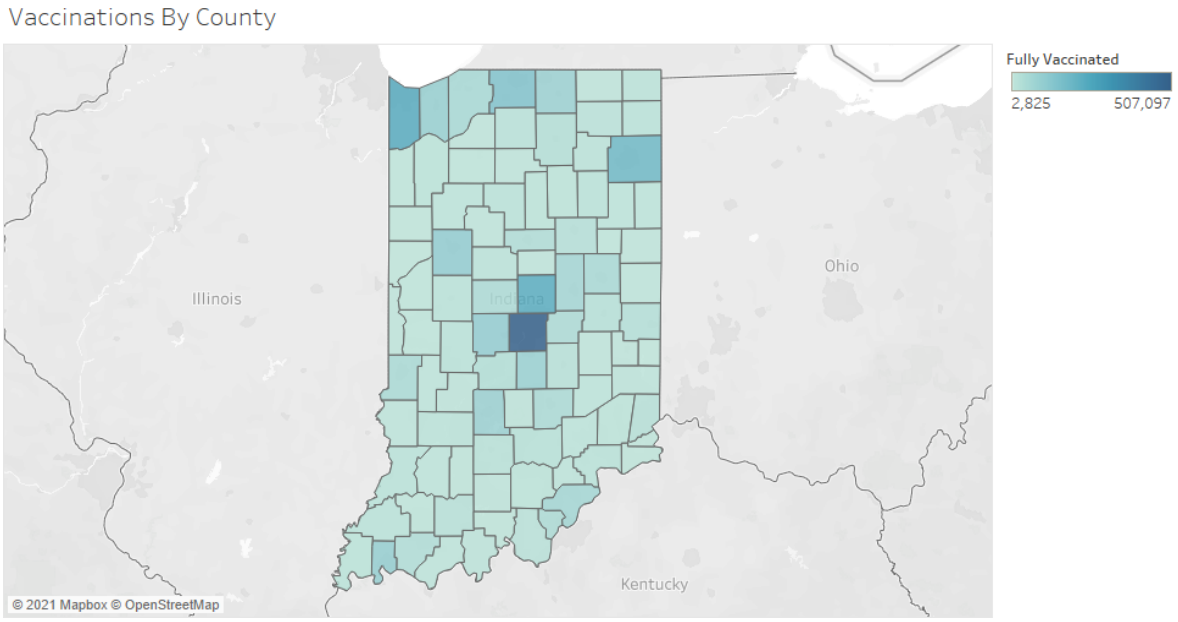
Covid-19 Vaccination Demographics



Boiler Hackattack

Name (full name)	**Purdue Email address**
Tejasvi Bhagwatkar	trbhagwa@purdue.edu
Ben	bhabegge@purdue.edu
Bethany	magee9@purdue.edu
Jason Estes	estes11@purdue.edu

Table of Contents

Introduction 3
Background 3
Questions 3
Problem Statement 3
Methodology 4
Results (1/2) 5
Discussion and Conclusion 7
References 7
Appendix A – Resources Used 8
Datasets 8
Tools used 8
Appendix B – Percent Contribution 9
Group Contributions 9
Individual Contributions 9
Appendix C – Individual Contributions 10
Team Member #1: Tejasvi Bhagwatkar 11
Team Member #2: Bethany MaGee 12
Team Member #3: Ben Habegger 13
Team Member #4: Jason Estes 14
Appendix D - Diversity Statement 15
Appendix E – Team Consensus 16
Team Consensus 16

Covid-19 Vaccination Demographic

Introduction

We chose to do our project on the vaccination numbers for COVID-19 in Indiana. This virus has affected the entire world and changed millions of lives. While most of us are aware of the negative impacts of the virus many of us are not aware of how people reacted to the vaccine. Throughout our project we will use the Indiana Census data on population to compare the rates of vaccination status of different demographics from Indiana Counties, i.e., age, race, gender.

Background

Our group decided to use a data set revolving around Indiana Census Data and county-vaccination-demographics because we believe demographics can provide important insights into the vaccine. Because COVID-19 shocked the world when no one expected, countless pieces of data were documented, and still are being documented. Previously the positive uptrend of state/nation-wide cases was the most important piece of information to track. Now as the vaccine has been released worldwide the hot topic is now on vaccination rates. Discussion over the virus and the many polarizing opinions on the topic create discourse which hardly ever comes to concise conclusions. Using data and visualizing it in a way that is digestible to the audience is integral to understanding how people of different groups are protecting themselves from the virus. In addition to Indiana Census data, we used the Covid-19 Vaccination dashboard progress by zip code in California, source data.ca.gov and United States Covid-19 cases and deaths by States over Time, source the CDC.

