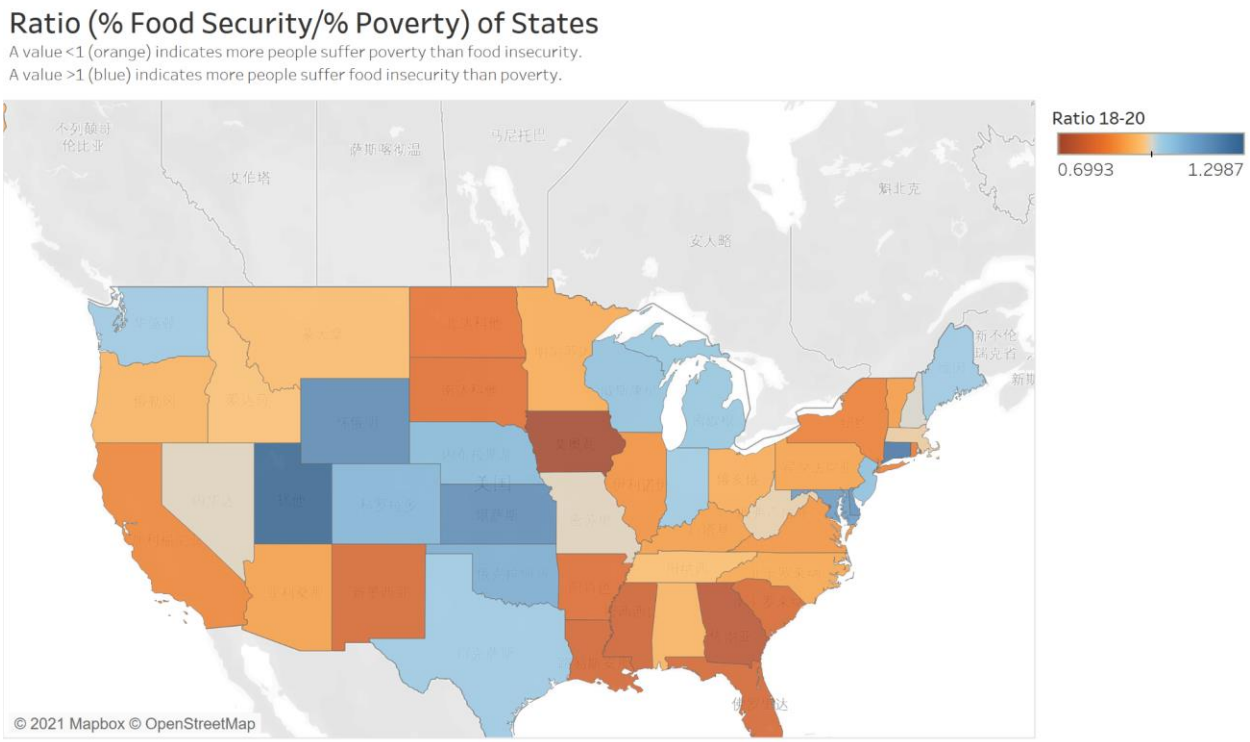
Food Insecurity And Poverty Across The U.S.



Team name

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Table of Contents

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Introduction

Our topic is mainly focused on food insecurity, poverty, and their relationship across the U.S.

Background

The datasets we chose for our project were mainly from the United States Government's open data and the United States Census Bureau. We also acquired a group of the dataset from the Economic Research Report to get some of the data that could meet our needs in visualizing different aspects of this topic. Food security and poverty are also strongly related to agriculture. Thus, we searched for and acquired data from the U.S. Department of Agriculture regarding food insecurity problems.

Questions

We want to find out the specific relationship between poverty and food insecurity across the United States. We want to understand why there are still many cases regarding food insecurity. We also want to comprehend to what extent poverty affects food insecurity. Finally, we want to learn the exact differences between each state in the U.S.

Our targeted audiences are researchers and experts in agricultural science, economics, government, and organizations. Our project is also targeted toward citizens in the U.S. who are interested in knowing the distribution of poverty and food insecurity and people who are concerned about their situation regarding food security and poverty.

