Data Science
for the Public Good

IOWA STATE
UNIVERSITY

Successful Employment for Persons with Disabilities in Iowa

Agenda

- Data Sources

- Cleaning / Transformations

- Demographics

- Employments and Earnings

- Services

- Dashboard Demonstration

Data Sources

American Community Survey (ACS)

- Data about Employment rate, and Employment Status for persons with Disability, as well as data about Median Earnings by Disability Type, was retrieved from ACS (American Community Survey) for the year 2020.

Iowa Behavioral Risk Factor Surveillance System (BRFSS)

- BRFSS data highlights select topics (Disabled and MENTHEL were used) for each of the 99 Iowa counties

- Iowa BRFSS county data is grouped together by 4-year time increments. Smaller counties may not contain enough data to report reliable estimates, even with the combination of 4 consecutive years.

Closed Iowa Vocational Rehabilitation Services (IVRS) Cases

- Iowa Vocational Rehabilitation Services (IVRS) mission is to provide expert, individualized services to Iowans with disabilities to achieve their independence through successful employment and economic support.

- This dataset provides information on closed cases where the individual received services from IVRS.

- Data includes cases closed 2008 – 2021.

Data Sources – Cont.

Iowa Department for the Blind (IDB)

- The Iowa Department for the Blind helps educate, train, and empower blind and visually impaired individuals to pursue lifelong goals.

- This dataset summarizes the successful employment outcomes of blind Iowans by Federal Fiscal Years 2012-2016.

Iowa Department of Management

- County Budgeted/Actual Expenditures By Service Area By Fiscal Year.

- The datasets provide budgeted/actual county expenditure data for every county in the State of Iowa beginning in the Fiscal Year 2005 (budgeted) and 2010 (actual).

Old-Age Survivors, and Disability Insurance (OASDI)

- The federal Old-Age, Survivors, and Disability Insurance (OASDI) program is the official name for Social Security in the United States.

- This dataset provides totals of disabled population groups who receive OASDI benefits in Iowa by county.

Data Sources – Cont.

Iowa's Mental Health and Disability Services (MHDS)

- The public data set provided us with information on Expenditures, Persons Served, and Unduplicated Persons Served by Service based on the MHDS service regions.

National Survey on Drug Use and Health (NSDUH)

- This data set provided us with information about the mental health status of individuals partaking in the survey conducted by the Substance Abuse and Mental Health Services Administration.

- Information is provided in substate-regions.

Cleaning / Transformations

American Census Survey (ACS)

- Used R to:
  - Pull and clean the 2016-2020 ACS data and split it by county level.
  - Calculate percentage gap between Employed and Unemployed people with Disability.
  - Merged disaggregated data to get totals.
  - Transformed data into a standardized format and calculated percentages and reliability.

Old-Age Survivors, and Disability Insurance (OASDI)

- Used Tableau to:
  - Calculate percentages of worker, spouses, and children's receiving benefits out of county totals.

Closed Iowa Vocational Rehabilitation Services (IVRS) Cases

- Used Excel to:
  - Adjust wage values for inflation.
- Used R to:
  - Split City, State, and Zip Code information from Client location.
  - Calculate wage changes from start of application to close.
  - Created new columns for whether the client saw an increase, no change, decrease, or was unemployed at end of case.
- Used Tableau to:
  - Determine whether client was employed or not at end of case.

Iowa Department for the Blind (IDB)

- No changes were needed for this dataset.

TidyCensus Code Snippet

```{r}
emp_stat_disability <-c("In the Labor Force,Employed with disability"= "C18120_004", "In the Labor force,unemployed
with a disability" = "C18120_007",  "Not in the Labor force, with a disability" = "C18120_010")

emp_stat_no_disability <- c("In the Labor Force,Employed with no disability"= "C18120_005", "In the Labor
force,unemployed with no disability" = "C18120_008", "Not in the Labor Force, with no disability" = "C18120_011")
```

```{r}
empl_status_disability <- get_acs(
  geography= "state",
  year = 2019,
  variables = "B18121_001",
  output = "wide"
)
View(empl_status_disability)

#empl_status_disability= empl_status_disability %>% mutate(sum_of_estimates
(estimate/sum(estimate)) )
#View(empl_status_disability)

empl_status_no_disability <- get_acs(
  geography= "county",
  year = 2020,
```

	GEOID	County	In the Labor Force, Employed with Disability (Estimate)	In the Labor Force, Employed with Disability (MOE)	In the Labor Force, Unemployed with Disability (Estimate)	In the Labor Force, Unemployed with Disability (MOE)	Not in the Labor Force, with Disability (Estimate)
1	19003	Adams	117	46	11	12	68
2	19005	Allamakee	325	96	18	20	233
3	19009	Audubon	159	65	3	4	190
4	19013	Black Hawk	3745	435	754	264	4230
5	19015	Boone	933	228	29	24	699
6	19019	Buchanan	680	145	22	20	406
7	19023	Butler	370	76	19	15	386
8	19025	Calhoun	172	48	4	5	279
9	19029	Cass	278	109	24	21	436
10	19031	Cedar	357	100	23	24	513
11	19035	Cherokee	353	131	21	27	157
12	19037	Chickasaw	462	112	16	16	259

Demographics

ACS data:

- Percentage of the disabled population by age group in total population by county

- The proportion of each difficulty type among all people with difficulty

- Percentage of disabled 18-64 years

- Percentage of the disabled population age 18-64 by age group in the total disabled population aged 18-64 by county

- Disability rate by age group for the disabled population aged 18-64

- Percentage of the disabled population by age group and population by difficulty type in the total disabled population aged 18-64 by county

- The racial composition of the disabled population aged 18-64

- Disability rates by race and ethnicity for the disabled population aged 18-64 (state level)

BRFSS data:

- Percentage of county population by disability status

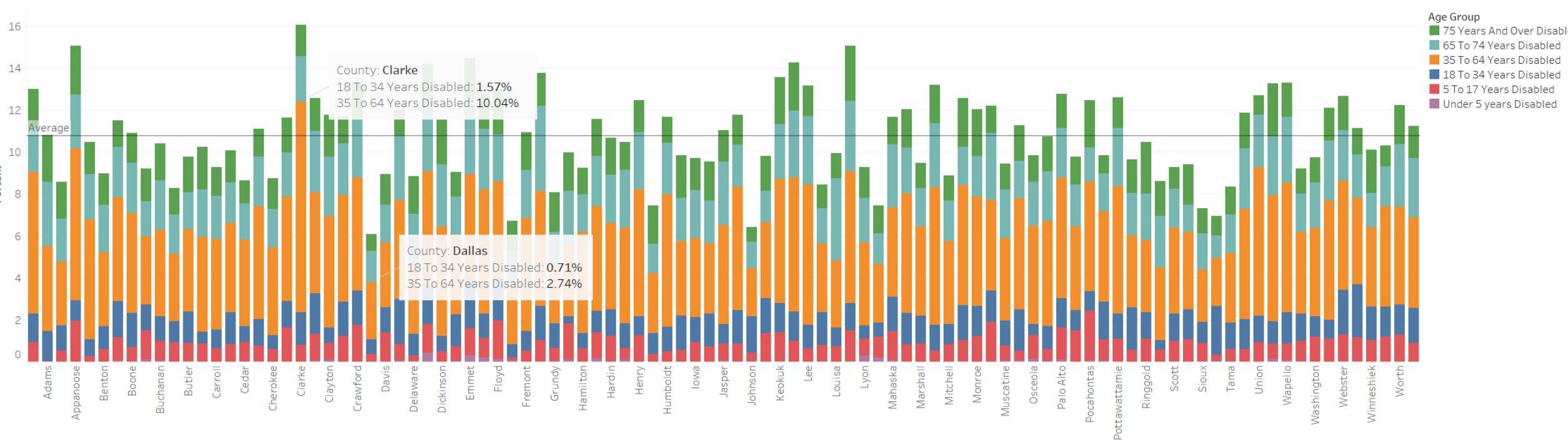- Percentage of county population by the number of days with poor mental health

NSDUH data:

- Percentage of population with mental illness by NSDUH region

Demographics

- Among the population of all ages, Clarke County has the highest percentage of people with disabilities at 16.05%, and Dallas County has the lowest percentage of people with disabilities at 6.09%.

Percent of the Population with a Disability by Age Group

Age Group
- 75 Years And Over Disabled
- 65 To 74 Years Disabled
- 35 To 64 Years Disabled
- 18 To 34 Years Disabled
- 5 To 17 Years Disabled
- Under 5 years Disabled

County: **Clarke**
18 To 34 Years Disabled: **1.57%**
35 To 64 Years Disabled: **10.04%**

County: **Dallas**
18 To 34 Years Disabled: **0.71%**
35 To 64 Years Disabled: **2.74%**

Base population = Total population of each county
Total with a disability / Total population = Percent of total population with a disability
Data source : 2016-2020 American Community Survey (ACS) 5-Year estimates

Demographics

- People aged 35 to 64 have higher disability rates than those aged 18 to 34.

