

INFO 4310/5311: Interactive Information Visualization

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HOMEWORK 4:

Disability Statistics

U.S. disability statistics from the American Community Survey (2022)

PROJECT URL: <https://info4310-hw4-ccdn.onrender.com/>

DATA

Source visualizations

www.DisabilityStatistics.org

- Prevalence
<https://disabilitystatistics.org/acs/1>
- Employment Rate
<https://disabilitystatistics.org/acs/2>
- Poverty
<https://disabilitystatistics.org/acs/7>

Dataset

- Custom dataset of disability statistics (prevalence, employment rate, poverty) generated by Bill Erickson at the Yang-Tan Institute on Employment and Disability from the 2022 American Community Survey.

Purpose of visualizations

The purpose of these visualizations is to provide a wide variety of disability statistics to the public in an easy-to-use format. These statistics are not available from the Census Bureau. While the Census Bureau provides disability, employment, and poverty statistics, they do not, for example, provide employment data by individual disability type, educational status, race, ethnicity, and other variables provided by this dataset. The audience for these visualizations include people with disabilities, family members of people with disabilities, advocates, policy makers, and researchers.

CRITIQUE

Original screenshots

We will focus on Employment Rate (<https://disabilitystatistics.org/acs/2>) for the critique, because the strengths and weaknesses of the prevalence and poverty visualizations are exemplified by this example.

View of interface before “Search” button is clicked

Find U.S. disability statistics in 3 easy steps

STEP 1

1 Select a Statistic

Individual Statistics

American Community Survey

- [Prevalence](#)
- **Employment Rate**
- [Not Working but Actively Looking for Work](#)
- [Full-Time / Full-Year Employment](#)
- [Annual Earnings](#)
- [Annual Household Income](#)
- [Poverty](#)
- [Supplemental Security Income \(SSI\)](#)
- [Educational Attainment](#)
- [Veterans Service-Connected Disability](#)
- [Health Insurance Coverage \(and Type\)](#)

STEP 2

2 Adjust Search Filters

Search Form

Source: **6** American Community Survey (ACS) **1**

Statistic: **5** Employment Rate **1**

Gender: **1** Male or Female ▾

Disability Status: ▾ with ▾

Disability Type: **1** Any Disability ▾

Age: ▾ Ages 21-64 ▾

Race: **1** all races ▾

Education: **1** all education levels ▾

Hispanic: **1** regardless of ethnicity ▾

Value: ▾ Percentage ▾

Year: ▾ 2022 ▾

Search

STEP 3

3 Review Results

NOTE:

To review results, select a statistic in STEP 1: SELECT A STATISTIC and click the SEARCH button in STEP 2: ADJUST SEARCH FILTERS.

4

Primary strengths

- (1) This dashboard-like, “one-page” interface is designed to lead users through three simple steps to access statistics without losing their place by having to pogo-stick between different windows. The intent of the “steps” was to provide visual structure and instructions for new users and helpful reminders for intermittent users.
- (2) All available individual statistics (e.g., prevalence, employment rate, etc.) are visible without looking for them so the scope of the application is revealed.
- (5) Definitions are provided for many key terms.

Primary weaknesses

- (2) Users are not sure what “Individual Statistics” are without links to definitions, and they are not necessarily familiar with the concept of a “source” (6).
- (4) “One page” model makes the interface crowded and can be overwhelming.

- (3) While it was a deliberate design choice to keep Step 3 grayed out to start to try and reduce cognitive load, some users prefer to see data up front before having to interact with the interface.

View of interface after “Search” button is clicked.

Find U.S. disability statistics in 3 easy steps

STEP 1

1 Select a Statistic

Individual Statistics

American Community Survey

- Prevalence
- Employment Rate**
- Not Working but Actively Looking for Work
- Full-Time / Full-Year Employment
- Annual Earnings
- Annual Household Income
- Poverty
- Supplemental Security Income (SSI)
- Educational Attainment
- Veterans Service-Connected Disability
- Health Insurance Coverage (and Type)

STEP 2

2 Adjust Search Filters

Search Form

Source: American Community Survey (ACS)

Statistic: Employment Rate

Gender: Male or Female

Disability Status: with

Disability Type: Any Disability

Age: Ages 21-64

Race: all races

Education: all education levels

Hispanic: regardless of ethnicity

Value: Percentage

Year: 2022

Search

Written Description

Description of Statistics

In the year 2022, an estimated 45 percent (plus or minus 0.28 percentage points) of non-institutionalized, male or female, with a disability, ages 21-64, all races, regardless of ethnicity, with all education levels in the United States were employed.