We aim to solve the relationship between poverty and food insecurity throughout recent years. Some researchers have already finished collecting data about food insecurity and poverty in different states and years. We need to integrate everything and figure out the relationships based on the existing datasets.

Problem Statement

From articles published before our research, most of the visualizations focused on state-level food insecurity/poverty status in one specific year or temporal graph that showed the change of food insecurity/poverty rates in a particular section of years.

The problem of food insecurities worsens without the government and its people recognizing its source. The most direct consequence will be the unhealthy state of citizens suffering from poverty. If people cannot access secure food sources, there would be negative impacts on the state's economic condition, and the society wouldn't be sustainable and healthy. Also, it would negatively influence the state's potential talented individuals.

We want to let viewers know the extent of the problem of food insecurity and poverty to raise awareness on this issue to change people's perceptions, which will affect their actions. We believe change starts by understanding the situation.

By creating visualizations that show direct relationships between poverty and food security, the public can understand how these two elements are bonded together. Governments and organizations can thus find a point to cut into and start solving the problem of food insecurity.

Methodology

As a team, we discussed what problem we wanted to look into specifically; and discussed the kind of data we would want in our project. After digging around the internet, we found a series of datasets we could use. We then made sure our datasets were filtered appropriately and created the visualizations. After that, we all looked at the visualizations and adjusted to each other's feedback. We divided up the work for the presentation, each team member taking part in an area.