- Disability rate = Disabled population of an age group / Total population of that age group

Disability Rates for Iowans Aged 18-64 by Age Group per County

Age Group
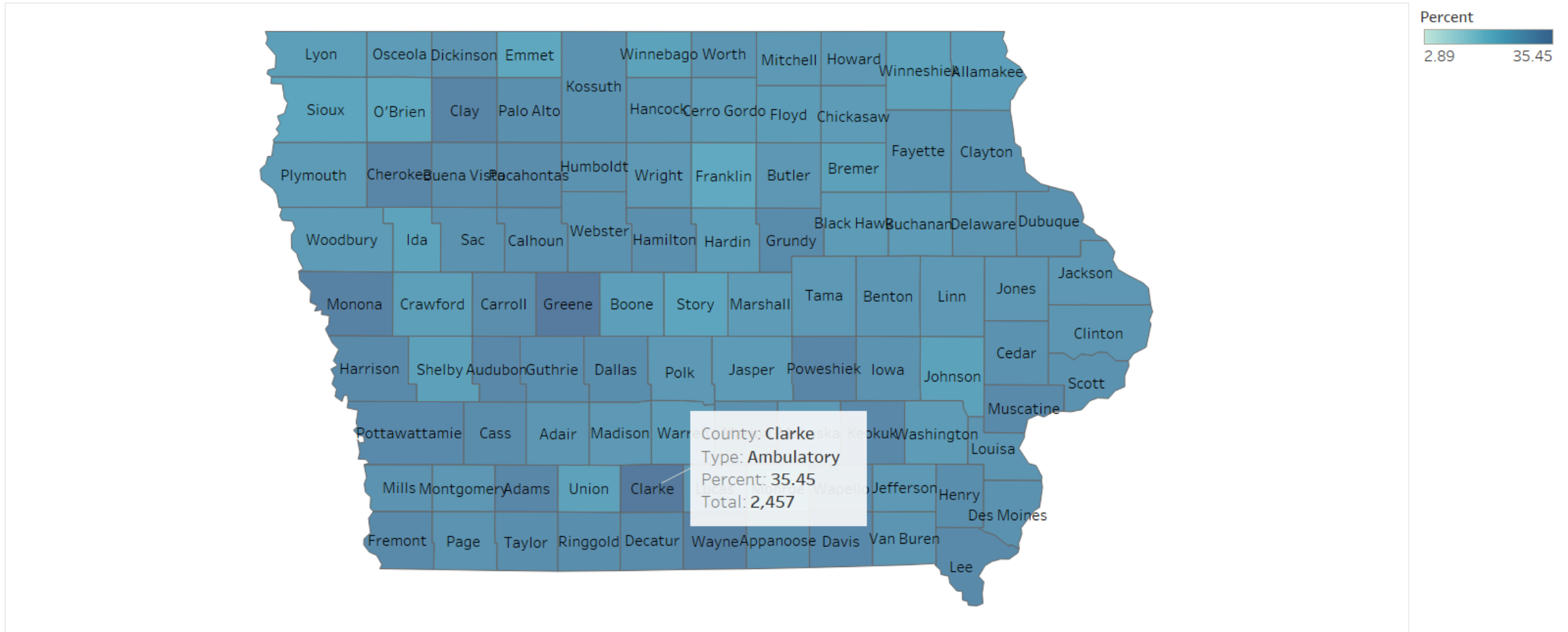- Disabled 18 to 34 years
- Disabled 35 to 64 years

Base population = Total population by age group per each county
Data source : 2016-2020 American Community Survey (ACS) 5-Year estimates

Demographics

- For the majority of counties, the population of ambulatory difficulty has the highest proportion of the six difficulty types.

Population by Difficulty Type For All Ages (Ambulatory)

Base population = Total population of all difficulty types in all age groups per county
The proportion of each difficulty in all difficulty types and the population in that difficulty type
Data source : 2016-2020 American Community Survey (ACS) 5-Year estimates

Demographics

- At the state level, the American Indian and Alaska Native has the highest disability rate among the 18- to 64-year-old population at 17.71%, and the Asian has the lowest disability rate at 5.04%.

- Disability rate = Disabled population of a race or ethnicity / Total population of that race or ethnicity

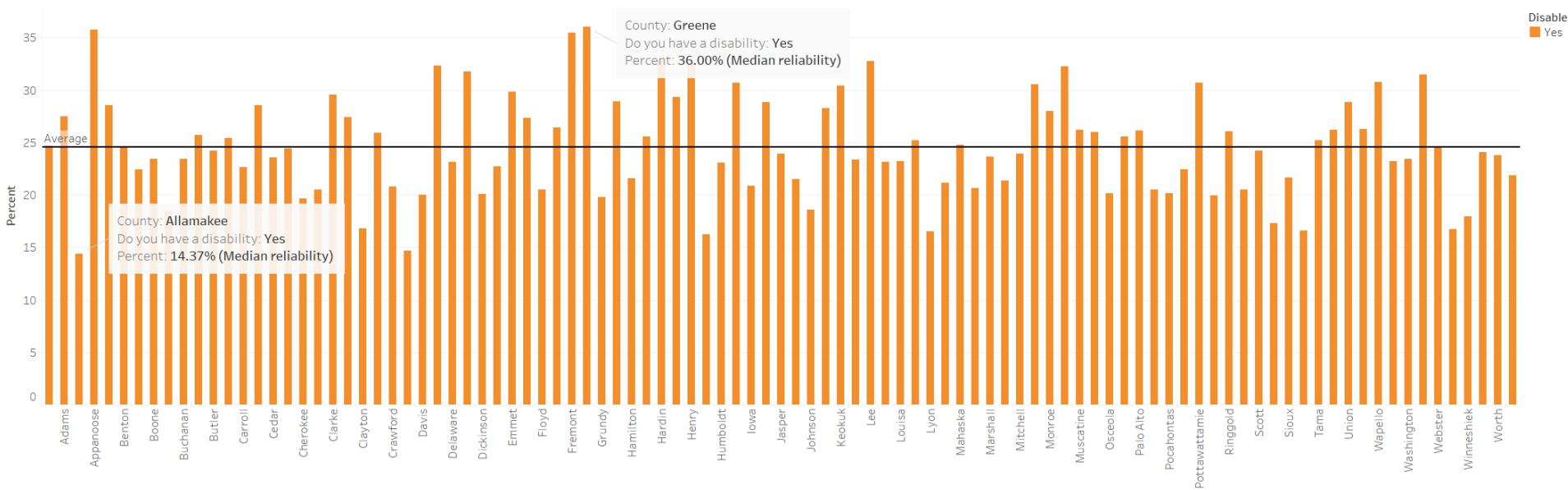Percent of Race and Ethnicity Group with a Disability (State Level, 2020)
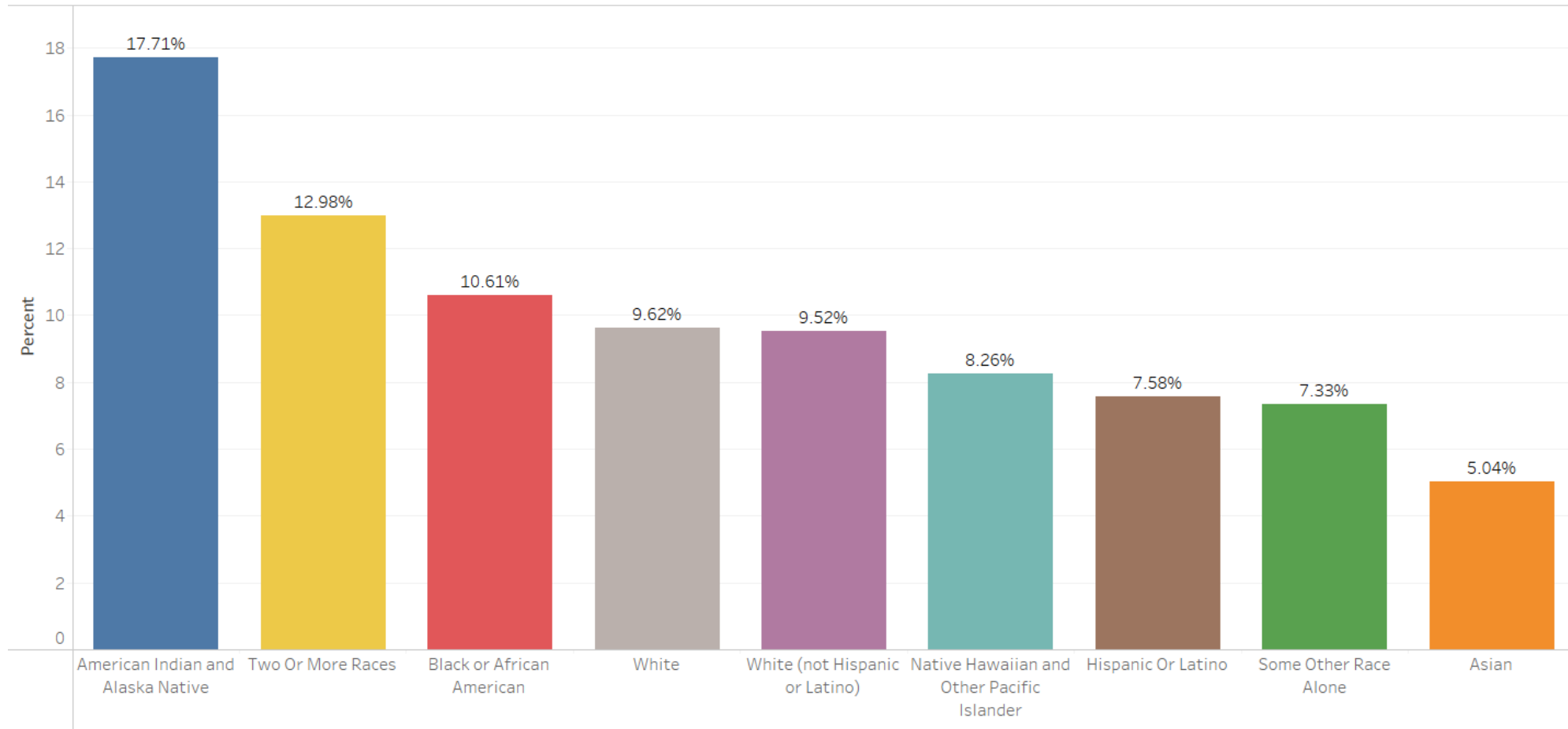
Base population = Total population of each race and ethnicity
Data source : 2016-2020 American Community Survey (ACS) 5-Year estimates

Demographics

Do you have a disability?