Questions

Our main question we asked ourselves is how are different demographics responding to the vaccine in Indiana? We wanted to focus on vaccinations and how the Indiana population responded. Our audience is Indiana Residents and health care professionals, it is important that these two groups of people are up to date with the most recent information regarding vaccinations and the pandemic. Additional questions we have sought out to answer include: Which Indiana counties have the most fully vaccinated residents? As well as how are vaccination numbers reflected in different demographics? Lastly, how does Indiana compare to other states? Much of the current research done on COVID-19 demographics and vaccination statuses derive from KFF. KFF seeks to find answers and insights into groups of people choosing to get vaccinated or not or even those with only one dose. For example, “Over the course of the COVID-19 pandemic, analyses of federal, state, and local data have shown that people of color have experienced a disproportionate burden of cases and deaths.” KFF covers the entire United States and tracks many different data points.

Source: https://www.kff.org/coronavirus-covid-19/issue-brief/latest-data-on-covid-19-vaccinations-by-race-ethnicity/

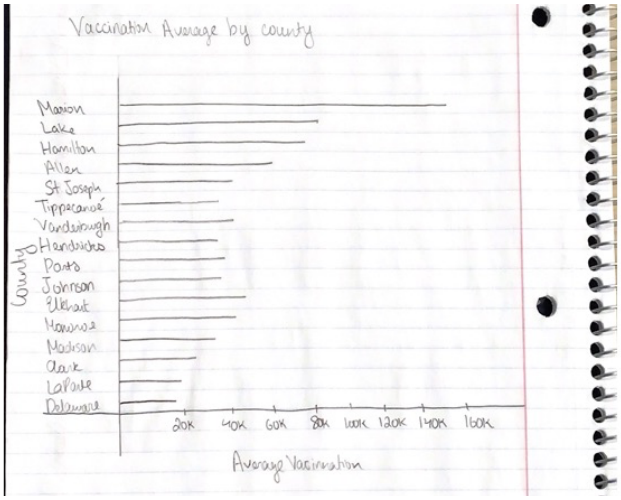
Problem Statement

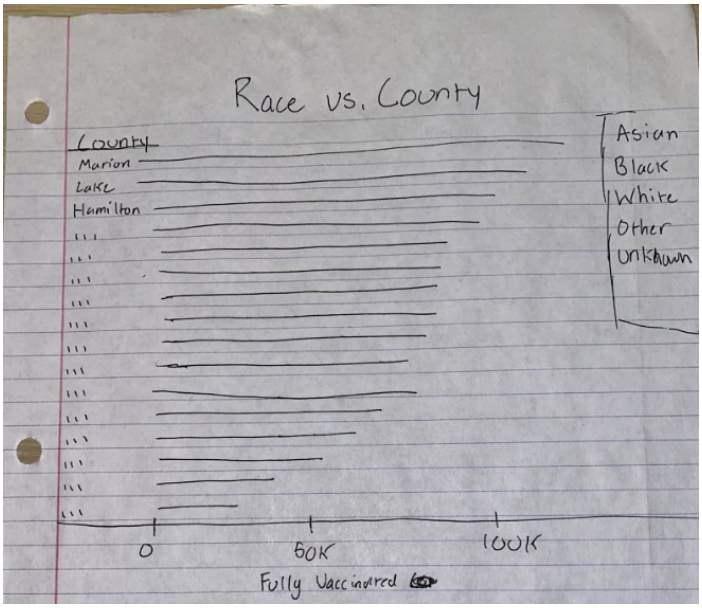
Information and data of the vaccine is often misconstrued or falsified to fit certain narratives. We want to show our audience how the vaccinated population of Indiana is broken down. We want our readers to know and care about our topic because we think it is important for them to be aware of the actual data and know which different demographics received the vaccine for the pandemic. Our work gives the audience a chance to be informed without persuasion from political propaganda, biased media, and uninformed public opinion.

Methodology

We used Tableau as our main software for Visualization. We began by looking at different datasets that help us answer our questions and go deeper into the response to the vaccine. We then filtered the data (usually by filtering certain counties), then mined the data for certain patterns. We sketched our ideas then we each made specific visualizations for some of the patterns we found in the mining stage. We represented the data by creating the visualizations in Tableau. Afterwards we had our colleagues critique our visualizations and implemented any suggestions that they made.