Results

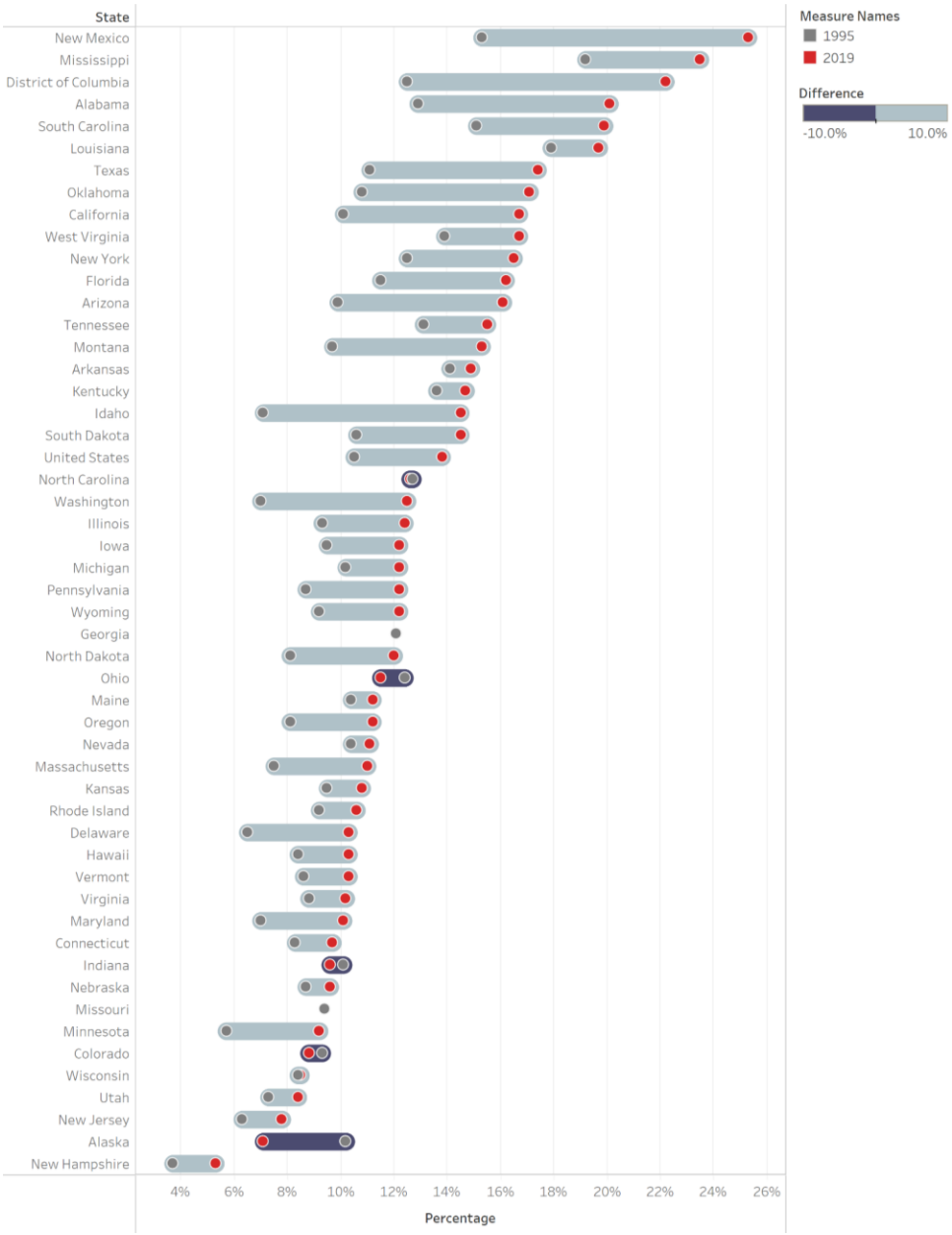


Fig. 1 Decrease of Poverty Percentage from 1995 to 2019 Each row listed two values - the population percentage under the poverty line in 1995 (grey) and 2019 (red). The rows stated each state in the order of the 2019 poverty rate. The length of the connected line showed the decrease of the population under the poverty line, with grey lines as positive (decreased) and dark blue lines as negative (increased). The graph clearly showed the change of poverty in each state without having a chance for readers to misinterpret the information in the map graph. The indicators are well-ordered and color-blind friendly. They were not too complicated for a chart that shows details for all states in the U.S.