County: Greene
Do you have a disability: Yes
Percent: 36.00% (Median reliability)

County: Allamakee
Do you have a disability: Yes
Percent: 14.37% (Median reliability)

Disable
Yes

For how many days during the past 30 days was your mental health not good?

Menthlth
14 - 30 days
< 14 days
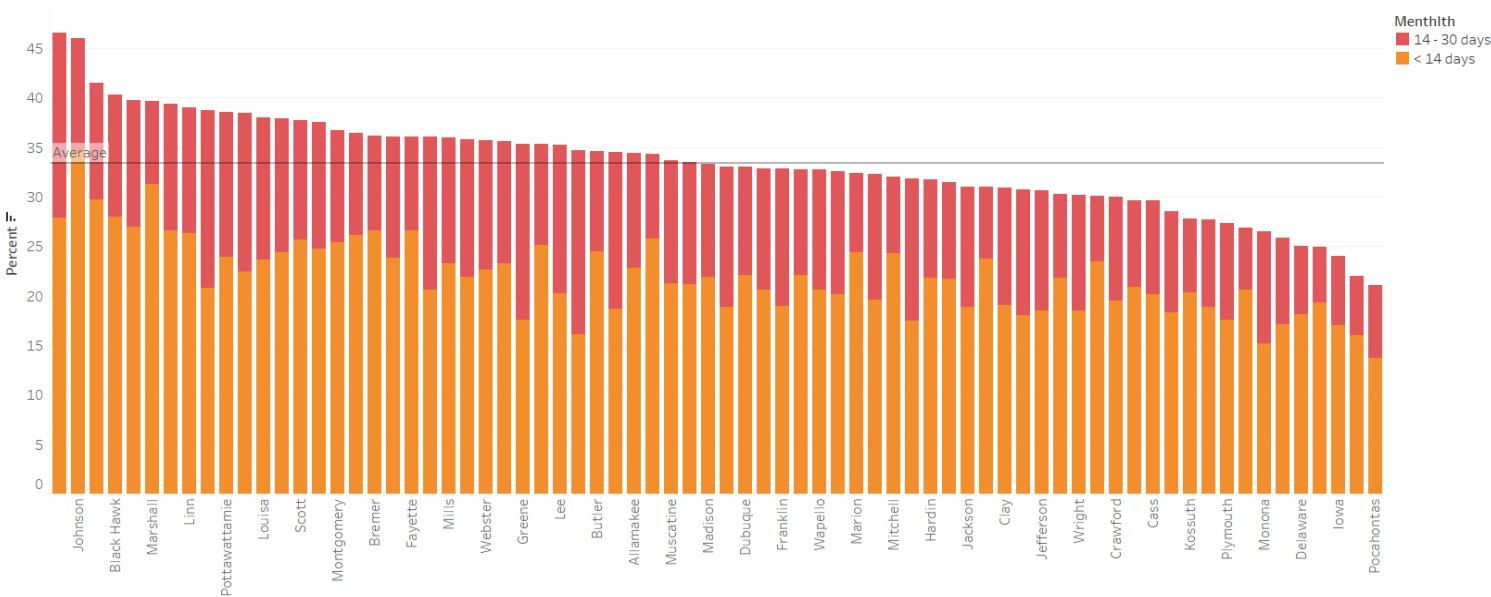
Employment and Earnings

Findings

- Percent of Iowans with a disability
- counties stand out as having lower percent of people with a disability working
- Comparison of Employment between Metropolitan and Non-Metropolitan counties
- Labor Participation Rates & Gap between individuals with disabilities and without disabilities
- Median Earnings vs Population of Iowans with Disabilities
- Difference in hourly wages by Employment Type, for Blind Iowans
- Change in wage over years

Employment and Earnings

Data Retrieved from ACS

- Map compares Employment Gap Between Persons with Disability and Without for all Counties in Iowa
- Counties with a smaller gap suggest better employment conditions for persons with disability.
- Lighter Shades of Green indicate a smaller gap, **Monroe County** has the smallest gap of 15%
- Darker Shades of Blue indicate a larger gap. **Jones County** has the largest gap of 53%

Percent Gap
15%   53%

Employment Gap Between Persons with a Disability and Without, 2020

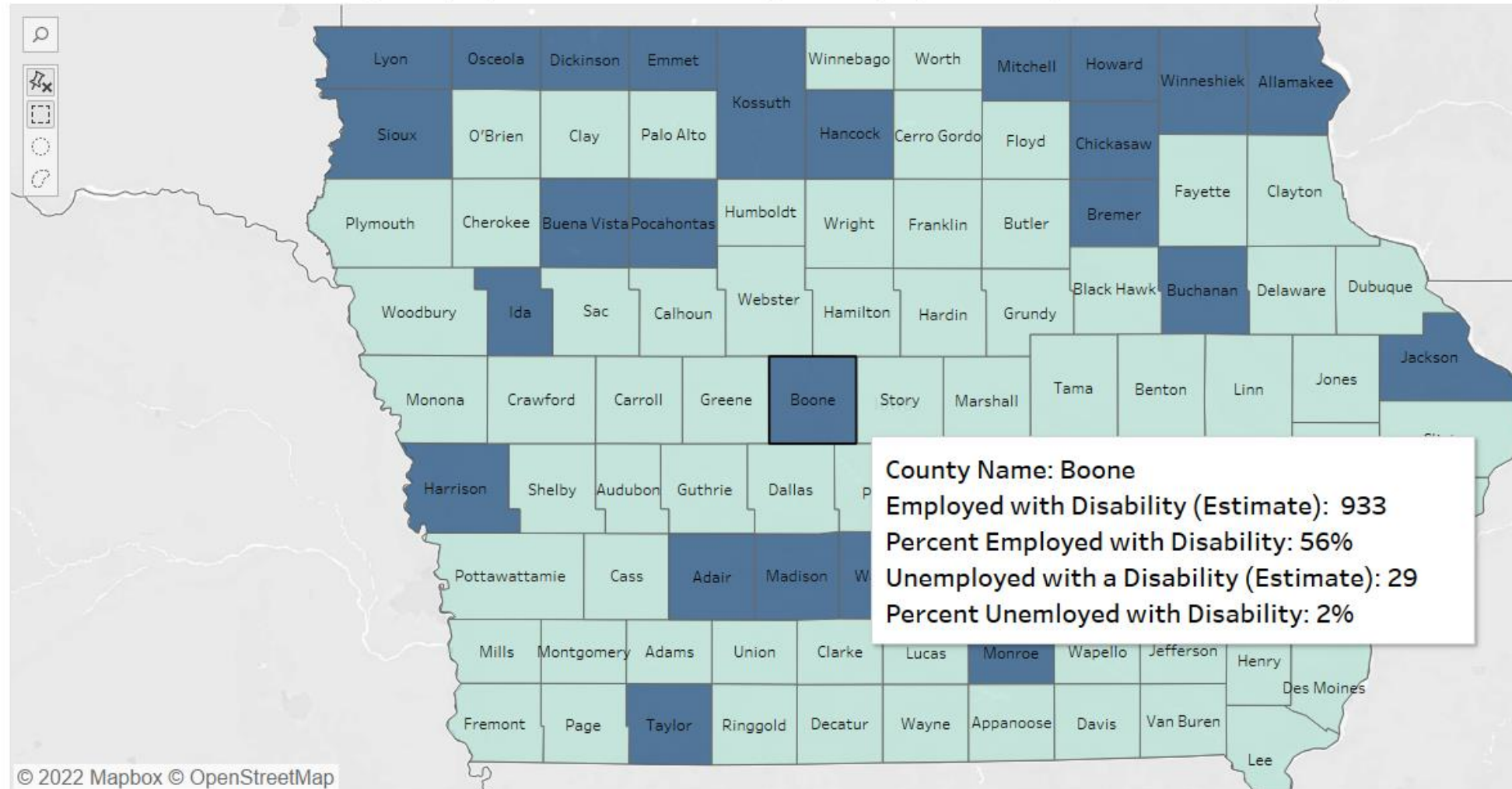| County Name:	Monroe
Employed with Disability (Estimate):	338
Percent Employed with Disability:	67%
Percent Employed without Disability	82%
Estimated Employment Gap:	15%
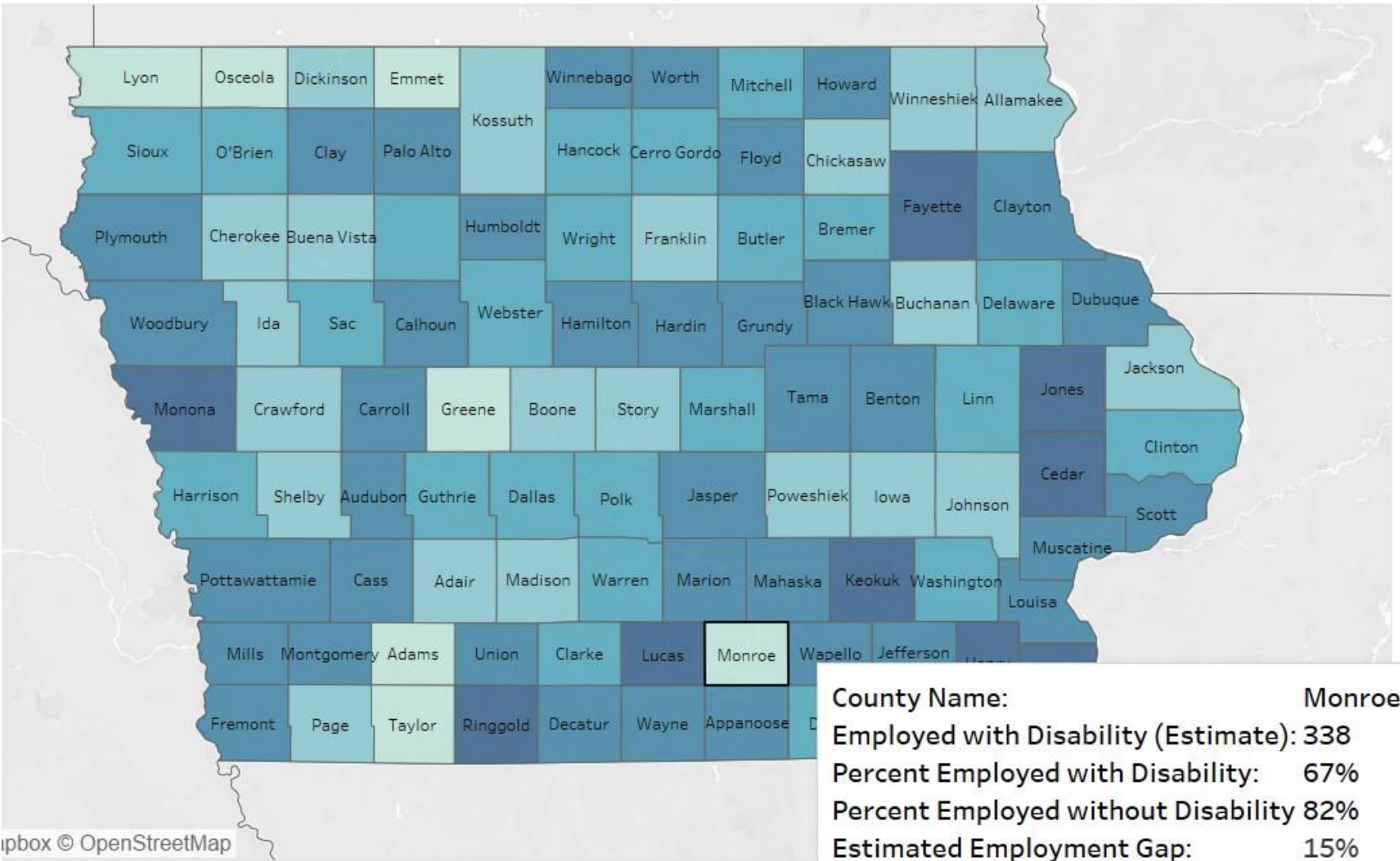
Employment and Earnings

