

Exploring Community Sentiment and Vaccine Uptake Related to COVID-19:
Quantitative and Qualitative Views Across the High Needs Pediatric Population in Rhode Island

By

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Thesis

Submitted in partial fulfillment of the requirements for the Degree of Master of Science in the
Graduate Program of Biotechnology at Brown University

PROVIDENCE, RHODE ISLAND

May 2024

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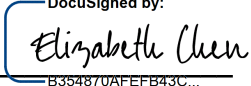
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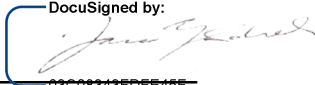
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Acknowledgments

First, I would like to thank my thesis advisor Dr. Elizabeth (Liz) Chen for her expertise and incredible support throughout the thesis process. Her mentorship and the resources provided through the Clinical Informatics Innovation and Implementation (CI₃) lab were invaluable in strengthening my knowledge in biomedical informatics and quantitative analysis. I would also like to thank my thesis committee, Dr. Indra Neil Sarkar and Dr. Jacquelyn Schell, for their insights throughout my graduate and thesis writing process. Next, I am hugely appreciative of the time and expertise that Grace Smith and Jonah Bradenday provided me in the qualitative and quantitative research sections. Their support helped immensely during the planning and analysis phases of this research. Finally, thank you to my family, Carole, John, and Jaci, and my boyfriend, Grant, for their unwavering support.

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Abstract of Exploring Community Sentiment and Vaccine Uptake Related to COVID-19: Quantitative and Qualitative Views Across the High Need Pediatric Population in Rhode Island, by Jilliana Zarzycki, ScM, Brown University, May, 2024.

Despite the recommendation from the Centers for Disease Control and Prevention (CDC) that everyone six months and older receive a COVID-19 vaccine, adolescent vaccination rates in the U.S. remain substantially lower than other age groups.¹ Children with complex medical conditions or other disorders are at a greater potential health risk than the general adolescent population.² Today, there is very little research that focuses on the high needs pediatric population with respect to COVID-19 vaccination and testing. The objective of this research is to use qualitative and quantitative analyses to identify trends and themes (e.g., barriers and facilitators) impacting vaccination uptake in Rhode Island's (RI) high need pediatric population. Four main themes were developed from focus groups representing potential facilitators and barriers to vaccination: (1) extra consideration around vaccination given certain health conditions, (2) societal feeling and community morale, (3) personal experience of the COVID-19 pandemic, and (4) communication dissemination and news effectiveness. Based on results from statewide health data collected through the RI health information exchange ("CurrentCare"), a majority of the high need pediatric population did not receive the COVID-19 vaccination. The results of this research may be used to inform strategies to improve vaccine uptake in the high need adolescent population in Rhode Island.

Chapter 1: Introduction

The COVID-19 pandemic heightened the nation's awareness and public discussion around pediatric vaccination. The rapid development and deployment of vaccines against COVID-19 created a glimpse of a "return to normal" for many communities across the globe. Despite the strong COVID-19 vaccine uptake in the adult Rhode Island (RI) population – 95% of state residents received at least 1 dose of the vaccine and 86% of state residents fully vaccinated – there is a clear vaccination rate cliff in younger age groups. In the RI pediatric population, the percentage of fully vaccinated individuals drops to 56% across the 5 - 11 age group as of October 2022.³ Similarly, as of July 2022, only 3.2% of children under the age of 5 in Rhode Island had received at least one dose of the COVID-19 vaccine.⁴

There has been a broader trend of vaccine hesitancy and declining vaccination rates in the pediatric population in the U.S. in recent years. The CDC reported that adolescent vaccination rates for state-required vaccines across the U.S. decreased from 95% to 93% from the 2019 - 2020 to 2021 - 2022 school years.⁵ Adolescent vaccination is a critical measure to control and prevent disease among healthy and high needs individuals alike. High needs adolescents can be defined as a child living with complex medical needs.⁶ Children with a high needs condition are disproportionately affected by COVID-19 due to the risk of developing a severe side effect to the SARS-CoV-2 virus.⁷ Today, research is lacking to support the high needs pediatric community so that parents and/or caretakers can decide whether the COVID-19 vaccination is right for their child. The investigation of vaccine adherence and rates for the high need adolescent community in RI would be an important step to ensuring public and community health across the state.

Adolescent COVID-19 vaccination rates in the U.S. remain substantially lower than other age groups, where the total U.S. population fully vaccinated for COVID-19 is 74% in the 18 - 64

age group, 61% for the 12 - 17 age group, and 32% for the 5 to 11 age group.³ The staggering discrepancy in adolescent vaccination adherence may be due to the lack of information around long-term risks in not receiving the vaccine, general distrust or concern around adolescent vaccination, and potential barriers to receiving the vaccine. In recent years, a primary focus in scientific literature relates to demographics and vaccination patterns in adolescents.⁸ While this is a critical element of understanding overall adolescent vaccination patterns and adherence, it lacks more specific information about high need adolescents.

Overall, 1 in 6 children have a developmental disability.⁷ Developmental disabilities include conditions like attention-deficit hyperactivity disorder (ADHD) and autism spectrum disorders.⁹ Developmental disabilities can also lead to other conditions for the individual, including impulse control disorders and mood disorders (e.g., anxiety and depression).¹⁰ In addition to the goal of vaccinating as much of the overall adolescent population as possible, there is an elevated need for high vaccination uptake for vulnerable pediatric groups. The CDC identified these children are at an increased risk for severe COVID-19 and state that the COVID-19 vaccine is the best protection against COVID-19 related hospitalization and death.¹¹ In addition, the CDC also notes that the chance of a severe side effect from the COVID-19 vaccine in adolescents is rare.¹ There is a need to investigate and better understand adolescent COVID-19 vaccination rates, specifically in the high needs pediatric population living in RI.

This research focuses on understanding existing vaccination trends and perceptions around vaccination to inform strategies to improve vaccination uptake in high need adolescents in RI. It leverages qualitative and quantitative analyses to analyze community sentiment and vaccine uptake. The work is part of a National Institutes of Health (NIH) Rapid Acceleration of Diagnostics for Underserved Populations (RADx-UP) project focused on COVID-19 testing and

vaccination of high needs children in RI. The qualitative portion of the project involved focus groups conducted between March 2022 and February 2023 to answer the following question: *What barriers and facilitators impact access and decision to vaccinate amongst Rhode Island's (RI's) high need adolescent community?* The qualitative work was completed in partnership with the Rhode Island Parent Information Network (RIPIN), which is a group of parents, family members, transition age youth, and adults with behavioral health lived experience.¹² The quantitative portion involved analysis of a COVID-19 pediatric dataset from the Rhode Island Quality Institute (RIQI) Health Information Exchange (HIE). This portion of the research sought to identify vaccination trends among high need adolescents living in RI based on demographics and those with specific mental health conditions that were mentioned in the focus groups. The quantitative work also looked at COVID-19 testing rates within the high needs pediatric community.

