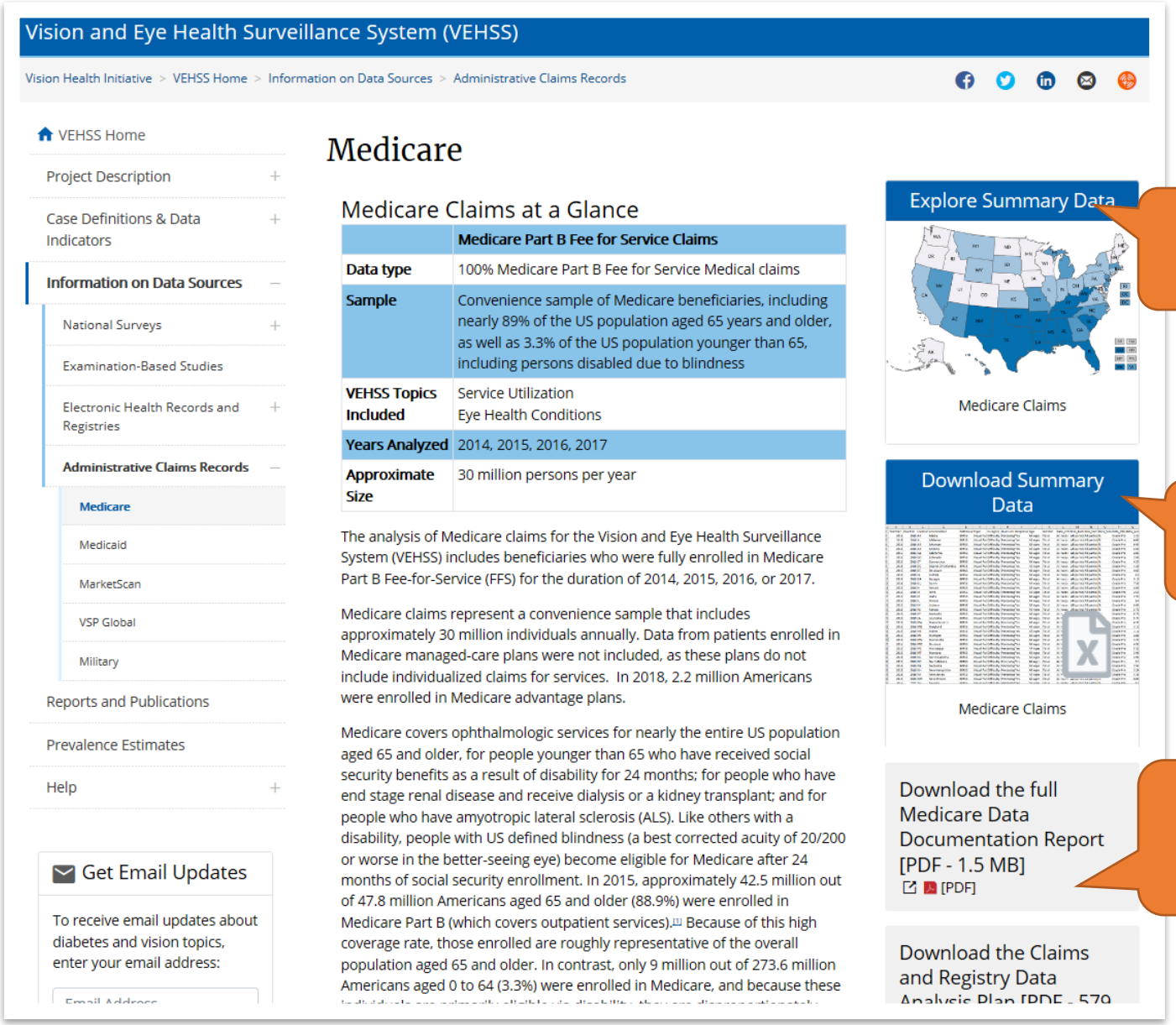
VEHSS Website


Centers for Disease Control and Prevention
CDC 24/7: Saving Lives. Protecting People™
A-Z Index
Search
Advanced Search
Vision and Eye Health Surveillance System (VEHSS)
Vision Health Initiative
VISION & EYE HEALTH SURVEILLANCE SYSTEM
Now Available:
Composite Estimates of the Prevalence of Vision Loss and Blindness
VEHSS integrates multiple data sources into composite estimates of the prevalence of vision loss and blindness.
Click for more information and to explore the estimates.
Explore VEHSS Data for One Location
Territories GU MH MP PR VI
Select an Item
Alabama
Go
National Data
Composite Estimates
VEHSS Integrated Prevalence Estimates
Data Sources
Review of Examination-Based Studies
A review of published examination studies on vision loss and major eye disorders
National and State Surveys
Nationally representative survey indicators for vision and eye health
Electronic Health Records Registries
Vision, eye health, and healthcare services data extracted from medical records
Administrative Claims Databases
Medical services and treated eye health conditions
Explore VEHSS Data for All Locations
Type
Composite Estimates
Claims Database
Topic
Category
Indicator
GO
About VEHSS
Project Overview
Reports and Papers
Data Indicators (Case Definitions)
Help
Use the Data Portal
Need to work with the Vision & Eye Health data directly?
Go to the Vision & Eye Health Data Portal to create your own filtered dataset, customize visualizations, download data, and more.
Vision & Eye Health Data Portal
Quick access to the Composite Estimates
Location Explorer: shows all data available for a state or national location
Data Documentation
Data Explorer: shows all data available for any location
Indicator Documentation and Help pages
Access the data portal for back-end data access, PUFs and APIs

Data Documentation Pages

- Data overview
- Analytic methods
- Indicators analyzed
- Limitations
- VEHSS Data access
- VEHSS Data Portal PUF access
- PDF reports

