Have You Herd Project Documentation

By Matt Harrell

Project Summary

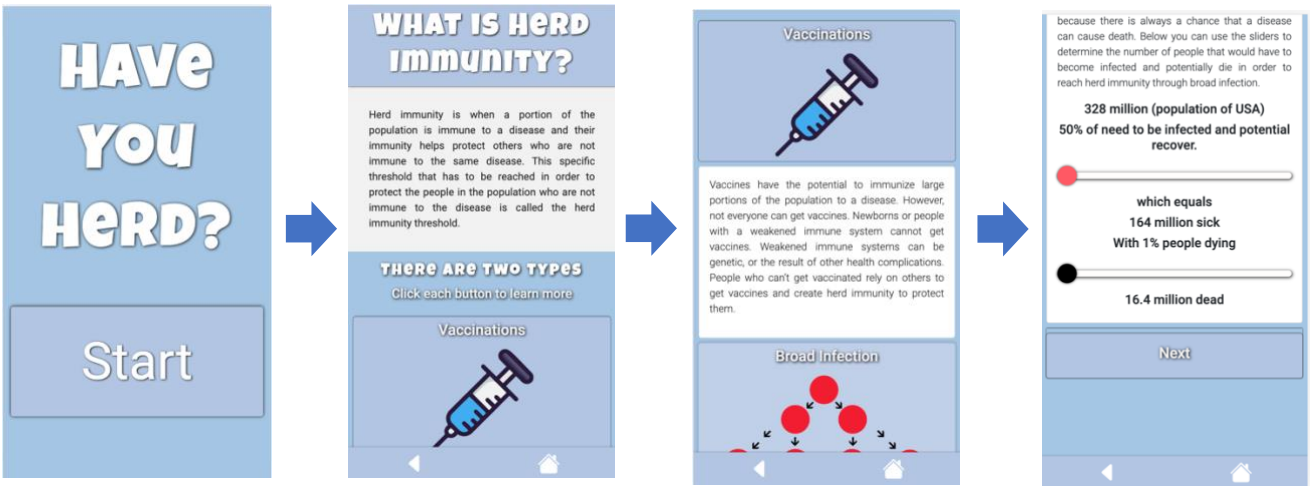
I created a progressive web app or PWA (which is an app created using, CSS and JavaScript than can run in a browser or any device) that addresses the problem of the reduction of parents vaccinating their children. The desired outcome for this app is to persuade vaccine hesitant parents that vaccines are not just for their children but are needed to protect other children who can't get vaccinated. Within the app, I used different storytelling techniques and interactive experiences to build to build an empathic argument that vaccines are needed for herd immunity.

Objectives of the App

- Objective 1
  - Users will have a firm grasp of herd immunity and the benefits of it.
- Objective 2
  - Users will want their children to be vaccinated and understand the ramifications of not having a majority of the population vaccinated for herd immunity to be successful.

Summary of how objectives were accomplished

Objective 1: After the user hits start, the user is met with a brief explanation of herd immunity and they cannot progress to the next parts of the app till both buttons are clicked. Once both buttons are clicked, a next button appears. Below is short outline of that user journey.

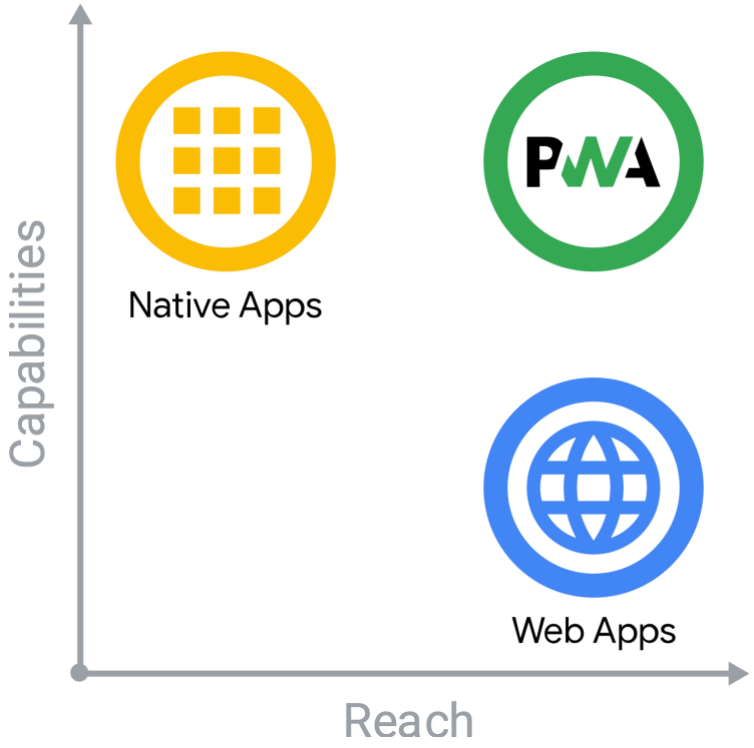


This leads to the rest of the app that has experiences each explaining the impacts of herd immunity in an interactive story telling manner.

Objective 2: I believe the experiences the app provides creates strong emphatical arguments for vaccination. According to the research that will be discussed later in this documentation, taking an emphatical approach and emotional approach for each experience creates a stronger argument for vacations than trying to persuade with logical reasoning. However, it should be noted the result from this objective can only be conclusive if user testing on vaccine hesitant parents is completed. This would then definitively show if the app is effective.

Final Deliverable

“Have you Herd?” is a progressive web app which is an app created using HTML, CSS and JavaScript that is compatible any device. PWA’s offer the most capabilities of native apps while offering the most reach of a web app.



Source: https://web.dev/what-are-pwas/

Currently, the app lives on herd.matthharrell.com which is a subdomain of my portfolio.

Research

I used four primary types of research materials: academic journals, news articles, experts, and social media. Below are the main findings per each source of materials:

Academic Journals

- The main insight that I found in this portion of my research is that fear is the main reason why parents are vaccine hesitant. This is because they are concerned about the side effects of vaccines, especially regarding a link to autism, and their harm toward their child's health (Enkel et al., 2018). However, even though some parents know that autism being linked to vaccines was found false, fear of other side effects has still caused them to be hesitant toward giving their children vaccines (Enkel et al., 2018).

New articles

- Many of the pieces I created were inspired by how other have presented data in digestible form, but I took it a step further and made them less text based. The herd immunity simulation was inspired by "What Happens Next?" by Marcel Salathé (epidemiologist) and Nicky Case (artist and coder). The "Vulnerable" animation was inspired by a Washington Post article by Harry Stevens.

Experts

- I met with several strategic communications professors and an immunologist to talk out best way to communicate with parents using empathy and how to create a herd immunity simulation. They advised to focus on emotional point of herd immunity and herd immunity is not just for the parents' own child but for others as well. Also, they recommended that the herd immunity simulation did not have to be a complex mathematical model but rather an animation showing how the number of vaccinated people protects the unvaccinated.
- The experts also provided several websites and articles. Here is the list:
- Code to use:
    - http://personal.stevens.edu/~iporada/project3/
    - https://apl.wisc.edu/covid
    - https://apl.wisc.edu/beta-testing/zombie-unicorn-outbreak
    - https://github.com/statnet/EpiModel
    - https://github.com/ncase/covid-19
- Vaccine Hesitant Parents' Perspectives
    - https://www.vaccineconfidence.org/
    - https://instituteforpr.org/vaccine-communication-resource-center/
    - https://www.nytimes.com/2021/01/31/opinion/change-someones-mind.html
- Other resources provided
    - https://www.youtube.com/watch?v=GpEQ4OWNO4Y&ab_channel=Forbrukerr%C3%A5detNorge
    - https://creativegood.com/blog/21/losing-faith-in-ux.html
    - https://www.prosocialdesign.org/