Some Sketches:





Sketch Visualized:

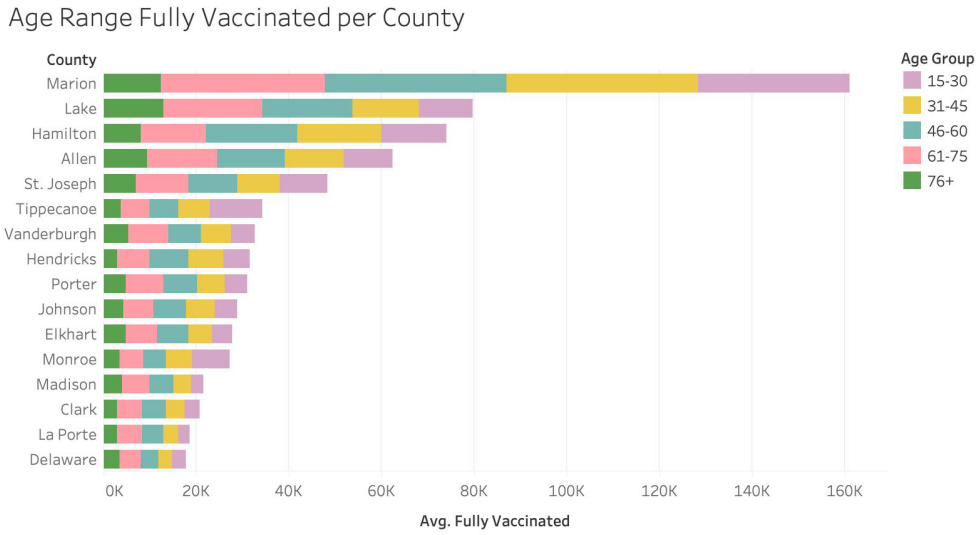


Fig. 1: Vaccination numbers across age groups in top 16 Indiana counties.

Results (1/2)

Jason Estes

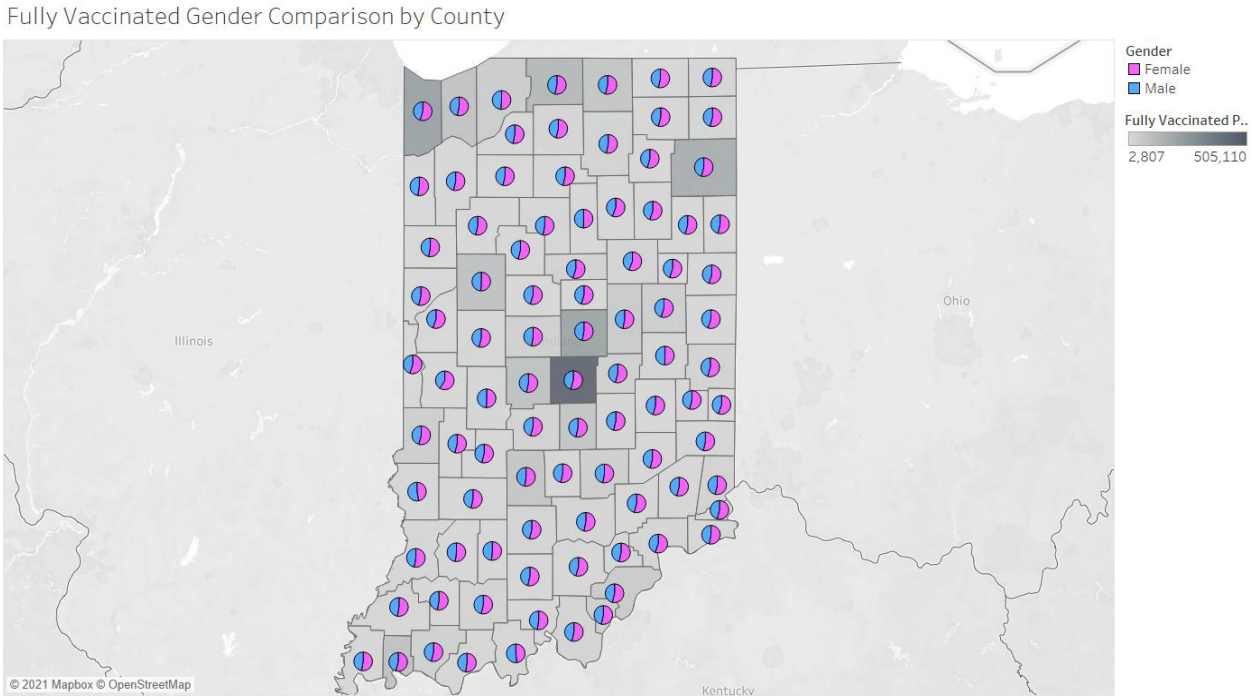


Fig. 2: This map shows the volume of fully vaccinated residents in each county and the ratio of female to male fully vaccinated residents. It reveals the most vaccinated counties and that females are more vaccinated across all counties.

