IMPROVING PEDIATRIC PROVIDER CONFIDENCE IN INFLUENZA VACCINES AT A RURAL HEALTH CENTER

UNIVERSITY OF HAWAIʻI AT MĀNOA NANCY ATMOSPERA-WALCH SCHOOL OF NURSING

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Abstract

Influenza (flu) is a highly contagious and highly preventable respiratory illness, and children younger than five years old are especially susceptible to complications from the flu. Vaccination remains the most effective way to prevent the flu, but vaccine hesitancy remains one of the biggest barriers to flu vaccine acceptance. This paper studied the effect of flu vaccine education on provider confidence at a rural primary care clinic. Educational video about flu vaccine safety and effectiveness with recommendations about patient education was presented to eight health care providers at a rural clinic. Two surveys evaluated the change in provider confidence levels in flu vaccines before and after this education. Survey results suggested the increase in mean scores of provider confidence in flu vaccine safety and effectiveness, as well as increase of confidence level to provide recommendations about flu vaccine. A 3% increase in pediatric flu vaccine uptake rates was also noted in the first quarter of 2024, however that result was not statistically significant due to limitations. The small convenient sample of eight participants and diverse levels of education in health care staff limited the generalizability of the results. Despite having some limitations, this cost-effective educational intervention has a potential for future sustainability to benefit the clinic staff and the patients at the clinic and in the community.

Table of Contents

List of tables in appendices

List of figures in appendices

Improving Pediatric Provider Confidence in Flu Vaccines at a Rural Primary Care Clinic

Influenza (flu) is a highly contagious viral respiratory illness that can result in serious health complications, especially in vulnerable populations including young children, the elderly, pregnant women, and people with certain existing chronic medical conditions like asthma, diabetes, and heart disease (American Academy of Pediatrics [AAP], 2023). According to Lomte (2023), the 2022-23 flu season was rated as highly severe among adolescents and children, with more hospitalized unvaccinated pediatric patients compared to previous years. Additionally, during this time influenza-related medical visits, hospitalizations, and deaths were noted to be higher in children under five years of age (Lomte, 2023). According to the Centers for Disease Control and Prevention (CDC)(2023a), 106 pediatric flu-related deaths were reported during the 2022-23 influenza season, 80% of children who died from flu were not fully vaccinated and most were eligible for immunization, and 41 were under 5 years old (CDC, 2023a).

"Children younger than 5 years, and especially those younger than 2 years, are at an increased risk for hospitalization and complications due to influenza" (AAP, 2023, High-Risk Groups in Pediatrics, para. 1). "Hospitalization rates of children with influenza are the highest in those younger than 5 years of age, especially in those who were born preterm or near term" (AAP, 2023, Introduction, para. 1). That is why preventing flu is so important in communities.

The keystone of influenza prevention is vaccination (Kilbourne, 2006). Flu vaccine has been used in the United States (U.S.) since the 1930s and has been shown to be safe in all individuals without contraindications ages 6 months and older (World Health Organization, n.d.-a). Flannery et al. (2017) found that the overall effectiveness of the flu vaccine against death was 65% in children without high-risk conditions and 51% in children with high-risk conditions. The

CDC currently recommends a yearly flu vaccine to everyone 6 months of age and older as the first and most important step in protecting against flu viruses (CDC, 2023d). While the flu vaccine may not prevent illness entirely, it does however still reduce the severity of illness (CDC, 2023d).

Flu season is the time of the year when flu rates are the highest and typically runs between October through May (CDC, 2023d). American Academy of Family Physicians (AAFP) (2023) recommends that "influenza vaccine dose(s) should be received by the end of October for optimal protection during the flu season." CDC (2023e) notes that the "national flu vaccination coverage for children 6 months - 4 years of age is 40.5%" as of November 2023. Healthy People 2030 target is to have "70% flu vaccine coverage in the U.S." (Office of Disease Prevention and Health Promotion, n.d.).

Hawaii State Department of Health (2023), in its Week 36 of 22-23 influenza report, states that there were at least 4 influenza-associated pediatric deaths in Hawaii. At the end of the 2022-23 influenza season, flu immunization coverage in Hawaii in children 6 months - 4 years of age was 69.4%, compared to US coverage of 65.6% (CDC, 2021a).

Background

Federally Qualified Health Centers (FQHCs) are the backbone of America's primary care as they provide affordable care to over 28 million medically underserved individuals (National Association of Community Health Centers, 2019). Waimanalo Health Center (WHC), one of two FQHCs located on Oahu's Windward side, primarily serves the underserved populations of Waimanalo, Kailua, and Kaneohe - areas with healthcare provider and service shortage (Bureau of Health Workforce, n.d.).

Waimanalo area consists of two Census Designated Places (CDPs). In 2021, Waimanalo CDP had over 6,000 residents, with 44% multi-ethnic and 29% Hawaiian/Pacific Islander (Census Bureau, n.d.). Only 16% of the population had a bachelor's degree or higher and about 10% lived below the poverty line (Census Bureau, n.d.). Waimanalo Beach CDP had over 4,800 residents with 26% having a bachelor's degree (Census Bureau, n.d.).

Additionally, many underserved patients who moved out of the area continued their established relationship with WHC. As an FQHC, WHC provides health services regardless of insurance status including free immunization for ages 0-18 through Vaccine for Children (VFC) program, serving over 1,400 pediatric patients. WHC reported annually on vaccination measures via the Uniform Data System (UDS).

One of the reported UDS measures specifically involves children ages 2 and under who received age-appropriate immunizations. This measure includes all routine childhood vaccines and 2 influenza vaccines received by a child's second birthday (Bureau of Primary Health Care, 2022). Health Resources and Services Administration (HRSA) considers a childhood immunization measure to be a Clinical Quality Measure (CQM) based on which additional grant funding can be provided to the clinic (National Association of Community Health Centers, 2019).

In November 2023, WHC served about 150 pediatric patients ages 0-2 years of whom 93 were eligible to receive flu vaccine, and influenza vaccine uptake was 41.1%.

Problem Statement

Children are at an increased risk for flu-related complications, hospitalization, and death. Children also play a pivotal role in flu virus transmission to their household and community members (AAP, 2023). Many families in Waimanalo live in multigenerational homes with the

elderly caring for their grandchildren and great-grandchildren. An under-vaccinated child who becomes ill with flu may infect their caregivers who are also at a high risk for flu-related complications.

Most pediatric patients at WHC qualify to receive free Vaccines for Children (VFC) because they have QUEST insurance or are uninsured. WHC receives updated flu vaccines from DOH annually beginning each August. Despite the availability of free vaccines at WHC, many caregivers decline the flu vaccine for their children for various reasons.

To address missed immunizations in pediatric patients at WHC, a nurse or MA performs monthly vaccination recalls during which the parent or guardian is notified that their child is due for immunizations. The vaccine catch-up appointments are offered and scheduled during such calls. Immunization status is always checked at every type of pediatric appointment during the check-in process and recommended vaccines are offered. WHC also participates in data sharing with the Hawaii Immunization Registry, and all providers and medical staff use it to review patient immunization status if the vaccination record is unavailable.

Currently, healthcare staff at WHC, including physicians, nurse practitioners, registered nurses, and medical assistants, do not routinely receive specific on-site training regarding flu vaccines. However, Medical Assistants (MAs) and MA apprentices are checked off on their immunization administration competency. Registered Nurses (RNs) working at the clinic are baccalaureate-educated and are assumed to know safe vaccine administration practices.

Review of Literature

Search Strategy

The following scientific databases were utilized: PubMed and Cochrane Database Library. In PubMed and Cochrane MeSH subject headers “influenza, human”, “Vaccines”,

"health knowledge, attitudes, practice", "clinical competence", "health personnel", and "vaccination hesitancy" were utilized. The search was enhanced by using subject headers "health care providers", "pediatric", "medical assistants", "nurses", "physicians", "influenza", and "education". Reference mapping was also utilized to assist with retrieval of relevant articles.

The hierarchy of evidence in medical research was used to determine the level of evidence of selected articles (see Appendix A).

Barriers to Immunizations.

Less than ideal uptake of immunization by children and adults, and the significance of missed immunizations to their health have prompted multiple research studies to understand the causes of this phenomenon. Esposito et al. (2014) identified three main types of barriers to vaccination: health system barriers, parental barriers, and provider barriers.