Social Media

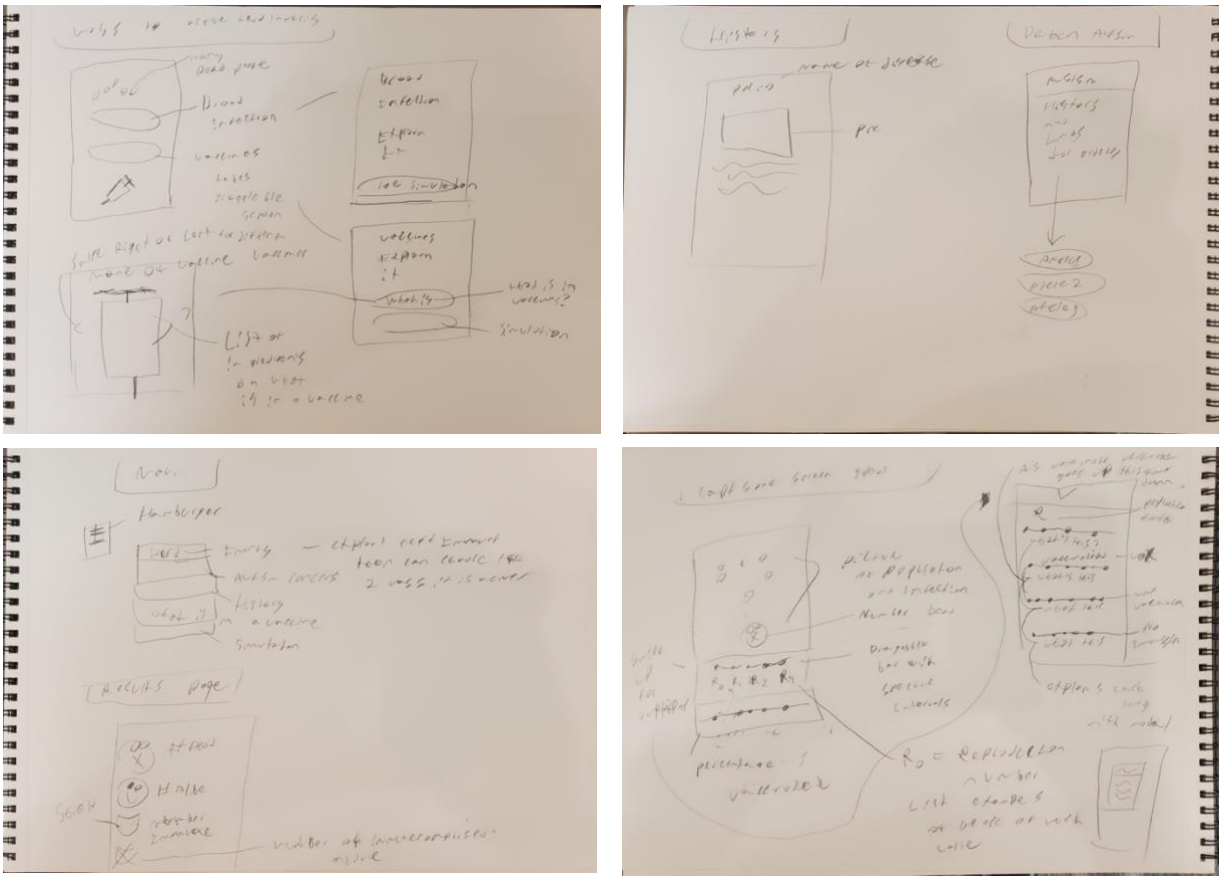
- I went of Twitter, Facebook, Instagram to find groups of vaccine hesitant parents in order to get further insights on this audience. I found these two groups on Instagram which helped me create my personas.
    - https://www.instagram.com/vaccine_injury_awareness_us/
    - https://www.instagram.com/vaccine_choice_canada/

  I found that vaccine hesitant parents fell into two main categories for their reasoning behind vaccine hesitancy. This first group was concerned mainly with the side effects of vaccines and how it could hurt their children. The second group was concerned about how governments were forcing them to vaccinate their children in order to get into schools and felt they should have a choice to which vaccines are required. It should be noted the beliefs of these two groups overlap at times and they both share that same fear of the potential vaccine side effects.

Design and development process

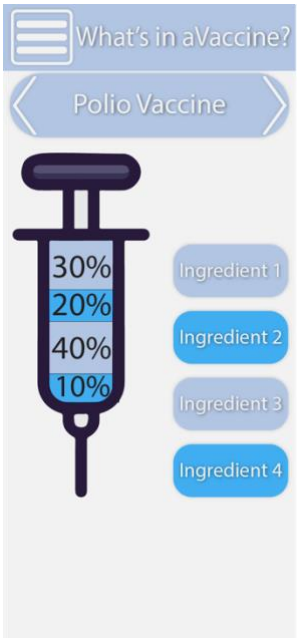
Sketches

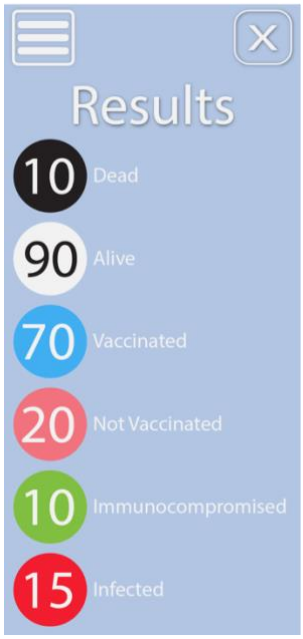
In the first stage of development, I created drawings to visualize how I wanted app to look and function.

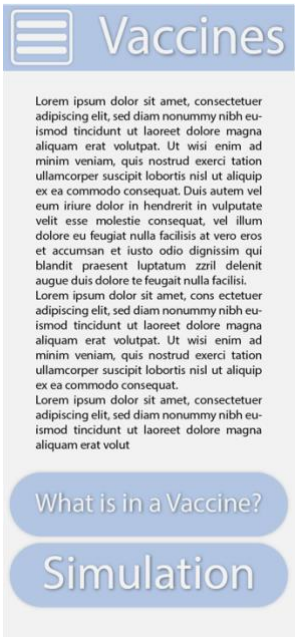


Rough Illustrator mockups

After, I made Illustrator mock-ups based on those drawings. This is where I considered color and took a more in-depth look at the layout of each screen.

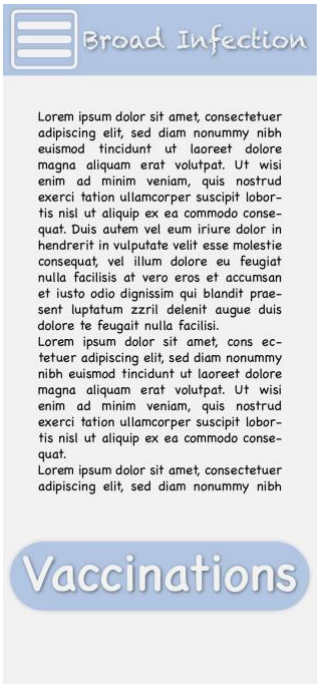


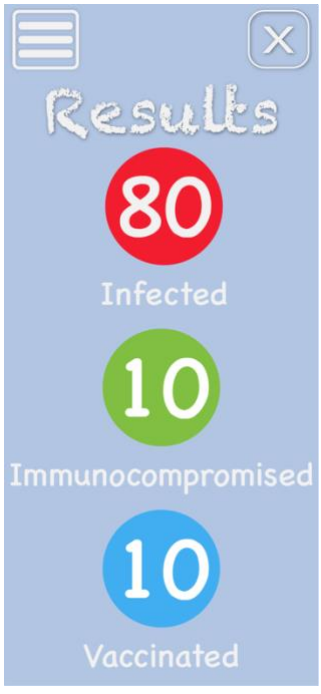


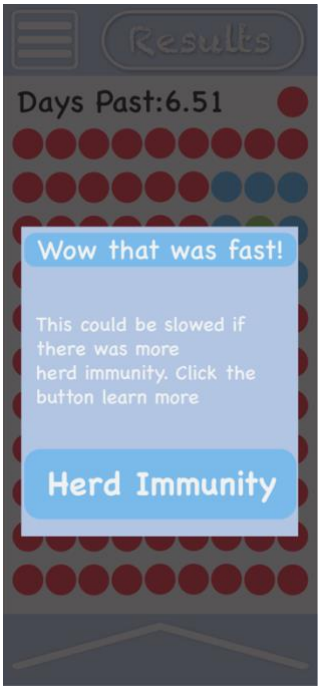


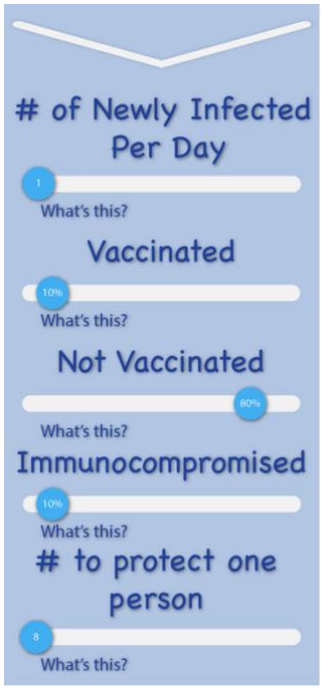
Final Illustrator mockups

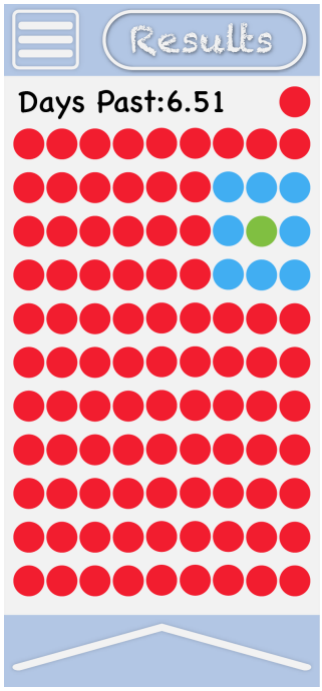
After some feedback from my colleagues, I made some more Illustrator mockups implementing their critiques. I also included some more screens that to be considered in the final version of the app.