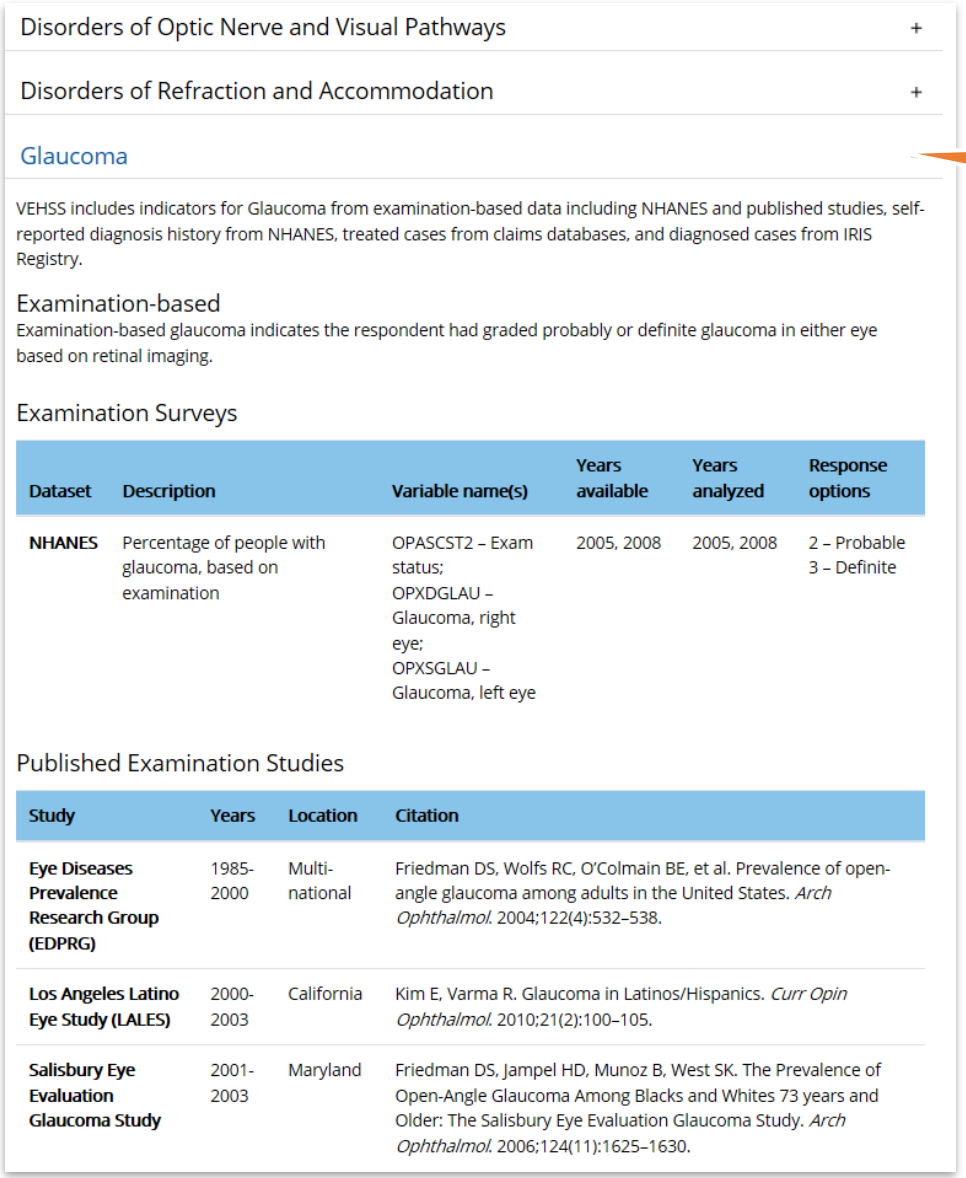


Indicator Documentation Pages

Overview

Datasets represented

Variables included



Disorders of Optic Nerve and Visual Pathways +

Disorders of Refraction and Accommodation +

Glaucoma

VEHSS includes indicators for Glaucoma from examination-based data including NHANES and published studies, self-reported diagnosis history from NHANES, treated cases from claims databases, and diagnosed cases from IRIS Registry.

Examination-based

Examination-based glaucoma indicates the respondent had graded probably or definite glaucoma in either eye based on retinal imaging.

Examination Surveys

Dataset	Description	Variable name(s)	Years available	Years analyzed	Response options
NHANES	Percentage of people with glaucoma, based on examination	OPASCST2 – Exam status; OPXDGLAU – Glaucoma, right eye; OPXSGLAU – Glaucoma, left eye	2005, 2008	2005, 2008	2 – Probable 3 – Definite

Published Examination Studies

Study	Years	Location	Citation
Eye Diseases Prevalence Research Group (EDPRG)	1985-2000	Multi-national	Friedman DS, Wolfs RC, O'Colmain BE, et al. Prevalence of open-angle glaucoma among adults in the United States. *Arch Ophthalmol.* 2004;122(4):532–538.
Los Angeles Latino Eye Study (LALES)	2000-2003	California	Kim E, Varma R. Glaucoma in Latinos/Hispanics. *Curr Opin Ophthalmol.* 2010;21(2):100–105.
Salisbury Eye Evaluation Glaucoma Study	2001-2003	Maryland	Friedman DS, Jampel HD, Munoz B, West SK. The Prevalence of Open-Angle Glaucoma Among Blacks and Whites 73 years and Older: The Salisbury Eye Evaluation Glaucoma Study. *Arch Ophthalmol.* 2006;124(11):1625–1630.