Health System Barriers

Cost, ability to safely store vaccines, and vaccine supply chain problems are existing barriers relevant to all clinical settings. However, programs like VFC, which are sponsored by the Department of Health, allow clinics to maintain their full vaccine stock and offer age-appropriate immunizations to all eligible patients for free. The availability of a system that collects vaccination information within the state and shares the data with providers allows for a better assessment of a patient's immunization status. Medical homes are optimally suited to address missed opportunities for immunization by offering continuous and accessible care (Esposito et al., 2014).

Parental Barriers

WHO designated vaccine hesitancy as one of the 10 leading threats to global health (World Health Organization, n.d.-b). According to Kempe et al. (2020), 1 in 15 US parents are

hesitant about routine childhood immunizations, and 1 in 4 are hesitant about influenza vaccine. Furthermore, 1 in 8 parents have concerns about vaccine safety, and only 1 in 4 believe that influenza vaccine is effective (Kempe et al., 2020). Esposito et al. (2014) identify lack of knowledge, fear of adverse effects, and transportation and economic issues as the main parental barriers to immunization. Paterson et al. (2016) note that the lack of trust between patient and provider can also result in significant vaccine refusal. Lafnitzegger and Gaviria-Agudelo (2022) state that parental concerns about vaccine safety and effectiveness are common, adding that some parents have incorrect beliefs about vaccines causing the actual illness and that their children were receiving too many vaccines. Nekrasova et al. (2020) highlight the fact that some parents who agreed for their children to receive one dose of flu vaccine but declined the second recommended dose due to inaccurate beliefs about the seriousness of influenza disease.

Provider Barriers

According to Esposito et al. (2014) & Paterson et al. (2016), multiple factors contribute to provider vaccine hesitancy: lack of knowledge about vaccination, increased workload, and limited healthcare resources. Paterson et al. (2016) note that providers who are more confident about vaccines are more likely to recommend them. According to Suryadevara et al. (2015), pediatric provider vaccine hesitancy is under-recognized, and some providers have unfounded concerns about vaccine safety and believe that vaccines can cause autism and can overwhelm the immune system if administered with other vaccines. Suryadevara et al. (2015) further state that 5% of surveyed providers did not routinely recommend flu vaccines and only about 16% believed that influenza vaccine was safe, while 30% believed that flu vaccine was effective. In addition, Lafnitzegger and Gaviria-Agudelo (2022) also note that up to 6% of pediatric providers are vaccine-hesitant. Hargreaves et al. (2020) state that deviation from the recommended

vaccination schedule due to parental request to limit the number of vaccinations given at each visit often results in significant vaccination nonadherence. A strong and consistent provider message during each visit is necessary to address underimmunization (Hargreaves et al.,2020).

Vaccine Safety: Facts and Public Perceptions.

Influenza vaccine is safe to use in children and adults without contraindications. According to CDC (2023c), hundreds of millions of Americans have received flu vaccine in the last 50 years. Gidengil et al. (2021) in their systematic review found routine vaccines to be safe across populations and that serious adverse side effects were rare. The Advisory Committee on Immunization Practices (ACIP) recommends administering inactivated flu vaccine at the same time or sequentially with other live or inactivated childhood vaccines (American Academy of Family Physicians [AAFP], 2023). AAFP (2023) further specifies that co-administration of two live vaccines is safe either at the same time, or, otherwise, 4 weeks apart. Walter et al. (2020) state that vaccine co-administration is a safe practice that can reduce the number of patient visits and the chance of missed vaccinations. Walter et al. (2020) found that delaying flu vaccine administration after receiving DTaP and PCV13 vaccines did not reduce the occurrence of post-immunization fever in pediatric patients. Bonanni et al. (2023) also recommend vaccine co-administration, when not specifically contraindicated, as an effective way to improve vaccination coverage. CDC (2023b) recommends simultaneous vaccine administration as a safe practice that can ensure that a person is fully vaccinated at the appropriate time. Furthermore, CDC (2021b) also recommends the flu vaccine to patients who have a mild illness such as fever, runny nose, cough, or ear infection, and advises that vaccines do not make symptoms of illness worse.

Strategies for Increasing Childhood Influenza Vaccination

While the evidence strongly supports the safety and effectiveness of influenza vaccines, achieving higher rates of pediatric flu vaccine uptake should be a priority. This requires addressing of multiple barriers to vaccination: parental vaccine hesitancy, access to health services and geographic location, staffing, vaccine supply, immigrant populations, local laws, social media content, and existing knowledge about vaccines (Esposito et al., 2014).

Patient Education

Parent education about the flu vaccine helps increase vaccine acceptance in their child (Scott et al., 2019). When addressing vaccine hesitancy, a multimodal and tailored approach is recommended. Lafnitzegger & Gaviria-Agudelo (2020) recommend passive education and one-on-one sessions tailored to the specific community. Lafnitzegger & Gaviria-Agudelo (2020) emphasize that healthcare providers are among the most trusted sources of vaccine information for parents, and a strong provider recommendation can influence vaccine-hesitant parents. The opinion of other healthcare staff, such as nurses and medical assistants, is also valued (Lafnitzegger & Gaviria-Agudelo, 2022). Maintaining an open dialog between provider and patient and using a non-confrontational way of sharing evidence helps building trust and guides parents to choose vaccinations wisely (Lafnitzegger & Gaviria-Agudelo, 2022). Tokish and Solanto (2020) state that a motivational interview that considers parental values and concerns while empowering them to make an informed decision is more likely to succeed with vaccine-resistant parents. Importantly, providers who use strong presumptive language while offering vaccines may help result in a higher vaccine acceptance rate, while still allowing the opportunity for a dialog with patients and promoting trust (Paterson et al., 2016). In addition to educating parents and families, ensuring that healthcare professionals themselves are well-informed and confident about vaccines is crucial for improving vaccination uptake.

Provider education

To address gaps in vaccine education for healthcare professionals, several recommendations have been proposed. Expressing concerns about inadequate vaccination training in medical curricula, Lanza et al. (2023) emphasized the need for healthcare professionals to receive better education on this topic. They also suggest implementing courses on vaccines and vaccinology at medical and nursing schools. Continuing education of medical professionals is also crucial for deepening medical professionals' knowledge and improving their confidence in vaccines (Lanza et al., 2023). Suryadevara et al. (2015) recommend peer-to-peer education to address providers' personal vaccine concerns and misconceptions and review information about vaccine safety and importance. They suggest that peer education may be more effective in reducing provider vaccine hesitancy than passive educational methods.

Summary of Recommendations for Addressing Parental Vaccine Hesitancy

To improve vaccine uptake and address hesitancy, AAP (2023) advises that providers should offer strong presumptive influenza vaccine recommendations at each type of visit and use a consistent message about the vaccines among the members of the care team. AAP (2023) also recommends bundling the influenza vaccine recommendation with other vaccines and using any patient contact as an opportunity to offer immunization, even if the patient has a mild illness. AAFP (2023) further reassures that egg allergy is no longer a contraindication to receiving the flu vaccine, and patients with egg allergy should receive flu vaccine that is otherwise appropriate for their age. Lafnitzegger & Gaviria-Agudelo (2020) offer multiple communication strategies with vaccine-hesitant parents, including active listening and motivational interviewing when addressing parental concerns about vaccines. The authors also emphasize the importance for

healthcare professionals to obtain knowledge about common vaccine myths and be able to confirm or refute the accuracy of that information to patients.

Summary of Evidence

After conducting an extensive review of the literature, it became apparent that the existing knowledge is strongly supporting multi-component interventions when addressing immunization barriers (Lafnitzegger & Gaviria-Agudelo, 2022; Lanza et al., 2023; Nekrasova et al., 2020; Paterson et al., 2016; Scott et al., 2019). However, the evidence also highlights the gaps in knowledge about effective ways to improve pediatric immunization rates. None of the reviewed studies demonstrated any harm from any of the interventions alleviating safety concerns about conducting this DNP project. Importantly, evidence supports that provider vaccine hesitancy is an underestimated barrier and should be addressed to improve immunization acceptance (Esposito et al, 2014; Hargreaves et al. 2020; Lafnitzegger & Gaviria-Agudelo 2022; Suryadevara et al. 2015). The summary of this literature review underscores the need for multi-faceted interventions to improve pediatric influenza vaccination rates, particularly those that target provider knowledge and attitudes. Building on this evidence, this DNP project aims to improve pediatric provider confidence about flu vaccines.

PICOT

PICOT Question: Will providing influenza vaccine education to healthcare staff at a rural primary care clinic improve healthcare provider confidence in influenza vaccines compared with the current standard of care?