Data Retrieved from ACS

• Map of comparison of Counties to State Average, Employment Rate for persons with Disability. Iowa has a state average of 46.33%

•Counties in Dark Blue, have an Employment Rate, that is above the state average, and an Unemployment Rate that is below the state average.

•Counties in Green, have either employment rate below the state average or unemployment rate above state average

Comparison of Counties to State Average
Counties with Above Average Employment & Below Average Unemployment for persons with Disability, 2020

County Name: Boone
Employed with Disability (Estimate): 933
Percent Employed with Disability: 56%
Unemployed with a Disability (Estimate): 29
Percent Unemloyed with Disability: 2%

© 2022 Mapbox © OpenStreetMap

Employment and Earnings

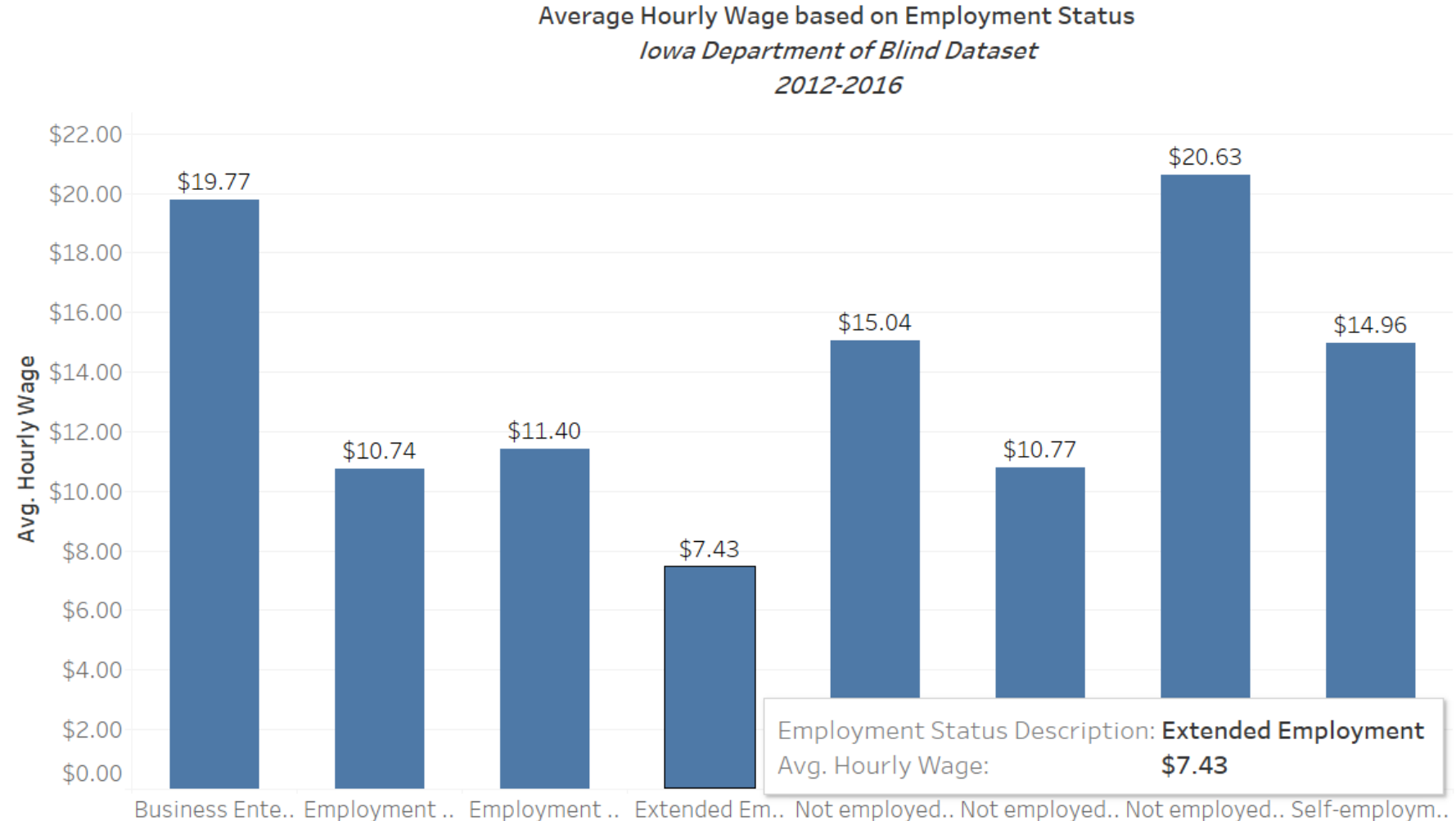•Bar Graph shows the Average Hourly Wage based on Employment Status, for Blind Iowans, from 2012-2016

•Users can use the filter option to select a particular year, and compare the average hourly wages

Average Hourly Wage based on Employment Status
Iowa Department of Blind Dataset
2012-2016

Bar chart — Avg. Hourly Wage by Employment Status:
- Business Ente.. — $19.77
- Employment .. — $10.74
- Employment .. — $11.40
- Extended Em.. — $7.43
- Not employed.. — $15.04
- Not employed.. — $10.77
- Not employed.. — $20.63
- Self-employm.. — $14.96

Employment Status Description: **Extended Employment**
Avg. Hourly Wage: **$7.43**