Results (2/2)

Ben Habegger

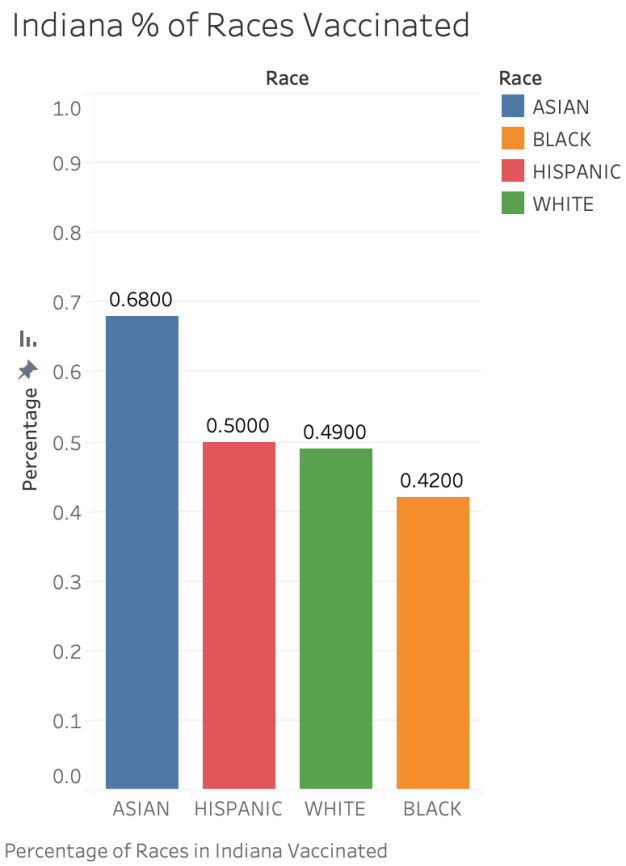


Fig. 3: Percentage of Races in Indiana vaccinated relative to population size. Although some races have larger populations, the chart ranks them based on what percent of their population is fully vaccinated. This puts Indiana's majority population, white, in 3rd ranking.

Discussion and Conclusion

The first visualization created by Jason Estes visualizes the volume of fully vaccinated residents in each county in Indiana (*according to Indiana Census Data*) and the ratio of female to male fully vaccinated residents. It reveals the most vaccinated counties and that females are more vaccinated across all counties. This visualization relates back to our problem statement as making a statement if males or females are more likely to get the vaccine would be quite a common assumption typically made from biases. What Jason's visualization shows is a definitive conclusion that females are more vaccinated than males in every single county.

The second visualization created by Ben Habegger visualizes the percentage of races in Indiana vaccinated relative to population size. It reveals that although more white people have been vaccinated overall, this is because white people dominate the general population in Indiana comparatively to other races. The visualization also shows that the Asian race comes in first and black in last in vaccination rates among races with Hispanic falling in 2nd. Although this visualization is rather simple, it's especially important to the problem statement because race is one of the most falsified topics when it comes to *anything*. In the end a solidified and simple graph shows the proper data in this subject.

References

1. https://www.kff.org/coronavirus-covid-19/
2. https://usafacts.org/visualizations/covid-vaccine-tracker-states/state/indiana

Appendix A – Resources Used

Datasets

Indiana Census Vaccination Demographics:
https://hub.mph.in.gov/dataset/covid-19-vaccinations-demographics-by-county-and-district

Used to create visualizations for demographics in Indiana

California Vaccine Progress Dashboard
https://data.ca.gov/dataset/covid-19-vaccine-progress-dashboard-data-by-zip-code

Used to compare Indiana to California vaccinations

US Case Data
https://data.cdc.gov/Case-Surveillance/United-States-COVID-19-Cases-and-Deaths-by-State-o/9mfq-cb36/data

Used to gather case data for whole United States

US Vaccination Data
https://data.cdc.gov/Vaccinations/COVID-19-Vaccinations-in-the-United-States-County/8xkx-amqh/data

Used to compare Indiana to whole United States vaccinations

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
Tableau	Data visualization
Weebly	Website development

Appendix B – Percent Contribution

Group Contributions

As a group we all: Brainstormed for topic ideas, served as rotating team leader, researched additional data, applied the data visualization process, contributed to slideshow for video, helped write scripting, recorded voiceover for 5-minute video, contributed to Hackathon Report.

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
Bethany MaGee	*Identified patterns, helped filter data, created two visualizations, refined slideshow content, refined scripting,*	*25%*
Ben Habegger	*Identified references, created two visualizations, compiled slideshow content, wrote scripting, edited the video presentation.*	*25%*
Tejasvi Bhagwatkar	*Identified additional datasets, made comparisons for other locations, created four visualizations, outlined the video presentation, created the website*	*25%*
Jason Estes	*Identified vaccination data, came up with the appropriate questions, created two gender visualizations, captured video and audio presentation, refined report*	*25%*
	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 home town/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.