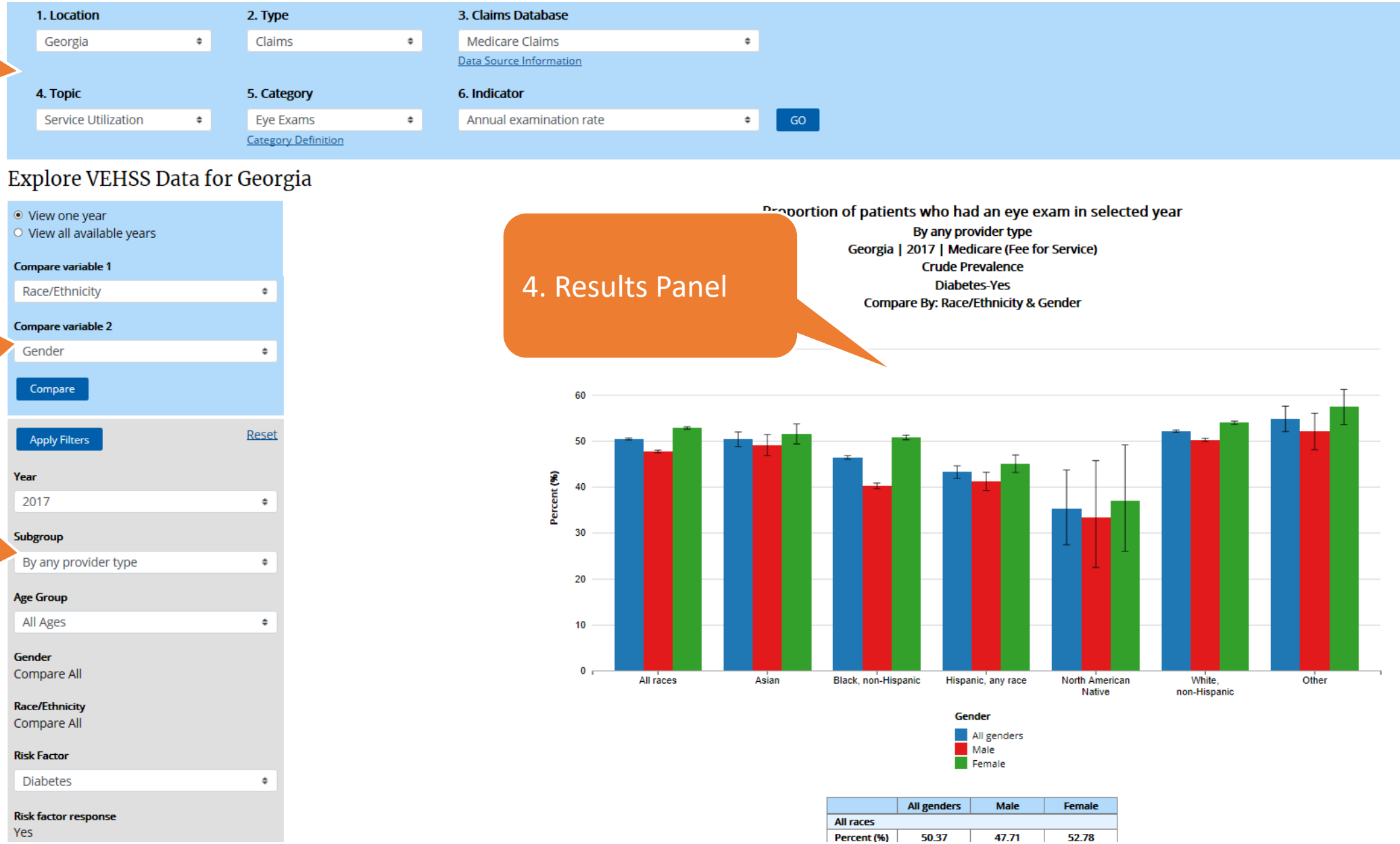
Click + to open indicator details

1. Selector Box: Complete all 6 dropdowns and click GO

2. Compare Box: Compare 1-2 stratification factors and click Compare

3. Filter Box: Filter data to selected groups and click Apply Filters

4. Results Panel

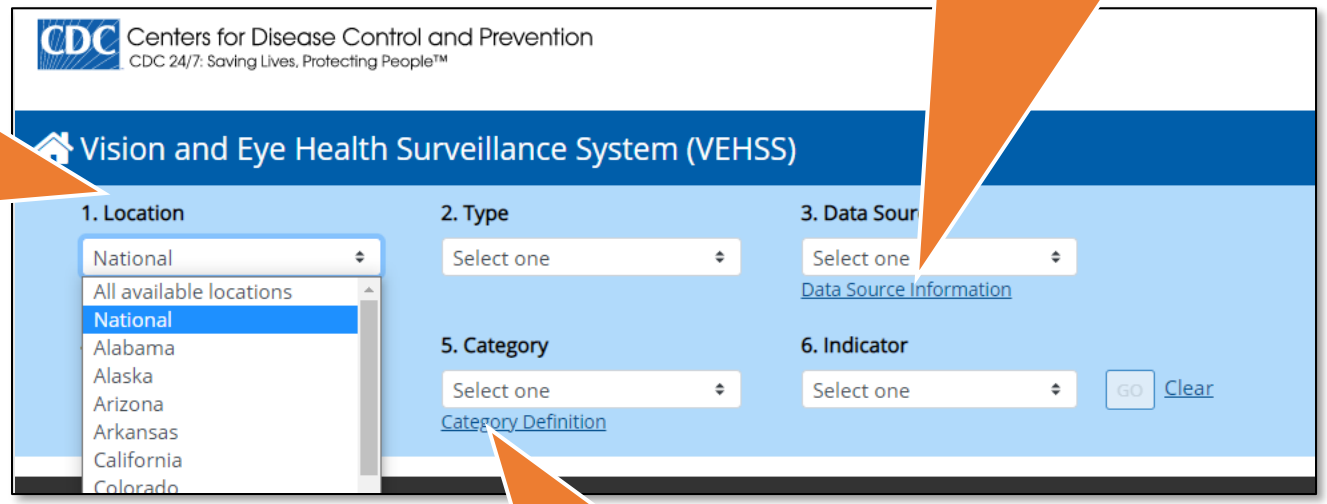


VEHSS - The Vision & Eye Health Surveillance System

1. Selector Box

Selecting All available locations defaults to state level map

Selecting National or any state defaults to chart+table with compare box



Click Data Source Information to open documentation page for selected data source

Click Category Definition to open documentation page for selected indicator category

2. Compare Box:

Not available in map views

Select all years of data for trend line analyses

3. Filter Box:

Filters get reset when Compare changes

Explore VEHSS Data for Georgia

View one year
View all available years

Compare variable 1

Years

Compare variable 2

Diabetes

Compare

Apply Filters Reset

Year
Compare All

Response
Yes

Age Group
All Ages

Gender
All genders

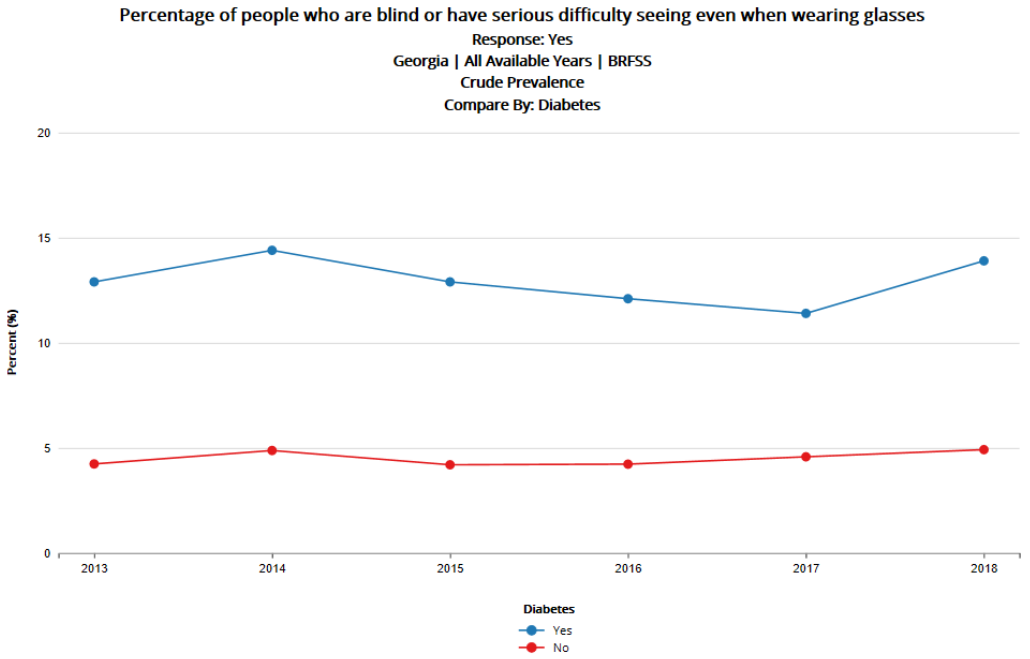
Race/Ethnicity
All races

Risk Factor
Compare All Diabetes

Data Type

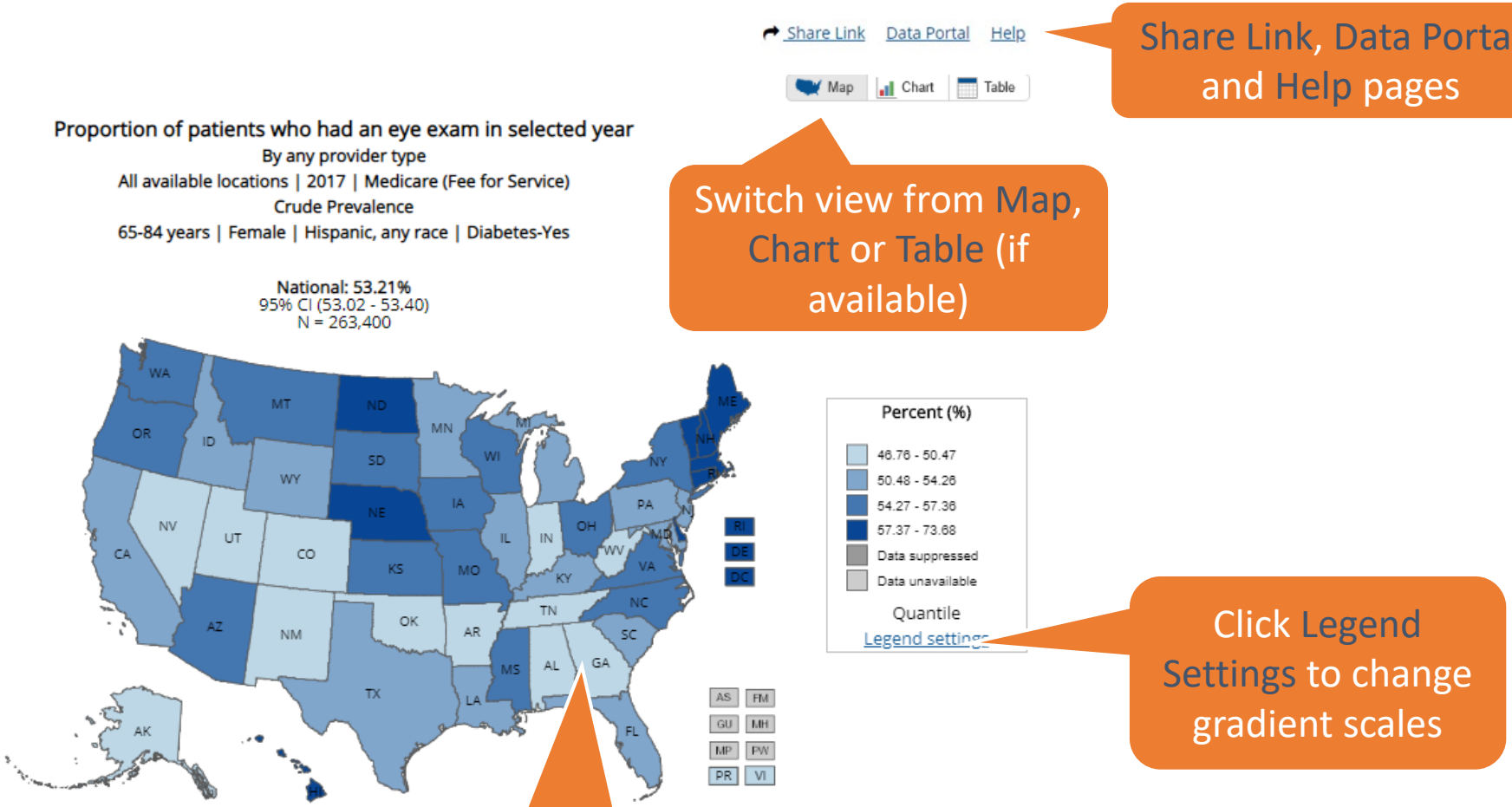
Crude Prevalence

Apply Filters Reset



	Yes	No
2018		
Percent (%)	**13.90**	**4.92**
95% CI	11.70 - 16.50	4.35 - 5.56
n	136,000	333,000
2017		
Percent (%)	**11.40**	**4.58**
95% CI	8.71 - 14.80	3.94 - 5.33
n	99,000	310,000
2016		
Percent (%)	**12.10**	**4.23**
95% CI	9.53 - 15.10	3.52 - 5.07
n	111,000	283,000
2015		
Percent (%)	**12.90**	**4.20**