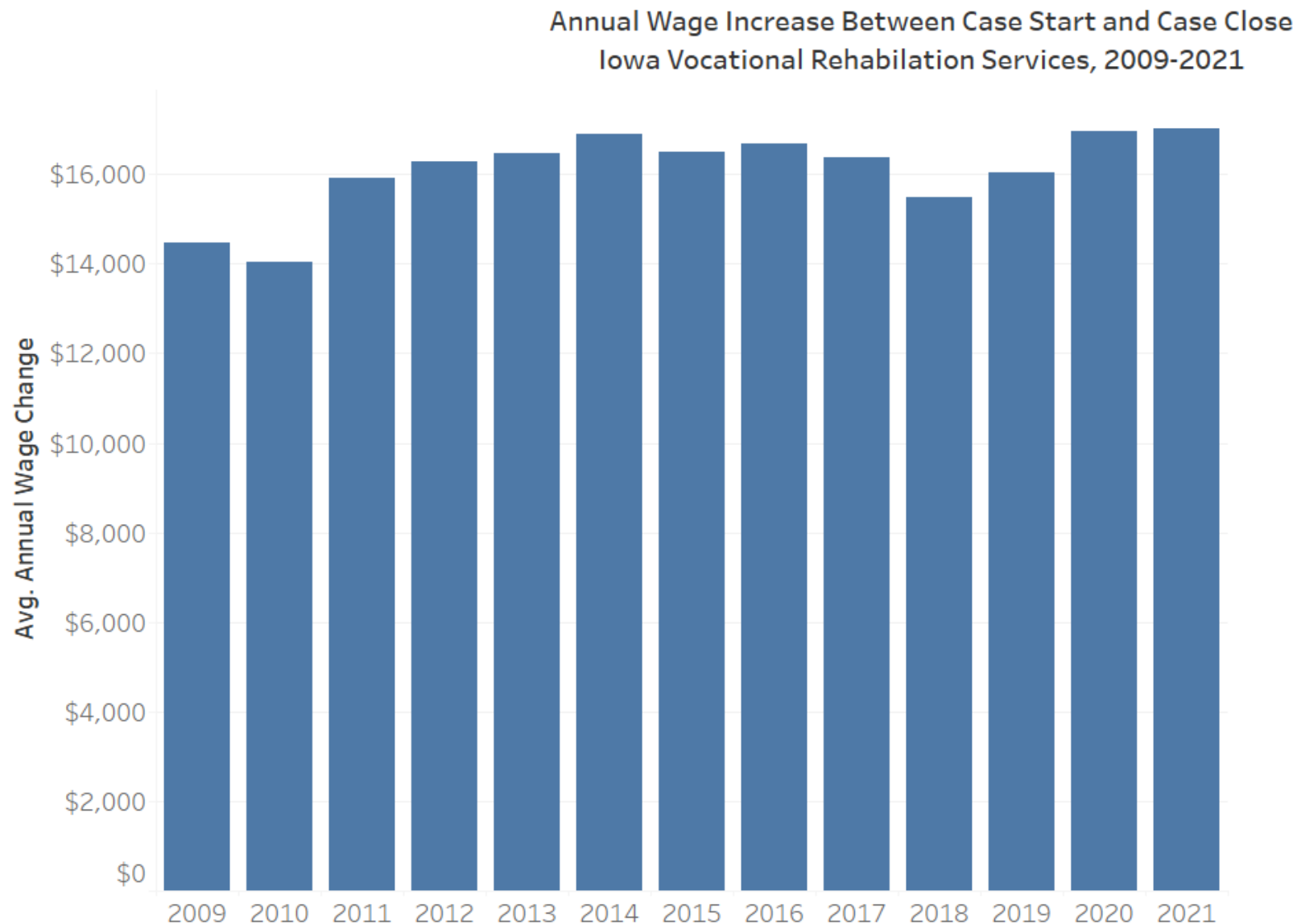# Employment and Earnings

Data Retrieved from ACS

- The scatterplot compares Independent Living Disability to Median Earnings, for different counties in Iowa.
- It is an example of one of the Disability Types
- Users can use the drop down filter option to select a Disability Type, and compare the Median Earnings

Independent Living Disability vs Median Earnings
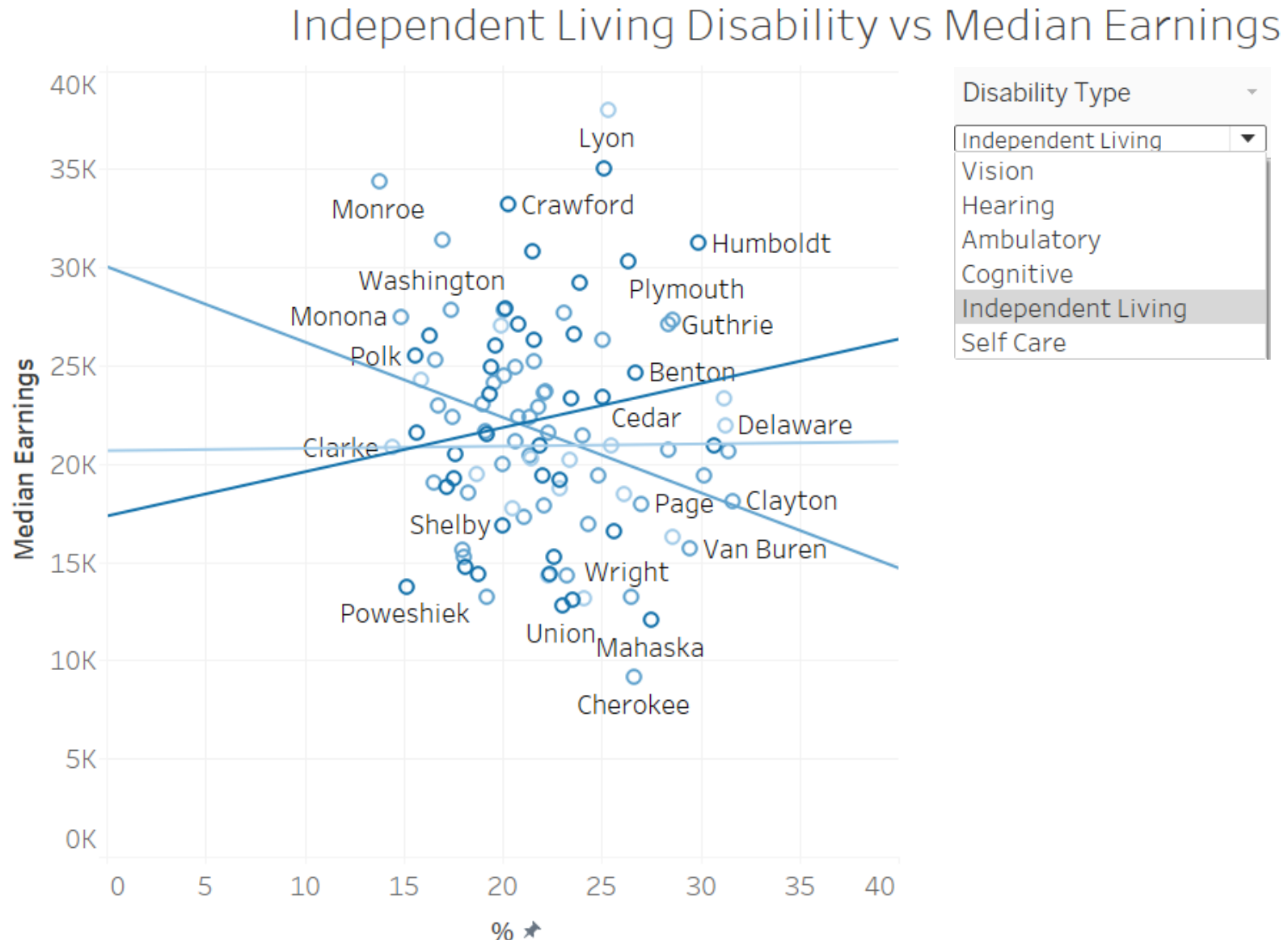
Employment and Earnings

- Retrieved from the IVRS Dataset- The bar graph shows the Annual Wage Increase between Case Start and Case Close from 2009-2021
- The interactive dashboard allows users to hover over the bars and compare the change in Annual Wages

Annual Wage Increase Between Case Start and Case Close
Iowa Vocational Rehabilation Services, 2009-2021

Employment and Earnings

•Retrieved from the IVRS Dataset- The bar graph shows the Hourly Wage Increase between Case Start and Case Close from 2009-2021

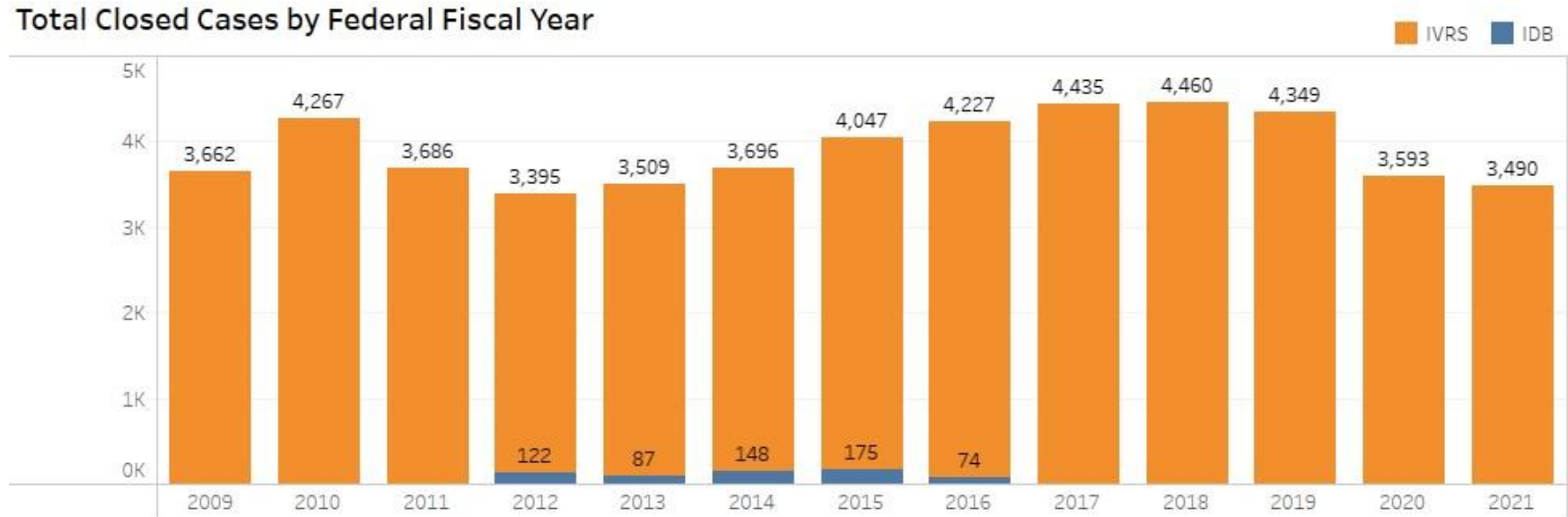•The interactive dashboard allows users to hover over the bars and compare the change in Hourly Wages