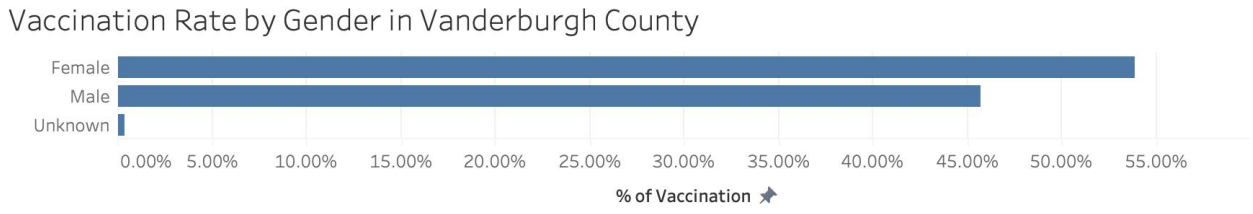
Start adding individual page content on the next page.

REMOVE any blank pages before submitting.

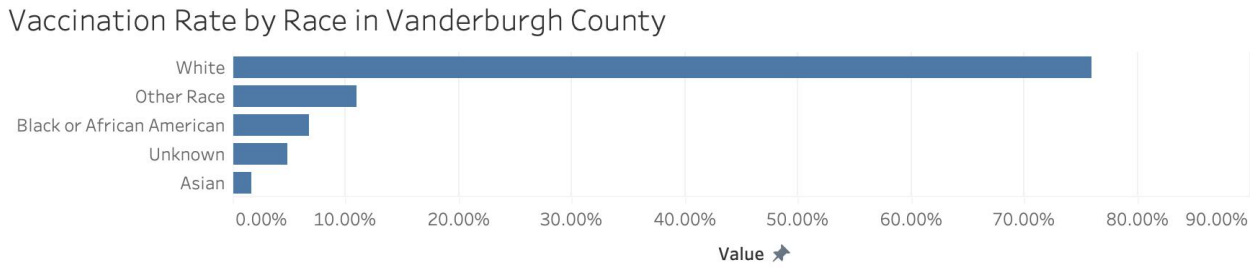
Team Member #1: Tejasvi Bhagwatkar
My Hometown/City/Country: Evansville, Indiana U.S. Hackathon Topic (dataset): Indiana Census
Include your story and visualization below.

The problem we were looking to address is accurately knowing which demographics in Indiana are fully vaccinated. Meaning which gender had the highest vaccination rate or which race had the highest vaccination rate. In our team finding we found that females had the highest vaccination rate supported by figure 2 in our report. We also found out that a higher percentage of Asians are fully vaccinated, in respect to the individual populations. Our first finding matches up perfectly with my hometown. In Vanderburgh County with 53.9% of females getting fully vaccinated and 45.7% males getting fully vaccinated. Our other findings, however, does not line up with my hometown. When looking at the whole state of Indiana we found out that 68% of Asians were fully vaccinated, however, in Vanderburgh County Asians had the lowest percentage of vaccination rate. With white people having the highest vaccination rate and other races, and African American following behind. This can be due to Asians having a small population in Vanderburgh County and majority of the county being white dominated.

I found all this information really interesting because it showed me where my hometown lied in comparison to the whole state. It also made me familiar with the vaccination trends in different demographics in my hometown.