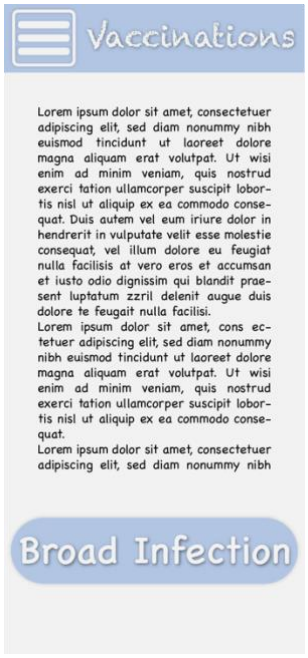


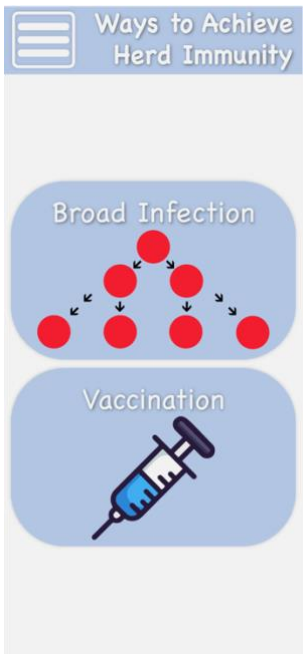






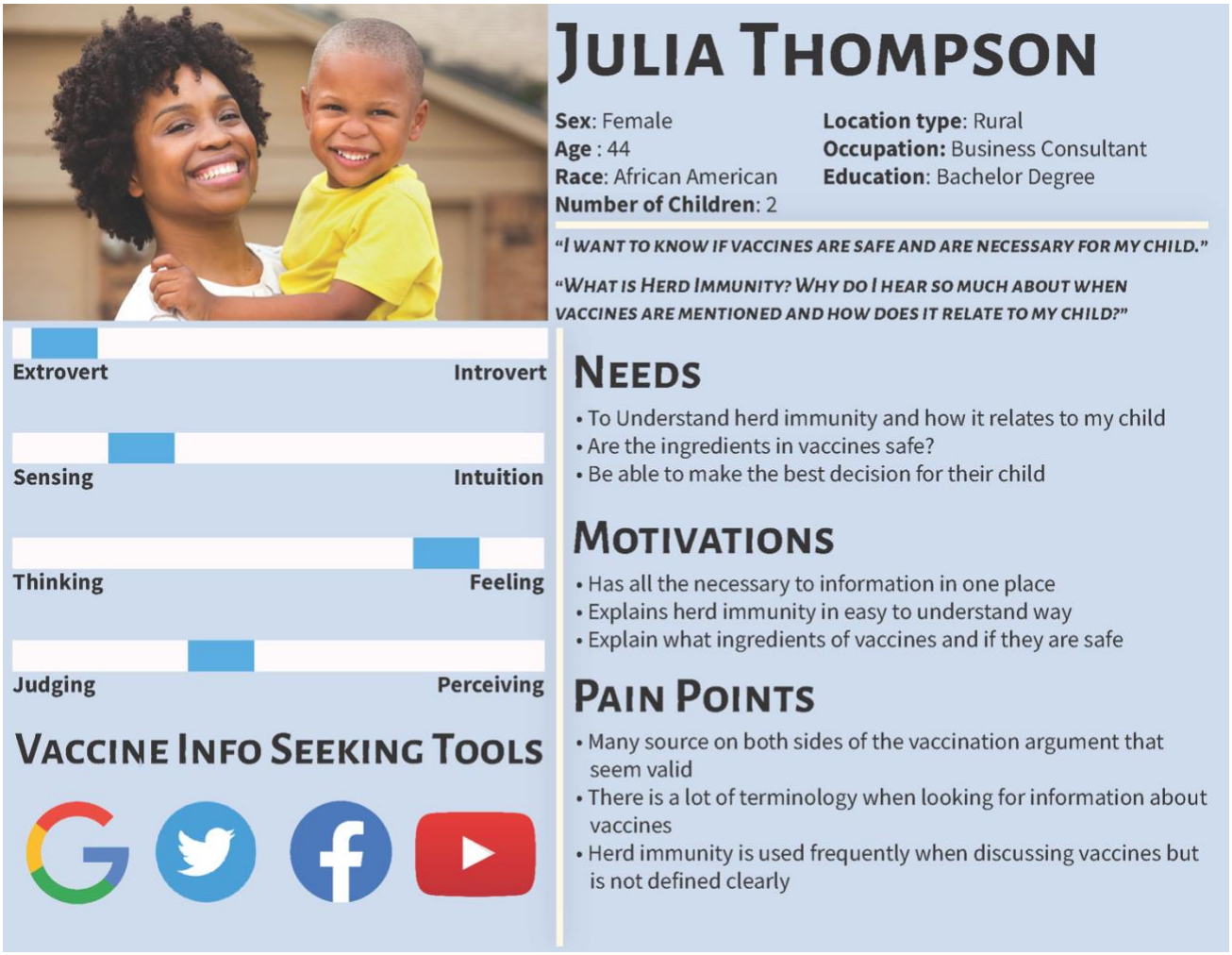
Final Illustrator mockups (continued)





Personas

Before I moved on the next stages of development, I took a step back and made personas of a couple vaccine hesitant parents. I wanted to be sure to focus on the user when continuing through the developmental process.



Personas (cont)

Micheal Henderson

Sex: Male
Age : 43
Race: Asian American
Number of Children: 3

Location type: City
Occupation: Tattoo Artist
Education: Bachelor Degree

"It is my right to choose whether to vaccinate or vaccinate. I shouldn't be forced to vaccinate my child"

"There are only some vaccines that I don't trust. I think some are beneficial to my children"

Extrovert — **Introvert**

Sensing — **Intuition**

Thinking — **Feeling**

Judging — **Perceiving**

Vaccine Info Seeking Tools

Needs

- Which vaccines are safe for my children?
- How are vaccines and Herd Immunity connected?
- Will having an alternative vaccine schedule affect my child's health?