Overall, this research aims to identify themes and trends, leveraging qualitative and quantitative data, related to the RI high needs pediatric community. Results from use of a mixed methods approach could be used to provide more comprehensive insight for design of future implementation strategies to increase COVID-19 vaccine uptake.

Chapter 2: Qualitative Work

Introduction

This chapter focuses on the qualitative analysis around COVID-19 vaccination and testing sentiment with focus group data collected through the RADx-UP program in partnership with a local parent network. The RADx-UP initiative was created by the National Institutes of Health (NIH) “to reduce disparities for those underserved and vulnerable populations who are

disproportionately affected by, have the highest infection rates of, and/or are most at risk for complications or poor outcomes from the COVID-19 pandemic.” For this research, the Rhode Island Parent Information Network (RIPIN) was selected as the community health partner based on their connection to the Rhode Island high risk pediatric community. RIPIN is a group of parents, family members, transition age youth, and adults with behavioral health lived experience.¹³ The mission of RIPIN is to “inform, educate, support, and empower all families to be equal partners in advocacy for the education, health, and socio-economic well-being of their children and families.”¹⁴

This section of the research was guided by the Consolidated Framework for Implementation Research (CFIR), an implementation science framework for assessing existing or potential barriers and facilitators to successful implementation of an intervention.¹⁵ The CFIR framework was selected for this research as a way to analyze the focus group data from the semi-structured RIPIN interviews and guide future COVID-19 vaccine implementation strategy recommendations in the RI high needs pediatric community. The framework was used to identify barriers and facilitators impacting vaccination uptake in Rhode Island’s high need adolescent community (Damschroder et al. 2009). The CFIR framework’s five major domains can be leveraged to identify barriers to COVID-19 vaccination uptake in high risk pediatric populations, including (1) Interventional Characteristics, (2) Outer Setting, (3) Inner Setting, (4) Characteristics of Individuals, and (5) Process of Implementation.

Methods

The participant recruitment process was community driven through RIPIN’s parent network. Between March 2022 and February 2023, multiple focus groups were held with RIPIN community members. Overall, there were 14 focus groups, where each focus group included a

new set of participants. The RIPIN participants (n = 94) were all adults (18+) living in Rhode Island (RI), who self-identified as parents of a high needs child. The focus group interviews were conducted by trained project team members with a RIPIN staff member over Zoom and lasted 60 to 90 minutes. All focus groups were conducted in English. Informed consent to participate in the focus groups was provided to all participants during the focus group registration process as well as at the beginning of each focus group Zoom meeting. The focus group participants were asked questions about their perceptions about the COVID-19 pandemic and about COVID-19 testing and vaccination (Table 1). The sessions were recorded on Zoom and transcribed by an external transcription service. The data, once qualitatively coded, was stored in the NVivo system, which is used for qualitative data management.

Table 1. RIPIN Focus Group Questions.

#	Focus Group Questions
1	What is your current opinion of the pandemic? What do others that live in your home think? What do your neighbors, or friends think?
2	What resources do you use to learn about the pandemic? How do you get those resources?
3	What are your thoughts on the mask requirements?
4	When do you feel comfortable not wearing your mask? When do you feel like you need to wear your mask?
5	Has your opinion changed after getting vaccinated?
6	What are your thoughts on people who wear their masks? And What about those who don't use their masks?
7	What do you think about getting COVID-19 tested at this point in the pandemic?
8	If you had to get tested, how would you go about it?
9	After receiving your positive or negative result, did your behavior change in any way? How?
10	If you have been vaccinated, would you like to share your personal experience?

11	If you haven't been vaccinated, can you share why? What can you share about your neighbors', friends', and family's experiences?
12	*Can you please share if there have been any social or mental health related impacts throughout the COVID-19 pandemic for your children? What challenges have you and your children experienced as the pandemic has progressed?
13	*What were the barriers to accessing needed resources and services for your children? Do you feel like there are additional mental health and social resources and services needed as a result of the challenges faced throughout the COVID-19 pandemic?
14	How could RIPIN further support you?

*Note: questions with an asterisk were only included in the focus groups questions in the last few focus groups.

After the group interviews were complete, they were coded and entered in the NVivo system.

The group interview transcripts were accessed based on the selected codes pertinent to the research question of “*What barriers and facilitators impact access and decision to vaccinate amongst Rhode Island's (RI's) high need adolescent community?*” Based on the research focus, the perceived facilitators and barriers to vaccination were identified within RI's high need adolescent community. The perceived barriers and facilitators are listed in Table 2.

Table 2. Perceived barriers and facilitators to COVID-19 vaccine uptake in the RI high need pediatric community.

Type	Description
Facilitator	1. Perceived positive benefit to user
	2. Perceived positive benefit to the community
	3. Historical vaccination immunization
	4. Physician or caretaker recommendation / mandate
Barrier	1. Lack of trust / misinformation about the vaccine
	2. Lack of access to the vaccine
	3. Lack of perceived benefit of the vaccine

	4. Consent is not the individual's own
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These perceived barriers and facilitators to vaccine uptake in the high need pediatric community were used to compare against the existing codes that are available in the CFIR framework and identify the codes applicable to my research focus. In the content analysis portion of qualitative coding, there were 3 CFIR constructs and 6 codes from CFIR subconstructs identified that were most relevant to the research question. These included (1) Intervention Characteristics (receiving a COVID-19 vaccination or getting tested for COVID-19), (2) Outer Setting (RI), and (4) Characteristics of Individuals (RIPIN community-members and their children). There were four inductively generated codes related to social influences that were applicable to the research (Table 3).

Table 3. Qualitative Codes selected based on perceived barriers and facilitators to COVID-19 vaccine uptake in RI high needs pediatric community.

Code ID	Consolidated Framework for Implementation Research (CFIR) Domain/Subconstruct	Code Definition
1	Intervention Characteristics Domain	
1B	Evidence Strength and Quality	Stakeholders' perceptions of the quality and validity of evidence supporting the belief that the intervention will have desired outcomes.
1C	Relative Advantage	Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution.
1D	Adaptability	The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.
2	Outer Setting Domain	

2A	Patient Needs & Resources	The extent to which patient needs, as well as barriers and facilitators to meet those needs are accurately known and prioritized by the organization.
4	Characteristics of Individuals	
4A	Knowledge and Beliefs about the Intervention	Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.
4E	Other personal attributes	A broad construct to include other personal traits such as tolerance of ambiguity, intellectual ability, motivation, values, competence, capacity, and learning style.
6	Inductive Codes: Social/Societal Influence Domain	
6A	Trust	Level or aspects of trust in the implementation, intervention, process of delivery, related leaders/perspectives, etc.
6B	Misinformation	References to conspiracies, rumors, 'stereotypes,' biased news stories, etc.
6C	Sources of Information	Mostly in response to the question 'where do you get your information about COVID from?'; might also apply to sources of testing info, etc.
6F	Interpersonal Influences/Other People	References to any consideration (including the beliefs, actions, protection, or interactions) of others with regard to decisions about participating in the intervention.