Visualization made by Jiaxiang Li

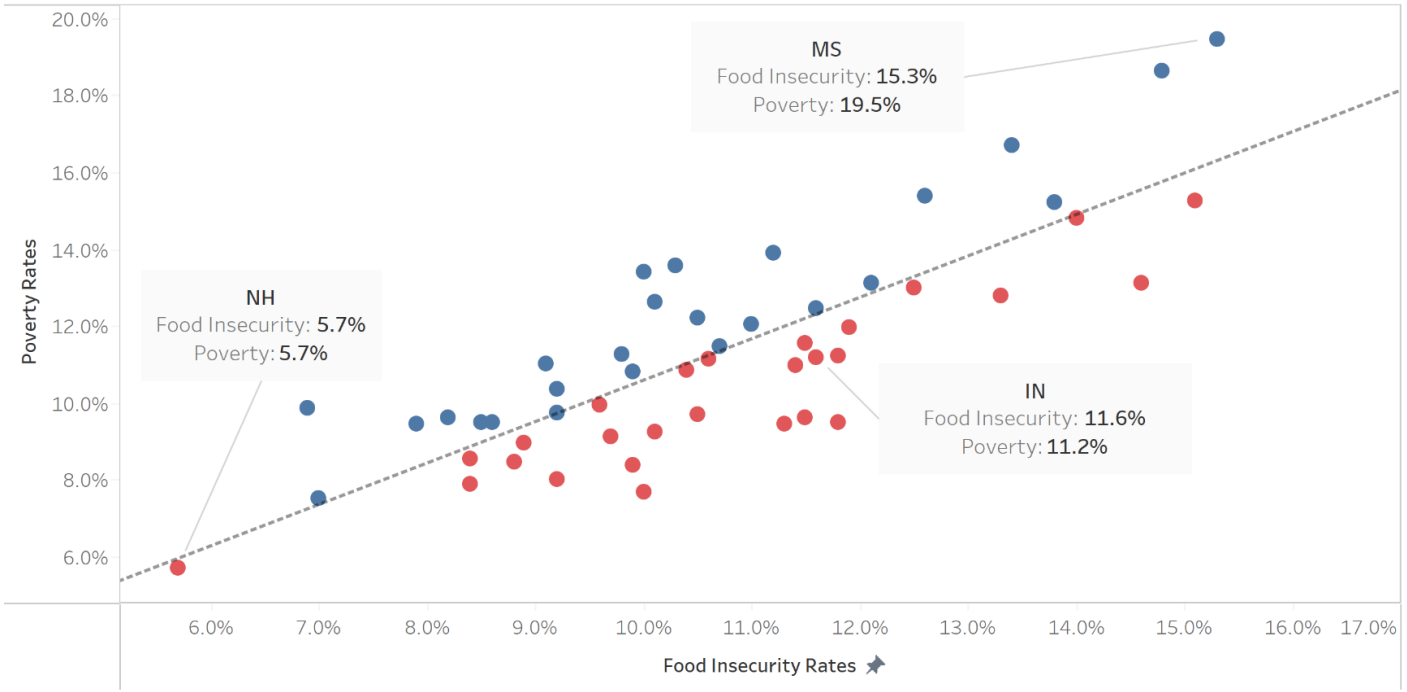


Fig. 2 Relationship Between Poverty Rates and Food Insecurity Rates 2018-2020 X-axis showed values of food insecurity rates, and Y-axis showed values of poverty rates. Each dot indicated a state (with values of poverty and food insecurity rates averaged from data from 2018-2020). A trend line was shown, suggesting a relationship between the two aspects. Blue dots were states that tend to suffer more poverty than food insecurity. Red dots were those that tend to suffer more food insecurity than poverty. This graph was the culmination of the project (a part of it, since there was the same type of graph showing indexes for states from 2007 to 2010 and 2015 to 2017). In this graph, a significant linear relationship between the two rates was conducted, indicating the inseparable connection between poverty and food security. We can show this to other people and clearly state the reasoning without confusion. Visualization made by Jiaxiang Li

Discussion and Conclusion

After analyzing the visualization and data, we can conclude an overall improvement in food security and poverty elimination for most states over the years. However, the numbers show that there's room for improvement.

We can deduce that the severity of both aspects depends mainly on the state's economy, for the food insecurity index is positively related to the state's overall income level of citizens. Furthermore, we can also see an increasing gap between states with higher and lower-income.

Indiana sits in the middle when compared to other states. Compared to both food insecurity and poverty, Indiana's data shows that its population suffers more from food insecurity than poverty. It is reasonable when considering the overall environment and the distribution and density of the food industry/import.

We suggest governments, organizations, and agricultural research centers focus on both poverty and food insecurity from our result. They are tied and, according to the visualizations, inseparable. It is significant to look into both aspects when problems are found in one of them.

References

- "Definitions of Food Security." *USDA ERS - Definitions of Food Security*, https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security.aspx.
- Ke, Janice, and Elizabeth Lee Ford-Jones. "Food Insecurity and Hunger: A Review of the Effects on Children's Health and Behaviour." *Paediatrics & Child Health*, Pulsus Group Inc, Mar. 2015, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4373582/.
- What Is Food Insecurity in America? (2021, November 18). Retrieved from https://hungerandhealth.feedingamerica.org/understand-food-insecurity/

Appendix A – Resources Used

Datasets

- Key Statistics & Graphics. (n.d.). Retrieved from https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics.aspx#foodsecure
- *U.S. Census Bureau quickfacts: United States*. (n.d.). Retrieved December 4, 2021, from https://www.census.gov/quickfacts/fact/table/US/PST045219.
- Coleman-Jensen, A., Rabbitt, M. P., Gregory, C. A., & Singh, A. (2021). "Household Food Security in the United States in 2020." *Economic Research Report* No. (ERR-298) 55 Pp.
- Population and Poverty Status - States 2015-2019, from https://covid19.census.gov/datasets/USCensus::population-and-poverty-status-states-2015-2019/
- Historical Poverty Tables: People and Families - 1959 to 2020, from https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-people.html

Tools used

List all tools used in the project and a brief description (see the examples below); add more if applicable.