4.Results Panel



Share Link, Data Portal and Help pages

Switch view from Map, Chart or Table (if available)

Zoom or reset map

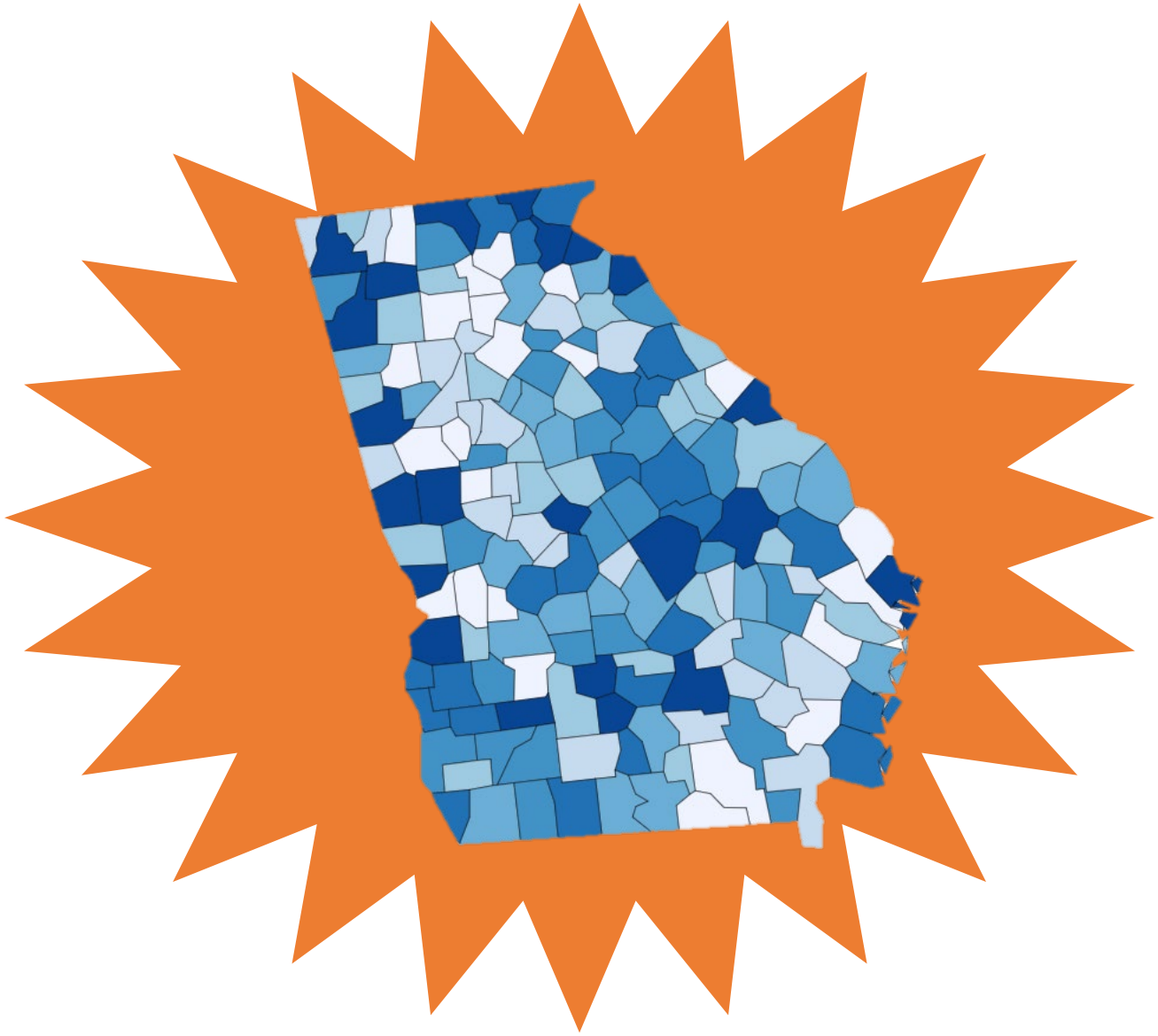
Click Legend Settings to change gradient scales

Click a state to zoom, or explore all data for location

Export formatted PDF report, or CSV table

New for 2021:

- Composite estimates of the prevalence of visual acuity loss
- County-level mapping:
  - ACS
  - Medicare
  - Composite estimates of vision loss
  - Medicaid coming soon



Vision and Eye Health Surveillance System (VEHSS)

1. Location: North Carolina
2. Type: Composite Estimates
3. Composite Estimates: Prevalence Estimates
View as county map
Data Source Information
4. Topic: Visual Function
5. Category: Measured Visual Acuity
Category Definition
6. Indicator: Prevalence of Vision Loss, by major age groups
GO Clear

County map option is shown if user selects a state and a data source that has county-level results