These codes were used to identify and outline themes generated from the RIPIN study group interviews within the coded transcripts. The thematic analysis was performed by analyzing the coded data for recurring or common sentiments, then using those to define and describe the broader theme represented across the focus groups.¹⁶ From the 14 focus groups, there were 4 themes identified through the thematic analysis process.

Results

Overall, there were 14 focus group sessions held with RIPIN community members.

Four major themes were identified based on the sentiments across the focus groups. Participants expressed differing opinions regarding COVID-19 vaccination and testing. Some participants discussed the importance of the COVID-19 vaccine and testing practices for their family and for their child, while others expressed skepticism and disdain towards it. An overarching sentiment from the focus groups was that the high needs or vulnerable population was overlooked during the COVID-19 pandemic vaccine roll-out and testing practices. There was also an observed feeling of information fatigue and/or mistrust, which surfaced across people who were both for vaccinating their children and those who were against vaccinating their children.

THEME I: Each child is different and there are multiple deciding factors at play to ensure the health and stability of the child's condition.

Across the RIPIN focus group participants, there was great consideration that went into determining if the COVID-19 vaccine was right for their child. This was a thoughtful process that included multiple decision factors.

Facilitators: Depending on the condition, a child with special needs could benefit by receiving the vaccine. Parents mentioned a partnership with their doctor, general news information from trusted sources, and a gut feeling as reasons in favor of receiving the COVID-19 vaccine.

“My daughter has special needs. She also has epilepsy, so when we were getting her vaccine, her doctor said that the vaccine might trigger a seizure for her. We struggled with that. Wanting to get her the vaccine but then worrying if a seizure was going to come on from that. Then we did end up getting her the vaccine...”

Timing also played a role in the decision to vaccinate one's child, where it could potentially help protect a child.

“We were also boosted earlier than we probably should have been because he was going into his chemo treatment and they wanted him boosted before that.”

Given the condition, the vaccine offered elevated protection for certain children living with a medical, psychological, or behavioral condition.

Barriers: The barriers to receiving a COVID-19 vaccination included certain health conditions preventing the individual from receiving it or concern that the vaccine might exacerbate the condition(s).

“My daughter is not vaccinated and I don’t plan on getting her vaccinated anytime soon. She’s nonverbal, she’s not cognitively aware enough to be able to tell me if something is wrong with her internally and everything is basically a guessing game for me... For me getting her vaccinated, it was, I think there’s too many variables at that point.”

In other cases, parents wanted their child to have autonomy to make the decision.

“I have one child that is vaccinated because she needed it to go to a program, but my other child is on the spectrum. She refused to -- it’s so hard for her to do needles and the stuff... I left it as their choice at this point, which I’m not even sure if that’s the correct thing to do.”

In cases where a child is not fully informed of the risks of contracting COVID-19, this approach may lead to side effects that could have otherwise been prevented through the COVID-19 vaccine. This demonstrates that in addition to educating adults, caretakers, and healthcare providers of the benefits of the COVID-19 vaccine for the pediatric population, it is also important to provide information to children about vaccine benefits. Overall, the decision to vaccinate a high needs child is one of careful consideration due to complex physical, psychological, or mental conditions.

THEME 2: Societal feeling and community morale influenced one’s opinion about the COVID-19 vaccine and the decision to vaccinate their child.

A significant facilitator in COVID-19 vaccination and testing sentiments was the shared belief that the COVID-19 vaccine had a positive impact in family and community protection.

Facilitators: There was a belief that vaccination was not a singular action; it was a sign of communal progress and protection.

“We all got vaccinated and my whole family. Most of us got our boosters...I think once we got vaccinated, I felt a little bit more at ease about not wearing the masks.”

People viewed the vaccine as a positive step forward in societal protection and wanted to protect their families and their communities.

“If you have the option to protect yourself, you should do it and help protect others, because I have compromised children in the house, too, and just the people around me...It’s just like, ‘If I can add that extra layer of protection, why shouldn’t I?’”

This sentiment was echoed multiple times.

“Like I said, it’s to protect others, not just ourselves.”

Finally, the COVID-19 vaccine offered psychological safety for participants. One mother in the focus group commented that she felt that she had to persuade her daughter into getting the vaccine because she believed it would offer the most protection.

“I had to coax her into it. What kid wants to sit there and watch a shot happen? My thought process was I was going to do what I could to keep her safe.”

Across the focus groups, there was a strong collectivist sentiment that drove participants to receive a COVID-19 vaccine for themselves or for members of their family.

Barriers: Contrary to the viewpoint that the COVID-19 vaccine offered a strong community safeguard, one of the most significant barriers to COVID-19 vaccination uptake across the community was the perceived societal pressures to get it. Some people did not share the feelings that the vaccine had an individual and community clear upside, which deterred people from

receiving it. Another notable sentiment was exacerbation around any COVID-19 health measure which pushed people towards a “let it be” mindset.

“We have not been vaccinated, we’ll not be vaccinated because of the pressure and the risks from the government not taking accountability for the side effects.”

In some cases, workplace and local mandates or guidance to receive the COVID-19 vaccine had a negative impact on individual trust of the COVID-19 vaccine and other pandemic efforts (e.g., masking, COVID-19 testing).

“My four-year-old, currently she’s now six, she is my autistic ADHD child...I do have one immuno-compromised child that’s my youngest. I was nervous about him, but overall, I was like, it is what it is....They used so much fear and so much scare tactics that you still have people three years later going, “Oh my gosh, I can’t go out, I can’t do this, I can’t--” Enjoy your life.”

Overall, a top-down approach to COVID-19 recommendation seemed to offset participants and cause negative sentiments to the COVID-19 vaccine.

THEME 3: The COVID-19 vaccine benefits for adults and children were unclear to some participants in addition to a belief that the COVID-19 deployment and immunization handling lacked a personalized approach for vulnerable pediatric populations.

Many focus group participants noted that the COVID-19 vaccine benefits were not clear to them or that they did not think that the benefits outweighed the risk of receiving the vaccine. Other participants commented that they did not think there was enough support for vulnerable pediatric populations. In particular, participants noted that the process or event of getting vaccinated caused distress for them or for their child due to inconsistent bedside manner to support a high needs child.

Facilitators: A parent’s opinion on vaccination influenced their preference to vaccinate their child. Also, the proper support for the parent or child was a facilitator to receiving the vaccine.

Nursing, school aid, doctor, or clinician support helped parents ease the process of accessing the vaccine and also making it the best experience for their child.

“Myself and my kids, we have all been vaccinated. We did it at Walgreens. It was an okay process...not something I would love to do again, I prefer to go to my doctor or at least for my kids, because I don’t think the pharmacists were prepared for that. Their bedside manner is lacking.”

When COVID-19 vaccination was not seen as difficult or intense, it typically led participants to think that receiving the vaccination or recommending it for their kids was the right thing to do.

Barriers: There were many feelings against the vaccine because participants were unclear on the benefits of it for them or for their children. In the case that the parent or caretaker was vaccinated, there were sentiments that this was enough protection for their family and that children were less susceptible to negative reactions to the SARS-CoV-2 virus.