Purpose and Objectives

The purpose of this evidence-based practice project was to implement a pediatric clinic staff education regarding flu vaccines to improve provider confidence when giving immunization recommendations to patients and families.

The objectives of this project were to provide a one-time 15-minute provider education to two pediatric physicians, two pediatric clinic MAs, two pediatric registered nurses, and two pediatric clinic MA apprentices. The education was provided asynchronously due to scheduling conflicts. The narrated PowerPoint presentation was emailed to providers and staff. The educational content included information on overall influenza vaccine hesitancy, and flu vaccine safety and recommendations. It briefly discussed the recommended influenza vaccine schedules, explained the benefit of multiple vaccine coadministration, provided tips about effective communication with parents using motivational interviewing strategies, and emphasized the importance of a consistent message among the health care team. The goal was for providers to review the information in the video and to complete two surveys. The information from the surveys provided insight into provider flu vaccine confidence levels and practice issues affecting the immunization rates at WHC.

Framework

The Iowa Model was selected as a theoretical model for the implementation and dissemination of evidence-based practice (EBP) quality improvement (QI) projects. It was developed by nurses in the 1990s to promote quality care. Iowa Model was based on Roger's theory and was widely used in evaluating and applying research findings in patient care (Buckwalter et al., 2017). The Iowa Model was last revised in 2015. The strengths of the Iowa model, as highlighted in Titler (2007), are that it approaches EBP from a systems or organization

perspective rather than from the perspective of an individual provider and it emphasizes the need to pilot the EBP in the setting in which the practice will be used.

Utilizing the Revised Iowa Model

According to Buckwalter et al. (2017), the following seven steps are included in the Revised Iowa Model:

- Identifying a triggering issue
- Stating the question
- Forming a team
- Appraising the evidence
- Designing and piloting the practice change
- Integrating the change into practice
- Disseminating the results

To facilitate this project, the Iowa Model steps were followed to synthesize evidence and to implement changes in the pediatric clinic at WHC. The triggering issue of declining vaccine uptake at the clinic was brought up by the content expert who had extensive knowledge of the Waimanalo community and this health center. As an organizational leader, the content expert approved the implementation of this QI project at WHC. Further, the issue was also discussed with the WHC pediatrician, who agreed with the significance of it for the clinic and the patients.

The PICOT question was approved by the project team, which included the project chair, a content expert, and the third reader. The University of Hawaii at Manoa librarian aided with the literature search. The quality and quantity of evidence were evaluated according to the seven levels of evidence illustrated in Grove et al. (2019) (see Appendix A). Risks to patients and the

organization were evaluated and none were found. Based on the reviewed evidence about vaccine hesitancy and strategies to address it, an evidence-based intervention was selected and approved for implementation by the project committee.

A logic model (see Appendix B) was used to guide project planning, implementation, and evaluation. The piloting of this QI project was conducted in January- February 2024. The data was collected and analyzed in February-March 2024. The project poster (see Appendix H) was used as a dissemination tool and was presented at the 2024 Nancy Atmospera-Walch School of Nursing (NAWSON) Poster Festival and at the clinic. The annual poster festival, held at the University of Hawaii at Manoa, invites nurses from local organizations to share their research.

Methods

Project Design

The project was designed based on the clinic's needs and was guided by the current literature evidence. AAP (2023) and CDC (2023b) recommend influenza immunization to all pediatric patients ages 6 months and older who do not have contraindications. The Iowa Model used in this project, utilized evidence to make changes in the entire healthcare system. For this project, the focus was on provider education to influence patient outcomes. The project was implemented at the rural pediatric clinic and was limited to healthcare workers involved in direct patient care: MAs, MA apprentices, RNs, and pediatric providers.

Evidence from research showed that provider vaccine hesitancy can impede immunization rates (Esposito et al., 2014, Hargreaves et al, 2020, Lafnitzegger & Gaviria-Agudelo, 2020, and Paterson et al., 2016). Confident providers, a consistent message among the healthcare staff, and knowledge about motivational interviewing tactics can help improve influenza vaccine uptake (Lafnitzegger & Gaviria-Agudelo, 2022 & Lanza et al.,

2023). This QI project was focused on the delivery of education to providers and staff at the rural pediatric clinic to improve their confidence when discussing influenza vaccine concerns with vaccine-hesitant parents.

The pre-recorded voiceover PowerPoint video (see Appendix E) focused on local and national statistics of influenza disease burden, influenza vaccine recommendations, and flu vaccine safety and efficacy. The presentation discussed the main parental reasons for vaccine hesitancy and provided information about effective ways to conduct motivational interviewing and convey strong recommendations for receiving influenza vaccine.

Pre- and post-implementation surveys were completed by all participants to evaluate the baseline attitudes and effectiveness of this intervention (see Appendices C&D). Survey questions were adapted from Suryadevara et al. (2015) but were not tested for reliability or validity. Pre-implementation survey consisted of 15 questions that evaluated responders' baseline attitudes.

This QI project did not satisfy the definition of the research which is "… a systematic investigation, including development, testing, and evaluation, designed to develop or contribute to generalizable knowledge…" (Steneck, 2007). Thus, this project did not need IRB approval.

The performance of interest was provider confidence scores in influenza immunization. Personal data of patients or clinic staff was not collected. UH Manoa Human Studies Program (n.d.) worksheet 301 was completed and it was confirmed that this QI project did not meet the definition criteria for human subjects or research study.

Setting

This QI project took place at a FQHC in Waimanalo, Oahu which served about 150 pediatric patients under two years of age as of November 2023. One full-time pediatric

physician and one family medicine physician, two medical assistants, two registered nurses, and two medical assistant apprentices participated.

During the usual check-in process, the MA or RN informed parents of the recommended immunizations for their child(ren). Upon completion of the check-in, the MA/RN let the provider know if the parent has agreed to receive the immunizations. The provider addressed the parental concern about the immunizations during the visit and sent the orders electronically. The MA/RN received the orders and administered the vaccines after the provider had completed the visit. The MA/RN offered the Vaccine Information Statement (VIS) folder to parents or printed the VIS pages for parents upon request. Additionally, the RN or MA printed a monthly list of patients who were delinquent with their immunizations and called parents to offer a vaccine catch-up visit or a well-child visit (WCV) if the patient was due.

Intervention

Eight members of the pediatric clinic staff agreed to participate in this QI project. In January 2024, the participants were informed by email about the QI project and that their participation was voluntary. The Google Forms pre-survey (see Appendix C) was emailed during the third week of January 2024. During the last week of January 2024, provider education materials (see Appendix E & F) were emailed, with a reminder email to watch the video sent on Thursday. During the first week of February, a Google Forms post-survey (see Appendix D) was emailed, with a reminder email to complete it sent on Thursday. All eight participants completed all three parts of the intervention, resulting in a 100% participation rate.

Data Collection

The main interest of this QI project was to provide pediatric healthcare clinic staff with brief education about flu vaccines and to evaluate if the effectiveness of the education. Pre- and

post-surveys were adapted from Suryadevara et al. (2015); however, no information about the reliability and validity of survey questions was available.

Data collection was done retrospectively in March 2024. Pre-survey responses to Questions 1-11 & 15 gave qualitative data about common trends and attitudes toward flu vaccines. Responses to Questions 12, 13, and 14 in the pre-survey provided numerical measures on a scale of 1-4 evaluating the level of confidence in flu vaccines (Table 1G & Figure 2G). Questions 12, 13, & 14 from the pre-survey are repeated as Questions 2, 3, and 4 in the post-survey, measuring the level of confidence on a scale of 1-4 (Table 1G & Figure 2G). No personal information about providers, clinic staff, or patients was collected in this QI project. In addition to the data obtained from surveys, quality measure data related to childhood influenza immunization were retrieved from WHC Quality Reporting System (Azara).

Analysis

Data obtained from pre- and post-surveys were analyzed using Google Forms and Microsoft Excel software. All participants (100%) responded to the surveys and confirmed that they had watched the narrated educational PowerPoint video. Quantitative data, including Likert scale responses, were analyzed using descriptive statistics, such as mean scores and percentages (see Appendix G). Mean scores were used instead of median scores due to the small sample size and the relatively normal distribution of Likert scale responses without outliers. The qualitative data from the presurvey was analyzed for common themes in provider responses regarding flu immunization in pediatric patients at WHC. Data from Azara were reviewed and analyzed separately and helped to supplement the understanding of the impact of this project on the childhood influenza immunization rates at WHC.