In other words, 9,408,000 out of 20,920,400 non-institutionalized, male or female, with a disability, ages 21-64, all races, regardless of ethnicity, with all education levels in the United States were employed.

The estimates above are based on a sample of 210,386 persons who participated in the 2022 American Community Survey (ACS).

STEP 3

3 Review Results

Map

Employment Rate Estimate 2022

Employment Rate: The percentage of non-institutionalized, male or female, with any disability, ages 21-64, all races, regardless of ethnicity, with all education levels in the United States who were employed in 2022.

2022 Estimate
Maine: 41

30 40 50 60

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Table

Employment Rate:

The percentage of non-institutionalized, male or female, with any disability, ages 21-64, all races, regardless of ethnicity, with all education levels in the United States who were employed in 2022.

Location	Estimate (%)	90% MOE	Base Population	Sample Size
United States	45.0	± 0.28	20,920,400	210,386
Alabama	38.1	± 1.70	427,100	4,197
Alaska	48.1	± 5.05	51,400	488
Arizona	49.8	± 1.73	440,900	4,358
Arkansas	36.2	± 2.11	272,800	2,889
California	44.3	± 0.79	2,051,700	21,152
Colorado	55.5	± 1.96	336,500	3,284
Connecticut	44.2	± 2.56	197,600	1,984
Delaware	45.3	± 4.61	61,300	550

Primary strengths

- (6) Written descriptions of the statistics based on the selected filters and definitions are provided by the application so users can copy/paste the text into papers, grant submissions, etc.
- (7) A simple choropleth and (8) tabular data are both provided to provide a comparative view and access to precise numbers.

Primary weaknesses

- (6) The text can be overwhelming. (This page is very long.)

- (7) The choropleth is small. The labels and mouseover text are very hard to read.
- (8) The data table is limited to either the percentage or number. Both would be useful to have in a single table.
- While this application provides statistics not otherwise found in an interactive format online, there is a lot to be done to improve the usability, design, and quality of the visualizations so that users can better access and understand the data.