“I didn’t want my children to be vaccinated because kids are actually doing pretty well getting COVID. They’re not as at risk. I mean, unless they have underlying health issues, which mine don’t and we don’t know to a certain degree, the side effects for the COVID vaccines for the kids.”

Unpleasant or negative side effects from the COVID-19 vaccine also deterred others from receiving the vaccine.

“I know many people that were really sick with the vaccine, and everybody I know that’s had COVID had the vaccines. I don’t think it does anything to help you.”

Finally, participants expressed that contracting COVID-19 after receiving the vaccine discouraged them from further vaccine boosters.

“I am vaccinated. My kids are partially vaccinated. We had gone and gotten vaccinated, and within the three weeks before they went back to get vaccinated, they got COVID. Then it was at a time where I felt like things were kind of settling down, we didn’t go back and they didn’t get their second or their boosters.”

Similarly, participants had a desire for more support systems to help them successfully navigate the COVID-19 pandemic with a high needs child.

“People with disabilities are vulnerable, and there just needed to be a lot more consistency...everything was one size fits all.”

Negative perception around the COVID-19 vaccine’s effectiveness was one of the most significant barriers in vaccine uptake in the high needs pediatric population. The lack of support around the vaccine administration also seemed to negatively influence parents or caretakers.

THEME 4: Information dissemination and news effectiveness played a large role in individual trust for the vaccine.

The COVID-19 pandemic led to an increase in news coverage around public health recommendations and therapies. This increased coverage was met with mixed opinions, where some cited it as a positive during the pandemic and others noted overwhelming feelings to discern what was reliable news.

Facilitators: At first, national news sources (e.g., CDC, Department of Health) were viewed as trustworthy. As the pandemic evolved, people placed more trust in local advisory groups (e.g., healthcare practitioners, word of mouth, local schools).

“Initially, we were following the CDC, and then to a certain degree, certain things that they said then they backtracked, and then this... you were just listening to one train of thought. Now we’re getting more information, which is good and people can make more of a choice or an informed decision.”

The information from medical outlets (e.g., doctor’s offices, medical news sources) also was a trusted source of information.

“Well, if I go to the doctor’s office, I always get information from the doctors because usually the doctors get the information before we do.”

Barriers: There was a noticeable mistrust of the news from government sources. The distrust may have existed prior to the pandemic, which only grew with the nation-wide coverage of the COVID-19 vaccine rollout in the US.

“I don’t trust the government so we’re not vaxxed.”

Also, as the pandemic progressed, there was an overall element of information fatigue and conflicting guidelines that led to increased mistrust and lower community engagement.

“I don’t want any more resources, I don’t want to hear another word about it, honestly. I don’t trust anything I read anymore. You got to be so selective about which channels you turn it to.”

Many people felt that COVID-19 was already a stressful time to balance the change from the status quo, so the surplus of news and information from multiple angles ultimately discouraged some participants from engaging further.

Discussion

This research explored the facilitators and barriers to COVID-19 vaccination in Rhode Island’s high need pediatric community in order to build a stronger understanding of what prevents vaccination uptake in the community. The results show that there were significant barriers that existed that prevented high needs children in RI from getting the COVID-19 vaccination. These can be summarized by the (1) lack of research done on high needs conditions, leading to a gap in knowledge for parents or caretakers, (2) unclear benefits of COVID-19 vaccination for children, (3) lack of agency that children have in making decisions for themselves, forcing them to rely on their parents or caretakers views, and (4) general mistrust and fatigue around pandemic related topics, including COVID-19 vaccination and testing efforts. The conditions that were most often cited among the focus group participants included children

with anxiety, Attention-Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), depression, and Obsessive Compulsive Disorder (OCD). The findings show that it was an emotional period for participants and their families. Because of this, the excess of information and news surrounding the pandemic was perceived negatively.

The facilitators to COVID-19 vaccination included (1) community beliefs that if *everyone* in the community received the vaccination, then the community as a whole would be stronger; (2) vaccination was a privilege that was a “no brainer” if it was easily accessible and free; and (3) vaccination offered some psychological safety and a feeling of control that was hugely desired amongst parents and caretakers. Some cited their religious, personal experience, or day-to-day interactions with members of their community as pluses in receiving a vaccine.

These viewpoints offered a unique view into the RI high needs community and how people navigated the pandemic with a high needs child. It demonstrates that there was no quintessential point that influenced someone to vaccinate their child, but a variety of inputs that ultimately led to the decision to vaccinate a high needs child with the COVID-19 vaccine.

Chapter 3: Quantitative Work

Introduction

This section of the research focuses on the quantitative analysis around COVID-19 vaccination and testing rates across the RI pediatric population and five pediatric mental health cohorts. The mental health cohorts were selected based on conditions that were frequently mentioned in the Rhode Island Parent Information Network (RIPIN) focus groups: (1) anxiety, (2) depression, (3) attention deficit hyperactivity disorder (ADHD), (4) autism spectrum disorder

(ASD), and (5) obsessive-compulsive disorder (OCD). These overall pediatric cohort and five mental health cohorts were used to answer the following research questions:

- How many adolescents are fully vaccinated and not fully vaccinated for COVID-19?
- Do sex, age group, or ethnicity affect pediatric vaccination rates?
- Are certain mental health cohorts more or less likely to get vaccinated?

Basic characterization techniques were performed to identify trends across different demographics (ethnicity, sex, and age group) for the cohorts. Analyses were conducted using Observational Health Data Sciences and Informatics (OHDSI) ATLAS and Microsoft Excel. The goal of this chapter is to highlight vaccination and testing trends across the selected mental health cohorts and the total RI pediatric population.

Methods

Data

The Rhode Island Quality Institute (RIQI) operates Rhode Island’s HIE “CurrentCare” and is the state-designated Regional Health Information Organization (RHIO). CurrentCare contains Electronic Health Record (EHR) data from all acute care hospitals in Rhode Island, and from many ambulatory and laboratory facilities across the state. As of 2019, over 500,000 individuals have opted to share their data with CurrentCare. De-identified data (HIPAA Expert Determination) from CurrentCare were provided by RIQI for the study period January 2018 – April 2023. This COVID-19 pediatric dataset contained lab-confirmed, suspected, and possible cases of COVID-19. These cases were demographically matched (on age group, sex, race, and ethnicity) to controls who tested negative or equivocal for COVID-19, at a ratio of 1:2 (cases to controls) as defined in the phenotype for the National COVID Cohort Collaborative (N3C).¹⁷

Analyses

The RI HIE COVID-19 pediatric dataset was analyzed using OHDSI ATLAS to identify and find pediatric vaccination trends based on SARS-CoV-2 test results and vaccinations rates.

OHDSI ATLAS is a software tool that allows researchers to analyze data in the Observational Medical Outcomes Partnership (OMOP) common data model (CDM) format.¹⁸ OHDSI ATLAS allow users to create cohorts based on specific features or conditions of interest.¹⁹ The use of OHDSI ATLAS in this research made it possible to leverage observational health data collected through CurrentCare and create cohort sets based on OMOP standards.