Motivations

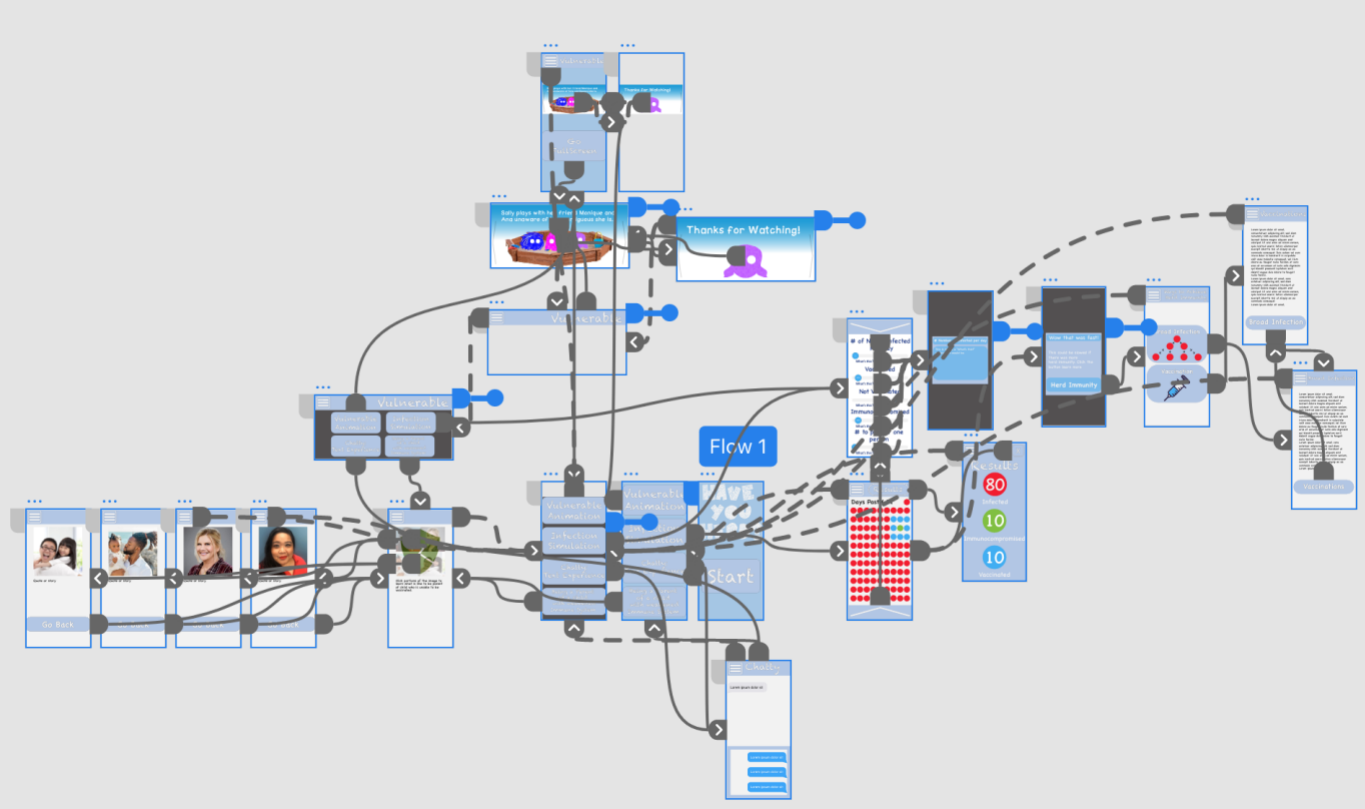
- List ingredients for vaccines and explains why they are safe
- Explains herd immunity and its connection to vaccines
- Information is organized and centralized

Pain Points

- There is long list of vaccines both recommended and required
- Their child forced to vaccinated even though he doesn't under stand what is in the vaccine

Adobe XD mockups

After my persona considerations and additional feedback from my colleagues, I took my illustrations and created high-fidelity mockup in Adobe XD.



User testing

Once I finalized my design in Adobe XD, I did some user testing with the mockup. I tested two versions of the app on two separate groups, both listed here:

- Version 1: https://xd.adobe.com/view/53449bb6-82bb-491a-be4c-b953d71771ba-0617/?fullscreen&hints=off
- Version 2: https://xd.adobe.com/view/b3c0fb1b-4223-4348-928c-6e823719921d-e693/?fullscreen&hints=off

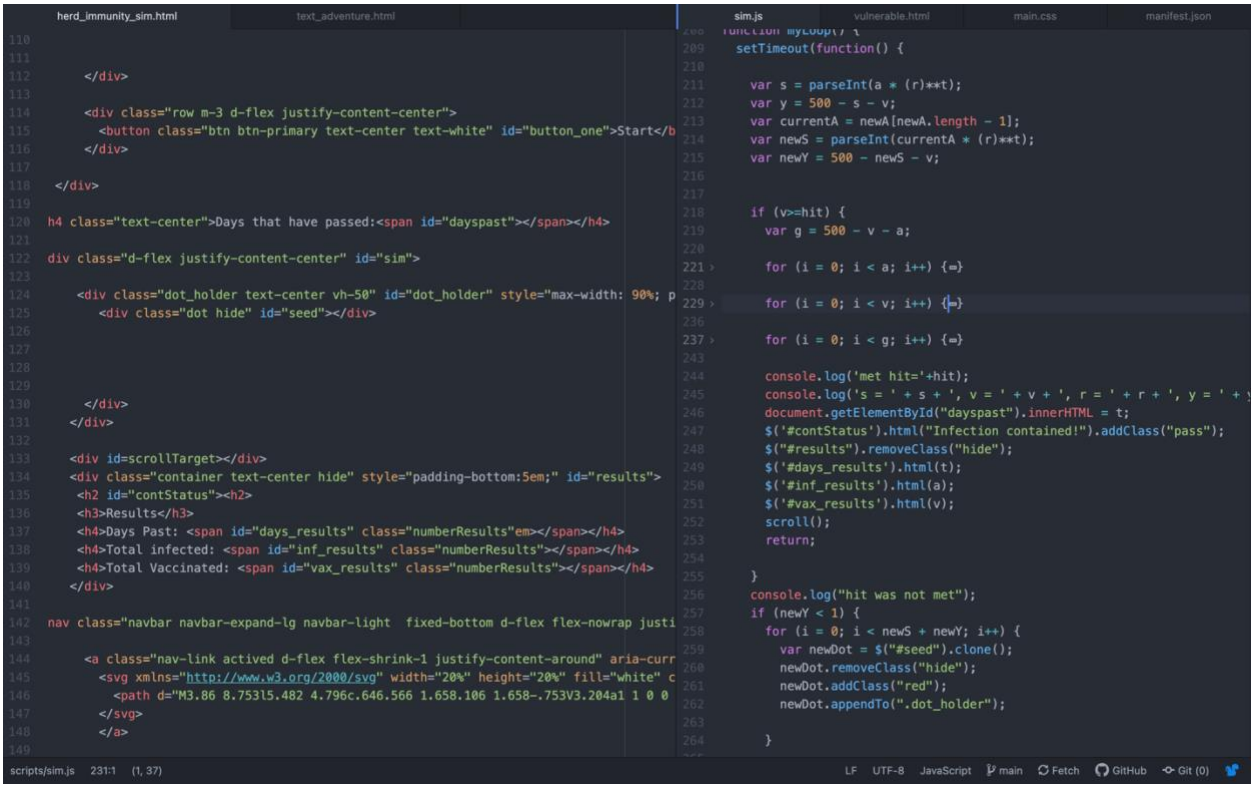
Version 1 had ambiguous experience titles. This was in hopes to entice the user curiosity and thus click on the experience. Version 2 experiences were all titled so the user would have an understanding about what each experience was. After the testing was complete, I created a user testing report.

Coding the PWA

I took all the data gathered and began coding. Throughout the is process, I made many changes based on feedback I received from my colleagues. The GitHub repository will demonstrate how these changes were made and the evolution of my code.

https://github.com/mharrell8/Have-you-Herd-

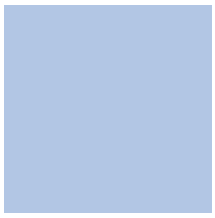
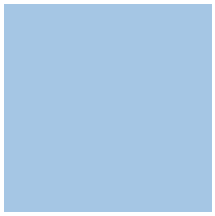
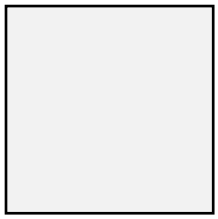
Here is screen shot of some my code from the herd immunity simulation experience.



Design Style Guide

Overview

The main feeling I wanted to convey was trustworthy, medical and playful. I chose blue because many associate it with trust and it resembles the blue seen in medical wear such as surgical gloves. The font Luckiest Guy was chosen to give the app a playful feel to lighten the mood for the serios topics that are discussed within the app. Roboto was chosen as body font because it is clean font that is most commonly paired with display fonts like Luckiest Guy.