Tool/Application	**Description**
Excel	Data cleaning and format changing for further analysis and visualization in Tableau
Tableau	Data visualization
Wix.com	Group website development

Appendix B – Percent Contribution

Group Contributions

Contributed to the data visualization process

Contributed to brainstorming topic, problem, and question

Contributed to script writing and video recording

Individual Contributions

In the table below list each team member's full name, their contribution (body of work) and their % of the work completed. The total must add up to 100%

Team Member	Description	Contribution
Henry Lai	*Researched datasets for visualizations. Made sure all data visualizations work well together in the presentation. Added insights to the presentation and worked on the overall coherence of our project. Focused on using the available visualizations to tell the story. Put together the video.*	*25%*
Jiaxiang Li	*Searched for state-wise datasets of poverty and food insecurity. Created visualizations for decrease of poverty/food insecurity and relationships.*	*25%*
Enguang Liu	*In charge of poverty in different states. Finding the data sources and creating the data visualizations for poverty in different states.*	*20%*
Aidan Sun	*In charge of data regarding food insecurity in the United States. Worked on the powerpoint/video slides that correspond to food insecurity and voiced the portion of the video regarding food insecurity.*	*15%*
Cora Hughey	*Researched background information on food-insecurity for the presentation. Helped make the group website as well as the powerpoint slides.*	*15%*
	Total	100%

Appendix C – Individual Contributions

In this appendix each team member must contribute a one-page document relating the team's topic/data to their home town or home country. The one-page document must contain: (1) a description of the problem, (2) a comparison of the team's findings with insights about your hometown/country related to the hackathon data (3) a visualization to support items (1) and (2).

Each person should create their individual page **(1-page only)** and make it available to the designated team member who will upload the final document.

This will be viewed and assessed as part of each person's individual contribution.

Leave this page as is.

Start adding individual page content on the next page.

REMOVE any blank pages before submitting.

Team Member #1: Henry Lai

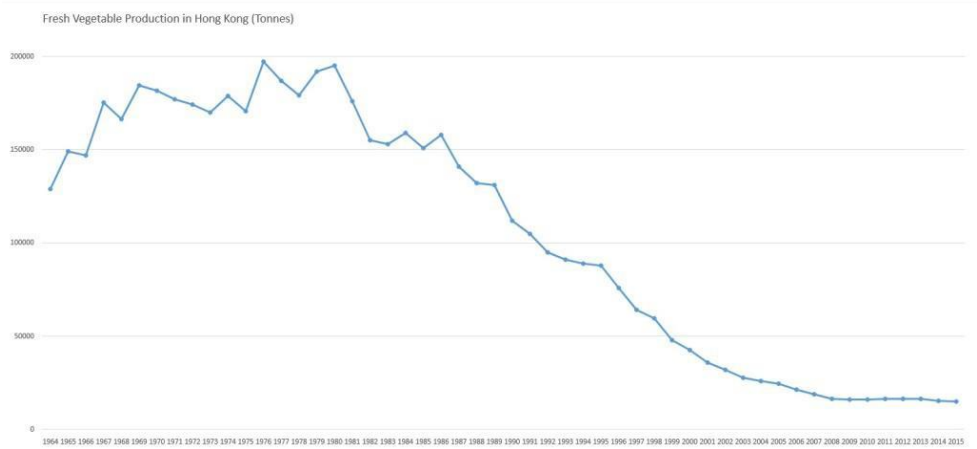
My Hometown/City/Country: Hackathon Topic (dataset): Food Insecurity

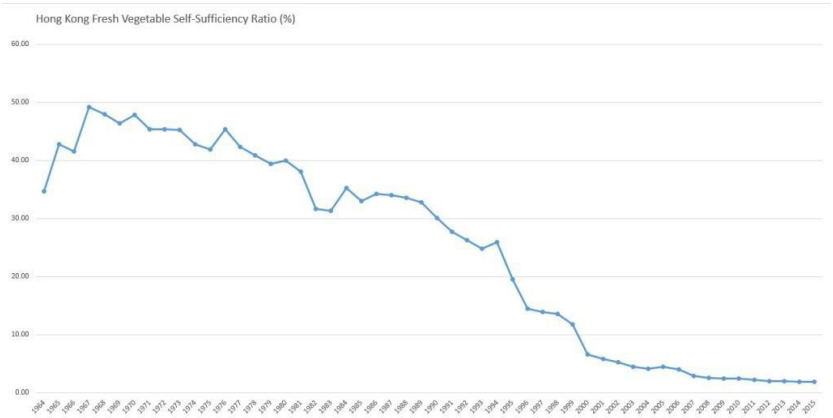
Include your story and visualization below.