For this work, the mental health cohorts were identified using PhecodeX to determine the corresponding International Classification of Diseases (ICD) codes for each mental health condition.²⁰ PhecodeX is the reference for the most current phecode nomenclature used in ICD codes.²¹ Figure 1 depicts the process for identifying and analyzing cohorts: (1) use PhecodeX to find codes for specific mental health conditions, (2) convert the ICD codes to OMOP IDs, (3) build the concept sets in OHDSI ATLAS based on the OMOP IDs, (4) define the cohort definitions, and (5) characterize the cohort.

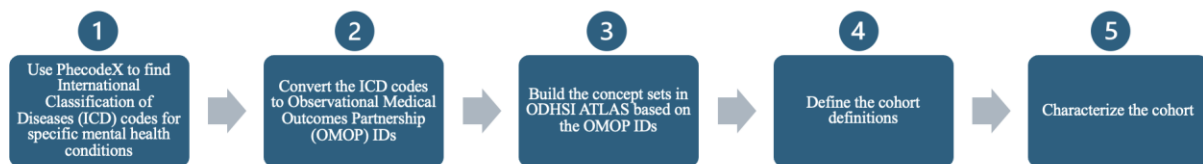


Figure 1: Building cohorts in OHDSI ATLAS to analyze RI HIE Pediatric dataset.

Code Identification (steps 1 and 2)

Prior to creating the concept sets, PhecodeX was used to identify the corresponding ICD code groupings for two of the mental health cohorts: ADHD and OCD (concept sets were

already created for anxiety, ASD, and depression). This included utilizing the PhecodeX “phecodeX_ICD_CM_map_flat.csv” file that includes mental health condition ICD code mapping.²² ICD codes for ADHD and OCD were located under the "Mental" domain. Once the specific ICD codes were determined, these were used to convert the ICD codes to OMOP IDs and naming based on the data available in the “omop_concept_id” and “concept_name” fields using OMOPVocabMapper, a Julia program developed by the Brown Center for Biomedical Informatics for mapping ICD codes to OMOP IDs.

Concept set creation (step 3)

Once the ICD codes were identified and converted to OMOP IDs, these were used to create the concept sets in OHDSI ATLAS. New concept sets were created for ADHD and OCD and existing concept sets were utilized for anxiety, depression, and ASD. The ADHD and OCD concept sets were built by searching and selecting the OMOP IDs and adding them to the respective concept sets. Once all OMOP IDs were selected and added to the concept set, they were saved in ATLAS.

Cohort definitions (step 4)

The cohorts were built using the concept sets created for anxiety, depression, autism, ADHD, and OCD. In ATLAS, new cohort definitions were created by importing the concept set of interest (e.g., ‘Obsessive compulsive disorder’ concept set). The cohort definitions that were used in this research is outlined in Table 4.

Table 4. Cohorts used for analyses.

Cohort Title	Cohort Description
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RADx-UP not fully vaccinated against COVID-19	Received no more than 1 dose of Pfizer or Moderna COVID-19 vaccine OR no Johnson & Johnson vaccine
RADx-UP fully vaccinated against COVID-19	Received two doses of Pfizer or Moderna COVID-19 vaccine OR one dose of Johnson & Johnson COVID-19 vaccine
Tested positive for COVID-19	A measurement of COVID-19 positive lab results
Tested negative for COVID-19	A measurement of COVID-19 negative lab results
Anxiety	Individuals with an anxiety medical diagnoses defined in ICD
Depression	Individuals with a depression ICD medical diagnoses defined in ICD
Autism spectrum disorder	Individuals with an autism medical diagnoses defined in ICD
Attention deficit hyperactivity disorder	Individuals with an attention deficit disorder (ADHD) medical diagnoses defined in ICD
Obsessive compulsive disorder	Individuals with an obsessive compulsive disorder (OCD) ICD medical diagnoses defined in ICD

Characterization (including feature analyses) (step 5)

The characterization feature in OHDSI ATLAS was used to understand the RI HIE pediatric data with respect to the mental health cohorts outlined above and other demographics, including ethnicity, sex, and age group. Once the desired cohort definitions were imported to the characterization, other feature analyses were applied. The feature analyses included ethnicity (Hispanic or Latino or Not Hispanic or Latino), sex (male and female), and age group (0 - 9, 10 - 14, and 15 - 19). Once each respective characterization was configured, they were run against the COVID-19 Pediatric dataset.

Results

A total of 22,074 individuals were included in the COVID-19 pediatric dataset. Table 5 shows the overall subjects included in the COVID-19 pediatric dataset by ethnicity and sex; the total participants in the ethnicity analysis did not match the overall pediatric total, which might be due to missing or not collected data. There was a slight difference between the total participants reported in the age demographic compared to the sex demographic due to 8 negative values entered in the dataset. Without this issue, the totals for the sex and age group demographics would be the same.

Of the five mental health cohorts, the largest ones were anxiety and ADHD. Hispanic or Latinos represented 31.6% of the overall pediatric population. Among the Hispanic or Latino population, the anxiety cohort had the most subjects ($n = 486$; 35.35%) out of the five mental health cohorts. Similarly for females, the anxiety cohort ($n = 777$; 54.49%) had the most subjects compared to the other cohorts. Within the male pediatric population, the ADHD cohort ($n = 919$; 67.92%) had the most subjects compared to the other cohorts.

Table 5. RI HIE Pediatric data by mental health cohort and ethnicity, sex, and age group.

		Total	Anxiety	ADHD	ASD	Depression	OCD
	Total	22,074	1,426	1,153	447	972	98
Ethnicity	Not Hispanic or Latino	13,670 (68.40%)	889 (64.65%)	887 (68.13%)	296 (68.52%)	607 (65.55%)	74 (77.08%)
	Hispanic or Latino	6,315 (31.60%)	486 (35.35%)	415 (31.87%)	136 (31.48%)	319 (34.45%)	22 (22.92%)
	Total	19,985	1,375	1,302	432	926	96
Sex	Male	11,140 (50.47%)	649 (45.51%)	919 (67.92%)	339 (75.84%)	325 (33.44%)	50 (51.02%)
	Female	10,934 (49.53%)	777 (54.49%)	434 (32.08%)	108 (24.16%)	647 (66.56%)	48 (48.98%)
	Total	22,074	1,426	1,353	447	972	98
Age group	0 - 9	16,073 (72.84%)	241 (16.90%)	420 (31.04%)	206 (46.09%)	30 (3.09%)	11 (11.22%)
	10 - 14	1,060 (4.80%)	599 (42.01%)	631 (46.64%)	157 (35.12%)	318 (32.72%)	40 (40.82%)
	15 - 19	4,933 (22.36%)	586 (41.09%)	302 (22.32%)	84 (18.79%)	624 (64.20%)	47 (47.96%)
	Total	22,066	1,426	1,353	447	972	98

Table 6 depicts the overall COVID-19 vaccination and testing prevalence. There was an overall not fully vaccinated rate of 77.34% and a fully vaccinated rate of 22.66%, indicating that there are many in the pediatric population that remain not fully vaccinated. The highest percentage of fully vaccinated participants within a group was in the OCD cohort. The highest percentage of not fully vaccinated participants was in the autism cohort (72.71%). Overall, there was a majority of negative test results across all mental health cohorts, where the total COVID-19 negative test rate was 90.72%.