Hourly Wage Increase Between Case Start and Case Close
Iowa Vocational Rehabilation Services, 2009-2021
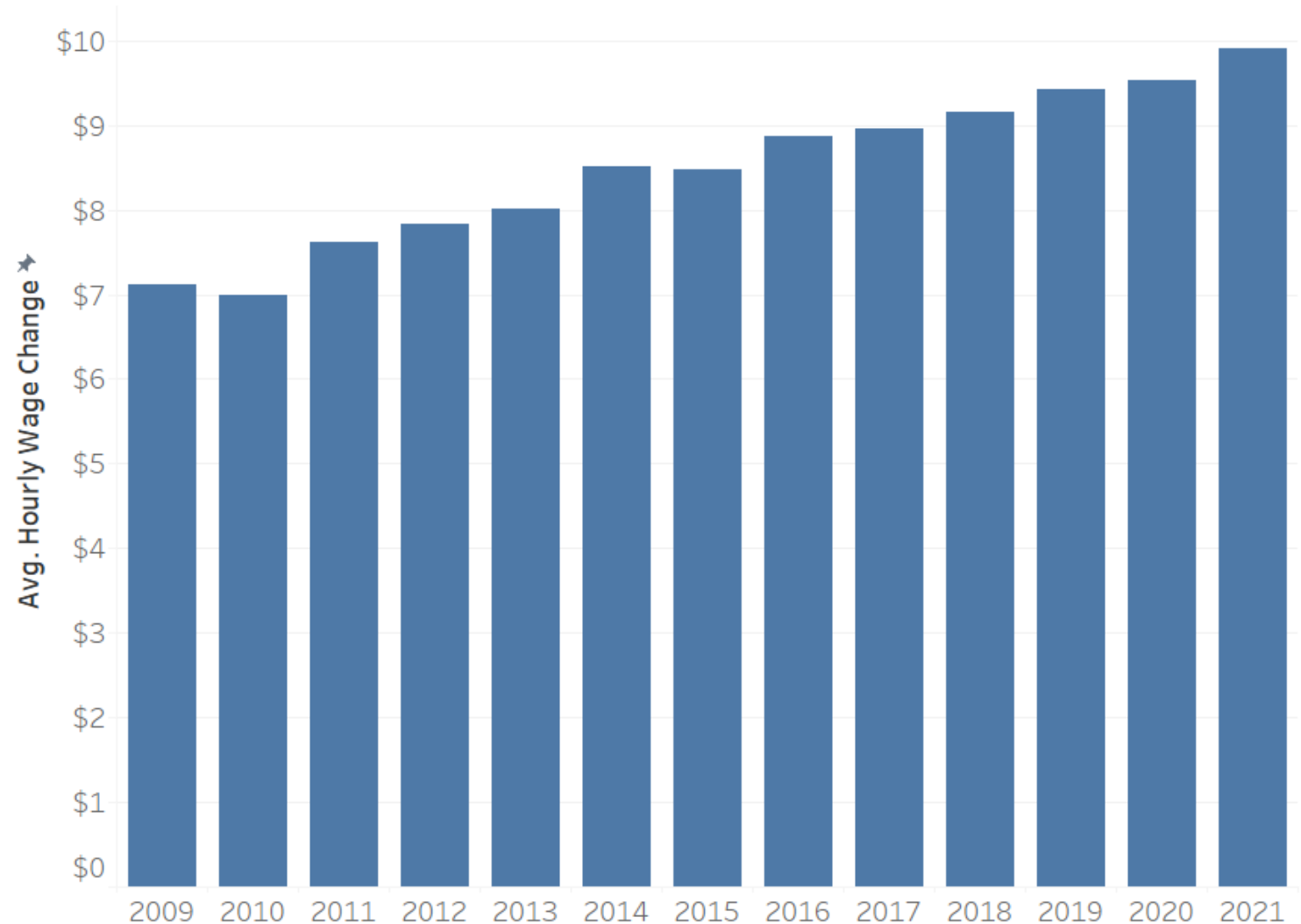
Programs and Services

Dashboard Graphs:

- Compares total cases for IVRS and IDB.

- IVRS services many more Iowans than the IDB.

Total Closed Cases by Federal Fiscal Year

Legend: IVRS (orange), IDB (blue)

Year	IVRS	IDB
2009	3,662	
2010	4,267	
2011	3,686	
2012	3,395	122
2013	3,509	87
2014	3,696	148
2015	4,047	175
2016	4,227	74
2017	4,435	
2018	4,460	
2019	4,349	
2020	3,593	
2021	3,490	

Programs and Services

Dashboard Graphs:

- Compares percentage of cases in the wage change categories and average wage by federal fiscal year.

- On average about half the clients saw an increase in hourly wages and the average wage at case closure was about $10.

IVRS Percent of Employed Persons Receiving IVRS Services with Increase, Decrease, and No Change in Hourly Wage at End of Case 2009 - 2021, Iowa

Legend: ■ Decrease ■ No Change ■ Increase

Year	Increase %	Avg. Hourly Wage Change at Case Closure
2009	54.4%	$9.00
2010	44.6%	$8.69
2011	51.9%	$9.17
2012	57.5%	$9.25
2013	56.1%	$9.32
2014	55.1%	$9.74
2015	53.4%	$9.68
2016	49.4%	$10.01
2017	44.5%	$9.90
2018	43.7%	$9.87
2019	44.7%	$9.99
2020	43.0%	$9.98
2021	45.6%	$9.91

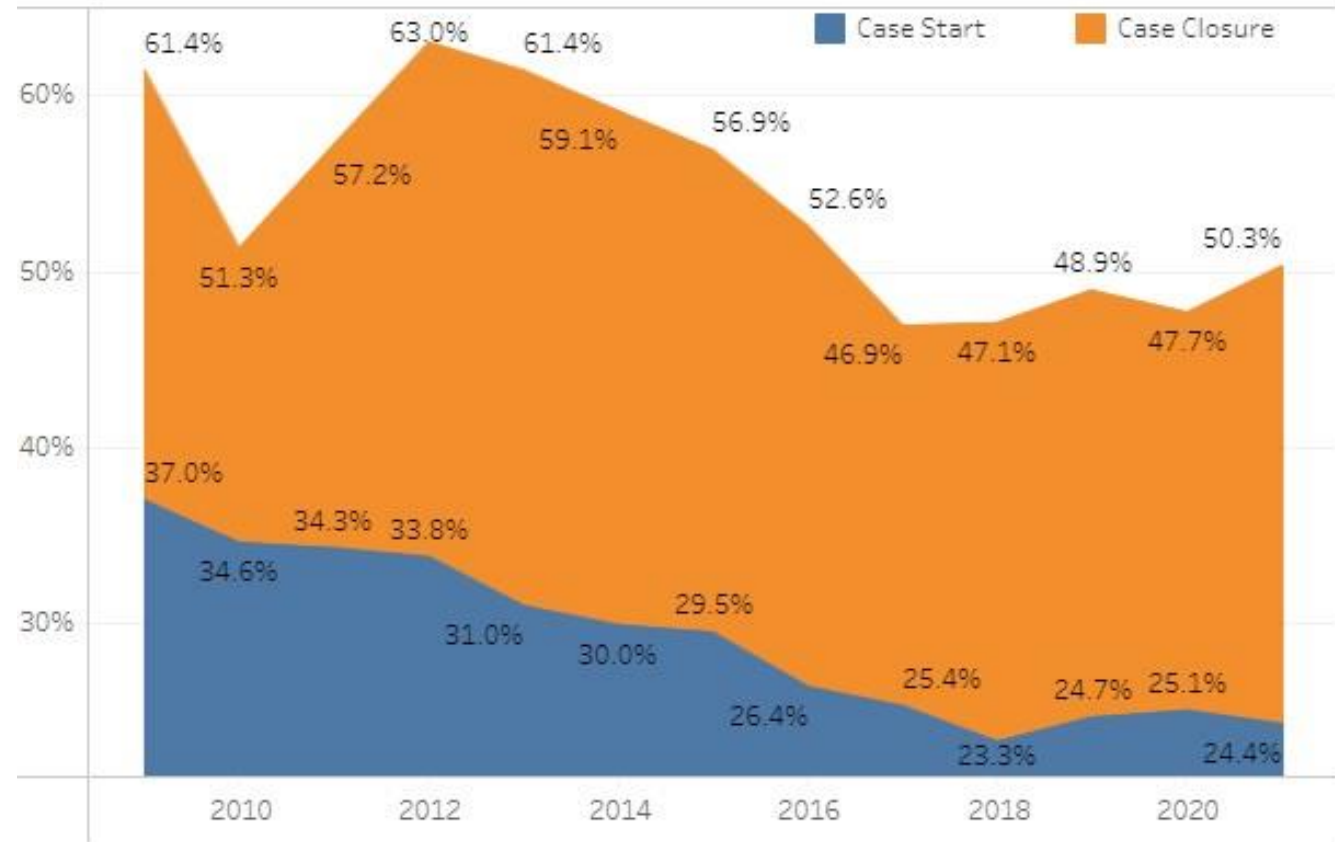Note: Wage Values Adjusted for Inflation

Programs and Services

Dashboard Graphs:

- Compares changes in percentage of employed cases at start and end of cases.

- On average there is an increase in employed cases by about 85%.