Results

Provider education intervention was held in January-February 2024 with a total of eight participants including two physicians, two registered nurses, two medical assistants, and two medical assistant apprentices. The pediatrician saw pediatric patients at the clinic full-time five days a week, and the family practice physician covered in pediatric clinic one afternoon each week. Registered nurses, medical assistants, and medical assistant apprentices completed their training in the pediatric clinic process, and at least two of the above-mentioned healthcare staff assisted the physician during the clinic hours. The intervention included pre- and post-surveys, one narrated PowerPoint presentation video, and one supplemental patient education handout. The intervention was completed over three weeks.

The main interest of this project was to evaluate the effect of education on pediatric provider confidence. Mean scores were obtained to quantify the change in confidence level before and after receiving provider education with a maximum possible confidence score of 4. A positive change in provider flu vaccine confidence mean scores was noted (see Table 1G & Figure 2G). Mean confidence scores to recommend flu vaccine and to discuss flu vaccine concerns with families have increased from 2.65 to 3.5 before and after the intervention respectively. Providers' mean confidence scores in flu vaccine safety for patients ages 2 and younger increased from 3.125 to 3.625 before and after intervention. And, finally, providers' mean confidence scores about flu vaccine effectiveness increased from 2.875 to 3.625 in pre-and post-survey.

In addition to quantitative data, the presurvey evaluated qualitative data, which included provider flu vaccine attitudes and perceived barriers to immunization at WHC. Before the intervention, all participants (n=8) routinely offered flu vaccine to all eligible patients. One participant (n=1) reported seeing serious side effects from the vaccine, and several (n=3) thought

that flu vaccines "maybe" caused autism, febrile seizures, and Guillain-Barre syndrome (see Figure 3G). None of the participants (n=0) thought that multiple vaccine coadministration reduced the effectiveness of vaccines, but some (n=3) believed that it could overwhelm the infant's immune system. All participants encountered vaccine-hesitant parents “daily” or “sometimes”, and two (n=2) considered themselves as “maybe” vaccine-hesitant before intervention. Participants agreed that parents were most frequently concerned about flu (n=4) and COVID-19 (n=7) vaccines. Parents' religious preferences, fear of side effects, fear of multiple vaccine coadministration, and the lack of school requirements for flu immunization were named among the most common flu vaccine barriers. More than half (n=5) of the participants agreed that they needed more training regarding flu vaccine to improve their level of confidence.

The postsurvey also evaluated the qualitative data about the usefulness of provided education (see Figure 4G), 100% of participants agreed that the education they received helped them improve their level of confidence in flu vaccines, and most (n=7) participants stated that they were open to receiving additional training and resources on vaccination in the future.

Discussion

The purpose of this QI project was to improve confidence levels in flu vaccines among healthcare staff at a rural pediatric clinic. WHC pediatric flu vaccine rates of about 40% were below the national goal of 70%, prompting the need for a QI project. The literature review identified multiple barriers to immunization, including health system barriers, and flu vaccine hesitancy in both parents and providers. Kempe et al. (2020) emphasized that one in four parents were hesitant about flu vaccines, one in eight had concerns about flu vaccine safety, and only one in four believed that the flu vaccine was effective. Suryadevara et al. (2015) found that providers also had incorrect beliefs about flu vaccines thinking that they could cause autism and

overwhelm an infant's immune system if administered concomitantly with other vaccines. Furthermore, only 16% of surveyed providers believed that the flu vaccine was safe, 30% believed that it was effective, and 6% considered themselves vaccine hesitant. The flu vaccine is safe and effective in preventing influenza and related complications and death. Offering strong presumptive recommendations by confident providers and staff may help improve immunization uptake.

Concurring with literature review findings, provider vaccine hesitancy, and patient vaccine hesitancy were identified as relevant barriers to immunization at WHC. Pre-survey revealed that some providers (n=3) at WHC had inaccurate beliefs about flu vaccines causing autism and febrile seizures and that they could overwhelm infants' immune system when co-administered with other vaccines (see Figure 3G). The presurvey also revealed that some (n=2) WHC providers considered themselves as “maybe” vaccine-hesitant, and the mean score of confidence in vaccine safety was 3.125, and confidence in vaccine effectiveness was 2.875, which aligns with the results of the literature search.

Additionally, WHC quality measure data was accessed to analyze the flu immunization status of pediatric patients ages two and younger in March 2024 (see Figures 5G & 6G). Interestingly, in the first quarter of 2024, there was a 3% increase in flu vaccine immunization status from December 2023 through March 2024 (see Figure 5G). In patients ages two and younger who received at least one flu shot, flu vaccine uptake in March 2024 increased by 7%, compared with March 2023 (see Figure 6G). However, this data could be incidental and may not be used to draw conclusions about correlation with this QI project. Overall pediatric flu immunization rates at WHC continued to remain below the national goal of 70%. The data

obtained in this project was useful for understanding of the problem of underimmunization at WHC. It is also important to examine the strengths and limitations of the project itself.

Strengths

Participation in this QI was voluntary, anonymous, and not incentivized. The surveys and the education video were created with the provider's workload in mind and were no longer than 15 minutes long. In addition, giving providers one week to complete each stage of the project eliminated added workload stress. Providers and staff had extensive experience and knowledge of the community and their survey responses gave valuable information that could potentially help with planning future QI projects at this facility.

Limitations

This QI project had several limitations that should be considered. First, it involved a small convenient sample without randomization, limiting the ability to interpret the results statistically or generalize findings to a wider population. The sample size (n=8) was insufficient for statistical analysis.

Another limitation was the variability of education levels and roles among the participants. Staff with lower levels of education may have benefited more from this educational intervention compared to providers with advanced degrees.

Additionally, the short timeframe of intervention made it difficult to assess its true effect on vaccine uptake. Flu vaccination rates fluctuate seasonally, with higher uptake rates seen mostly in the fall and early winter. Conducting intervention during months with lower vaccine uptake may not accurately capture true immunization trends over a longer period.

Implications

Despite the project limitations, the results offer valuable insight for enhancing provider flu vaccine confidence. With around 30 health care professionals involved in patient care employed at the health center during this project, many could potentially benefit from receiving similar education. This intervention may be impactful in family practice settings, where pediatric patients are often seen, and adult patients often bring children to their appointments. Confident and knowledgeable providers in these settings can also help improving pediatric flu vaccine acceptance.

The future efforts to improve provider vaccine confidence could consider incorporating a more engaging, animated content into the educational video. The improvements to educational content may cater to the diverse learning styles within the audience. The focus of this project was on pediatric immunization which is a high-priority public health issue, emphasizing the potential for continued implementation and lasting impact on community health outcomes. This initiative allowed for demonstration of key competencies aligned with the DNP Essentials.

DNP Essentials

The Association of Colleges of Nursing (AACN) (2021) defined 10 DNP Essentials:

Domain 1: Knowledge for Nursing Practice. Nursing knowledge of the nature and prevention of infectious diseases, the magnitude of influenza in the US and the state of Hawaii, and the immunization schedules helped build a strong foundation for this project.

Domain 2: Person-Centered Care and Domain 3: Population Health. The knowledge of patient demographics as well as the knowledge of pediatric population specifics were utilized to make this project applicable to the setting. The ultimate idea of the project was to improve the community health in this rural area.

Domain 4: Scholarship for Nursing Discipline. A scientific process was utilized to obtain evidence-based information supporting the practice change. The Iowa Model served as the theoretical framework to develop and implement this project.

Domain 5: Quality and Safety and Domain 7: System-Based Practice. Evidence-based knowledge was utilized to promote the safety of the QI project for patients at the health center. The potential for sustainability may benefit the entire health center when applied to a wider audience.

Domain 6: Interprofessional Partnerships and Domain 9: Professionalism. Including participants who played various roles in patient care helped the project stay bias-free and revealed data valuable to understanding the issue of influenza vaccine uptake.

Domain 8: Informatics and Healthcare Technologies. Utilizing various available resources to search for knowledge, as well as to create the project content was integral to the process.

Domain 10: Personal, Professional, and Leadership Development. One of the roles of a nurse practitioner is to participate in research. This project was done to address a high-priority issue at a healthcare facility. The completion of it promoted the DNP student's personal and professional growth and provided an opportunity to improve nursing leadership skills.

By fulfilling the key competencies across DNP Essentials domains, this QI project aimed at improving provider confidence in flu vaccines demonstrates the important role of the DNP-prepared nurse in promoting population health through evidence-based practice.