Table 6. COVID-19 Vaccination and Testing among pediatric cohorts.

		Total	Anxiety	ADHD	ASD	Depression	OCD ₁
Vaccination status	Fully vaccinated	5,002 (22.66%)	652 (45.72%)	489 (36.14%)	122 (27.29%)	571 (58.74%)	60 (61.22%)
	Not fully vaccinated	17,072 (77.34%)	774 (54.28%)	864 (63.86%)	325 (72.71%)	401 (41.26%)	38 (38.78%)
	Total	22,074	1,426	1,353	447	972	98
Testing Status	Tested Positive for COVID-19	1,153 (9.28%)	149 (13.48%)	123 (12.42%)	35 (10.2%)	90 (12.10%)	
	Tested Negative for COVID-19	11,278 (90.72%)	956 (86.52%)	867 (87.58%)	308 (89.80%)	654 (87.90%)	
	Total ₂	12,431	1,105	990	343	744	

¹ In the testing status section, the OCD testing data are redacted due to low profile numbers.

² The testing status data showed overall lower numbers than the vaccinated status data, which might mean that testing data were missing or not collected for all participants.

Table 7 illustrates the number of participants who were fully vaccinated or not fully vaccinated in relation to testing status. For those who tested positive for COVID-19, there were 284 (9.26%) fully vaccinated pediatric participants and 869 (9.28%) not fully vaccinated pediatric participants. For those who tested negative for COVID-19, there were 2,784 (90.74%) fully vaccinated pediatric participants and 8,494 (90.72%) not fully vaccinated pediatric participants. Overall, there were higher numbers of not fully vaccinated pediatric participants. From these results, the findings show that being fully vaccinated did not significantly impact the likelihood of testing negative for COVID-19. Similarly, the percentage of subjects who tested positive for COVID-19 was largely similar across the fully vaccinated and not fully vaccinated cohorts.

Table 7. COVID-19 Vaccination status among tested participants.

		Fully vaccinated	Not fully vaccinated
Testing status	Tested positive for COVID-19	284 (9.26%)	869 (9.28%)
	Tested negative for COVID-19	2,784 (90.74%)	8,494 (90.72%)
	Total	3,068	9,363

Table 8 depicts COVID-19 vaccination rates by age group. Three age groups (0-4, 5-9, and 10-14) were combined to avoid low subject numbers. Despite having a smaller population size overall, the older age group (15-19) showed more vaccinated subjects across four out of the five mental health cohorts compared to the younger age group (0-14). There is an exception in the ADHD mental health cohort, where the fully vaccinated percent was 48.02% for the 15-19 age group and 51.98% for the 0-14 age group. Overall, the depression cohort contained the most fully vaccinated subjects (n = 395; 74.11%) across the 15-19 age group. The ADHD cohort contained the most fully vaccinated subjects (n = 210; 51.98%) among the 0-14 age group. The autism mental health cohort was the most prevalent not fully vaccinated (91.43%) cohort in the 0-14 age group.

Table 8. Pediatric cohort volume by age group (V = Fully Vaccinated; NV = Not Fully Vaccinated).

	Total	Anxiety		ADHD		ASD		Depression		OCD	
		V	NV	V	NV	V	NV	V	NV	V	NV
0 - 14	17,133 (77.64%)	189 (32.81%)	651 (76.59%)	210 (51.98%)	841 (88.62%)	43 (44.33%)	320 (91.43%)	138 (25.89%)	210 (47.84%)	20 (36.36%)	31 (72.09%)
15 - 19	4,933 (22.36%)	387 (67.19%)	199 (23.41%)	194 (48.02%)	108 (11.38%)	54 (55.67%)	30 (8.57%)	395 (74.11%)	229 (52.16%)	35 (63.64%)	12 (27.91%)
Total	22066	576	850	404	949	97	350	533	439	55	43

Table 9 shows COVID-19 vaccination rates by sex. The male and female distribution was 49.53% male and 50.47% female. Females showed higher fully vaccinated values in the anxiety, depression, and OCD cohorts. When looking at the greatest difference in vaccination status comparing the male and female cohorts, ASD showed the largest percentage of not fully vaccinated pediatric males (77.71%). For females, the highest unvaccinated group compared to males was the depression cohort, where 61.28% of the overall unvaccinated depression cohort was female.

Table 9. COVID-19 Vaccination rates by sex (V = Fully Vaccinated; NV = Not Fully Vaccinated).

		Anxiety		ADHD		ASD		Depression		OCD	
	Total	V	NV	V	NV	V	NV	V	NV	V	NV
Male	11,140 (49.53%)	223 (38.72%)	426 (50.12%)	239 (59.16%)	680 (71.65%)	67 (69.07%)	272 (77.71%)	155 (29.08%)	170 (38.72%)	24 (43.64%)	26 (60.47%)
Female	10,934 (50.47%)	353 (61.28%)	424 (49.88%)	165 (40.84%)	269 (28.35%)	30 (30.93%)	78 (22.29%)	378 (70.92%)	269 (61.28%)	31 (56.36%)	17 (39.53%)
Total	22,074	576	850	404	949	97	350	533	439	55	43

Table 10 shows the COVID-19 vaccination rates by ethnicity. The Hispanic or Latino population represented 31.60% of the total population and the non-Hispanic or Latino population represented 68.40% of the total population. The anxiety and depression cohorts were the most likely to be fully vaccinated (34.89% and 34.06%, respectively) among the Hispanic or Latino population. The ADHD cohort contained the highest number of not fully vaccinated subjects (n = 294; 32.38%) in the Hispanic or Latino population.

Table 10. COVID-19 Vaccination rates by ethnicity (V = Fully Vaccinated; NV = Not Fully Vaccinated).

		Anxiety		ADHD		ASD		Depression		OCD*	
	Total	V	NV	V	NV	V	NV	V	NV	V	NV

Hispanic or Latino	6,315 (31.60%)	194 (34.89%)	292 (35.65%)	121 (30.71%)	294 (32.38%)	25 (25.77%)	111 (33.13%)	173 (34.06%)	146 (34.93%)	16 (29.63%)
Non-Hispanic or Latino	13,670 (68.40%)	362 (65.11%)	527 (64.35%)	273 (69.29%)	614 (67.62%)	72 (74.23%)	224 (66.87%)	335 (65.94%)	272 (65.07%)	38 (70.37%)
Total	19,985	556	819	394	908	97	335	508	418	54

* In the not fully vaccinated for COVID-19 status section, the OCD testing data are redacted due to low profile numbers.

Discussion

Across the 22,074 total individuals included in the COVID-19 pediatric dataset, there is a noticeable difference in the number of fully vaccinated subjects (5,002; 22.66%) compared to those who are not fully vaccinated (17,072; 77.34%) (Table 3). This observation aligned with vaccination trends across other demographics. When looking at age groups, there were larger not fully vaccinated values across all mental health cohorts in the 0-14 age group (Table 8). This was not the case across the 15-19 age group, where fully vaccinated values were overall greater than not fully vaccinated values in the same mental health age group cohort. Some reasons that might explain this include the COVID-19 vaccine rollout schedule first being available to older pediatric groups. It is also possible that caregivers for younger adolescents are not aware of the potentially severe symptoms from COVID-19 as a child.