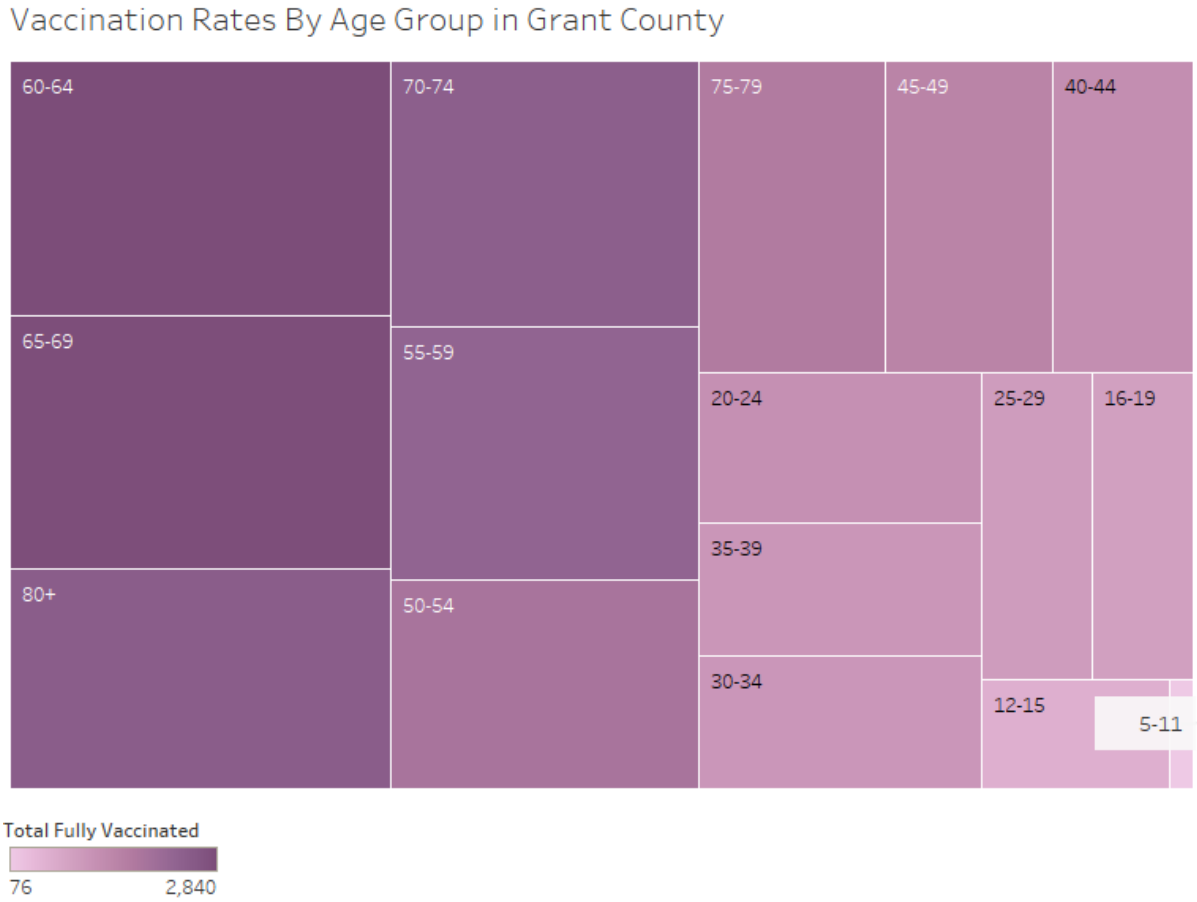


Female, Male and Unknown.



Asian, Black or African American, Other Race, Unknown and White.

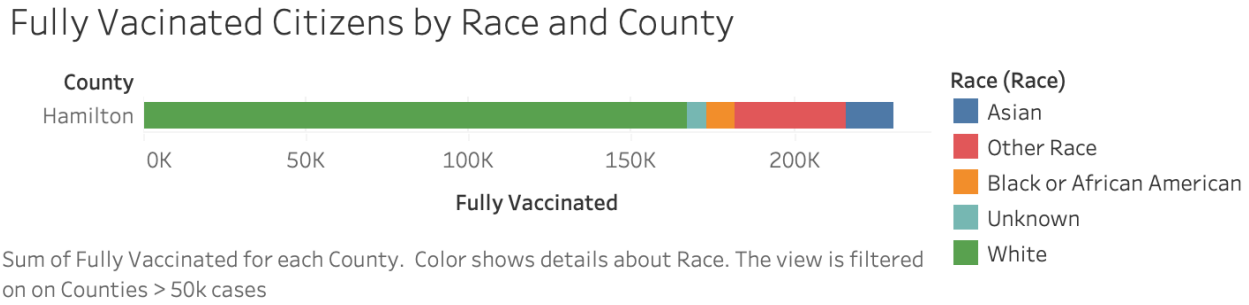
Team Member #2: Bethany MaGee
My Hometown/City/Country: Upland, Indiana Hackathon Topic (dataset): Indiana Census
Include your story and visualization below.