Explore VEHSS Data for North Carolina

Help

Apply Filters Reset

Year
2017

Subgroup
Any vision loss

Age Group
All Ages

Gender
All genders

Race/Ethnicity
All races

Risk Factor
All persons

Risk factor response
Total

Data Type
Prevalence Estimates

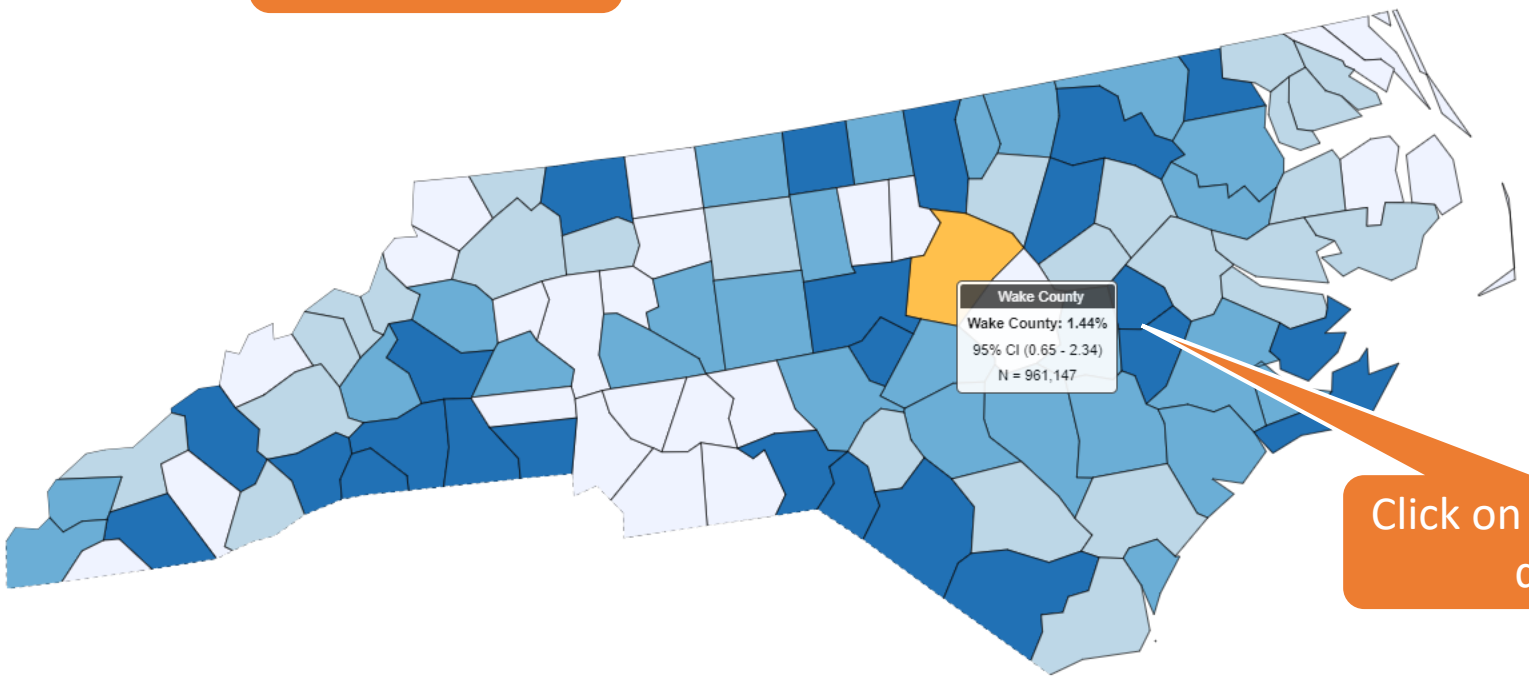
Apply Filters Reset

Map | Chart | Table

Map view selected

Prevalence of Vision Loss, by major age groups
Any vision loss
North Carolina | 2017 | Prevalence Estimatess
Prevalence Estimates
North Carolina: 2.25%
95% CI (1.89 - 2.58)
N = 10,273,419

State totals in header



Click on a county for detail

Search county

Percent (%)
01.89 - 03.11
03.12 - 03.62
03.63 - 04.08
04.09 - 05.66
Quantile
Legend Settings

Vision and Eye Health Surveillance System (VEHSS)

1. Location: North Carolina
2. Type: Composite Estimates
3. Composite Estimates: Prevalence Estimates
View as county map
Data Source Information
4. Topic: Visual Function
5. Category: Measured Visual Acuity
Category Definition
6. Indicator: Prevalence of Vision Loss, by major age groups
GO Clear