Conclusion

Children younger than five years of age are at an increased risk of flu complications and death, making flu vaccine a crucial preventive measure for this vulnerable population. While the

flu vaccine is safe and effective in preventing flu disease and related complications, suboptimal vaccination rates persist in many communities.

Rural medical clinics are sometimes the only places where the medically underserved population can receive medical care and immunization. Multigenerational families from Waimanalo often attend appointments together, creating perfect opportunities to provide immunization to all eligible family members. However, provider and patient hesitancy and knowledge gaps can impede these efforts. Evidence shows that knowledgeable, confident providers are more likely to recommend flu vaccines to patients and to establish trust with patients and caregivers.

To address the issue of a less-than-ideal flu vaccine uptake, this QI project implemented a brief educational intervention aimed to improve flu vaccine knowledge and confidence among the pediatric clinic staff at WHC. Survey responses indicated a positive impact of education on providers' self-reported flu vaccine confidence levels. Providers also expressed openness to receiving additional future vaccine-related training, indicating the potential for sustained educational efforts.

By improving provider knowledge and confidence, this project holds promise for improving flu immunization rates among pediatric patients served by WHC. Confident, well-informed providers are better positioned to have impactful conversations, address concerns, build trust, and improve vaccine acceptance in this rural community.

While this QI project had several limitations as discussed, it provided valuable insights into the educational approach to improve immunization rates at WHC. Continued sustainable intervention tailored to diverse learning needs of healthcare providers could help improve

community health outcomes. The positive impact of this project indicates the potential for broader implementation of similar initiatives to address vaccine hesitancy in other settings.

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Appendix A

Levels of Evidence and Number of Relevant Articles

Level of Evidence	Number of Articles
Level I: Systematic Reviews and Meta-analysis	3
Level II: Experimental design (RCT)	3
Level III: Quasi-experimental design	1
Level IV: Case-controlled, longitudinal studies, qualitative meta-synthesis	2
Level V: Correlation studies, cohort studies	1
Level VI: Descriptive studies, qualitative studies	3
Level VII: Authority opinion or expert committee reports	1
Other: Performance improvement, case reports, literature review, etc.	2
Total Number of Articles	16

Note: Adopted from: Grove et al. (2014).

Appendix B

Logic Model

Inputs	Outputs: Activities	Outputs: Participants	Short Outcomes	Medium Outcomes	Long Outcomes
Time: Program Delivery January-February 2024	Staff and providers participated in Google Forms Pre-implementation Survey in January 2024	One Pediatrician, one family medicine provider, 2 MAs, 2 MA apprentices, and 2 RNs	Increases staff and provider confidence when providing influenza vaccine education to parents of pediatric patients	Increased incidence of staff and providers offering flu vaccine to pediatric patients	Decreased vaccine hesitancy in the community
Time: Content expertise by Pediatrician, Project Chair, Content Expert, Third Reader	Educational PowerPoint was emailed to staff and providers in January 2024		Increased staff understanding of the burden of influenza in US and in Hawaii	Increased flu vaccine uptake, increased parent trust in provider and staff, improved parent satisfaction	Implementation of mobile or vaccine only clinic in Waimanalo during flu season
Equipment: computer, printer	Staff and providers participated in Google Forms Post-Implementation Survey in January 2024		Increased staff understanding about flu vaccine safety and effectiveness	Improved workflow in pediatric clinic when ordering and administering flu vaccine, implementation of flu vaccine standing order	Implementation of standardized all staff and provider education regarding flu vaccine in children and adult patients at WHC
Stakeholders: WHC pediatric clinic	Data from 2 surveys was collected		Decreased flu vaccine hesitancy in staff and providers	Improved UDS measure for pediatric immunization which can allow WHC to better meet HRSA requirements	

Appendix C

Pre-implementation Survey Questions

1. What is your role at the clinic?
    a. Provider
    b. MA
    c. MA apprentice
    d. RN
2. Do you offer influenza vaccine to all eligible patients?
    a. Yes
    b. No
    c. Not always
3. Do you see serious side effects from influenza vaccines in your patients?
    a. Yes
    b. Sometimes
    c. Never
4. Do you believe that some vaccines cause autism, febrile seizures, cause Guillain-Barre syndrome?
    a. Yes
    b. No
    c. Maybe
5. Do you believe that multiple vaccine administration reduces the effectiveness of the vaccines?
    a. Yes

   b. No
   c. Maybe

6. Do you believe that administering multiple vaccines at a single visit overwhelms the infant's immune system?
   a. Yes
   b. No
   c. Maybe
7. How often do you encounter vaccine hesitant parents?
   a. Every day
   b. Sometimes
   c. Rarely
   d. Never
8. Do you consider yourself vaccine hesitant?
   a. Yes
   b. No
   c. Maybe
9. Which vaccines are parents mostly concerned about?
10. Think about your practice and select the most common influenza vaccine barriers:
    a. Parents' religious preference
    b. Parents' fear about side effects
    c. Parents' concerns about having multiple shots (too many shots)
    d. Parents' incorrect beliefs that vaccines cause autism, asthma, illness, or mercury poisoning

e. Your own vaccine concerns
f. Your own concerns about multiple vaccines co-administration and possible side effects
g. Inefficient clinic workflow
h. Frequent staff shortage
i. Long appointment time
j. Mild illness in pediatric patients
k. History of egg allergy
l. Flu shots are not mandated for school attendance
m. Other

11. Do you think that having an influenza vaccine standing order at your clinic could help improve the vaccine uptake in pediatric patients?
    a. Yes
    b. No
    c. Maybe
12. How confident are you to give recommendations and to discuss concerns about influenza vaccine with pediatric patients?
    a. 1(not confident) →2→3→4(very confident)
13. How confident are you that influenza vaccine is safe to pediatric patients ages 2 and under?
    a. 1(not confident) →2→3→4(very confident)
14. How confident are you about influenza vaccine effectiveness?
    a. 1(not confident) →2→3→4(very confident)

15. Do you feel that you need more training about influenza vaccine to help you feel more confident about it?
    a. Yes
    b. No
    c. Maybe

Note: Adapted from Suryadevara et al., 2015

Appendix D

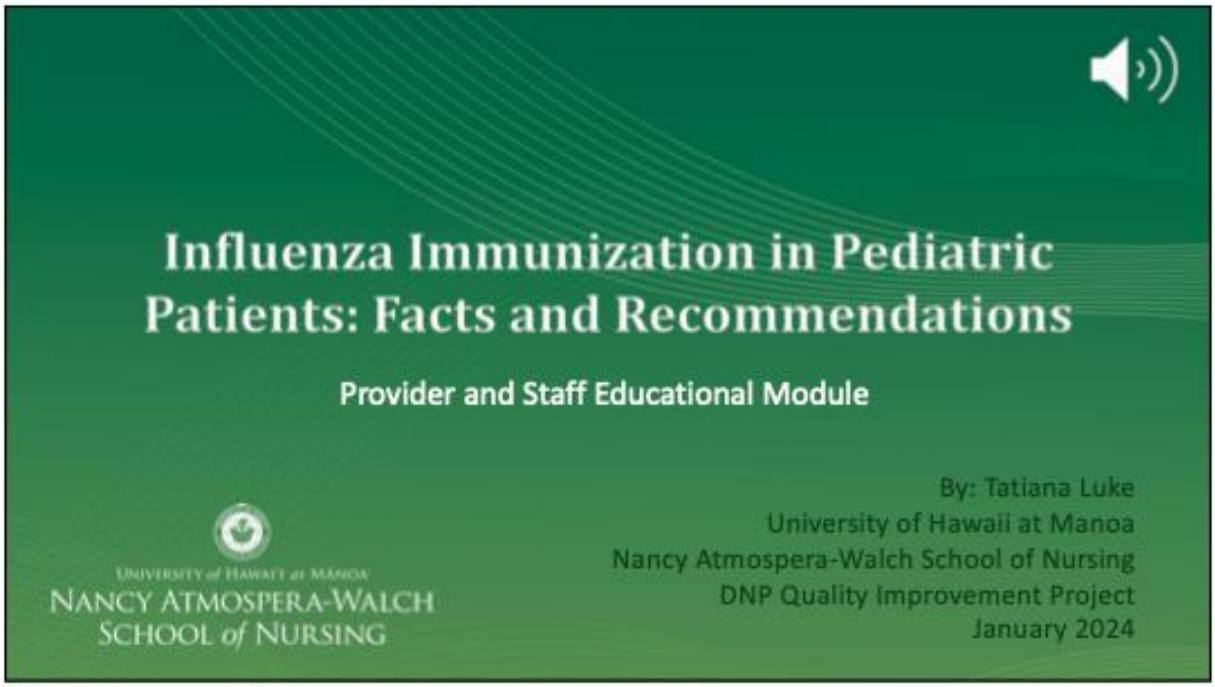
Post-implementation Survey Questions

1. What is your role at the clinic?
    a. Provider
    b. MA
    c. MA apprentice
    d. RN
2. How confident are you to give recommendations and to discuss concerns about influenza vaccine with pediatric patients?
    a. (not confident) →2→3→4(very confident)
3. How confident are you that influenza vaccine is safe to pediatric patients ages 2 and under?
    a. 1(not confident) →2→3→4(very confident)
4. How confident are you about influenza vaccine effectiveness?
    a. 1(not confident) →2→3→4(very confident)
5. Did the training you received help you feel more confident about the influenza vaccine?
    a. Yes
    b. No
    c. Maybe
6. Will you be open to receive additional education and resources on vaccination in the future?
    a. Yes
    b. No