IVRS Percentage of Employed Cases at Beginning and End of Case by Federal Fiscal Year, 2009 - 2021, Iowa
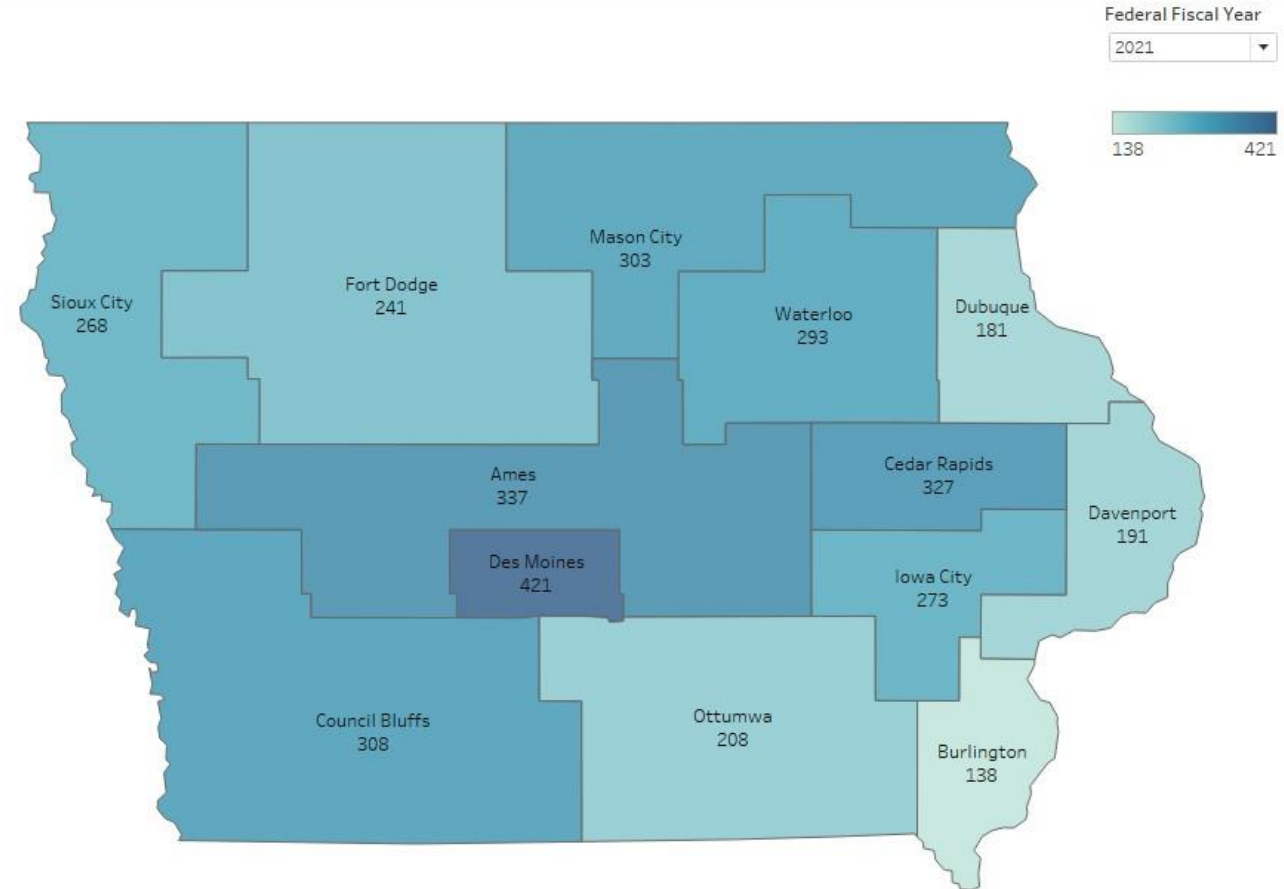
Programs and Services

Dashboard Graphs:

- Compares total cases by IVRS regions.

- Can choose to look at all years or a specific federal fiscal year.

Total Closed Cases by IVRS Region, 2021

Programs and Services

Dashboard Graphs:

- Compares total cases by IVRS regions.

- Can choose to look at all years or a specific federal fiscal year.

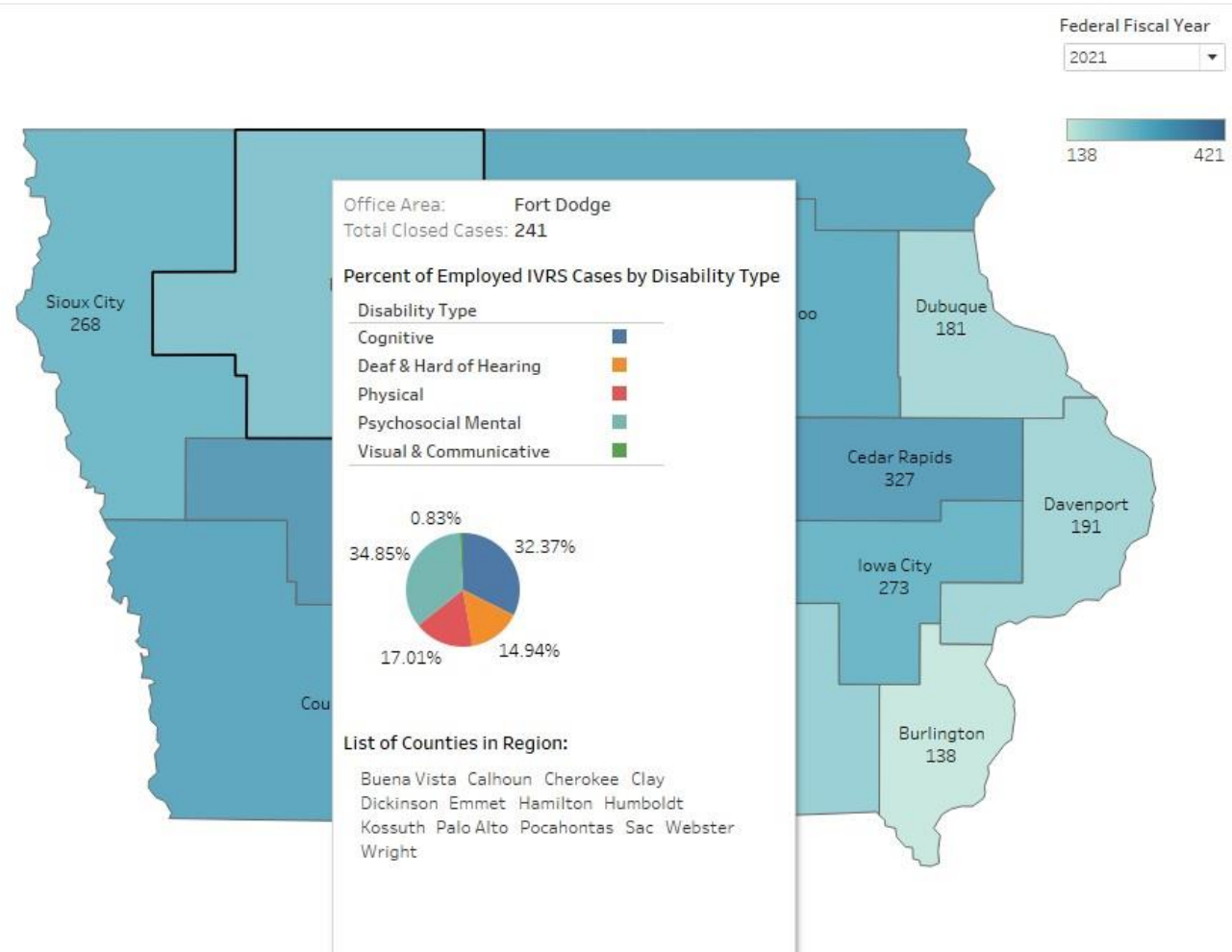- When selecting a region, users can see:
  - Percentage of cases in a region for each disability type
  - List of counties in the region

- There are consistently a large number of cases in the Ames and Des Moines regions.

- Of those regions cases, cognitive and psychosocial mental disability cases are the highest categories.


Total Closed Cases by IVRS Region, 2021

Federal Fiscal Year
2021

138   421

Office Area: Fort Dodge
Total Closed Cases: 241

Percent of Employed IVRS Cases by Disability Type

Disability Type
Cognitive
Deaf & Hard of Hearing
Physical
Psychosocial Mental
Visual & Communicative

0.83%   32.37%
34.85%
17.01%   14.94%

List of Counties in Region:

Buena Vista Calhoun Cherokee Clay
Dickinson Emmet Hamilton Humboldt
Kossuth Palo Alto Pocahontas Sac Webster
Wright

Sioux City
268

Dubuque
181

Cedar Rapids
327

Davenport
191

Iowa City
273

Burlington
138

Programs and Services

Dashboard Graphs:

- Compares total percentage of Iowans with a disability receiving OASDI benefits by county.