Explore VEHSS Data for North Carolina

Share Link | Data Portal | Help

Map | Chart | Table

Chart view selected

View one year

Compare variable 1: Race/Ethnicity

Compare

Compare box available in Chart and Table views

Apply Filters | Reset

Year: 2017

Subgroup: Any vision loss

Age Group: 65-84 years

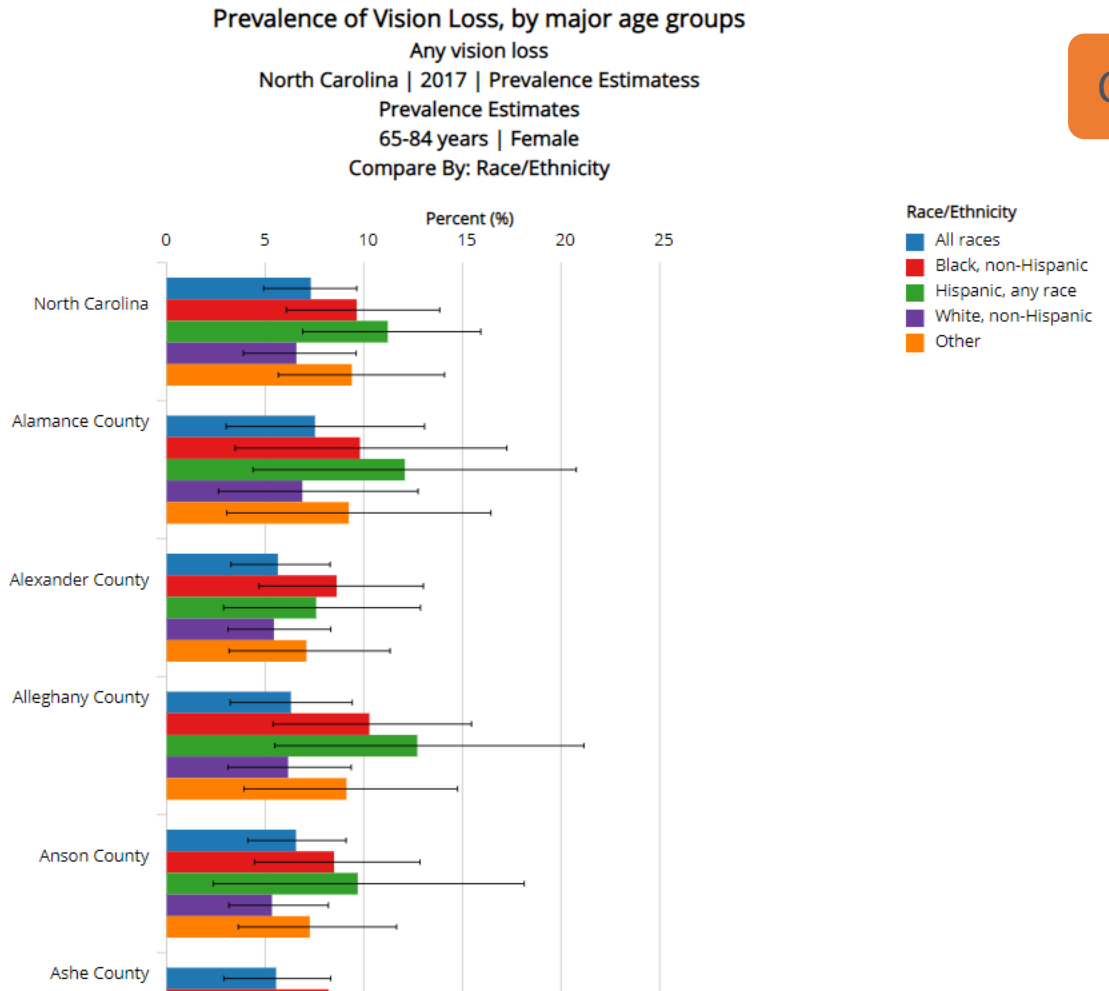
Gender: Female

Race/Ethnicity: Compare All

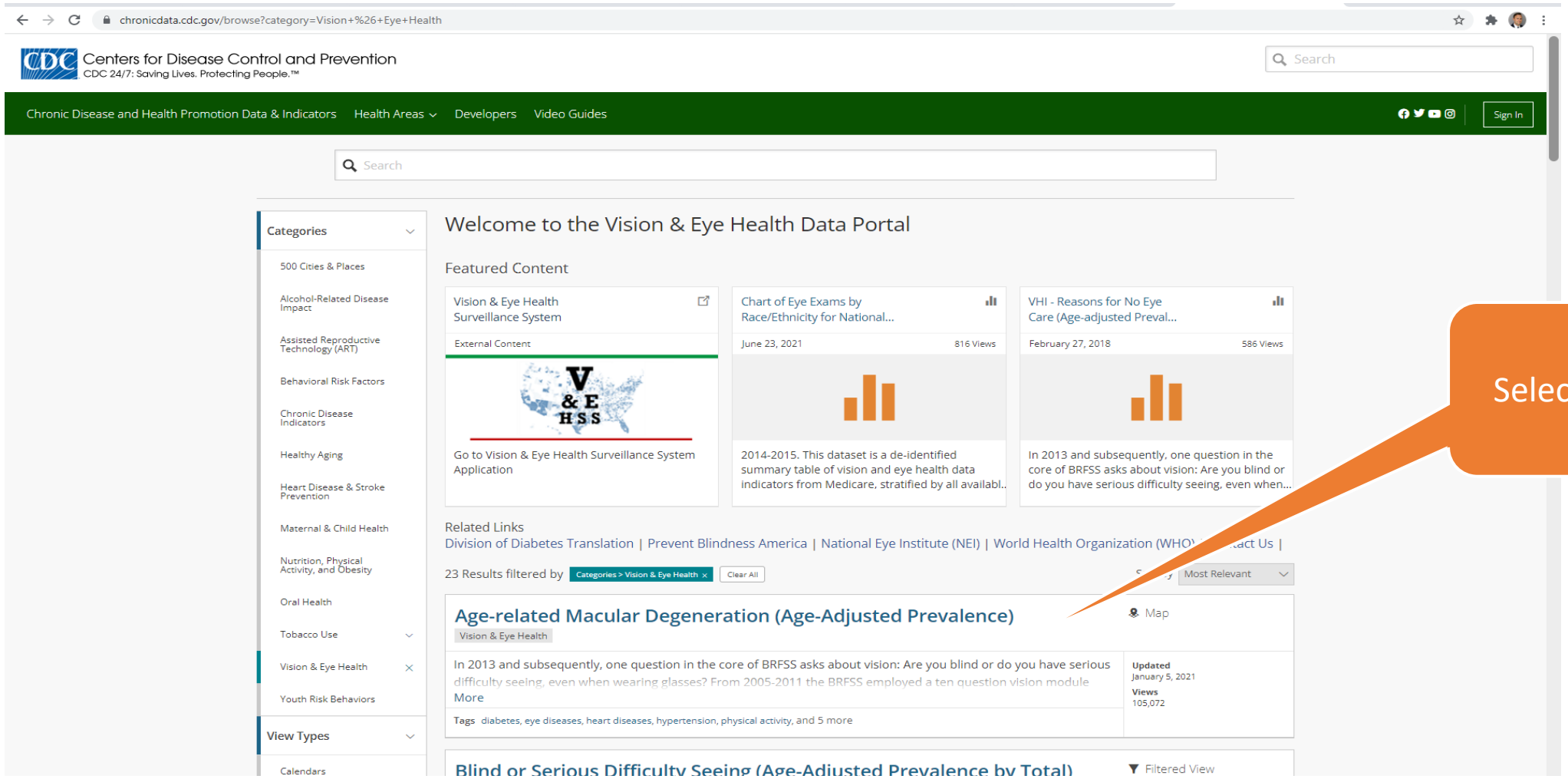
Risk Factor: All persons

Risk factor response: Total

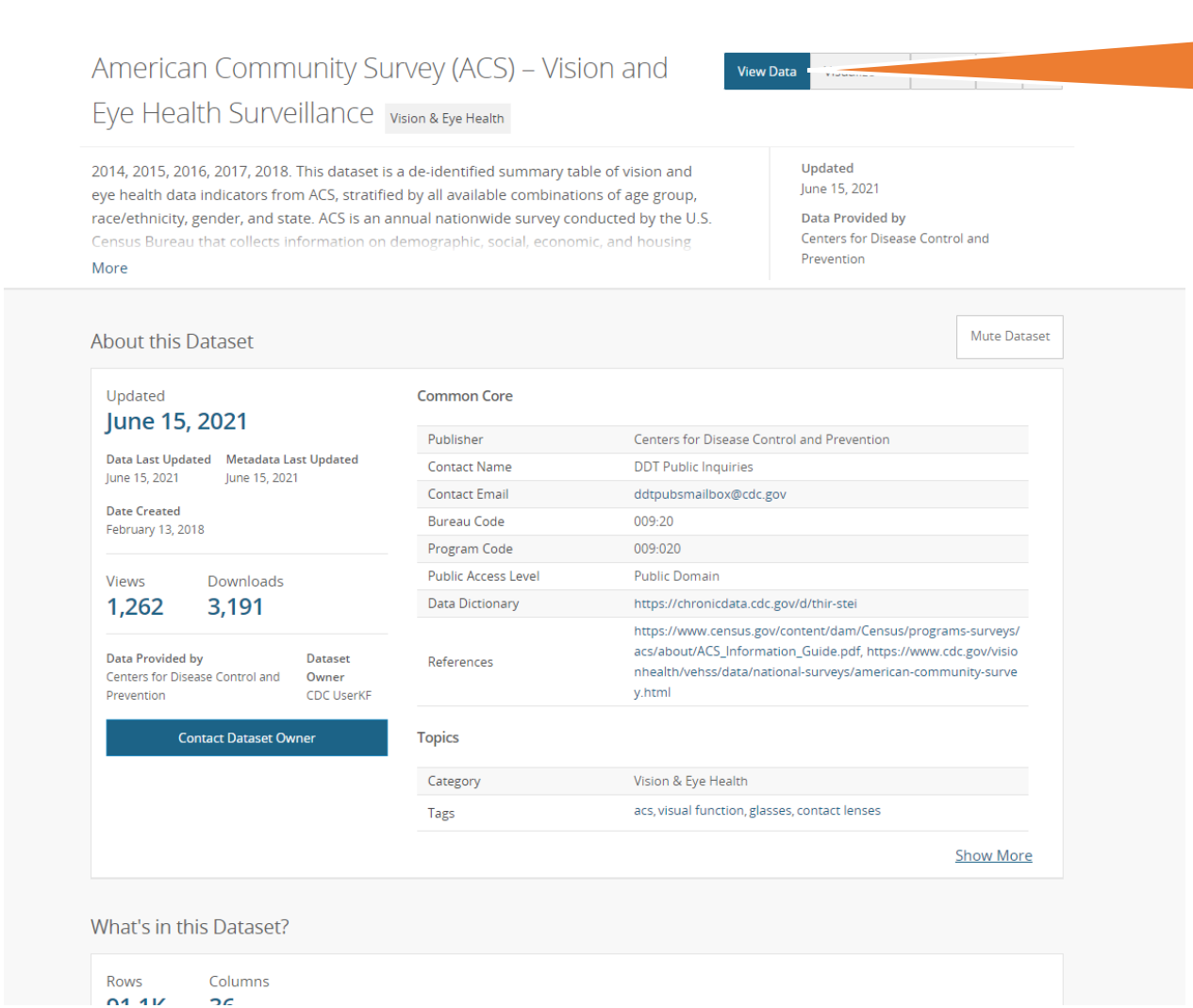
Data Type: Prevalence Estimates



Data Portal

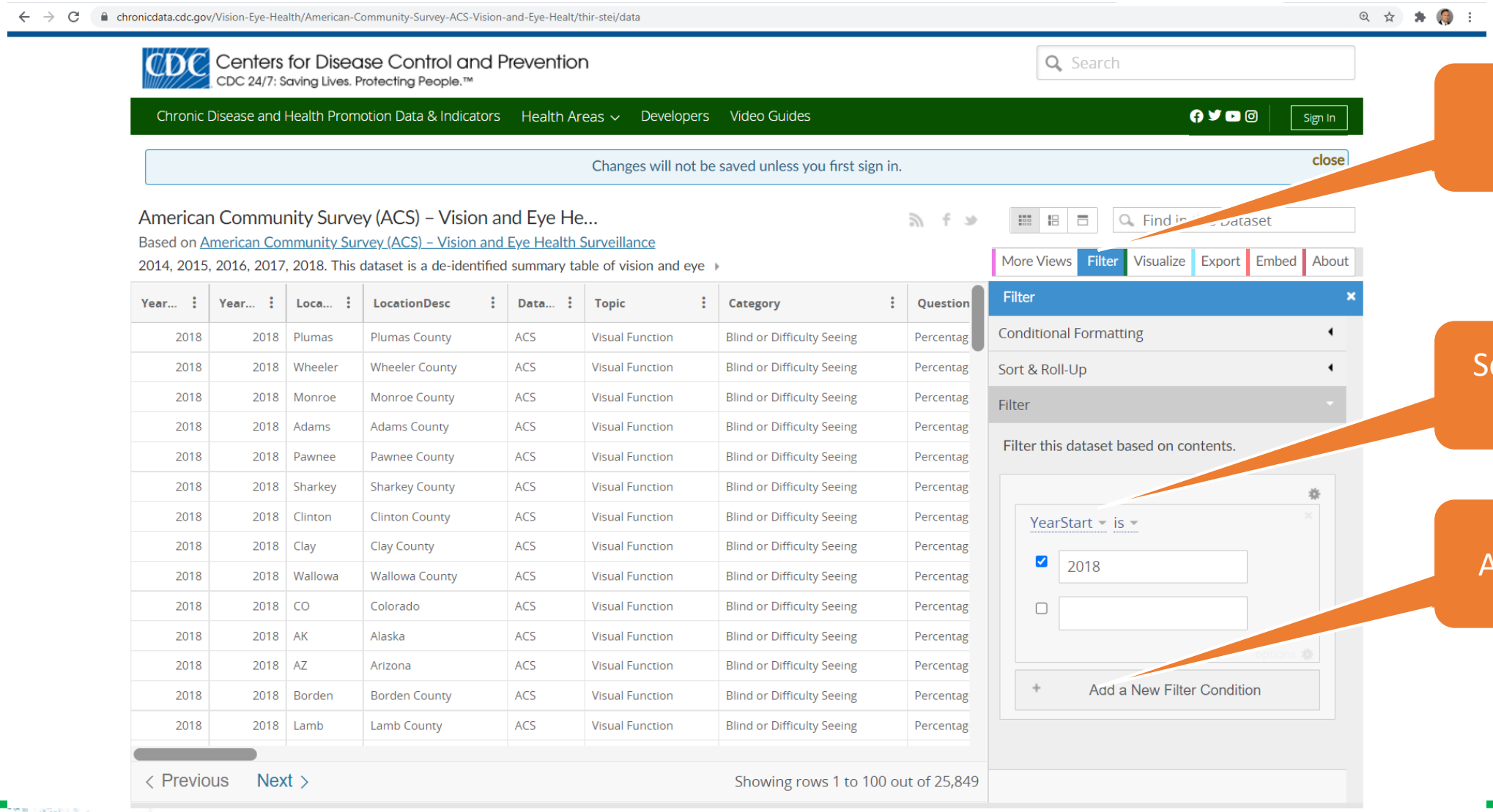

chronicdata.cdc.gov/browse?category=Vision+%26+Eye+Health
Centers for Disease Control and Prevention
CDC 24/7: Saving Lives. Protecting People.™
Search
Chronic Disease and Health Promotion Data & Indicators
Health Areas
Developers
Video Guides
Sign In
Search
Categories
500 Cities & Places
Alcohol-Related Disease Impact
Assisted Reproductive Technology (ART)
Behavioral Risk Factors
Chronic Disease Indicators
Healthy Aging
Heart Disease & Stroke Prevention
Maternal & Child Health
Nutrition, Physical Activity, and Obesity
Oral Health
Tobacco Use
Vision & Eye Health
Youth Risk Behaviors
View Types
Calendars
Welcome to the Vision & Eye Health Data Portal
Featured Content
