Vaccine Chat with Dr. Joy

MSC2006H Advanced Media Technologies

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01. Purpose

This project leverages empathetic language, a variety of visuals, and accessible language to deliver an intuitive and comprehensive experience to bolster vaccine confidence. The goal is to address common questions about the COVID-19 vaccine at a high level and to give users curated resources for in-depth learning. The overarching aim is to educate users rather than convince them to get the vaccine. An environment free of pressure and judgemental tones was created to avoid making users feel defensive about their pre-existing opinion. Online chatting is a ubiquitous function used by everyone regardless of age group and is thus a communication method relatively free of technology literacy barriers.

The usability testing was performed for quality assurance, to gather feedback on communication effectiveness, and to identify points of high friction or confusion in usability.

02. Problem statement

a. Can the user skip questions that they are not interested in to navigate through the dialogue tree?

b. Can the user find the glossary embedded in Dr. Joy's responses to clarify more complex or unfamiliar words?

c. Can the user immediately end the conversation with Dr. Joy once they have gone through all of the questions that interest them?

d. Are interactions of the Vaccine Chat intuitive enough that the users can proceed through individual questions without additional help?

e. Is the content (text and visual elements) of the Vaccine Chat easy to understand for the users without external help?

03. User profiles

User Profiles

Hesitant Helen *(Primary Persona)*

Personality and Characteristics

- Easily anxious, prone to worrying
- Limited technology literacy
- English is second language (not fluent)
- Introduced to Vaccine Chat by her child

User Goals

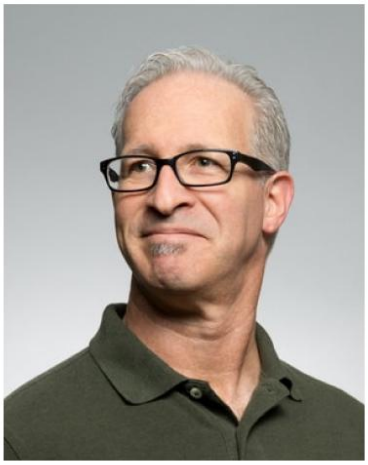
- Find out more about vaccine side effects
- Easily and quickly navigate around a source

> I'm scared of getting sick, but I'm worried if the vaccine is safe or not. Can someone please just explain what's really more risky?

Helen is a restaurant worker in her late 50's who immigrated to Canada two decades ago. She understands conversational English, but has a hard time keeping up in more formal contexts. She has been working throughout the pandemic as a restaurant worker out of the necessity of paying rent. Due to her age, she is now eligible to receive the COVID-19 vaccine. However, Helen is very hesitant to do so after reading web reports her friends have sent about fatal reactions and blood clots following vaccination. Her child (early 20s) sent her official COVID-19 resources before while urging her to get vaccinated, but they were in dense English and confusing to navigate.

She wants to be safe, and wishes someone trustworthy could explain simply if taking the vaccine or not taking it is the best way to achieve that.

Curious Craig *(Secondary Persona)*



Personality and Characteristics

- Likes to stick to what he knows
- Middle aged with limited technology literacy
- Native English speaker
- Found Vaccine Chat himself

User Goals

- Find out what the vaccine puts into his body
- Visit one free source and be done with it

> I might get the vaccine so I can visit the rest of my family, but I wish I could find clearer information about it in one place.

Craig is a carpenter in his late 50's who has taken a break from work due to the pandemic. His husband is an accountant working from home, so neither of them felt the need to rush to get vaccinated. However, their extended family hopes to host a small-knit birthday party for the youngest grandchild in two months, and would prefer for guests who can to be vaccinated by then. Craig has seen both good and bad things about the COVID-19 vaccine, and doesn't know where he should be looking at next, especially with so many paywalled news sites. He is concerned about all of the unknown terms and processes he's come across, such as "mRNA" and "viral vector," and about how fast the vaccine was made.

He wants to find out exactly what be going into his body if he does get the vaccine, and to do so without having to go through 20-something paid sites.

04. Methodology

The usability testing was conducted with 5 participants in a recorded interview format on Zoom. The participants were recruited to approximate our targeted audience and needed to conform to one of the following conditions: be middle aged or have low health science literacy.

All sessions were held remotely on Zoom due to Covid-19 restrictions. Each meeting had 3 people; one participant, one on camera moderator, and one off camera data logger. The data logger was off camera to avoid making the participant feel outnumbered, and to lower the burden on the Internet connection.

Once the participant joined the meeting, an introduction was read by the moderator to reiterate the important terms of the consent form that the participant had previously signed. Participants were given the choice to use their desktop or mobile for testing, since our website is designed to be functional on either.