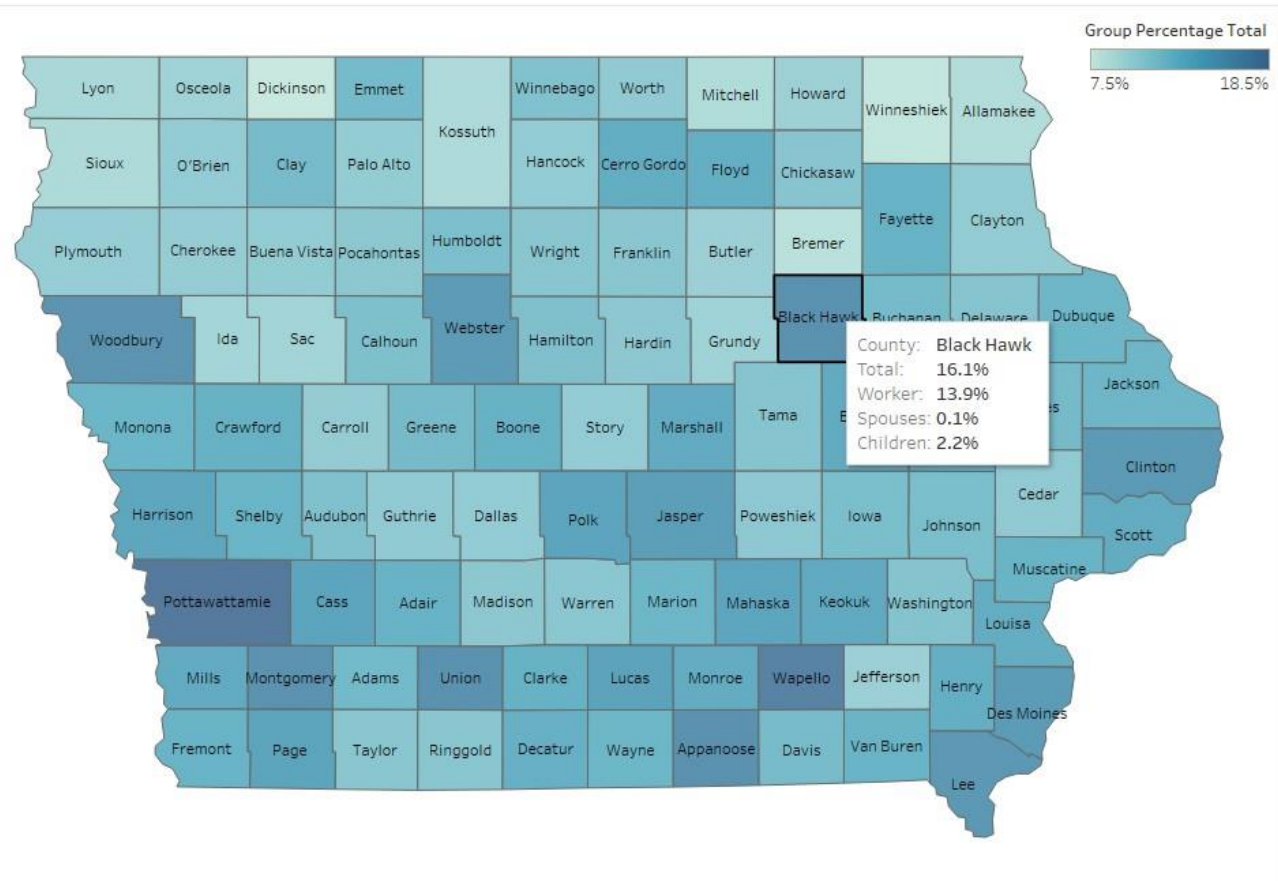Percentage of OASDI Benefits for Children, Spouses and Workers with Disabilites, 2020
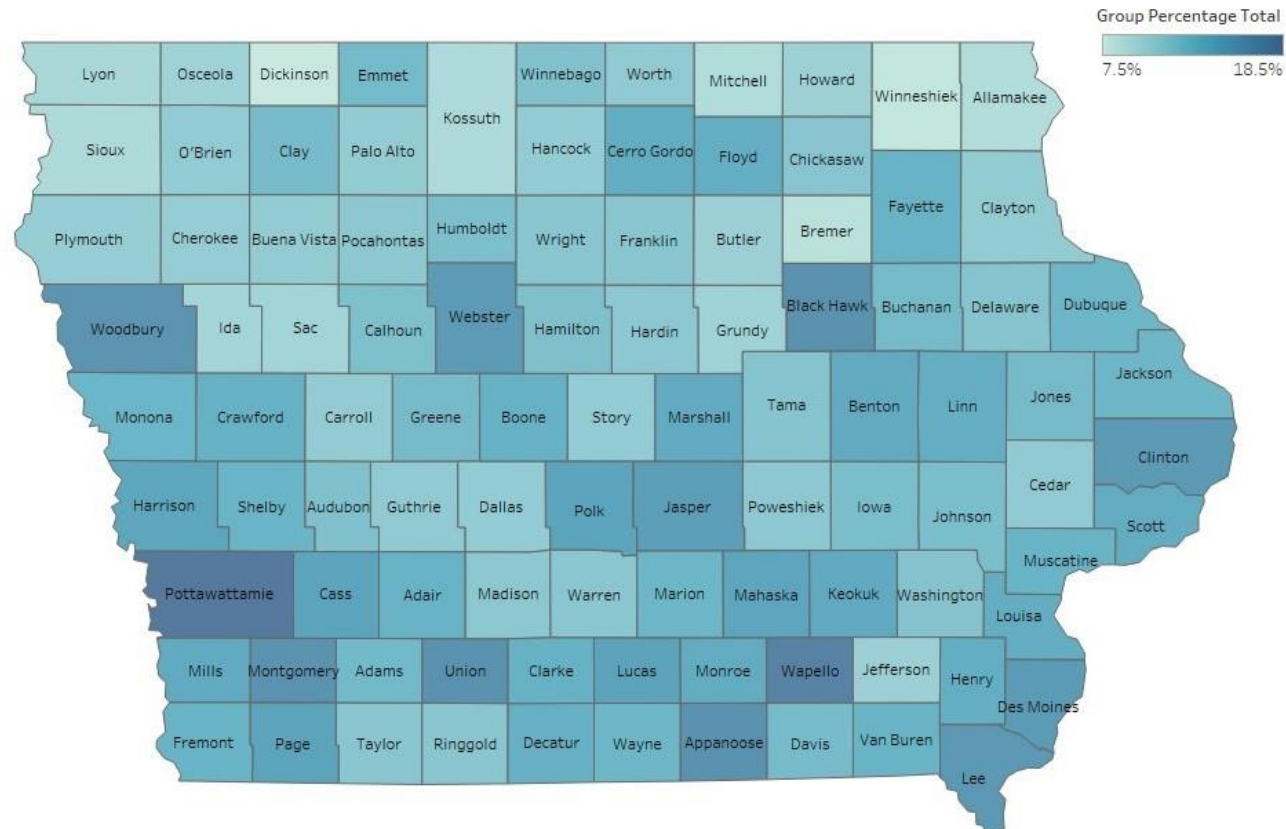
Programs and Services

Dashboard Graphs:

- Compares total percentage of Iowans with a disability receiving OASDI benefits by county.

- When selecting a county a user can see:
  - County name.
  - Total sum of disabled groups receiving benefits percentages.
  - Worker, spouses, and children percentage of disabled individuals receiving OASDI benefits.

Percentage of OASDI Benefits for Children, Spouses and Workers with Disabilites, 2020

Group Percentage Total

7.5%   18.5%

County:	Black Hawk
Total:	16.1%
Worker:	13.9%
Spouses:	0.1%
Children:	2.2%

Programs and Services

Dashboard Graphs:

- Compares total percentage of Iowans with a disability receiving OASDI benefits by county.

- When selecting a county a user can see:
  - County name.
  - Total sum of disabled groups percentages.
  - Worker, spouses, and children percentage of disabled individuals receiving OASDI benefits.

- Pottawattamie county has the highest percentage of Iowans with a disability receiving OASDI benefits, the majority of which are workers.

Percentage of OASDI Benefits for Children, Spouses and Workers with Disabilites, 2020

Dashboard Demo

https://dspg-2022.github.io/DHR-Disabilities/
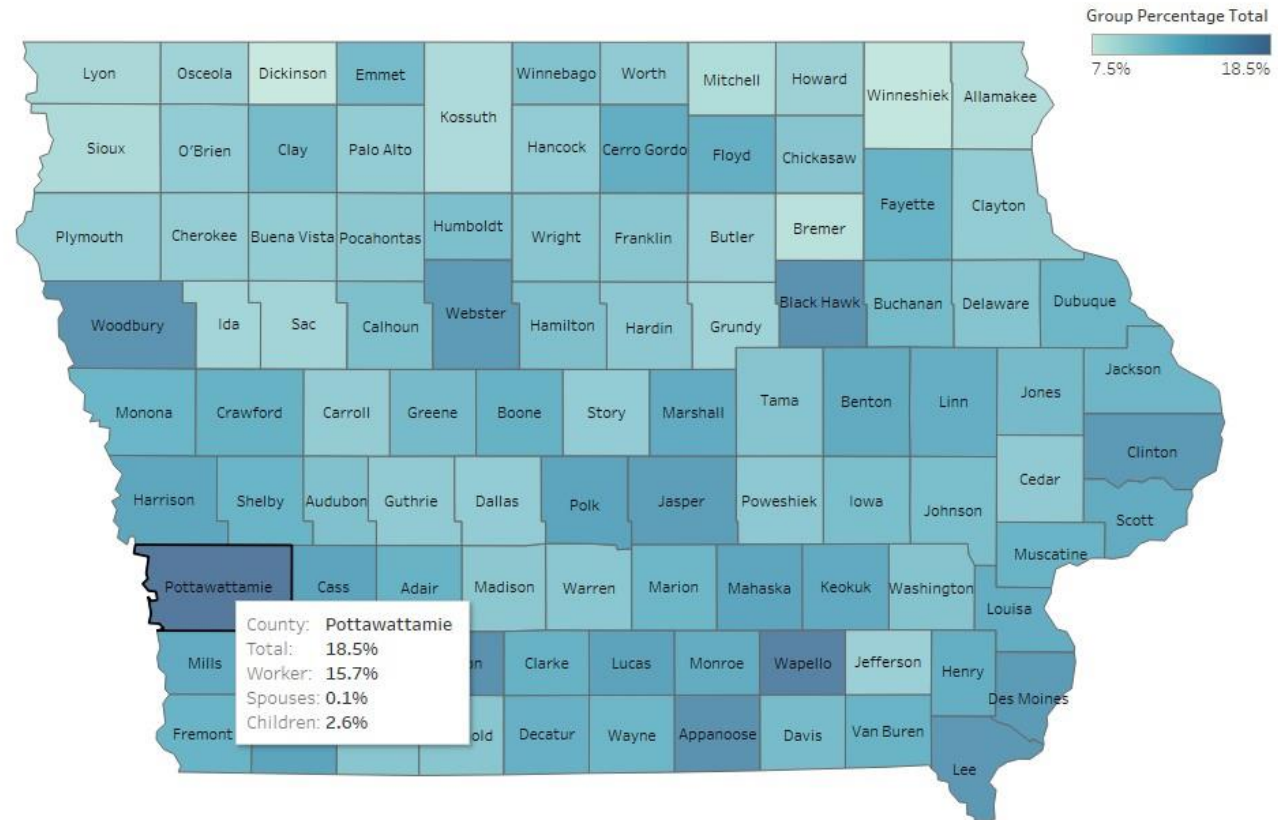
Thank you
Looking forward to your questions!