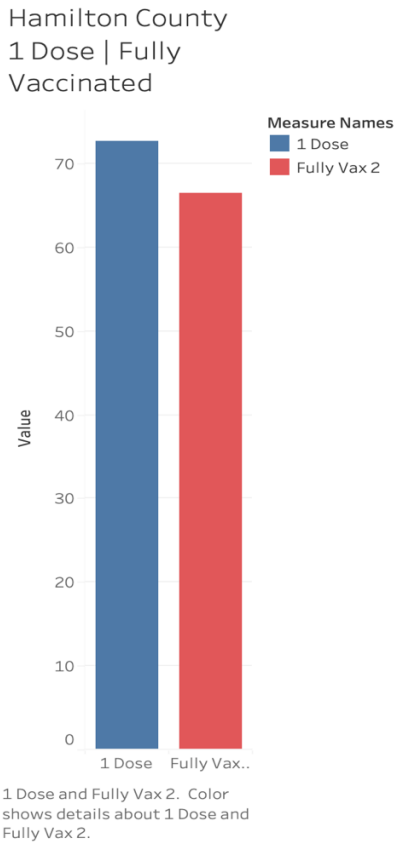
Our problem was that we did not know what demographics of people were getting the vaccine in Indiana, so I decided to check what age groups got the vaccine in Grant County, my home county. People in their 60s got the most vaccinations in my Grant County, followed by other older age groups. The youngest age groups got the fewest vaccinations. One thing I noticed was that while Grant County is home to two small universities, the vaccinations of 20-24 and 16-19 age groups have lower vaccination rates than I expected for the population, meaning students did not get vaccinated in Grant County or fewer students are vaccinated than I initially expected.

Other Indiana counties have seemed to have a more even spread of vaccinations across age groups than Grant County. Grant County seems to have a slightly more noticeable difference in the number of younger people vaccinated than older in some age groups.
If someone was concerned about vaccination rates within Grant County, that person could research ways to encourage younger people to get vaccinated. There could also be changes made on the college campuses to help students access the vaccine or find transportation to vaccination sites.

Team Member #3: Ben Habegger
My Hometown/City/Country: Fishers, Indiana | Hamilton County Hackathon Topic (dataset): Indiana Counties and Sum of Fully Vaccinated Persons
Include your story and visualization below.

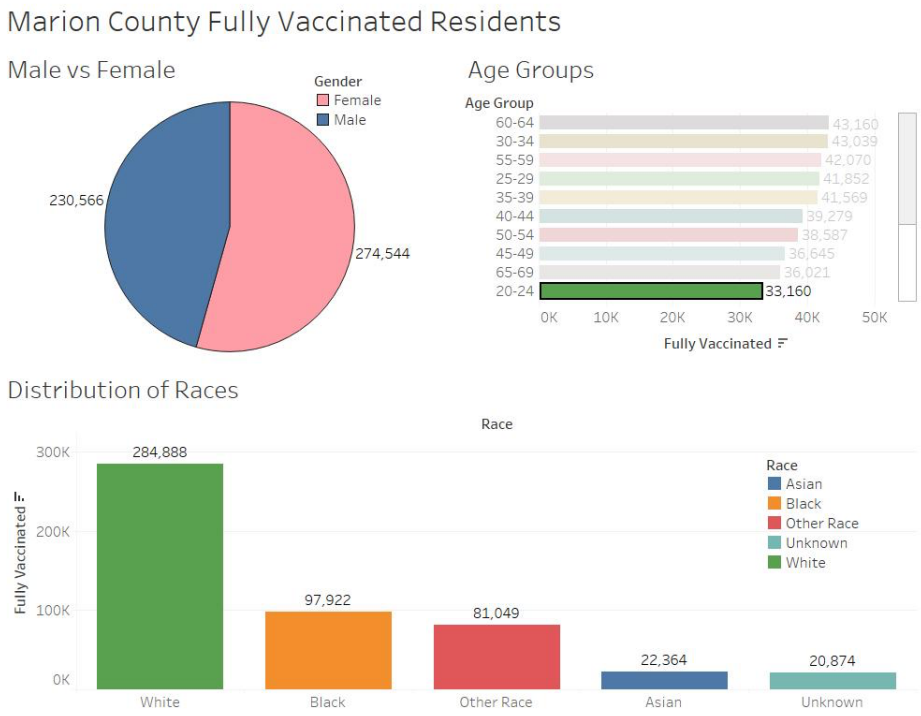


The problem here lies in the data revolving around who is getting fully vaccinated and where. I have filtered the view to just fixate on my home county, Hamilton County, home to Fishers, Noblesville, Carmel, and cities. With Indiana and Hamilton County being a majority white dominating location, this visualization shows just that. White by far overtakes other races in sheer number of vaccinated people, followed by other (mixed / Hispanic), then Asian, and lastly Black and unknown. The conclusion this visualization leads us to is just confirming biases. This visualization doesn't tell much of a story at all, and rather just confirms a common trope that white people get vaccinated more commonly than other races. This is true, but only because there are more white people in the population as said earlier. Similarly, to our groups data for all counties, this trend holds true throughout all counties including Hamilton. This is important information to me because living in Hamilton County, a white dominating yet diverse county, information like this is important to be shown to its residents so we can possibly make conclusions and come to findings of the data.