I am from Hong Kong. Despite it being a relatively wealthy city, the city's food security is an area of concern. The city has many fundamental issues revolving around inequality; it has a free market that attracts many foreign countries for business. This along with other factors resulted in a highly unequal city, with a large rich- poor gap.

Having said that, this project gave me an opportunity to learn more about this particular issue in the United States. And it was interesting for me to learn about how all the states compare to each other in terms of food security. Not only that, I also learned about food security as a whole; which really opened my eyes to something that I didn't think much about.

Another thing I learned is that geography has a huge impact on food security, as it is the foundation on which cities are built on. Geographical factors should not be taken lightly, as it is directly correlated to the quality of land available. In Hong Kong, the number of homegrown vegetables have decreased drastically because of the lack of land and competition from neighboring country - China.





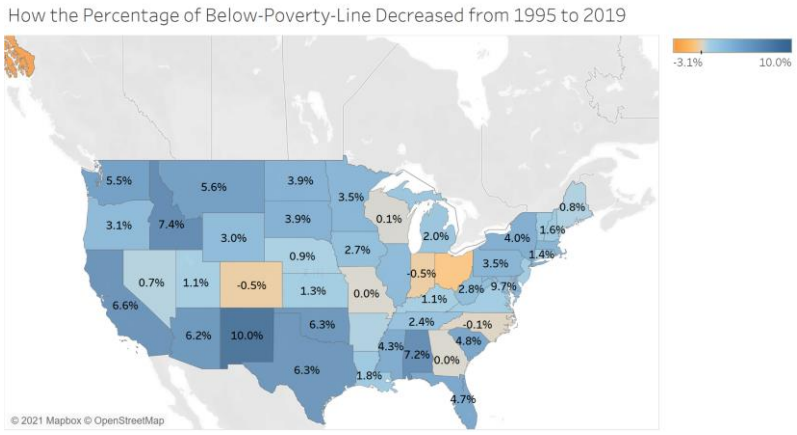
Team Member #2: Jiaxiang Li

My Hometown/City/Country: Beijing, China Hackathon Topic (dataset): Food Insecurity

I came from China, and I've lived in Beijing since I was born. Like metropolises like New York, Boston, and Los Angeles in the U.S., Beijing is a place where poverty and food insecurity problems are not an issue that will be reported and exposed every day. But after years of studying, I learned that poverty and food insecurity are prevalent in several regions of my country.

After this project, I understood the differences and similarities of poverty and food insecurity between China and the U.S. There are many places in both countries where these problems are fixed very efficiently throughout the years. There are also many regions where the fixing of these problems is stagnant - either because the local governments are too idle to make amends or because there are unpreventable incidents that disrupted the process. Doing visualizations to show the effectiveness of changing the status quo helped me comprehend the difference of situations between different regions.

However, the process also allowed me to understand how some organizations/individuals used the same information to let the public misinterpret the message. Because I learned that the map below doesn't show the poverty level of each state, but the change of poverty of each state, some states had a considerable decrease of the population under the poverty line but are still very poor compared to other states nowadays. People can easily manipulate those who don't care to investigate themselves and lead the public in the wrong direction.