Regardless of the platform, the link to the Vaccine Chat site was sent to the Zoom chat and the participant was asked to screen share from that point onwards. Once the usability testing was completed, the user was prompted to take a System Usability Scale test before ending the meeting.

05. Test environment and equipment requirements

Since our usability tests were remote, participants were required to have a desktop or mobile with a stable Internet connection in order to join via Zoom. Any device capable of running Zoom was more than sufficient to run the Vaccine Chat website without issue.

Desktop testing was easier to set up through Zoom and this website is designed to work on desktop as well, so it did not interfere with usability testing.

Mobile testing was ideal since the mobile platform is more commonly used for chatting. However, Zoom's mobile app was more difficult to navigate for first time users and the set up time for screen sharing was significantly longer than for the desktop.

06. Testing crew

a. The moderator greeted the participants and guided them through the usability test by reading the script, prompting feedback, and asking on the spot questions to clarify certain user behavior.

b. The data logger remained off-camera and took notes on participant performance, commentary, and notable behavior. The data logger also helped the moderator keep track of time.

c. The recording reviewer watched the testing recording with fresh eyes and complemented missing areas in the data logger's notes, but did not attend the usability sessions.

07. Evaluation measures

To evaluate results from the usability test, we used both quantitative and qualitative evaluation methods. Participants were constrained to stay within the Vaccine Chat to complete the tasks. However, they were not restrained from using any function within the Vaccine Chat.

Quantitative evaluation method was measured by the number of clicks for task completion and a System Usability Scale survey:

- Number of clicks for task completion
  - Success
    - 100 - Perform the task with one click (<3 sec)
      - The function of the tested element matched the user's interpretation of the icons/buttons in the Vaccine Chat.
      - Or/and the onboarding was effective to teach the user the functionality.
  - Partial success
    - 75 - Perform the task with two clicks (<10 sec)
      - The function of the tested element based on our description led to misunderstanding or misinterpretation.
      - Or/and the user performed similar actions (such as scroll or click) to complete the task.
      - Or/and the user completed the task but the outcome was not exactly what they expected.
  - Fail
    - 50- Too hesitant to click anywhere: long pause (>5 sec) before trying anything
      - The tested element was not salient enough.
      - Or/and the functionality was not obvious enough.
    - 30- Need guidance to complete the task
      - The functionality of the tested element was unclear and the user had to ask the moderator for help or hints.
- System Usability Scale survey (5 min)
  - On scale from 1 to 5, 1 being strongly disagree, 5 being strongly agree, we tested:
    - Likelihood of use the Vaccine Chat frequently

        - Readability of the content
        - Usability of the Vaccine Chat
        - Complexity of the Vaccine Chat
        - Integration of multi-functions in the Vaccine Chat
        - Consistency of the Vaccine Chat
        - Comfort level of using the Vaccine Chat
        - Learning curve of the Vaccine Chat
        - Accessibility of the content

Qualitative evaluation methods included verbal questions and feedback (verbal and written formats from System Usability Scale).

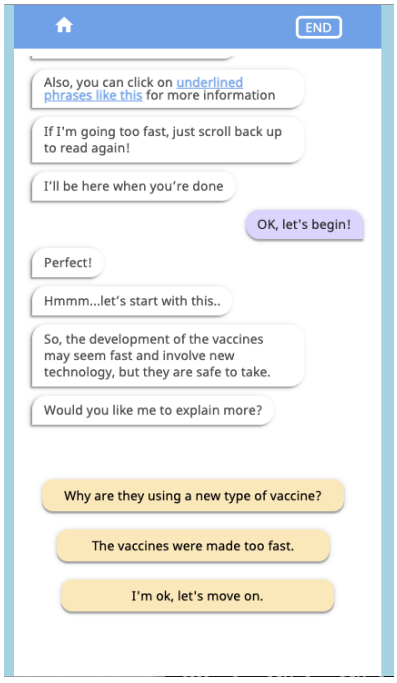
- Verbal feedback
    - Performed during the testing process (30-35 min)
- Written feedback
    - Included in the System Usability Scale survey (short answer part takes 1-2 min to complete, optional)

08. Task list

Directly Stated Tasks

a. **Task 1: Navigate the website until the next task is given to you.**

- Question addressed: Are interactions of the Vaccine Chat intuitive enough that the users can proceed through individual questions without additional help?
- Start state: The user clicks on the website link and reaches the start screen.
- Conditions for success:
  - Finding and clicking on the first button on landing page
  - Clicking on the "let's chat" button on the mission statement page
  - Navigating through the dashboard (it doesn't matter which question they choose to click on, as long as they know how to begin the chat)
  - Clicking on "Hi Dr. Joy!" to begin speaking to her
  - Complete the onboarding portion of the chat
  - Do the above successfully without hints or help, with 1 click.
  - Time is not evaluated since the participants were also asked to describe their actions and reasoning, which affects time elapsed.
- Start and end screens:

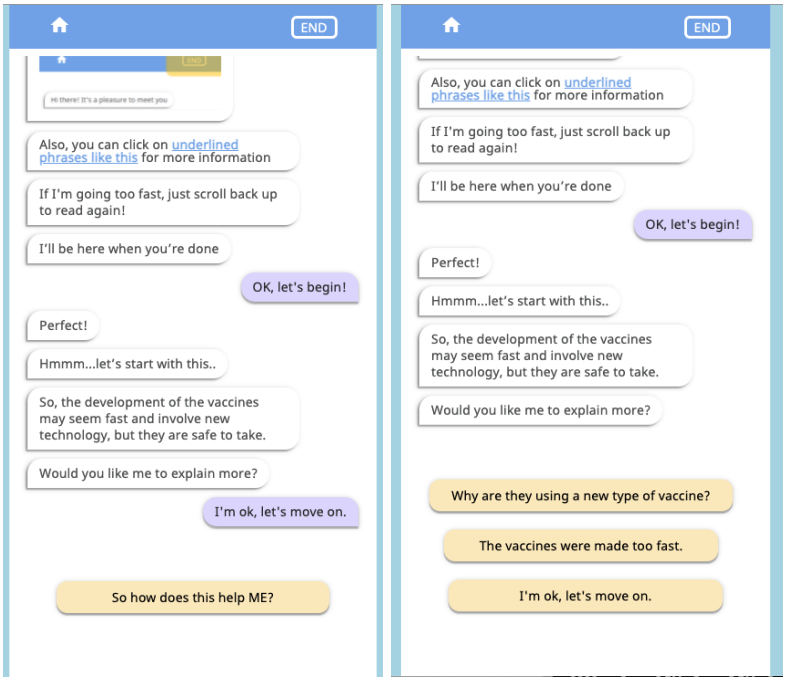


- Script: Thank you for loading our website, please begin and browse the website until we give you the next task.

b. **Task 2: Skip these questions.**

- Question addressed: Can the user skip questions that they are not interested in to navigate through the dialogue tree?
- Start state: The user has finished the onboarding section and is now given the first questions to choose from.
- Conditions for success:
    - Clicking on “I’m ok, let’s move on” with 1 click
    - Take less than 3s.

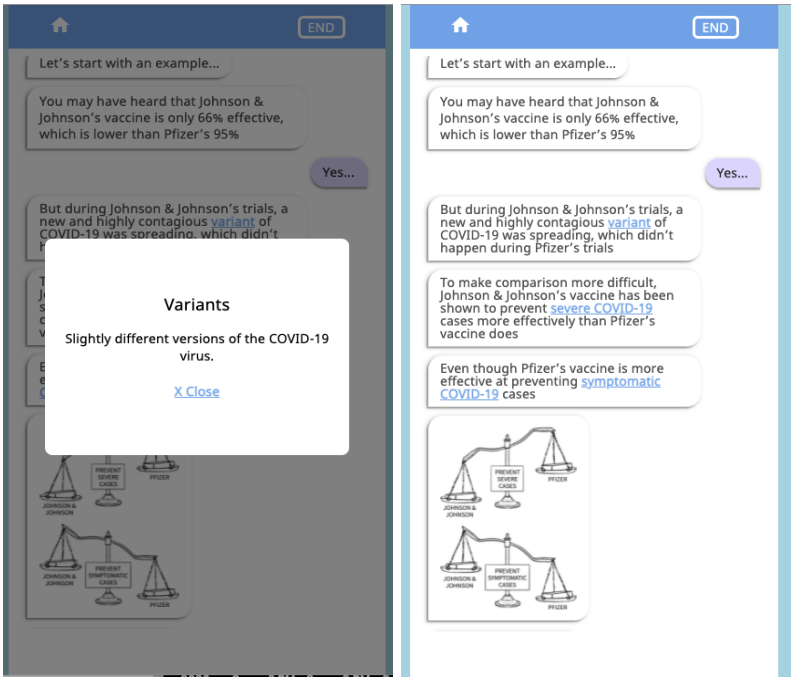
- Start and end screens:



- Script: For your first task, I’d like to ask you to skip the questions that are given as options. How would you proceed?
- Altered script (the 2nd participant pointed out that the script was leading him to look for the word “skip”, therefore the wording was altered): If neither of the questions are interesting to you, how would you proceed to continue to the next conversation?