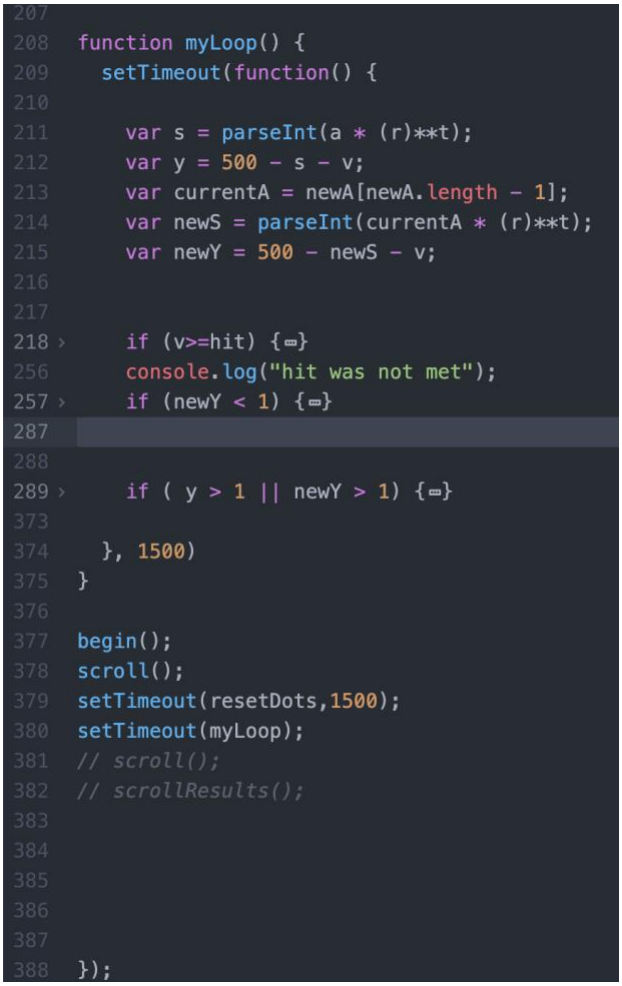
- Main Colors
  - #B2C6E4
    - 
    - For buttons and must have a drop shadow
  - #A5C6E4
    - 
    - For background of buttons, does not have drop shadow
  - #F2F2F2
    - 
    - To be used as the main background if there are large amounts of copy then text needs to be black #000000
- Font
  - All title fonts should be written in Luckiest Guy
  - Subtitles need to be Roboto font weight 600
  - All body font needs to be Roboto font weight 400
- Interactible Components
  - All intractable components need to have light drop shadow to signify that they are interactable

Technology Usage

- Design
  - Adobe Illustrator
    - A program used to make infinitely scalable graphics and designs.
  - Adobe Photoshop
    - A photo editor that can be user to resize content and edit color values.
- User Testing and high-fidelity mock-up
  - Adobe XD
    - A user experience design tool that can be used to create high-fidelity apps with simulated functionality.
- Writing Code
  - Atom
    - An open-source code editor.
  - Code used
    - HMTL
      - HyperText Markup Language is code that is used to create the structure of webpages
    - CSS
      - Cascading Style Sheets is code that is used to style HTML
      - SASS
        - This is preprocessor scripting language that is to interpret or compile CSS. It is comely used to style. Bootstrap elements.
    - JavaScript
      - jQuery
        - A JavaScript library that makes it easier and faster to write common JavaScript elements.
      - GreenSock
        - A JavaScript animation library that allows you to create animations more quickly than CSS animations.
      - Email.js
        - A JavaScript framework that allows emails to be sent using JavaScript and without server-side coding.
    - Bootstrap
      - A CSS framework made JavaScript that contains pieces of commonly used code that would take longer to implement directly without a framework. Also, Bootstrap makes it is easy to create mobile friendly webpages.

- Challenging Code Highlights
    - These are two pieces of code that were a challenge to create. These lines of code are the heart of the simulation. They allow it to loop till the herd immunity threshold is met or the infection has overrun the population. The specific lines that contain this main concept are lines 168-388. You can look at the whole code on [GitHub.]

```
166  var t = 0;
167  var newA = [];
168  function begin() {
169    console.log("time is zero");
170
171
172      var g = 500 - v - a;
173
174 ›    for (i = 0; i < a; i++) {…}
181
182 ›    for (i = 0; i < v; i++) {…}
189
190 ›    for (i = 0; i < g; i++) {…}
197
198
199
200
201      document.getElementById("dayspast").innerHTML = t;
202      t++;
203
204    }
```



```
207
208  function myLoop() {
209    setTimeout(function() {
210
211      var s = parseInt(a * (r)**t);
212      var y = 500 - s - v;
213      var currentA = newA[newA.length - 1];
214      var newS = parseInt(currentA * (r)**t);
215      var newY = 500 - newS - v;
216
217
218 ›    if (v>=hit) {…}
256      console.log("hit was not met");
257 ›    if (newY < 1) {…}
287
288
289 ›    if ( y > 1 || newY > 1) {…}
373
374    }, 1500)
375  }
376
377  begin();
378  scroll();
379  setTimeout(resetDots,1500);
380  setTimeout(myLoop);
381  // scroll();
382  // scrollResults();
383
384
385
386
387
388  });
```

- Version control and backup storage
    - GitHub
        - A website that allows online version control and storage for code.
- Testing
    - Google Developer Tools
        - These are tools built into the chrome browser that allow for viewing code, console errors, and emulating different screen sizes.
    - Firebase
        - A Google platform that can host mobile apps and can be used for rapid live testing.
    - Google Lighthouse
        - A program that conducts automated audits for performance, search engine optimization, accessibility, PWA optimization, and best boding Practices.

Primary Content Assets

Code usage

The code within this app can be reused by others in any other type of project with the limitation that credit must by attributed to Matt Harrell and the GitHub link (https://github.com/mharrell8/Have-you-Herd-) to the original project must be listed. The attribution can be listed within the code of the new project.

Logo Usage

The logo can only be used for the “Have You Herd?” app. It may be used to advertise the app with permission required.

Content style to be used with Have You Herd?

All content is meant to come from a place of understanding. Parents who are vaccine hesitant just want the best for their child and this idea should be at the forefront of thought when creating content for this app. Moreover, the content within the app is serious but should also have some playful aspect. The content of this app is a balance between meaningful lessons and fun.

Project Usage and Instructions

This app can be accessed via herd.matthharrell.com or through this QR Code.

List of Features with descriptions

- Watch “Vulnerable Animation”
  - An animation that tells a story of an immune weaken child becoming ill with the flu.
- Testimonials
  - Short anecdotes from people who have a weakened immune system or have children with a weakened immune system.
  - Note this is experience is not fully complete due to not being able to get enough participants. I will continue to reach out to groups to see if I am able to find more people willing to share their story.
- Herd Immunity Simulation
  - An interactive simulation that lets users interact with a variety of variables to see how herd immunity works.
- Text Adventure
  - A written story where the user is the parent of a child with a weaken immune system and they have to make various decisions within the narrative that leads to different endings.
- Vaccine Resources
  - A couple of websites from the CDC that helps parents find out where to get their child vaccinated and what vaccines they should get for their child’s age. This is for if the parent is persuaded after using the app that they want to vaccinate their child.
- Contact Page
  - A form where the user can fill out and contact me about issues with the app.

Sources

Enkel, S. L., Attwell, K., Snelling, T. L., & Christian, H. E. (2018). ‘Hesitant Compliers’: Qualitative Analysis of Concerned Fully-Vaccinating Parents. *Vaccine*

Additional Materials

Interactive Media Capstone Project Proposal

Project Description

The specific problem that was addressed is the reduction of parents vaccinating their children and the rise of the anti-vaccination movement. The desired outcome for this project was to persuade vaccine hesitant parents that vaccines are safe and needed to create the necessary herd immunity needed to protect immunocompromised persons. This message was delivered in an interactive and story-telling manner. This interactive story was told through a progressive web app. It explained the complexities and benefits of herd immunity in a user experience centric way. Some of the screens included are History of Vaccines, Broad Infection and Vaccination, Autism and Vaccines, Herd Immunity Simulation, Herd Immunity Simulation Settings, Herd Immunity Simulation Results, Vaccine Explanation, and Components of a Vaccine. Using a deconstructed approach, these screens breakdown the key aspects of herd immunity that assisted the parents in understanding this broad concept.

Project Goals and Objectives

1. Users will have a firm grasp of herd immunity and the benefits of it.
    1. I will research and define herd immunity in my progressive web application with the information amount not exceedingly more than 500 words so that it is easily digestible for the audience.
2. User will feel vaccines are safe and understand the components of vaccines.
    1. I will research the components of the polio, flu, and MMR vaccines and define them in my progressive web application.

2. I will define each ingredient within the polio, flu and MMR vaccine so that parents know that each ingredient is safe, and FDA approved.

3. Users will want their children to be vaccinated and understand the ramifications of not having a majority of the population vaccinated for herd immunity to be successful.
    1. I will create a user experience that conveys all of the information about herd immunity and its importance in an intuitive and digestible manner.

Project Relevance

Vaccines are vital in creating herd immunity and protecting the immunocompromised persons. However, there has been a rise of parents who are choosing not to vaccinate their child. In result of this rise of anti-vaccination, preventable diseases like measles, thought to have been eradicated in the United States, is making a return (Benecke & DeYoung, 2019). If more and more parents continue to lose faith in vaccines then herd immunity of other diseases could be damaged (Bolton et al., 2015). Losing herd immunity would be a major loss that has taken years to build through the progression of vaccines and will endanger thousands who are unable to be vaccinated.