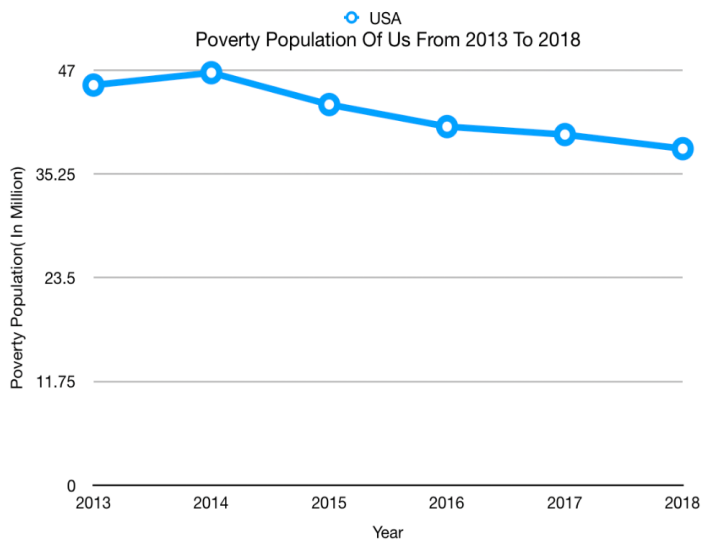
Team Member #3: Enguang Liu

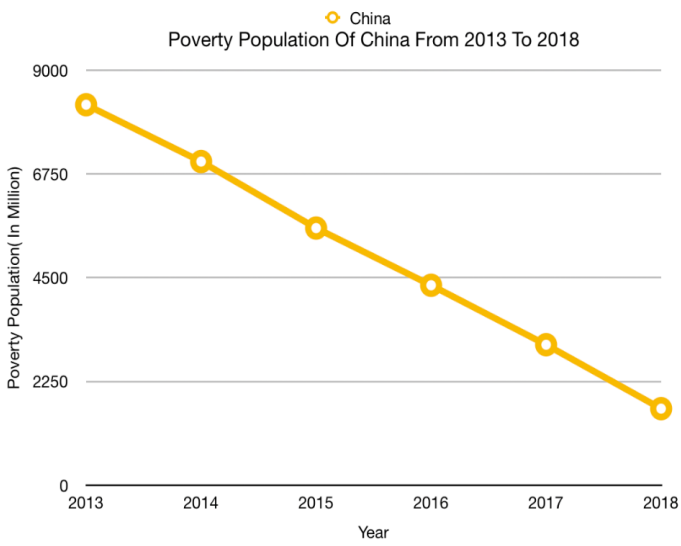
My Hometown/City/Country: Shanghai,China Hackathon Topic (dataset): Food Insecurity

Include your story and visualization below.

In this project, my group and I tried to find out the situation of poverty and food insecurity in the US. I am from Shanghai, China. Since I am from a different country, I was very curious about the food insecurity and poverty situation in the USA, and this project offers me a great opportunity to know and research it.

I made two visualizations to compare the poverty populations of the US and China. When we only compare the numbers. It is obvious that the US has less poverty than China, because the US has less population than China, and it has stronger national power. When we compare the trend, we can see that China has a steeper downward slope than the US. This is because China is having a catch up growth. The US is having a sustain growth. In most of the time, the speed of catch up growth will be a lot faster than the sustain growth.In this project, I learned how to apply data visualization to real use, and Visualizations is a great way to exhibit my research. In hackathon data, I found that the poverty rate of US is keep going down, and this is similar to my home town which also having a downward sloping poverty rate.