Areas targeted for improvement for HW4

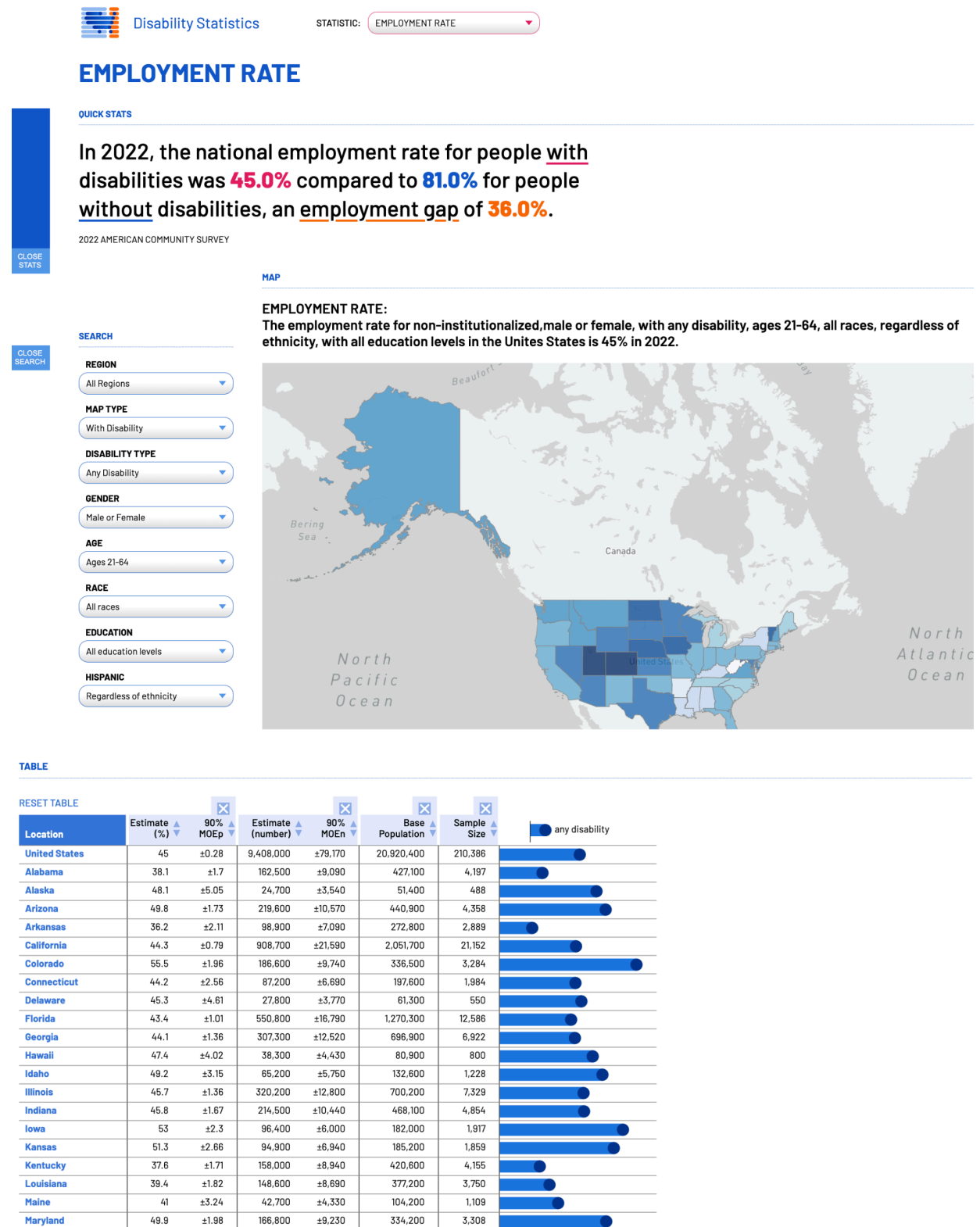
- Explore better ways of staging entry into the page. For example, provide simplified, national level data to orient users to the statistic.
- While maintaining a “one page,” dashboard design, provide ways to hide, reveal, and enlarge different elements.
- Enhance the table view to provide both percentages and numbers as well as additional visualizations. For example, the employment rate of people with disabilities is not compelling without understanding how this number compares with the employment rate of people without disabilities and the resulting employment gap.
- Explore additional visualizations (e.g., bar charts) to help provide a better overview of the data.

Examples of long-term areas for improvement

- YTI will continue to improve this site by providing account features so users can save queries.
- Downloadable images of visualizations and tables.
- Additional years will provide the ability to create time trend visualizations.
- Better instructional support on how to use statistics.
- Data journalism stories to provide further context for the data.

IMPROVED VISUALIZATION

HW4 screenshot (NOTE: State table is cut off to fit the page.)



Design rationale

How this project improves upon and exceeds the capabilities of source inspiration:

- **Quick Stats:** We provide “Quick Stats” to start each individual statistic page. Ideally, these national statistics would help introduce the user to the statistic—key variables, domain, range—before they venture into the weeds of the filters, map, and table.
- **Collapsible sections:** Several sections, such as the Quick Stats, Search filters, and table columns are collapsible so the user can free up screen real estate to look at a larger map or specific details in the table.
- **Region filter:** The option to filter the map and table by region helps reduce data overload.
- **Enhanced map:** The zoomable and pan-able choropleth is mapped on a mercator projection to include Puerto Rico. This was a hard call because it makes the map harder to see all at once since Alaska, Hawaii, and Puerto Rico are so far away. However, the commonly used Albers map never does the size of Alaska justice, and the choropleth was designed to be enlarged to accommodate the larger footprint.
- **Enhanced table view:** The table view now includes both percentages and numbers with the associated MOE, base populations, and sample sizes. These columns can be hidden to reduce the amount of data. The sortable table view now also provides a bar chart.
- **New charts:** The employment rate page now provides a stacked bar chart visualizing each state’s employment rate of people with disabilities, employment rate of people without disabilities, and the employment gap. This new visualization is important because the employment rate of people with disabilities is never considered without putting it in context with the rate of people without disabilities.