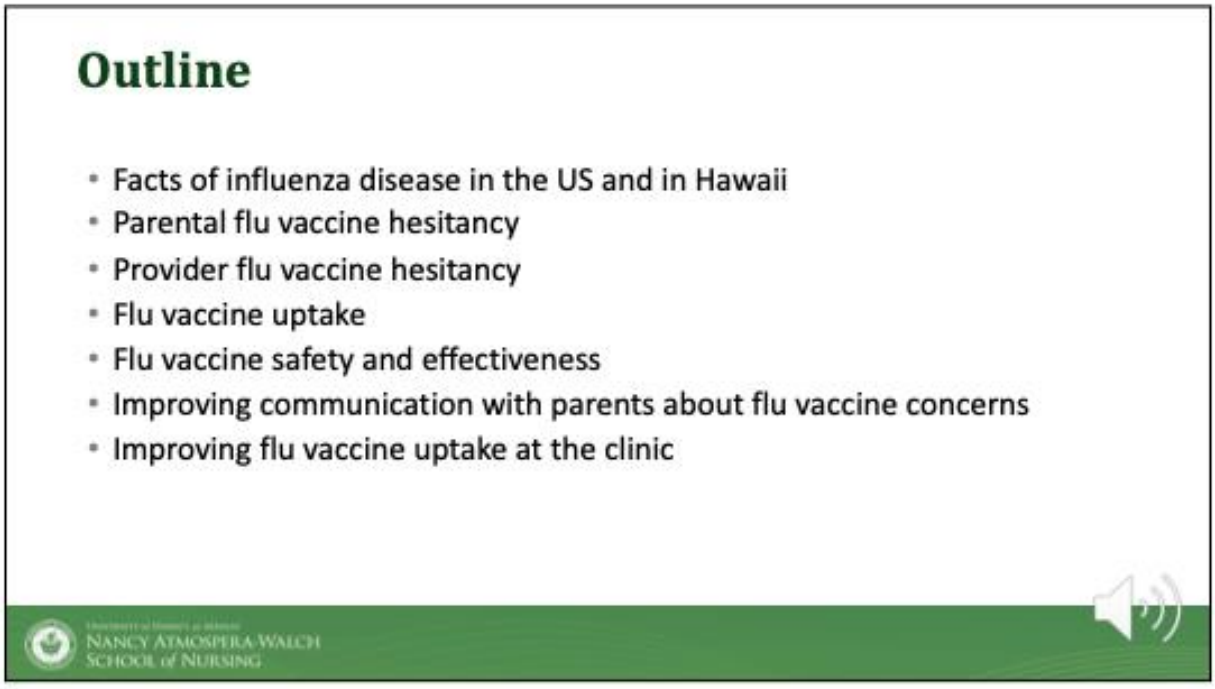
c. Maybe

Appendix E

Provider Education PowerPoint Slides



1

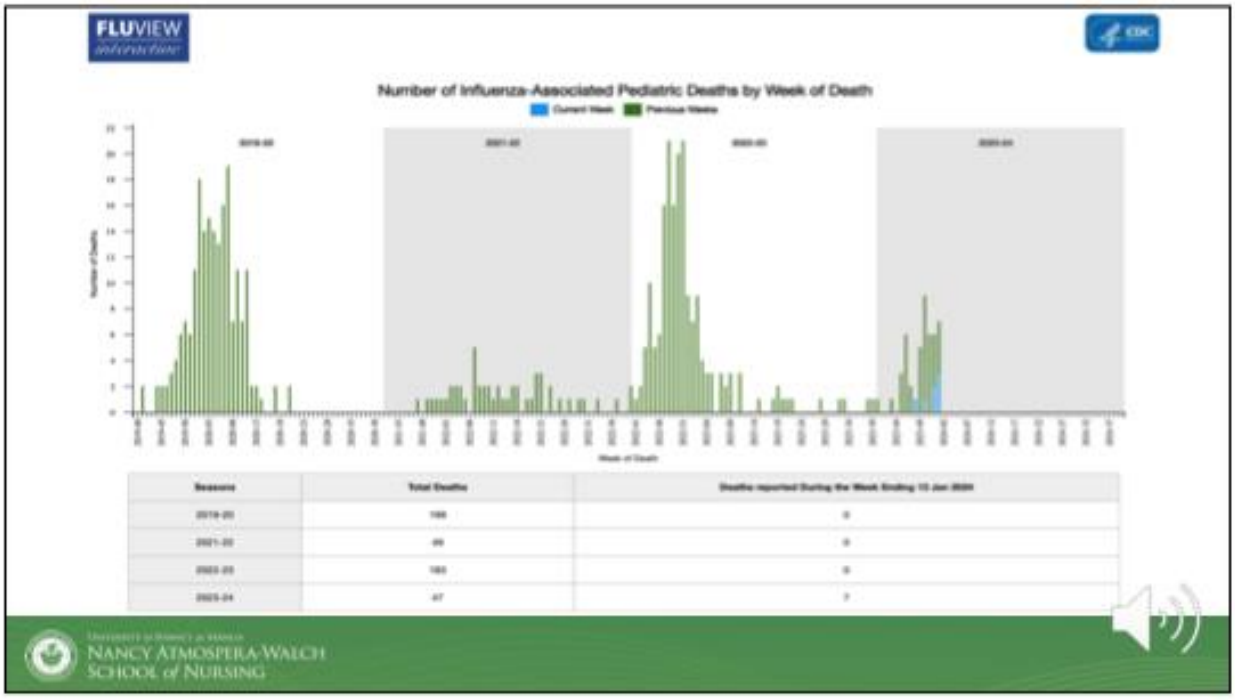


2

Facts:

- Children <5 years old and especially < 2 years old are at increased risk for hospitalization and death due to influenza
- 183 pediatric deaths occurred from flu during 2022-23 flu season (CDC)
- 80% of children who died from flu have not been fully vaccinated
- Not all flu related deaths are captured and the numbers are underestimated
- 4 influenza-associated pediatric deaths occurred in Hawaii during 2022-23 flu season
- 1 influenza-associated pediatric death occurred in Hawaii durring 2023-2024 flu season