Summary of Relevant Research

Some parents do not feel that vaccines are completely safe for their children. This is because they are concerned about the side effects of vaccines, especially regarding a link to autism, and their harm toward their child's health (Enkel et al., 2018). However, even though some parents know that autism being linked to vaccines was found false, fear of other side effects has still caused them to be hesitant toward giving their children vaccines (Enkel et al., 2018). Additionally, parents feel that they cannot trust their doctors for vaccine related information because they assume doctors would only promote vaccines and not give an

objectionable view (Enkel et al., 2018). These factors have led parents to seek alternative sources for their vaccine queries, such as the internet (Abbey et al., 2012).

Of course, many of the parents turned to Google for help in their quest for information but unfortunately Google had some bias in its algorithm (Ruiz and Bell, 2014). Ruiz and Bel (2014) found that if negative vaccine related terms are used in a search, then 3.6 times more vaccination myths will be yielded when compared to neutral vaccine related terms (Ruiz & Bell, 2014). Furthermore, 4.8 times more myths are yielded when negative vaccines terms are inputted when compared to positive vaccine terms are inputted (Ruiz & Bell, 2014). Google was not the only culprit for an overwhelming amount of biased anti-vaccination terms. Wolfe and Sharp (2005) analyzed AOL Search, Yahoo, MSN Search as well as Google and discovered they had these same issues. When the term vaccination was used independently, it yielded 60% anti-vaccination sites and 40% pro-vaccination sites (Wolfe & Sharp, 2005). On the other hand, the term immunization yielded 98% pro-vaccination websites and 2% anti-vaccination websites (Wolfe & Sharp, 2005). It is shown that from both of these studies, that the majority of the terms used for searching for vaccination information gives results pertaining to the anti-vaccination side of the debate. This means parents are more likely to find more information pertaining to anti-vaccination than vaccination.

If parents are still not satisfied with the information they find via search, then they will go to social media to find answers. This is problematic in terms of showing parents that vaccines are safe for, the more time parents spend on social media the more likely they think vaccines are dangerous for their children (Hwang & Shah, 2019). This could be due to social media's ease of access, meaning that anyone can make an account and post any information which makes much of the knowledge inaccurate (Bolton, Kendall & McMillan, 2015). These unregulated channels

have caused misinformation about vaccines to spread like wild fire. If this trend of anti-vaccination continues then humanity is looking at some serious problems and loss of herd immunity for many preventable diseases (Bolton, Kendall & McMillan, 2015). Moreover, this is already happening with measles, thought to have been eradicated in the United States, is on the rise (Benecke & DeYoung, 2019).

Target Audience

These audiences all share a common tie of concern about children and how vaccines affect them. Additionally, these audiences have some form of relationship with the child who may or may not be vaccinated. Moreover, they want to make the best decision for the child and genuinely care about the child's wellbeing. These audiences also are not completely anti-vaccination but are still open to hear the positives of vaccines and the benefits of herd immunity. Lastly, each audience is in search for information about vaccines and the importance of herd immunity.

The primary audience will be vaccine hesitant parents. These target parents would be ones in search for legitimate information about vaccinations and why they are important. These parents would more than likely be in the ages of 27-35 and have young children who would be eligible for vaccinations.

The secondary audience would be parents of vaccine hesitant parents. These grandparents would be concerned for their grandchild about not being vaccinated and are seeking information to convince their children to vaccinate the grandchild. Additionally, the grandparents could also be on the fence about vaccinations much like their child. This group's age range could be within 50-60 years of age.

The tertiary audience would be friends of the primary audience. This audience would be concerned for the child's wellbeing and could already be pro-vaccination. More than likely, this audience's age would be like the age of the primary audience which is between 27- 35. This audience also may or may not have children but are still equally concerned about the safety of children in general.

User Stories

1. *As a Parent, I would like to know if vaccines are safe so that I may have confidence in allowing my child to be vaccinated.*
2. *As a Parent, I would like to know the benefits of vaccination so that I may understand why my child should be vaccinated.*
3. *As a Parent, I would like to make the best decision for my child health and safety, so that I may have confidence that my child will be protected.*
4. *As a Parent, I would like to have access to the most accurate information about vaccines so that I may make the best decision to vaccinate or not vaccinate my child.*
5. *As a grandparent who is pro-vaccination, I would like to have the ability to explain to my child why they should vaccinate their child, so that I may feel that my grandchild is being protected from deadly diseases.*

Competitor Analysis

https://ncase.me/covid-19/

This is an extensive COVID-19 herd immunity guide made by Marcel Salathé & Nicky Case. This guide explains the reproduction rate of COVID-19 and how herd immunity can be created with COVID-19 with detailing several different scenarios. Each scenario is accompanied by a simulation with adjustable variables and explanation of each variable. Moreover, each

simulation builds on each other and points out the flaws that each particular simulation has that is addressed in the next simulation and scenario. At the end of the guide, it includes a call to action for the audience and a simulation with all the variables unlocked for the user to have free reign over the simulation.

The amount of text included in this guide both works well for it and hinders it. The amount of text can be overwhelming and is unbalanced to the number of visuals in the guide. The text on the other hand, provides rich information about each simulation and gives the guide itself a much better flow from one simulation to the next. One problem with each simulation is there is a lack of numbers within each result. The result of the simulation does not render any solid numbers and it is hard to visualize how much the Intensive Care Unit is overflowing with patients. Something that I wish to do different in my capstone's simulation is include actual numbers at the end of my simulation. However, my simulation will only include one hundred people and will not be longitudinal like the simulation presented here.

https://cucovid19.shinyapps.io/colorado/

This a COVID-19 cases projection model for Colorado created by Github users agb85, max-mcgrath, imkas1, and katiecolborn (Katie Colborn). This model yields cases, deaths, and hospital needs within Colorado for COVID-19 based on inputs about the population of Colorado. These inputs include varying levels of social distancing, mask wearing behaviors, case detection, case isolation and contact tracing efficiency. The model displays the results in a histogram fashion with each bar having the ability to yield specific results within the year displayed. This model also gives a brief explanation about the input variables and the importance of them.

This model does well in terms of giving actual number values for specific time frames but has limitations. The largest limitation that is apparent is all the data is based and projected for

Colorado. My progressive web app will use data from national historical averages of COVID-19 and other diseases to give a more general picture of the number of individuals infected. In doing this, it will not limit the audience to just one state and can be used nationally as a persuasion tool for pro-vaccinations. Also, this model is text heavy. There are very little accompanying visuals to help balance with the amount of text and visuals on the page. Moreover, this model does not provide any sort of call to action leaving the user having to interpret the "so what" outcome of the data visual.

https://graphics.reuters.com/HEALTH-CORONAVIRUS/HERD%20IMMUNITY%20(EXPLAINER)/gjnvwayydvw/

This simulation of herd immunity by Simon Scarr, Manas Sharma and Jane Wardell explains the two different ways of achieving herd immunity and how to slow the spread of COVID-19. It uses detail descriptions of the varying visuals plus a simple 3 variable input simulation at the end of the article to fully visualize herd immunity and how vaccines play a role in achieving it. Some of the visual it uses are how infection would spread with people wearing mask, social distancing, and a combination of the two. Under the last simulation, it breaks down the methodology of the creation of the simulation and how it functions.

The simulation at the end of the article is quite powerful in visualizing how rapid a disease can spread but falls short in terms of precision. Since each frame represents a portion of time in this model and it is nearly impossible for the user to know how many frames elapsed during the start of the simulation to the end, then it makes the user unable to determine time represented. Additionally, the simulation does not list the number of people represented, thus there is no frame of reference of how many people are infected. Next, the call to action is weak and is not heavily emphasized in the article. In my simulation, I plan on having one hundred

people presented that way it can easily be converted to a percentage and easier to translate into a real-world setting.

Needs Assessment

My project is something that is needed during this time of a global pandemic. Many parents have lost faith in medical practitioners and are seeking alternative sources for healthcare advice for their children. This has led many parents to believe that vaccines are not safe. I want to convince at least some of these parents that vaccines are safe, needed and are important for herd immunity. I plan to do this feasibly by creating a progressive web app that explains herd immunity and shows the importance of it in an interactive manner. This approach is viable because many progressive web applications have been made and I plan on pulling from multiple sources for design considerations and information presented.

In order to be successfully complete this project, I will need to delve deeper into coding and user centered design. I will be learning the HTML, CSS, and JavaScript necessary to create a progressive web app in my App Development course. I will be reviewing my notes from my Interactive Media Strategies course about user centered design to craft a meaningful user experience. However, one aspect of the project that may be beyond my skill set would be create a simulation that the is able to react to user inputs such as reproduction rate of a disease, number of people vaccinated, number of people infected, etc. I believe I can solve this problem by limiting the number of values that can be inputted into the simulation that there is a small number of screens needed for the desired outcomes.