Sex was also an indicator that someone might be more likely to get vaccinated. Vaccination rates were higher among the female population across anxiety, depression, and OCD. The anxiety cohort had the largest number of females (n = 777; 54.49%) with 353 vaccinated females (61.28%) (Table 9). The ADHD cohort had the largest number of males across all mental health cohorts and had a high not fully vaccinated rate (n = 680; 71.65%). Hispanic or Latino participants had lower fully vaccinated percentages across all mental health cohorts (Table 10).

Overall, this information could be used to target populations who are known as less likely to receive vaccinations and partner with healthcare professionals or caretakers to recommend vaccination among these groups.

Acknowledgments

De-identified data for this analysis were provided by the Rhode Island Department of Health (RIDOH) and the Rhode Island Quality Institute (RIQI), which operates CurrentCare, the RI statewide Health Information Exchange (HIE). Technical support was provided by Michelle Torti, CPHIMS, Senior Manager, Data & Product Support at RIQI. The project described was supported by Institutional Development Award Number U54GM115677 from the National Institute of General Medical Sciences of the National Institutes of Health, which funds Advance Rhode Island Clinical and Translational Research (Advance RI-CTR). The content is solely the responsibility of the authors and does not necessarily represent the official views of RIDOH, RIQI, and the National Institutes of Health. The work was conducted using computational resources and services provided by the Center for Computation and Visualization at Brown University.

Chapter 4: Discussion and Conclusion

This research aimed to increase knowledge and awareness of the Rhode Island (RI) high needs pediatric population in relation to COVID-19 vaccination and testing. Currently, there is limited research that captures the sentiments from the high needs pediatric community. In addition, COVID-19 vaccination data and testing trends that are widely available often do not report on various high needs mental health cohorts. The results from this research offer unique qualitative and quantitative insights that could inform interventions that improve COVID-19 vaccination and testing access for this vulnerable population.

First, this research explored potential barriers and facilitators to COVID-19 vaccine uptake in Rhode Island's high needs pediatric population. Guided by the Consolidated Framework for Implementation Research (CFIR), the qualitative analysis determined key themes across the Rhode Island Parent Information Network (RIPIN) focus groups. These themes provided insight to the limitations that exist for members of the RI high needs pediatric population related to COVID-19 vaccination. Second, the quantitative analysis of the COVID-19 pediatric dataset provided a view of the COVID-19 vaccination and testing trends across the total pediatric population, five mental health cohorts (anxiety, ADHD, ASD, depression, and OCD), and three demographics (age group, sex, and ethnicity).

Through the qualitative analysis, the results showed that a significant driver of receiving the COVID-19 vaccine for a high needs child was the perception or belief that vaccination uplifts communities as whole. Another primary driver to pursue vaccination for a high needs child was the psychological safety that the vaccine provided for many parents or caretakers. Significant barriers that existed across focus group participants was the large mistrust of the vaccine, either due to lack of trust in the governing bodies that promoted the COVID-19 vaccine or in the safety of the vaccine. Next, there was also confusion around the effectiveness of the vaccine. Participants shared personal accounts of contracting the SARS-CoV-2 virus despite receiving the vaccination, leading to personal perceptions that vaccinating their child might have little benefit or that the vaccine was not effective given it did not fully prevent infection. Finally, participants noted that the COVID-19 guidance and administration seemed to follow a "one size fits all" approach, noting a lack of personalized information or resources for the high needs community.

Looking at the overall vaccination rates across the pediatric population, the findings from the quantitative analysis show that the majority are not fully vaccinated. Across the total

COVID-19 pediatric dataset (n = 22,074), the number of not fully vaccinated subjects was more than three times larger than the fully vaccinated group [fully vaccinated subjects (n = 5,002; 22.66%); not fully vaccinated (n = 17,072; 77.34%)]. When looking at age groups, the results of this research found that age was a large indicator of the likelihood of a child being fully vaccinated for COVID-19. The 0 - 14 age group showed lower values for fully vaccinated subjects in every mental health cohort. This differs from the vaccination trends observed in the 15 - 19 age group, where each mental health cohort showed greater numbers of fully vaccinated subjects compared to the not fully vaccinated condition (Table 8). There are two potential reasons for the clear difference in vaccination uptake between the older age group and younger age group: (1) the varying approval times of the COVID-19 vaccine rollout to the pediatric population, where older children could receive the vaccine earlier than their younger counterparts; (2) parents or caretakers not recognizing the vaccination protection and benefits for the younger age groups. The rollout of the COVID-19 vaccine for the pediatric population was approved at different time points in the pandemic, with the 16 and older age group approved for emergency use authorization (EUA) in December 2020, 12 - 15 age range in May 2021, the 5 - 11 age range in November 2021, and the 6 month to 5 years old age range in June 2022.²³ Given the state of the pandemic, the later release and approval of the COVID-19 vaccine for younger age groups might have influenced parents or caretakers to not vaccinate their child based on their perceived improvements towards a “return to normal”. There was not a slight distinction for vaccination uptake based on sex. Females outpaced males for higher percentages of fully vaccinated subjects in the anxiety (61.28%), depression (70.92%), and OCD (56.36) mental health cohorts (Table 9).

When looking at ethnicity, Hispanic or Latinos represented 31.6% of the overall pediatric population. Overall, the Non-Hispanic or Latino subjects (68.40%) showed higher percentages of vaccinated subjects across all mental health cohorts (Table 10). Overall, this research aligns with national studies looking at the Hispanic or Latino population in comparison to the Non-Hispanic or Latino population. Similar to the results in this research, external data shows that members of the Non-Hispanic or Latino community are more likely to become infected with SARS-CoV-2, which puts them at higher risk to develop a potentially serious health effect.²⁴ There is opportunity to increase the vaccine uptake rates in Hispanic or Latino communities through a local community approach to build trust and remove concern about government intentions.

Future Opportunities

Given the heightened health considerations of the high needs pediatric community, it is critical that vaccination information specific to the high needs community is readily available to parents or caretakers. The insights from both the qualitative and quantitative arms of this research could inform future implementations strategies. Potential future public health efforts to address the barriers to COVID-19 vaccination among the RI high needs population include clarifying the vaccine's safety and testing process, including what personal protections the vaccine offers (e.g., hospitalization rates will decrease significantly). The CDC notes that protection from infection declines over time, which could inform the recommendation for a child's immunization strategy.²⁵ Next, more specific knowledge resources for the high needs community would benefit community members.