c. **Task 3: Find and read a glossary term.**

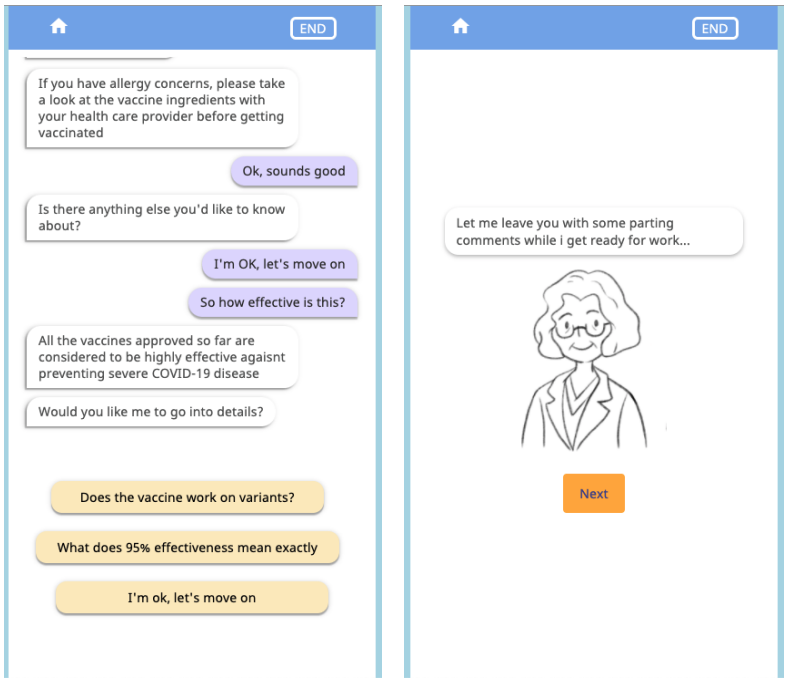
- Question addressed: Can the user find the glossary embedded in Dr. Joy's responses to clarify difficult to understand words?
- Start state: The user has reached a point in a given question that has glossary terms embedded in them. This start state may occur at different points, depending on which path the user chose.
- Conditions for success:
  - Finding and clicking on a glossary word (blue & underlined).
  - Closing the modal box.
  - Use 1 click per action and take less than 3s per action.



- Start and end screens:
- Script: Are there any words that are difficult to understand for you or for others? If so, please check its meaning using this website.

d. Task 4: End the conversation with Dr. Joy

- Question addressed: Can the user end the conversation with Dr. Joy once they have gone through all of the questions that interest them?
- Start state: At the end of the question that the user is reading at the moment or in the middle of any question, if time is running out.
- Conditions for success:
  - Finding and clicking on the “END” button in one click.
  - Complete the task in less than 3s.
- Start and end screens:



- Script: We see that we’re getting close to the end of our time with you. Please end the conversation with Dr. Joy so that we may get to the next steps.

09. Results

Table 1. Task score

Task	Participant score					
	1-C	**2-I**	**3-P**	**4-M**	**5-F**	**Average**
Task 1: Landing page	100	100	100	100	100*	100
Task 1: Mission statement page	100	100	100	100	100	100
Task 1: Dashboard	100	100	100	100	100	100
Task 1: Onboarding	100	100	100	100	100	100
Task 2	100	65	100	100	100	93
Task 3	100	100	50	100	100	90
Task 4	75	50	100	N/A	N/A	75

*The grey arrow/bar that comes with minimized mobile Zoom confused the user and she thought it was a part of our app. Once that was cleared up, the user found the button very easily. This is not counted towards a mistake click due to external interface issues.

**The user performed the task unprompted at first very confidently (score:100). The user was then asked by the moderator to skip a question, but due to the phrasing of the request, the user thought a button with the word “skip” needed to be found and the task could not be completed without clarification (score: 30). An average was made of the 2 results.

Overall, the website was very intuitive to navigate, but errors in conversation flow were unveiled during the testing of our prototype. Communication was effective in most of the participants’ experience, but some common areas caused confusion and hesitancy.

a. Task 1

This loosely defined navigation task was easily completed by all users. One click was used at each step to continue, and no extra clicking was needed. No hesitancy was noted in the users. Some users chose to read the questions on the dashboard, largely because this was a usability testing session and they felt like they had to click on it.

b. *Task 2*

Other than participant 2-I, there was no hesitancy or errors attributed with this task from other users.

c. *Task 3*

This task was completed without issues from most users. User 3-P was hesitant because the glossary word looked like a hyperlink that might bring them to another website.