3



4


State of Hawai, Department of Health
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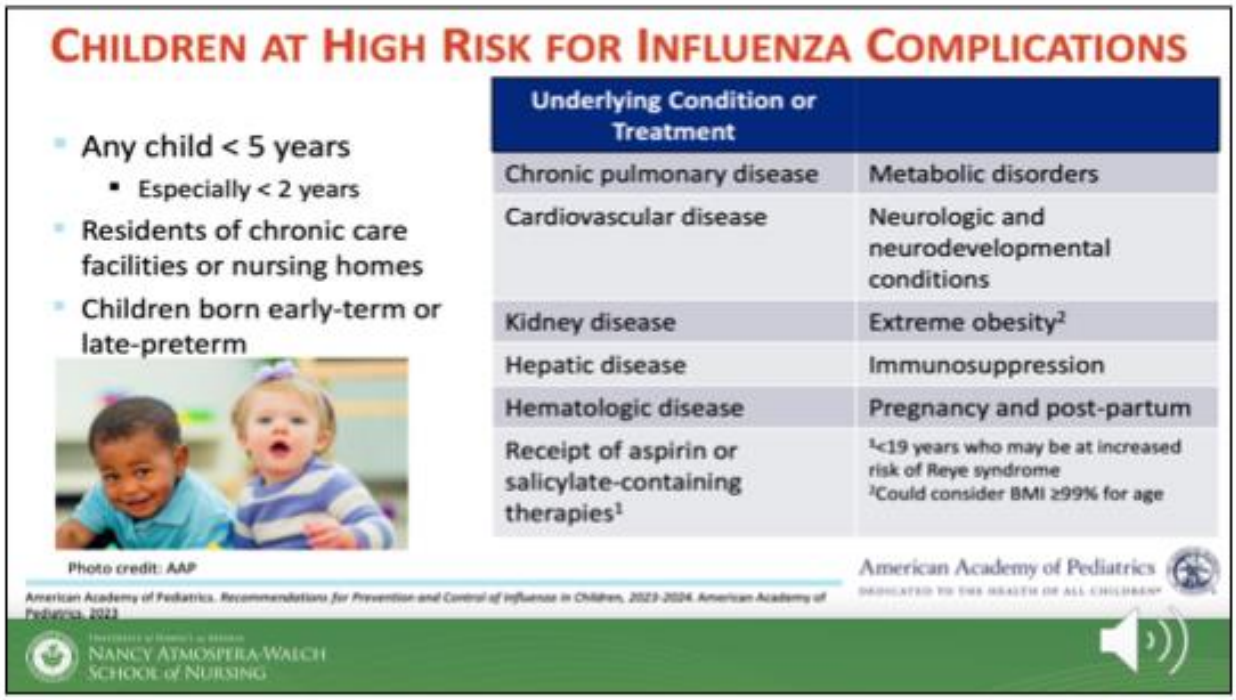
DEPARTMENT OF HEALTH ANNOUNCES FIRST HAWAI'I PEDIATRIC INFLUENZA-ASSOCIATED DEATH OF THE 2023-24 SEASON
Posted on Jan 16, 2024 in Newsroom
HONOLULU – The Department of Health (DOH) announced today the first influenza-associated death in a Hawai'i resident under the age of 18 during this influenza, or flu season. The child was an O'ahu resident. Out of respect for the family's privacy, no further information about the child is being released.
"We are always especially saddened to announce the death of a child in our community. Our thoughts and condolences are with the family at this difficult time," said Dr. Kenneth Fink, Director of Health. "If you or your loved ones have not received the flu vaccine this season, I hope you will consider doing so."
Hawai'i has seen a rise in flu cases in recent weeks in combination with rising RSV cases and continued COVID-19 activity. Unlike flu activity in other states, flu transmission in Hawai'i is observed year-round.
Recent studies have shown that flu vaccination decreases the risk of severe disease, emergency department visits, hospitalization, and death. Everyone six months and over can receive an influenza vaccine at pharmacies, clinics, or healthcare facilities. A list of COVID-19 and flu vaccination locations can be found at https://www.vaccines.gov/. DOH encourages anyone who is not up to date, or is unsure whether they are up to date, to consult with a pharmacist or healthcare provider about getting vaccinated.
Image from Health.Hawai.gov
NANCY ATMOSPERA-WALCH SCHOOL of NURSING

5


CHILDREN AT HIGH RISK FOR INFLUENZA COMPLICATIONS
Any child < 5 years
Especially < 2 years
Residents of chronic care facilities or nursing homes
Children born early-term or late-preterm
Photo credit: AAP
Underlying Condition or Treatment
Chronic pulmonary disease
Metabolic disorders
Cardiovascular disease
Neurologic and neurodevelopmental conditions
Kidney disease
Extreme obesity[2]
Hepatic disease
Immunosuppression
Hematologic disease
Pregnancy and post-partum
Receipt of aspirin or salicylate-containing therapies[1]
[1]<19 years who may be at increased risk of Reye syndrome
[2]Could consider BMI ≥99% for age
American Academy of Pediatrics
American Academy of Pediatrics. Recommendations for Prevention and Control of Influenza in Children, 2023-2024. American Academy of Pediatrics, 2023
NANCY ATMOSPERA-WALCH SCHOOL of NURSING

6

What About Aunties, Uncles, and Tutus?

- Multigenerational houses in Waimanalo- a sick child can infect everyone in the house
- Those who are 65 years and older are also at an increased risk
- Hawaiian and other Pacific Islanders, and Hispanic populations are at increased risk

NANCY ATMOSPERA-WALCH SCHOOL of NURSING

7

HEALTH DISPARITIES AND INFLUENZA

This Photo by Unknown Author is licensed under CC BY-NC

Hospitalization rates higher in Black, Hispanic, American Indian/Alaska Native and Asian/Pacific Islander children

Rate of in-hospital death is 3- to 4-fold higher in Black, Hispanic, and Asian/Pacific Islander children compared with white children.

O'Halloran AC et al. JAMA Netw Open. 2021;4(8):e2121880

American Academy of Pediatrics

NANCY ATMOSPERA-WALCH SCHOOL of NURSING

8

Morbidity from Influenza in Hospitalized Children

- Flu-related complications in children under 5 years of age:
  - Pneumonia
  - Dehydration
  - Worsening of chronic conditions
  - Brain dysfunction
  - Sinus problems and ear infections
- 20% require ICU care
- 17% with pneumonia
- 5% require mechanical ventilation
- 8-10% experience neurologic complication
- 0.5% die

9

Why Parents Don't Vaccinate Their Children?

- 1 in 15 US parents are hesitant about routine childhood vaccines
- 1 in 4 are hesitant about **flu** vaccines
- 1 in 8 are concerned about safety of **flu** vaccines
- Only 1 in 4 believed that **flu** vaccine is effective
- Many have inaccurate vaccine beliefs
- Many do not trust their provider

10

Provider Flu Vaccine Hesitancy

- 6% pediatric providers are vaccine hesitant
- 5% providers do not routinely recommend flu vaccines
- About 16% believe that flu vaccines are safe
- 30% believe that flu vaccines are effective
- Some providers believe in myths that vaccines cause autism or can overwhelm child's immune system if coadministered with other vaccines
- Providers who are knowledgeable and confident about the vaccines are more likely to recommend vaccination

11

Flu Vaccine Uptake

- Flu vaccine remains the most effective way to prevent influenza related complications and death
- National uptake of influenza vaccine was 51.8% in 2022-23 Flu season
- At **WHC only 17% of children are up to date** with all their recommended shots by their second birthday
- **23 of 93 (24.7%)** pediatric patients under 2 years old received recommended 2 doses of influenza vaccine at WHC (November, 2023)
- As of note, AAP recommends to have all patients vaccinated against flu by the end of October of each year to achieve optimal protection during flu season

12

Flu Vaccine Safety

- Flu vaccines approved in the US are **safe** and hundreds of millions of Americans received flu vaccines in the past 50 years without complications
- **Coadministration** of flu vaccines with other vaccines is safe
- Mild illness is not a contraindication and child can receive flu vaccine if they have: **Low grade fever, cold, runny nose, cough, ear infection, or mild diarrhea** (vaccines do not make the illness worse)
- Postpone immunisation when patients have **moderate and severe illness**
- **Contraindications**: severe allergic reaction to previous dose, Guillain-Barre syndrome within 6 wks after previous dose of flu vaccine

Egg Allergy

People with egg-allergy **may** receive any influenza vaccine (egg- based or non-egg based) that is otherwise appropriate for their age and health status; additional safety measures are no longer recommended

How Many Shots Can Be Administered on the Same Day?

- The risk of febrile seizures when PCV13 and flu vaccine coadministration is very small and ACIP recommends them administered concomitantly (WHC is no longer offering PCV13)
- All types✶ of vaccines can be administered at the same visit (separate injections by 1-inch)
- There is no upper limit to how many vaccines can be given at the same visit
- At WHC Inactivated Influenza Vaccine is used

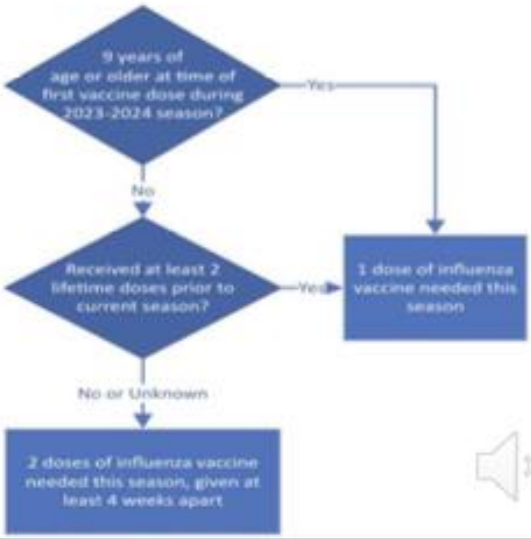
✶ rare exception with live vaccines and other conditions (see CDC, 2023b)

Flu Vaccine is Effective

- 65% effectiveness in children without high-risk conditions
- 51% effectiveness in children with high-risk conditions
- Children with who received flu vaccine are 50% less likely to have an emergency room visit and 70% less likely to be hospitalized.
- Every child 6 months of age and older without contraindications should receive 1-2 doses of influenza vaccine

How Many Doses Do My Patients Need?