I will need to conduct a mix of research that involves coding, vaccine history, disease reproduction rates, and user centered design theories. The coding that will be involved will be a mixture of HTML, CSS, JavaScript and possibly some other coding languages. The use of

JavaScript for the interactivity portion of the progressive web app plus the other potential languages will be where the bulk of the coding research will take place. Another avenue of research I will need to explore is disease reproduction rates. There have been several diseases that have caused harm to humanity such as polio, measles and the flu which have known reproduction rates. It will be vital to know the reproduction rate for each of those diseases for my simulation of herd immunity to function. Lastly, I will need to further rely on research from user centered design experts such as the Nielson Norman Group to craft the best user experience for my progressive web app in the time allotted.

Backlog

https://trello.com/invite/b/3LrVCfAn/366a4788da4fdcdc3b1664703888cfa4/capstone

Project Schedule

Persona of Parents	February 3rd, 2021
Wireframe High-Fidelity in Adobe XD	February 17th, 2021
User Testing Reports of Adobe XD	March 3rd, 2021
Rough Iteration of Progressive Web App	March 15th, 2021
User Testing Session of Rough Iteration	March 24th, 2021
Final Iteration of Progressive Web App	March 31st, 2021
Code Documentation and Design Decisions	April 14th, 2021

Project Budget

Item	**Purpose/Description**	**Cost**	**Actual Cost**
Adobe CC	Design/ Drafting	$52.99/month	Included in Tuition

LinkedIn Learning	Developing Coding Skills	$29.99/month	Included in Tuition
Microsoft 365	Planning/ Developing	$69.99/annually	Included in Tuition
MacBook	Running Needed Software	$999	Already Purchased with Personal Funds

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“Have you Herd?” Adobe XD Mockup User Test Report

Introduction

This user testing session is meant to gather data about the overall design of “Have you Herd” and emotions it initially creates. This test also seeks to indicate any potential pain points or moments of confusion that the design of the app creates. The app is being simulated in a high-fidelity state using Adobe XD. The current mock of the app has two experiences that are developed and almost complete. They are the animation and simulation of infection. The other two experiences that are in developmental and conceptual states are parent testimonials from parents who have a child who cannot be vaccinated and Chatty which is a text adventure simulating talking to a parent with a child who cannot be vaccinated.

Method

The testing session included 6 users in their twenties who were split into two groups. Users 1-3 were assigned to Version 1 of the app whose titles for each experience in the app were intentionally vague and more playful. Users 4-6 were assigned to Version 2 of the app whose titles were more descriptive but less playful. At the start of each test all users were told that the test was mainly focused on design and usability but were asked to think of this scenario while engaging with the app.

- You are a parent of 3 children. They are all about to enter school and are required by the school to receive certain vaccinations. You are unsure about the safety of some of the vaccines listed and why your children have to get them. You find this app and start to explore it.

After any questions from the user tester was answered then user testers were prompted to explore the app. Chatty and Parent Testimonials was explained by the moderator to the user tester since both features were in lower fidelity states than other portions of the app. User testers were asked to voice any design for usability suggestions and points of confusion during the exploration period. After the user felt they explored the app to its entirety the moderator would guide them to any other portion of the app that was missed. Once the app was fully explored the moderator asked the following questions:

- **Design questions**
    - How would you rate the navigation from a scale of 1-10?
        - 1 being very easy to 10 being extremely difficult. Why?
    - Does the font make the content feel less trustworthy?
    - On a scale of 1- 10 how would you rate the ability to read the text? Why?
    - Was there anything you felt detracted from the experience?
    - Did you feel anything was missing? Any questions gone unanswered?

Parent Perspective

- Names questions
    - Version 1: As a vaccine hesitant parent in the scenario provided, how did you feel about the names of the animation? Were they too vague?

    - Version 2: As a vaccine hesitant parent in the scenario provided, how did you feel about the names of the experiences? Were they too descriptive? Would you want a name that is more lighthearted?

- If you were a vaccine hesitant parent how would you feel after using this app? Examples informed, feel like you're being talked down to or anything else?
- What are your feelings about the story told in the animation?
- Did you feel more sympathetic toward children who were immunocompromised?

Test plan

Tentative Schedule

- 5 minutes for set up and introduction
- 15 minutes for testing
- 10 minutes for debrief

Location

- Remote

Number of Session

- 6 sessions
    - One for each user

When

- Will schedule testing based on user's schedule

Procedures

- Session length: ~30 minutes
    - Sign on zoom
    - Record session
    - Introduction and explanation of tasks and goals
    - Answer any questions
    - Observe and make notes
    - Ask debriefing questions
    - Farewell

Equipment

- User's laptop / desktop
- Moderator's laptop / desktop
- Web browser
- Zoom and record session
- Links to version 1 or version 2of adobe xd
    - Users 1-3
        - Version 1
            - https://xd.adobe.com/view/53449bb6-82bb-491a-be4c-b953d71771ba-0617/?fullscreen&hints=off
    - Users 4-6
        - Version 2

- https://xd.adobe.com/view/b3c0fb1b-4223-4348-928c-6e823719921d-e693/?fullscreen&hints=off

- Google Docs

Results

The results that are presented here are all paraphrased and consolidated answers provided by the user testers to questions asked by the moderator. In order to avoid redundancy, answers that were expressed by multiple user tests have been notated with the number of times repeated in parthese such as "Back button needed (x3)". This means three user testers expressed that they wanted a back button in the app. Moreover, some answers have the user tester identified because their answer was highly specific. This does not mean that other answers are not as valuable but are more general than the user noted answers.

Screen critiques

- Navigation
  - Back button needed (x4)
  - Have nav at the button since closer to thumb (x2)
  - Buttons were too close together (x2)
  - Chatty button was not centered in the animation nav
  - A hamburger menu is not used conventionally in a mobile setting
  - "Being a parent of a child with weakened immune system" title is too much for one button
- Home screen
  - *Version 1* seemed to confused participants (x2)
- Simulation
  - *Version 1* Body bumpers needs a further explanation (x3)
  - Confusion about what simulation is showing (x2)
  - Confusion about which simulation colors represent which type of person
  - Have settings scroll down so that there is more room for explanations of each setting (x2)
  - User 3 suggested that the result button be placed at the bottom of screen
  - The title of simulation should be present on the simulation page
  - There should be a key for the colors more accessible or apparent
  - Users did not know the arrow was an arrow (x3)
  - Users did not know that results button was a actual button
  - "What's this?" is not clear to users as a clickable link (x2)
  - Include real world time progression into simulation
  - On the results page sizing of the words is large and could be smaller. The numbers should be highlighted more.
  - User 1 thought the setting screen should have the word number instead of "#"
  - Setting should be first then simulation (x2)
  - The question mark on scene four and the explanation point on scene six could be same as narration font

    - User 5 felt that having both vaccinated and unvaccinated setting was redundant and could just be expressed as a number of people vaccinated then the rest of the population can be assumed as unvaccinated. Similarly, they felt that Immunocompromised could be percentage of not vaccinated individuals
    - User 5 was confused about why they could control the number to protect one immunocompromised person
    - User 5 felt that drop shadow on "what this?" and sub headers was unnecessary
    - User 5 suggested that results button could be navy blue from previous screens
- Herd immunity explanation
    - 5 of 6 users had trouble finding this screen
- Chatty Text experience
    - User 1 disliked the box interface
    - User 5 liked the box interface
    - If a user makes a bad choice have the bubbles stall as if someone is typing a long message
    - Add to drop shadow to speech bubble prompt (the white one) to increase visibility
- Vulnerable Animation
    - Have Sally turn green when she is sick maybe
    - Thought animation was children (x2)
    - Typos in multiple places
    - Need an indicator that there is a drop down nav in the full screen mode
    - Many of the word are too close to the edge of the screen
    - User 1 thought second to last scene goes by too fast
    - User 1 felt animation is too long and should be more of slideshow,
        - Have slide option where animations don't play, and a movie option were animations play
    - User 1 suggested that animation should lead to parent testimonials after animation completes
    - Animation should automatically go full screen
    - Potentially implement a landing page with a play button
    - User 5 suggested that eyes could be more detailed for main characters so that it would create a stronger emotional appeal
- Parent testimonials
    - User 6 liked broken shield symbol
    - The picture of shield on top of parents does not communicate separate buttons and could be spaced out more to show that it is actually four separate buttons
    - Format the screen so that the pictures are horizontal and as more accounts are submitted the user can scroll to another story like a blog
    - Include picture of parents with multiple children
    - Right and left margins could be smaller
    - Buttons could be smaller
- Miscellaneous
    - Confused about definition of immunocompromised (x2)
    - User 3 and 6 liked the color blue in the design because it made them feel that they could trust the information. It also made that app feel like it was "medical"
    - User 1 thought header were clickable