The problem here lies in not knowing what percentage of Hamilton County is vaccinated, a number that could change all the time or even lied about. In the view to the left, a graph of Hamilton County Residents with 1 dose vs. those with 2 doses (Or one Johnson and Johnson) is shown. This data is extremely important to me because living in Hamilton County my whole life, it is important to know how the people I live with and interact with daily are choosing to respond to the vaccine. While I won't know who is or isn't the visualization gives me an insight into how my county has responded to the vaccine. When comparing this data to the rest of the state of Indiana, Hamilton County is in the top 5 of fully vaccinated residents which makes me feel slightly better about the Covid-19 situation in where I am from. In comparison to our groups data, this visualization is especially important as our group mainly looked at demographics and how the responded to the vaccine, this shows everybody from Hamilton County.

Team Member #4: Jason Estes
My Hometown/City/Country: Indianapolis, Indiana | Marion County
Hackathon Topic (dataset): Indiana Census Data | Indiana Counties Vaccination Demographics
Include your story and visualization below.



I come from Indianapolis, Indiana which is the capital and largest city of Indiana. Indianapolis is in Marion County which has the largest population in Indiana at nearly 1 million residents according to 2020 census data. Being in a city that large and populated definitely raised extra concerns when Covid-19 hit. Throughout all of quarantine and the time since, many fears have been raised stemming from media and public opinion. Now that the vaccine is the main topic of the pandemic, there is a lot of public speculation around the facts of the vaccines. Many people only get their information from the news or what they see online instead of taking the time to research for themselves. The problem with this is that some news can be biased especially in today's political climate and the internet is filled with uninformed opinions from the public. I have seen firsthand how people can be persuaded to form opinions by the cluster of information that is going around. Before looking at my hometown, I believed being the largest city would present data consistent with Indiana as a whole. After taking a closer look, my findings are very similar to what we found for the whole state. Around 50% of Indiana is fully vaccinated and so is Marion County alone. More females are still vaccinated than males. With Indianapolis being among the most diverse Indiana cities, the distribution of races is still similarly proportioned to data for other cities/counties. When comparing the age groups to what we found, the middle and higher ages(25-69) are again majority of the vaccinated population with the lower age groups like my own and below are among the least. What's interesting is that ages 70+ are also among the lowest vaccinated. Hopefully if someone were to look at this data they would have better informed opinions. Looking at my hometowns population data

and vaccination demographics showed me the largest city could serve as a good representation of the whole state when analyzing data.

Appendix D - Diversity Statement

Some of the most enlightening outcomes are generated by diverse teams working together to solve complex problems. What does diversity mean and why is it important? Merriam-Webster defines diversity as:

1) the quality or state of having many different forms, types, ideas, etc.,
2) the state of having people who are different races or who have different cultures in a group or organization.

When solving complex problems having adequate representation is important. In the context of the hackathon, diversity could mean (but is not limited to): varied perspectives, varied points of view, different academic majors represented, different academic levels (Freshmen, Sophomore, Junior, Seniors) on the team, different ethnicities (state this professionally). Having a diverse team from different backgrounds can boot engagement and productivity and make us smarter (read short article: "How diversity actually makes us smarter").

Team Boiler Hackattack Diversity Statement:

Team Boiler Hackattack is composed of students from multiple levels of academic status and has students from different backgrounds and places. Consisting of two freshmen Ben and Tejasvi, Jason a junior, and Bethany a senior, our group brings different views and experiences in interpreting data. Having three Web Programming and Design Majors (Bethany, Jason, Tejasvi) and one User Experience Design major (Ben) creates an interesting dynamic. While not overtly diverse, having an 'odd one out' so to speak brings an entirely new view to how we display data, trying to make our visualizations as user friendly as possible. Additionally, our group is from different places in Indiana, Evansville, Upland, Indianapolis, and Fishers. Although we are all from Indiana, we come from vastly different populated areas and ways of life. We all see data everyday throughout the ways we live, and our hometowns reflect that. Everything about how a person is made up and looks influences their lives, while unfortunate, it is the truth. Having White, Black, and Indian group members again brings a perspective that is unique to everyone and allowed for us to make sure our data is suitable to everyone. Our diversity enabled us to collaborate effectively in a way that we could each make different recommendations and shape our project into the best version possible.

Appendix E – Team Consensus

Team Consensus

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

Team Member (full name)	Signature	Date
Ben Habegger	Ben Habegger	12/8/2021
Jason Estes	Jason Estes	12/9/2021
Tejasvi Bhagwatkar	Tejasvi Bhagwatkar	12/9/2021
Bethany MaGee	Bethany MaGee	12/9/2021