Future opportunities for research into the barriers and facilitators and COVID-19 vaccination and testing trends across the RI high needs pediatric community include using a formal method to combine the qualitative and quantitative results.²⁶ Mixed methods approaches

integrate qualitative and quantitative work to achieve greater insights. The exploratory sequential design defines a process to combine the methods based on the qualitative data that were collected in the focus group portion of the research (Figure 2). Applying this method in the future would help analyze the quantitative data in relation to the qualitative focus group data. This approach could help glean more targeted quantitative outputs that support statements or themes from the qualitative methods and analysis.



*Figure 2. Mixed Methods Research Design titled Exploratory Sequential Design for Combining Qualitative and Quantitative Methods.*²⁷

Another opportunity to further this research involves the Expert Recommendations for Implementing Change (ERIC) tool to recommend implementation strategy based on the selected CFIR constructs. The CFIR-ERIC implementation strategy tool generates the potential implementation strategies based on 73 pre-defined implementation methods.²⁸ The use of this tool could produce interesting recommendations that can be used to address the COVID-19 vaccine uptake barriers observed in the RI high needs pediatric population.

Strengths and Limitations

Strengths of this study include the direct interaction with the focus group participants through the RIPIN community focus group sessions. The focus groups completed in partnership with project team members offered a valuable forum to interact with participants that had a direct relationship or experience with the RI high needs pediatric community. The participants were engaged in the discussion groups and each focus group followed a standardized questioning

format that covered topics related to COVID-19 vaccine and testing (Table 1). All sessions were conducted through Zoom, making it a safe way to engage during the COVID-19 pandemic. Another strength was the extensive COVID-19 vaccination data available through the COVID-19 pediatric dataset collected. The dataset provided concrete values to compare different cohorts. Through the COVID-19 pediatric dataset, the demographic and mental health cohorts were also identified among the broader pediatric dataset, offering a valuable look at the volume and disparities among certain cohorts.

Limitations of this research include the format and timeframe of the analysis. This qualitative analysis was conducted over Zoom and recorded, which might have made some participants less interested in speaking freely about their experiences and perceptions about the pandemic. The focus groups were conducted through RIPIN, which is a strong partner and community network for the high needs community in Rhode Island. The participant recruitment and data collection for the qualitative work could be expanded to other high needs parent groups or included other interview sessions offering perspectives from community facilitators (e.g., physicians, teachers, counselors) to get a more holistic view of barriers and facilitators in COVID-19 vaccination uptake and testing. Finally, there were some limitations with the Hispanic and Latino demographic dataset, which did not match the overall COVID-19 pediatric totals observed. This occurrence might have changed the totals reported in the Latino or Hispanic community and improved the conclusions drawn from the analysis.

Conclusion

This research shed light on an under-researched vulnerable population in RI. The qualitative and quantitative work provided valuable information around community sentiment and vaccine uptake related to COVID-19. The findings show that there are meaningful

opportunities to increase vaccination rates in the high needs pediatric population through targeted information, improved vaccine administration efforts, and emphasis on the protection offered through the COVID-19 vaccine. These future efforts could help build trust and remove barriers to vaccination uptake in this community, which in turn will address improved health outcomes for the high needs pediatric community in RI.

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Appendix

Table 11. Selected Quotes from RIPIN Focus Groups corresponding to Qualitative Themes.

Theme	Quote
THEME I: Each child is different and there are multiple factors at play when considering the health and stability of the child’s condition.	“My daughter has special needs. She also has epilepsy, so when we were getting her vaccine, her doctor said that the vaccine might trigger a seizure for her. We struggled with that. Wanting to get her the vaccine but then worrying if a seizure was going to come on from that. Then we did end up getting her the vaccine...”
	“We were also boosted earlier than we probably should have been because he was going into his chemo treatment and they wanted him boosted before that.”

THEME 2: Societal feeling and community moral influenced one's opinion about the COVID-19 vaccine and the decision to vaccinate their child.	<i>"My daughter is not vaccinated and I don't plan on getting her vaccinated anytime soon. She's nonverbal, she's not cognitively aware enough to be able to tell me if something is wrong with her internally and everything is basically a guessing game for me... For me getting her vaccinated, it was, I think there's too many variables at that point."</i>
	<i>"I have one child that is vaccinated because she needed it to go to a program, but my other child is on the spectrum. She refused to -- it's so hard for her to do needles and the stuff... I left it as their choice at this point, which I'm not even sure if that's the correct thing to do."</i>
	<i>"We all got vaccinated and my whole family. Most of us got our boosters...I think once we got vaccinated, I felt a little bit more at ease about not wearing the masks."</i>
	<i>"If you have the option to protect yourself, you should do it and help protect others, because I have compromised children in the house, too, and just the people around me...It's just like, 'If I can add that extra layer of protection, why shouldn't I?'"</i>
	<i>"Like I said, it's to protect others, not just ourselves."</i>
	<i>"I had to coax her into it. What kid wants to sit there and watch a shot happen? My thought process was I was going to do what I could to keep her safe."</i>
	<i>"We have not been vaccinated, we'll not be vaccinated because of the pressure and the risks from the government not taking accountability for the side effects."</i>
	<i>"My four-year-old, currently she's now six, she is my autistic ADHD child...I do have one immuno-compromised child that's my youngest. I was nervous about him, but overall, I was like, it is what it is....They used so much fear and so much scare tactics that you still have people three years later going, "Oh my gosh, I can't go out, I can't do this, I can't--" Enjoy your life."</i>

Theme 3: The COVID-19 vaccine benefits for adults and children were unclear to some participants in addition to a belief that the COVID-19 deployment and immunization handling lacked a personalized approach for vulnerable pediatric populations.	<i>"Myself and my kids, we have all been vaccinated. We did it at Walgreens. It was an okay process...not something I would love to do again, I prefer to go to my doctor or at least for my kids, because I don't think the pharmacists were prepared for that. Their bedside manner is lacking."</i>
	<i>"I didn't want my children to be vaccinated because kids are actually doing pretty well getting COVID. They're not as at risk. I mean, unless they have underlying health issues, which mine don't and we don't know to a certain degree, the side effects for the COVID vaccines for the kids."</i>
	<i>"I know many people that were really sick with the vaccine, and everybody I know that's had COVID had the vaccines. I don't think it does anything to help you."</i>
	<i>"I am vaccinated. My kids are partially vaccinated. We had gone and gotten vaccinated, and within the three weeks before they went back to get vaccinated, they got COVID. Then it was at a time where I felt like things were kind of settling down, we didn't go back and they didn't get their second or their boosters."</i>
	<i>"People with disabilities are vulnerable, and there just needed to be a lot more consistency...everything was one size fits all."</i>
THEME 4: Communication dissemination and news effectiveness played a large role in individual trust for the vaccine.	<i>"Initially, we were following the CDC, and then to a certain degree, certain things that they said then they backtracked, and then this... you were just listening to one train of thought. Now we're getting more information, which is good and people can make more of a choice or an informed decision."</i>
	<i>"Well, if I go to the doctor's office, I always get information from the doctors because usually the doctors get the information before we do."</i>
	<i>"I don't trust the government so we're not vaxxed."</i>
	<i>"I don't want any more resources, I don't want to hear another word about it, honestly. I don't trust anything I read anymore. You got to be so selective about which channels you turn it to."</i>