d. *Task 4*

The distinction between skipping a question and ending the conversation was not clear to users. This caused the hesitancy/misclicking in participants 1-C and 2-I. Participant 3-P remembered the END function from the onboarding chat and did not hesitate. Participants 4-M and 5-F used the mobile version of the website, where the top navigation bar of the website is hidden by the top bar of the browser. This was a problem that occurred in ⅗ phones tested during the pre-usability testing dry run.

e. *SUS Score*

Table 2. SUS score summary

Participant SUS score					
1-C	**2-I**	**3-P**	**4-M**	**5-F**	**Average**
62.5	75	70	77.5	90	75

Overall, the SUS score average obtained (75) is considered above average, although there is still much room for improvement.

Most users found:

1. They probably won't use this website often.
2. This website is not unnecessarily complex.
3. This website is easy to use.
4. They wouldn't need a technical person to use this website.
5. The functions of this website are well integrated.
6. This website is not inconsistent.
7. This website would be easy to learn for most people.
8. This website is not awkward to use.
9. They felt confident using this website.
10. They do not need to learn a lot before using this website.

10. Discussion

a. Performance Data

Task 1 showed that the interactions of the Vaccine Chat are intuitive enough that the users can proceed through individual questions without additional help. The design goal was to make this website simple and free of extraneous details to streamline navigation. The common theme was that one single click would be enough to proceed to the next part of the experience. This suggests that the design goal was achieved.

Task 2 showed that the users would be able to easily skip questions that they are not interested in on their own. The wording of the button to skip questions can be considered clear.

Task 3 revealed that users can find the glossary embedded in Dr. Joy's responses to clarify difficult to understand words, but that the UI of the glossary itself should be improved to visually differentiate form hyperlinks.

Task 4 showed that while the user can end the conversation with Dr. Joy once they have gone through all of the questions that interest them, it may not be a function that they would expect. This is one of the places where this website departs from the normal chatbot experience, where the user would simply leave when they're done. While it was important for the storytelling of this project to have a concluding segment, the comparative low score in task 4 could point to a need to restructure how this feature is presented to the user.

b. Preference Data

In between the usability testing tasks, the moderator also asked qualitative questions regarding content clarity and whether the interactions felt natural. Overall, users commonly pointed out the same main pain points:

- The text is too long (especially in the mission statement and dashboard, where users are still deciding whether or not to continue)
- The amount of lean forward and lean back experience is inconsistent across questions.
- The clarity of the explanations seems to vary across different questions as well.
- The speed at which the messages pop up is too fast for any user to read in time.
- The images in particular pop quickly and take up a lot of vertical space, pushing up all of the content without the user having time to understand what is going on. Users instinctively try to scroll back up as messages and

images pop up, but the entire screen is brought back down as a new message appears. This may be frustrating and overwhelming to users and give the website a “broken feeling” as the screen is unresponsive to user manipulation.
- The users had a difficult time connecting the images’s relevance to the text messages before them. Images and text were seen as disconnected rather than supporting.
- After the user skips a question, the website immediately gives them another choice to make. This seems jarring because they were expecting Dr. Joy to say something first.
- Users became hesitant when presented with 2 different conversation options, since they do not know if they will be able to read what the other option leads to.

It seems that the content (text and visual elements) of the Vaccine Chat is easy to understand for the users without external help in general, but certain areas remain lacking.

c. SUS test

The results of the SUS test suggest that overall, this website is not difficult to use and the users felt relatively confident during their interactions with it. This is reassuring since most of the design around this website was concentrated on assuring that anyone, no matter their technology literacy, can comfortably navigate it.

11. Recommendations for change

Recommendations have been grouped by section, listed from most urgent to least urgent in each section.

a. Text

- Correct typos
  - Since this severely diminishes the trustworthiness of the website
- Make more of a connection between the text and the images that follow, by adding leading words such as “shown in the drawing below”.
- Revise the script to clarify points that may not be explained as clearly.
- Shorten the text where possible
  - To lower user disengagement when faced with long paragraphs

b. Flow and coding

- Fix dead ends in conversation flow due to coding issues.
- Fix the top navigation bar that gets hidden in some mobile browsers.
- Figure out whether broken images links are due to file organization or Bitbucket issues.
- Slow down message bubble speed, especially for images.
- Make the balance of sit back vs lean forward experiences more even across questions. This will also be used to help fix the “too many messages popping up without a break” problem above.
- Revise the dialogue tree to avoid unnatural Vaccine Chat response options.
- Revise interaction design to reduce the hesitancy associated with missing out on what the other dialogue options hold when making dialogue choices.
- Redesign the ‘End’ option so its function is more self explanatory.
  - Perhaps this can be done by revisiting how the onboarding is done

If you think this is useful, help us improve it and promote it.