Vision & Eye Health Surveillance System
External Content
Go to Vision & Eye Health Surveillance System Application
Chart of Eye Exams by Race/Ethnicity for National...
June 23, 2021
816 Views
2014-2015. This dataset is a de-identified summary table of vision and eye health data indicators from Medicare, stratified by all availabl..
VHI - Reasons for No Eye Care (Age-adjusted Preval...
February 27, 2018
586 Views
In 2013 and subsequently, one question in the core of BRFSS asks about vision: Are you blind or do you have serious difficulty seeing, even when...
Related Links
Division of Diabetes Translation | Prevent Blindness America | National Eye Institute (NEI) | World Health Organization (WHO)
23 Results filtered by
Categories > Vision & Eye Health
Clear All
Most Relevant
Age-related Macular Degeneration (Age-Adjusted Prevalence)
Vision & Eye Health
Map
In 2013 and subsequently, one question in the core of BRFSS asks about vision: Are you blind or do you have serious difficulty seeing, even when wearing glasses? From 2005-2011 the BRFSS employed a ten question vision module
More
Tags diabetes, eye diseases, heart diseases, hypertension, physical activity, and 5 more
Updated
January 5, 2021
Views
105,072
Blind or Serious Difficulty Seeing (Age-Adjusted Prevalence by Total)
Filtered View
Select a data file