- User 5 felt color scheme from setting page should be implemented more on the entire app
- User 5 felt lots of text was oversized for a mobile screen

Design questions

- **How would you rate the navigation from a scale of 1-10?**
  - **1 being very easy to 10 being extremely difficult. Why?**
  - Average rating: 3.33
- **Does the font make content feel less trustworthy?**
  - Liked it but thought the font was not appropriate for parents (x3)
  - Could use a more sans serif font to appeal more to parents
  - Chalked font makes it more attractive and interesting
  - Makes user more lighthearted and as ease readable (User 6)
  - Chalk visibility is tough and if going with font all elements should be chalk like (User 2)
  - Less fonts should be used (x2)
  - User 4 felt comics sans like font took away from trustworthiness
  - Body font should be smaller
- **On a scale of 1- 10 how would you rate the ability to read the text? Why?**
  - Average rating: 2.33
  - Drop shadow on settings makes it difficult
    - Font has too much spacing
  - Buttons could use more contrast
- **Was there anything you felt detracted from the experience?**
  - *Refer to screen critiques*
- **Did you feel anything was missing? Any questions gone unanswered**
  - Page that explains pages and herd immunity
  - Another view should be further on the top for because it has a stronger emotional appeal
  - Safety for their own child isn't answered
  - Contact screen for app creator
  - Contact screen for app help and technical support
  - A place to give feedback on the app.
  - App needs to further emphasize that vaccines are more for people who can't get them
  - Include a screen to where you can get your child vaccinated
  - Include a screen the details allergies that prevent a child from being vaccinated
  - User 4 desired more information screens
  - User 4 felt herd immunity should be emphasized more
  - User 5 thought a explanation of the app could be beneficial after the start button is clicked so that it give the user a reason to why they should continue to explore it

Parent Perspective Questions

Names questions

- **Version 1: As a vaccine hesitant parent in the scenario provided, how did you feel about the names of the animation? Were they too vague?**
  - Chatty title is confusing (x3)

        - User 1 felt that the “Vulnerable” title was too vague,
        - User felt that “Another View” was not a effective title
    - **Version 2: As a vaccine hesitant parent in the scenario provided, how did you feel about the names of the animation? Were they too descriptive? Would you want a name that is more lighthearted?**
        - User 6 liked Chatty title
        - User 6 believed that “Being a parent of a child with weakened immune system” title could be phrased as a question such as “Are a parent of a child who has a weakened immune system?”
        - User 6 thought Infection simulation could be community simulation to further emphasize togetherness of herd immunity
        - “Vulnerable Animation” title needs to be different to further connect theme of animation
        - User 4 felt title “Being a parent of a child with weakened immune system” did not apply to them
        - User 5 felt that “Chatty: Text Experience” was a confusing title
        - User 5 believed that “Being a parent of a child with weakened immune system” title needed to be phrased differently so that it was more emotional

- **If you were a vaccine hesitant parent how would you feel after using this app? Examples informed, feel like you are being talked down to or anything else?**
    - Not confused but having more visual and explanations would help the users feel more knowledgeable
    - Felt like app was aimed at kid due to the style and font choices
    - User 1 was still not sure why they should vaccinate their child after using the app
    - Animation and parent testimonials made a strong emotional connection (x2)
    - Simulation caused lots of confusions among participants
    - Infection simulation needs more of prompt to make the emotional connection stronger

- **What are your feelings about the story told in the animation?**
    - Thought it was believable and realistic
    - Like the simplicity of it (x2)
    - Story feels it is geared more toward children (x3)
    - Creating emotional connection with the user
    - User 6 felt that the music helped give the animation a stronger emotional appeal
    - User 1 felt that Monique should not be featured on title screen since the main character is Sally

- **Did you feel more sympathetic toward children who were immunocompromised?**
    - Yes (x3)
    - Sympathy is more placed on child who does not understand (User 2)

- Have Sally more emotional as she thinks she caused Monique to go the hospital (User 2)
- User 5 had the feeling of unconcerned for immunocompromised children but suggested that if an actual condition was listed that prevent a child from being vaccinated would spark more concern

Discussion of Most Prominent Results

Navigation

Many users felt the navigation was simple due to the fact that the average score was 3.33 out of 10. On the other hand, there were some paint points that could be remedied. The two most prominent paint points were not having a back button to navigate the app and the navigation not being at the bottom of the screen. These are two conventions that have been ingrained in the psyche and when they are not apparent, they confuse the user. The next interaction will include both conventions.

Names of Experience on the Home Screen

Both user tester groups felt that the title for the text adventure (version 1: "Chatty", version 2: "Chatty: Text Experience") was confusing and needed to be changed. This is interesting since version 2 was meant to be more descriptive than version 1 but version 2 still received negative feedback. Another title that received negative reactions was the parental testimonials. In version 1 it was called "Another View" while in version two it was called "Being a parent of a child with a weakened immune system." User testers in version 1 group thought "Another view" did not describe it well and was too vague. Reactions from user testers in version 2 group varied for "Being a parent of a child with a weakened immune system". Some thought the title could be reworded while others felt it needed to be completely changed. Overall, user testers preferred titles of experiences that did not leave them guessing as to what they were clicking on.

Simulation and Herd Immunity Explanation

Users were confused about interacting with the simulation. Many suggested that if there was an explanation screen that detailed what the simulation was, what each element was representing and described the variables that could be manipulated that the simulation would be more digestible. After interacting with the simulation, user testers were shown where explanation for each variable was but still felt those explanations needed to be upfront rather than left for the user to find out. Many also disliked that the explanation for herd immunity was hidden within the simulation and would display after the simulation was complete. User testers also expressed that this element should be presented first before interacting with the simulation.

Vulnerable Animation

User testers enjoyed the animation but felt it was more for children rather than adults. They suggested that font changes could help but more changes will need to be considered. This fact did not prevent most users from feeling sympathetic like emotions after watching the animation, but these emotions were a bit scattered. Some users had more sympathy for Sally (child who infected Monique) over Monique (immunocompromised child) while others had more sympathy for Monique. It was even expressed that the animation did not create a strong enough emotional appeal to feel sympathy for the children. It was suggested that a strong emotional appeal could be created if Monique had an actual condition like cancer that prevented her from getting vaccinated rather than just stating that she was immunocompromised.

Parent Testimonials

User testers like the concept of testimonies from parents who have children who cannot get vaccinated but felt the user interface was confusing. Some felt that the symbolism of the shield of the parent was not clear and the way the images were arranged made it seem like one button rather than separate buttons. There will need to be further consideration on how to create mosaic that has better symbolism or if it would be better to just have testimonies listed in a blog format.

Font

Users felt the font did not make the app difficult to read because on average they scored the font as 2.33 out of 10, but many felt the font gave the app a more child-like feel. User testers suggested that if the font was a sans serif font that it would make the audience feel it was more for parents or adults rather than children. User testers also question the size of many of the font choices. They asserted that it was oversized and could be made smaller.

Emotional Appeal Overall Versus the Need for Logical Appeal

In general, user testers had strong emotional responses from interacting with the application but still felt there needed to be screens solely for informational purposes. The goal of this app was to be highly emotional because vaccine hesitant parent use emotion and experiences from other parents to determine if the information presented is helpful to them (Enkel et al., 2018). According to user testing, there was not enough logical appeal to direct its users to the desired action. Several user testers advised that if the app was successful in persuading vaccine hesitant parents then there should be a screen that tells them where they can take their child to be vaccinated. In summary the app needs to have a balance of emotional appeal and information for logical appeal so that it has a higher chance to persuade vaccine hesitant parents.

Limitations

There were a couple of limitations in this user testing session. One being there was a lack of diversity within the user testers. User testers were mainly in their twenties and were highly familiar with technology which is different from the target audience who may not be as versed. However, these participants were chosen because they had much input on design and usability which was the goal of this user testing session. Another limitation was that user testing sessions took place on desktops computers that simulated a mobile environment. Some users were able to identify the problems of mobile users within the design, like not having a bottom navigation, but most users did not see these affordances. Testing on a mobile device should be conducted to further identify other mobile user obstacles.

Sources

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