Pitch as proof of concept

c. UI Design

- Find a way to increase text size within the constraints of the Bot.UI framework to increase accessibility. Using the native accessibility functions in the browser seems to create text format issues in Bot.UI at the moment.
- Run a color accessibility check of the current UI.

d. Illustrations

- Add labels to images where needed, to help users unfamiliar with objects depicted to orient themselves.

12. Limitations

Despite the participants allowing the testing session to be recorded, it remained difficult to fully grasp how they were actively engaging with the website. Furthermore, the fact that the participant had committed to be a tester meant that information on disengagement was already biased or lacking. For example, one of the participants said that they would have given up on the website had it not been a task they had committed to ahead of time.

The sample size of this usability testing was also too small to be able to make any positive findings from this beyond a sweeping generalization. However, the issues and pain points uncovered were valuable and will help make this website more user friendly moving forward.

13. Appendices

a. *Table 1. Calculations and result for SUS test*

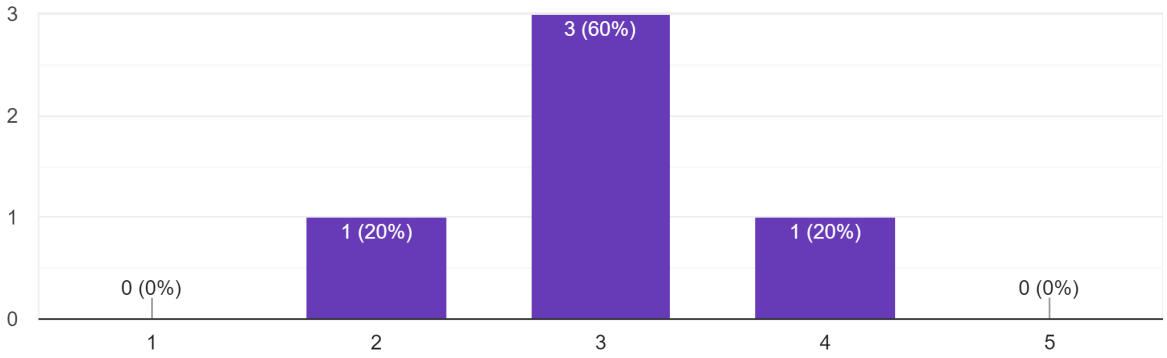
SUS analysis instructions:	**For each of the odd numbered questions, subtract 1 from the score. For each of the even numbered questions, subtract their value from 5. Take these new values which you have found, and add up the total score. Then multiply this by 2.5.**									
	1-C		**2-I**		**3-P**		**4-M**		**5-F**	
Q#	Original score	Calculated	Original score	Calculated	Original score	Calculated	Original score	Calculated	Original score	Calculated
1	2	1	3	2	3	2	3	2	4	3
2	5	0	2	3	1	4	3	2	1	4
3	5	4	4	3	4	3	4	3	5	4
4	1	4	2	3	5	0	1	4	1	4
5	4	3	4	3	4	3	4	3	5	4
6	3	2	1	4	2	3	1	4	1	4
7	4	3	3	2	4	3	4	3	5	4
8	4	1	2	3	2	3	1	4	1	4
9	4	3	5	4	5	4	3	2	4	3
10	1	4	2	3	2	3	1	4	3	2
total	33	25	28	30	32	28	25	31	30	36
x2.5 (final score)		**62.5**		**75**		**70**		**77.5**		**90**

Average	**75**									

b. SUS test raw data from Google Forms

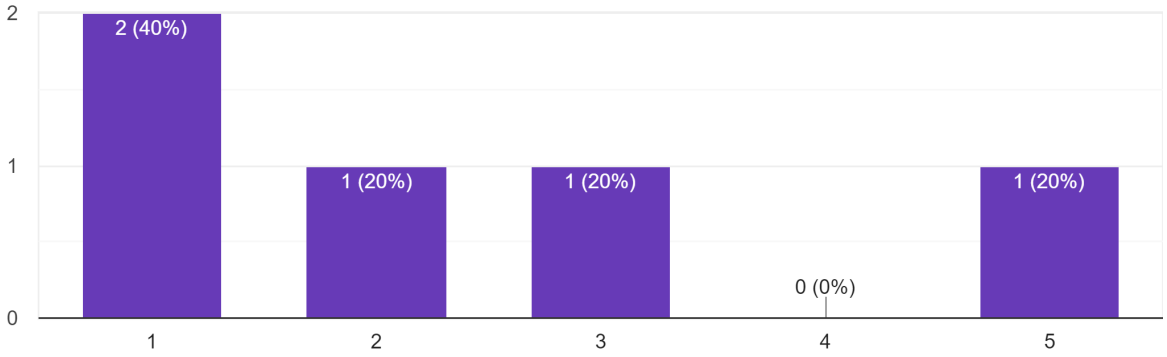
1. I think that I would like to use VaccineChat frequently.