Data Portal: Selected Data



Click View Data

Data Portal: Filter

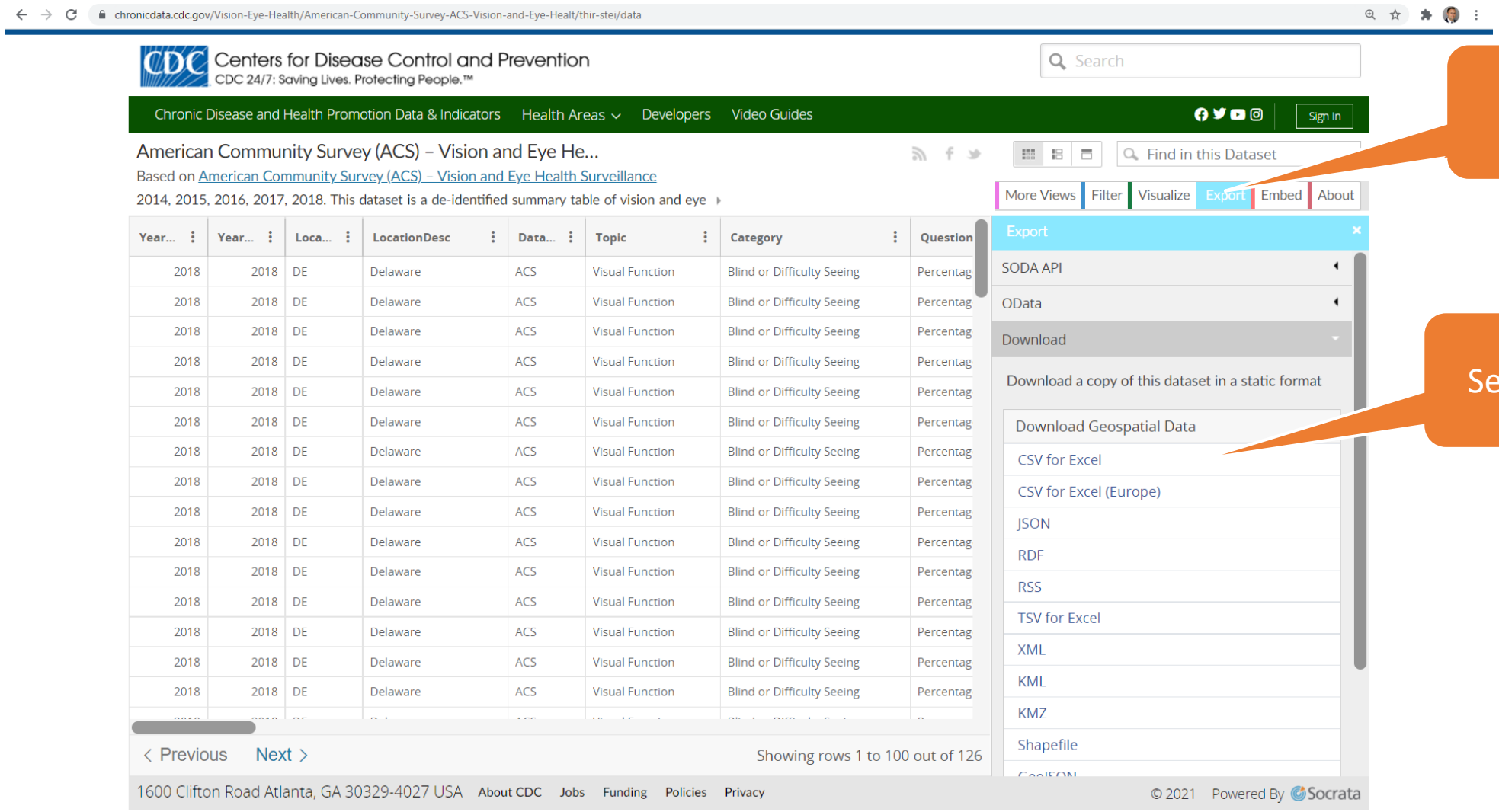


Click Filter

Select a variable, enter a value

Add more filters

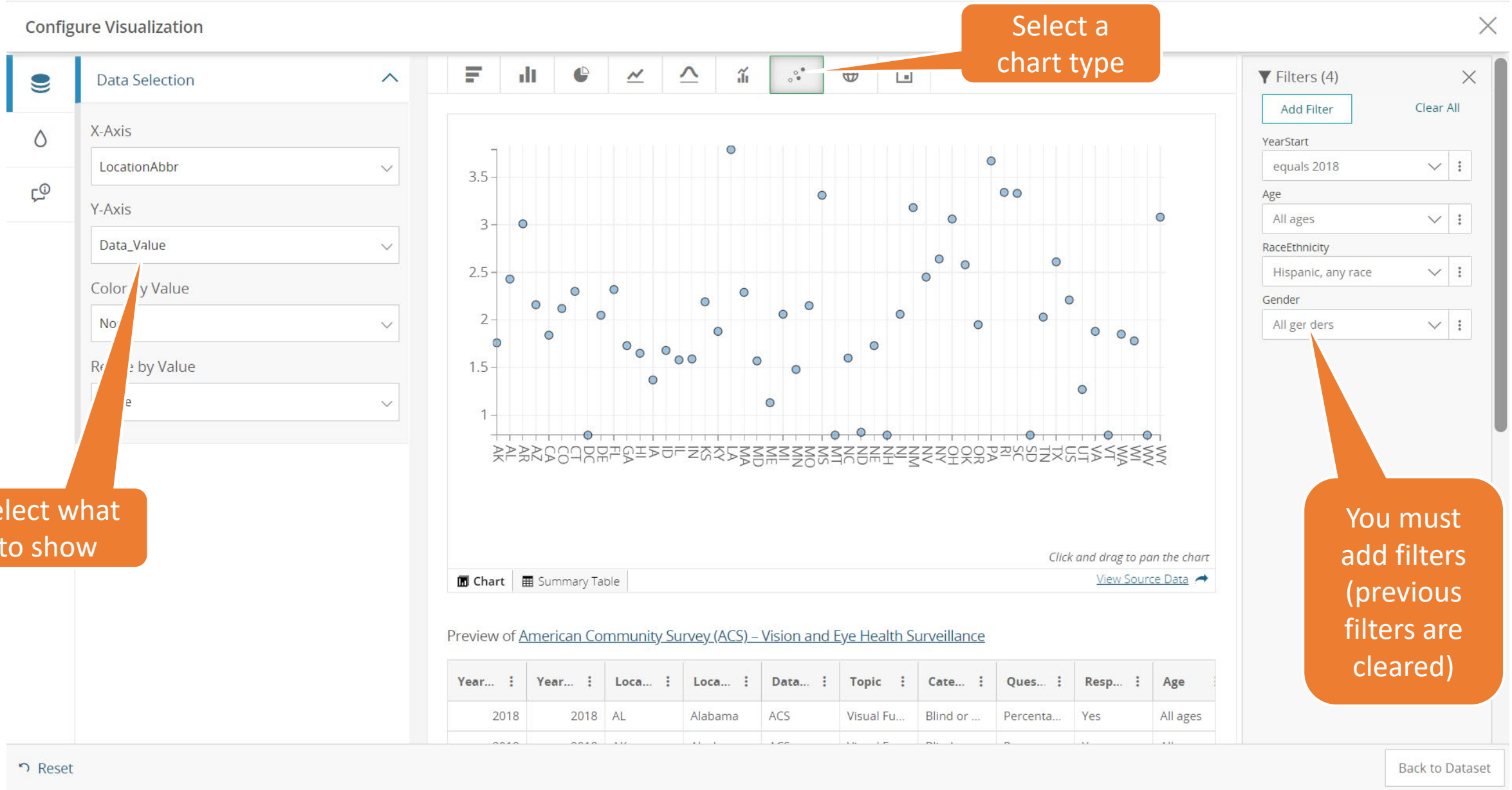
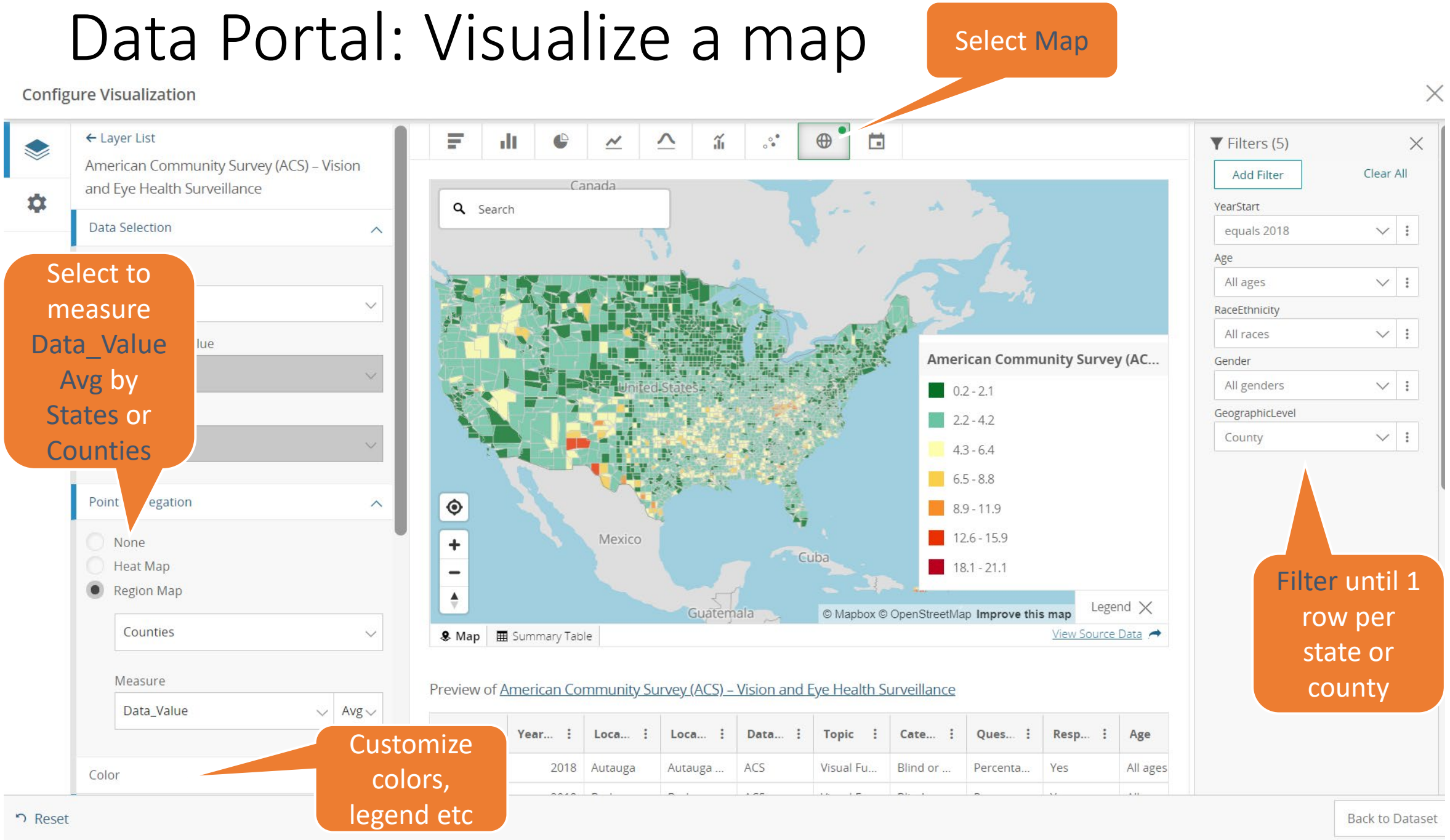
Data Portal: Export



After you filter, Click Export

Select a file type

Data Portal: Visualize a scatterplot



Data Portal: Visualize a map