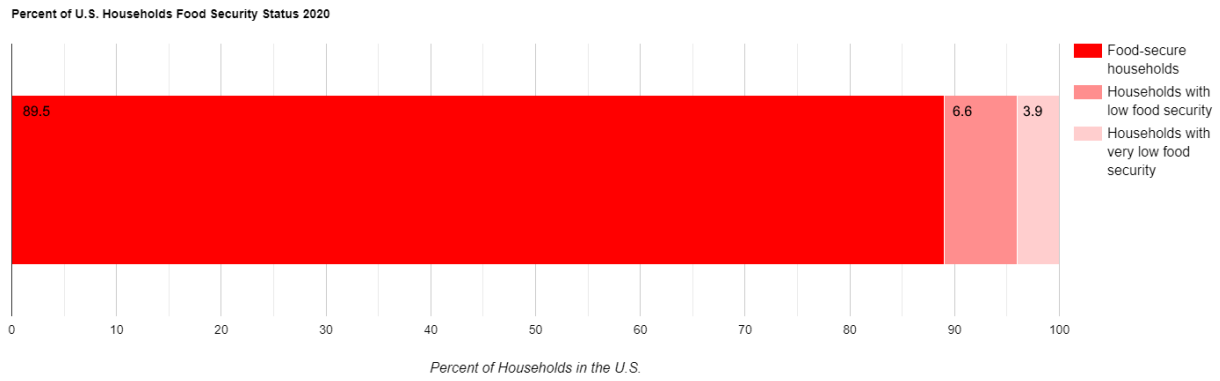
Team Member #4: Aidan Sun

My Hometown/City/Country: Suwanee, Georgia Hackathon Topic (dataset): Food Insecurity

I came to Indianna from a rather wealthy city/county in Georgia. Despite this though, I knew many people within my community who struggled to get a healthy amount of food each day and were thus food insecure.

With covid shutting down a lot of things, including schools, there was a big conversation regarding school lunches. It is a pretty known issue within my area that quite a large amount of families struggle with food insecurity and depend on school lunches for food. On top of that, the schools I've attended do annual food drives to donate food to families who suffer from food insecurity in the area.

These situations reminded me of the shocking data we found regarding food insecurity in the U.S., more specifically the statistic that over 1 out of every 10 households in the US are food insecure. Even in places you wouldn't expect food insecurity to be a problem, it is.



Team Member #5: Cora Hughey

My Hometown/City/Country: Carmel, Indiana Hackathon Topic (dataset): Food Insecurity

I am originally from Carmel, Indiana, which is a somewhat affluent suburb. Although food insecurity was not an issue many people from my town faced, Indiana as a whole has a rather high percentage of people who are food insecure, at 15% of Indiana's population, which is higher than the national average. Since I have lived in Carmel my whole life up until this year, this project has opened my eyes to the prevalence of food insecurity in areas around me. For example, the rates of food insecurity in Indianapolis, just minutes away from where I live, are the highest in the state. I was also surprised to learn that Purdue's campus was once considered a food desert.

Appendix D - Diversity Statement

In Team Tableau Gurus, we are all from two majors; Cora Hughey, Aidan Sun, and Henry Lai are majoring in UX design. Enguang Liu and Alvin Li are majoring in data visualization. Different major means we all have our specializations. Members who major in data visualization have a solid ability to make visualizations, so they can provide valuable suggestions when we are making visualizations, and both of them also made some excellent visualizations during the project. Members who major in UX design are very good at creating websites, and they also did a lot of work on refining, such as decorating the Powerpoint.

Our team also features students from different academic statuses. For example, Aidan, Alvin, Cora, and Henry are freshmen, while Enguang is a junior. Having members from different grade levels helps to bring new perspectives into how we look at things due to our age and our academic experience. We all have different experiences in what kind of topics we have learned about, as well as various skills we've learned in regards to collecting data, creating visualizations, etc.

Team Tableau Gurus also has members that are from different countries and regions. Enguang Liu is from Shanghai, China, and Alvin Li is from Beijing, China; Henry is from Hong Kong, Aidan is from Georgia, and Cora is from Indiana. All these different regional backgrounds have exposed each member to diverse experiences in everything, including food insecurity, whether at different levels or different from different causes. These different experiences and regional differences helped everyone contribute a unique perspective to the research and overall project.

We all valued this opportunity to work in such a diverse team, and we believe that it helped me be open-minded when thinking about the project.

Appendix E – Team Consensus

Team Consensus

I have read and approved of the content as a representation of the team's work and my contribution.

Team Member (full name)	Signature	Date
Henry Lai	Henry Lai	12/10/21
Jiaxiang Li	Jiaxiang Li	12/10/21
Enguang Liu	Enguang Liu	12/10/21
Aidan Sun	Aidan Sun	12/10/21
Cora Hughey	Cora Hughey	12/10/21