5 responses



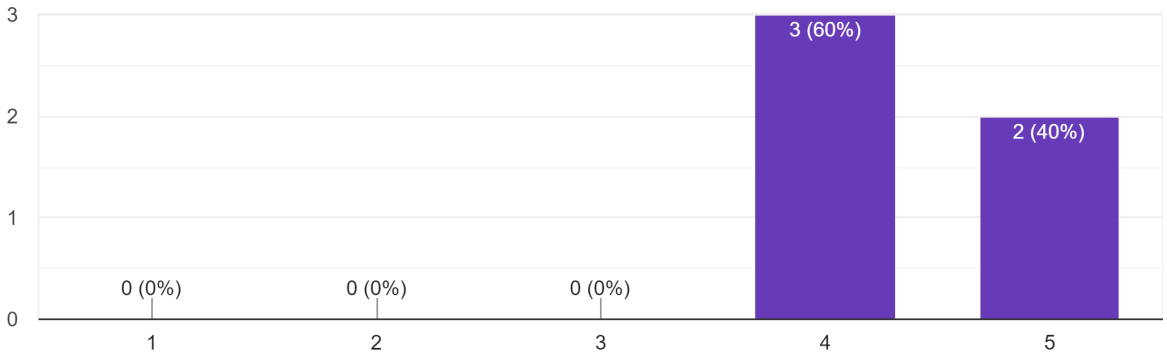
2. I found VaccineChat unnecessarily complex.

5 responses



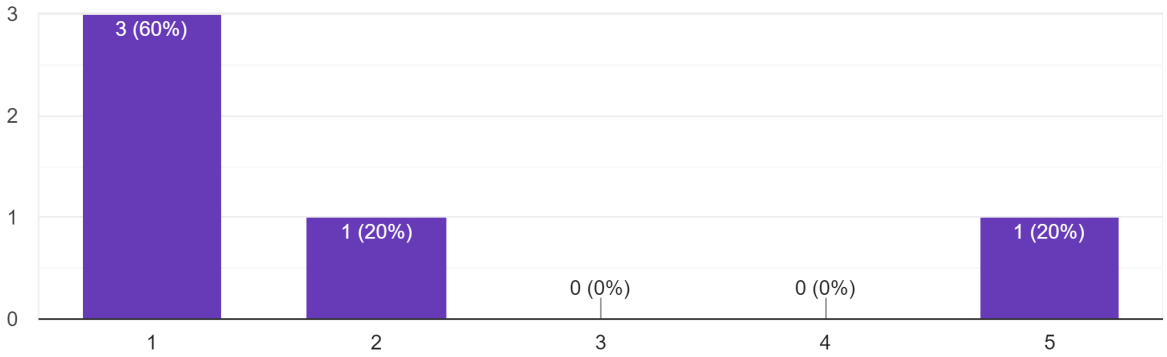
3. I thought VaccineChat was easy to use.

5 responses



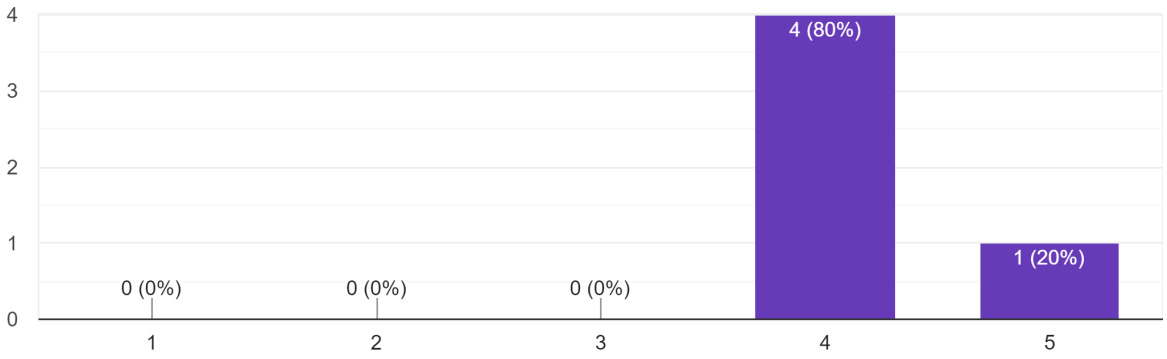
4. I think that I would need the support of a technical person to be able to use vaccineChat.

5 responses



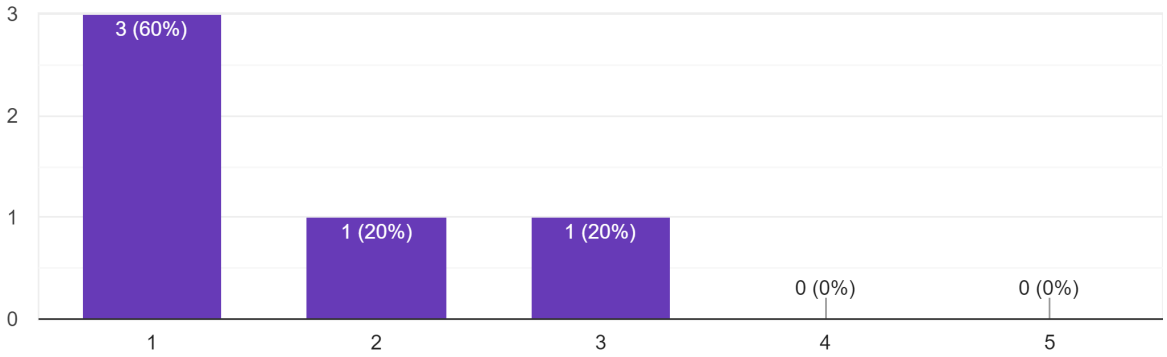
5. I found the various functions in VaccineChat were well integrated.

5 responses



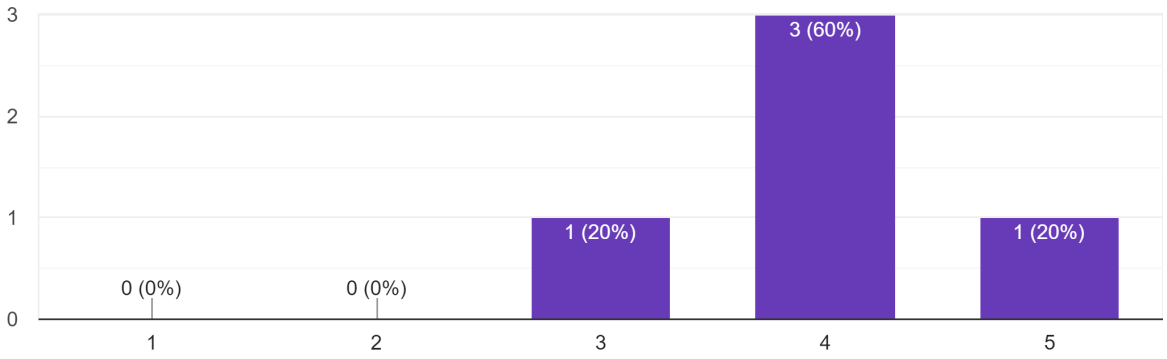
6. I thought there was too much inconsistency in VaccineChat.

5 responses



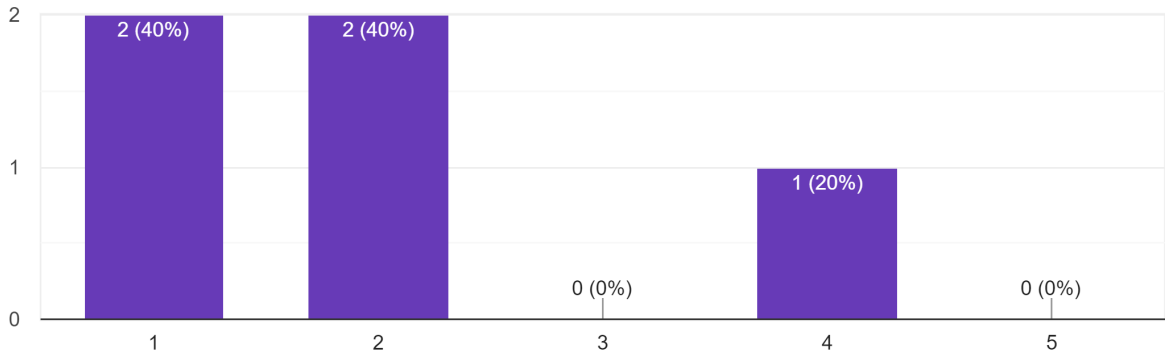
7. I would imagine that most people would learn to use VaccineChat very quickly.

5 responses



8. I found VaccineChat very cumbersome (awkward) to use.

5 responses



9. I felt very confident using VaccineChat.

5 responses