- Must be at least 6 months of age to be eligible for influenza vaccine
- Two doses is required for children less than 9 years of age who never received flu vaccine or only received one dose prior to current season.



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17

STRATEGIES FOR INCREASING INFLUENZA IMMUNIZATION:
PROVIDER / CARE TEAM

Photo Credit: Heather Hazzan, *SELF Magazine*

- Offer a strong, presumptive recommendation
- Bundle recommendation for influenza vaccine with recommendations for other needed vaccines
- Use consistent messaging across care team members
- Identify influenza champions

American Academy of Pediatrics
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18

How Do I Talk About Flu Vaccine With My Patients?

- Don't ask if they want a vaccine, instead, say "Your child will be receiving 3 vaccines today, do you have any questions?"
- Be prepared for visit by checking immunization status of all patients in advance
- Be knowledgeable about common myths and side effects(see handout) and act confident
- Reassure parents that side effects are expected and last for only 1-2 days
- Be honest and be a good listener when parents talk about vaccine concerns
- Ask if everyone in the family received their flu vaccine

19

Address Your Own Vaccine Concerns

- Be curious and try understanding your own vaccine reservations and seek evidence (immunize.org, CDC.gov)
- Talk to senior colleagues if need reassurance
- Talk to supervisors if clinic workflow prevents timely vaccine administration
- Ask for help with shots and patient education from colleagues if clinic is very busy
- And just try your best

20

Strategies for Increasing Influenza Immunization: Practice/Health System

Photo Credit: Heather Hazzan, *SELF Magazine*

- Review influenza vaccination status at all visits
- Bundle influenza vaccine with other needed vaccines
- Vaccinate at all visit types
- Vaccinate in all healthcare settings
- Increase access to influenza vaccine (eg, expanded hours, vaccine-only clinic)
- Provide evidence-based information to patients and families (eg, office-based educational handout)

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21

Flu Vaccine Common Misconceptions (Patient Handout)

Common Misconceptions About the Flu Among People Who Work in Child Care Settings

Get your flu vaccine today!

Note: The National Institute for Occupational Safety and Health (2013)

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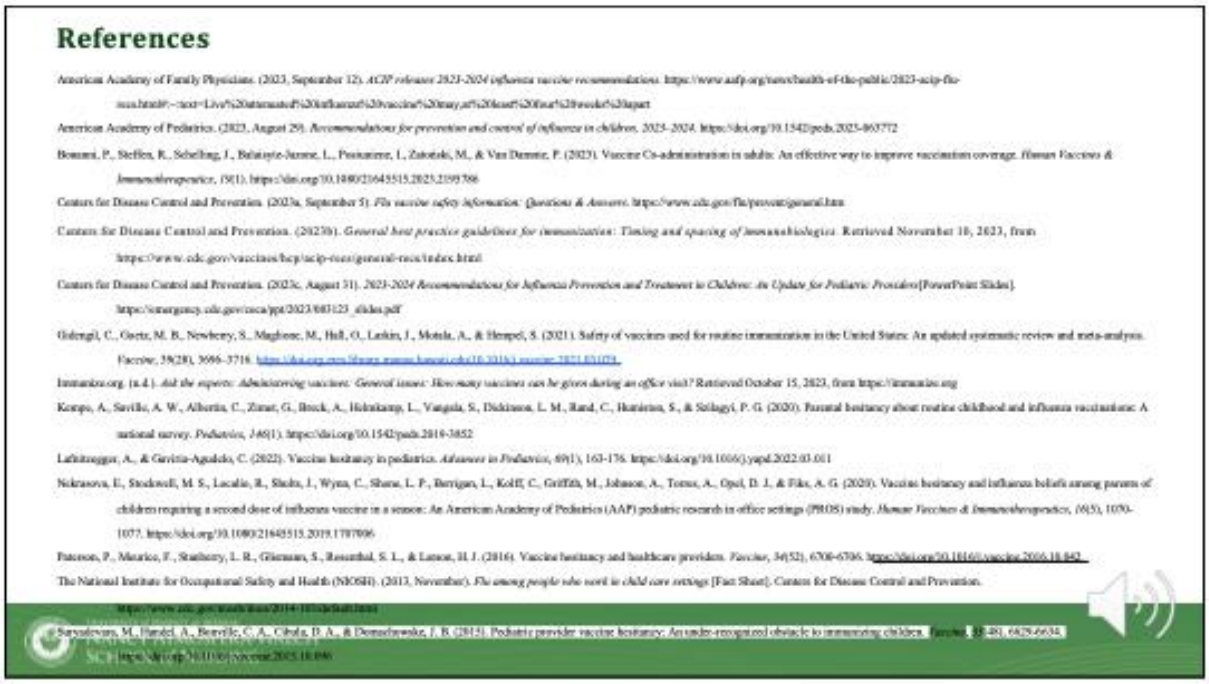
22



Note: PowerPoint presentation was recorded as narrated video and emailed to participants.

Adopted from CDC (2023f).

Appendix F

Supplemental Patient Education Handout

Common Misconceptions About the Flu Among People Who Work in Child Care Settings

The flu isn't that serious.
The flu is contagious and can lead to severe illness even in healthy children and adults. The number of U.S. flu-related deaths is estimated to have ranged from 3,000 to 49,000 per season.

My job doesn't put me at risk for getting the flu.
The flu can spread quickly in child care settings. Children are less likely to have immunity against flu viruses and therefore are more likely to get infected. In child care settings, they are constantly in close contact with one another and their caregivers; toys and other objects are often shared; and young children may not be able to wash their hands well or cover their mouth and nose when they cough or sneeze. These things increase the risk of flu spreading in these settings.

I don't need to get vaccinated.
Everyone 6 months of age or older should get the flu vaccine every year. Even healthy children and adults can get sick from the flu. Pregnant women, adults 65 and over, children younger than 5 years of age, and people with certain medical conditions are at greater risk of getting very sick from the flu. It is important for people who work in child care settings to get the vaccine to protect themselves, their families, and the children they care for. Infants younger than 6 months are too young to get the vaccine and are more likely to get very sick from the flu so it is especially important for their caregivers to get vaccinated.

I got the flu vaccine last year so I don't need to get vaccinated this year.
Flu viruses are constantly changing. Each year flu vaccines are updated to protect against the most common circulating viruses. Also, the protection the vaccine provides against the flu decreases over time, so it is important to get a flu vaccine every year. Flu vaccines from previous years may not protect you from getting the flu this year.

The flu vaccine doesn't work.
While protection from the flu vaccine can vary, getting vaccinated is the single best way to prevent the flu. Flu vaccines are most effective when the vaccine matches the flu viruses that are circulating in the community.

The flu vaccine can give me the flu.
The flu vaccine cannot give you the flu. The shot contains dead viruses, and the nasal spray contains weakened viruses. Neither form of the flu vaccine can cause flu illness. However, sometimes people may have flu-like symptoms after getting the vaccine. These symptoms can be caused by exposure to a virus other than the flu. You can also experience flu-like symptoms if you were exposed to the flu virus before you were vaccinated or in the two weeks it takes for the vaccine to take effect. Sometimes you can also be exposed to a flu virus that is not included in this season's vaccine.

The vaccine is not safe.
Hundreds of millions of people have safely received the flu vaccine over the past 50 years.

Get your flu vaccine today!

To find a location near you that offers the flu vaccine go to http://vaccine.healthmap.org/.

For more information about the flu and ways to protect yourself, your family, and the children you care for visit www.cdc.gov/flu or www.flu.gov.

Photo by ©Thinkstock

DHHS (NIOSH) Publication Number 2014-103
November 2013

Note: The National Institute for Occupational Safety and Health, 2013. Permission is not required.

Appendix G

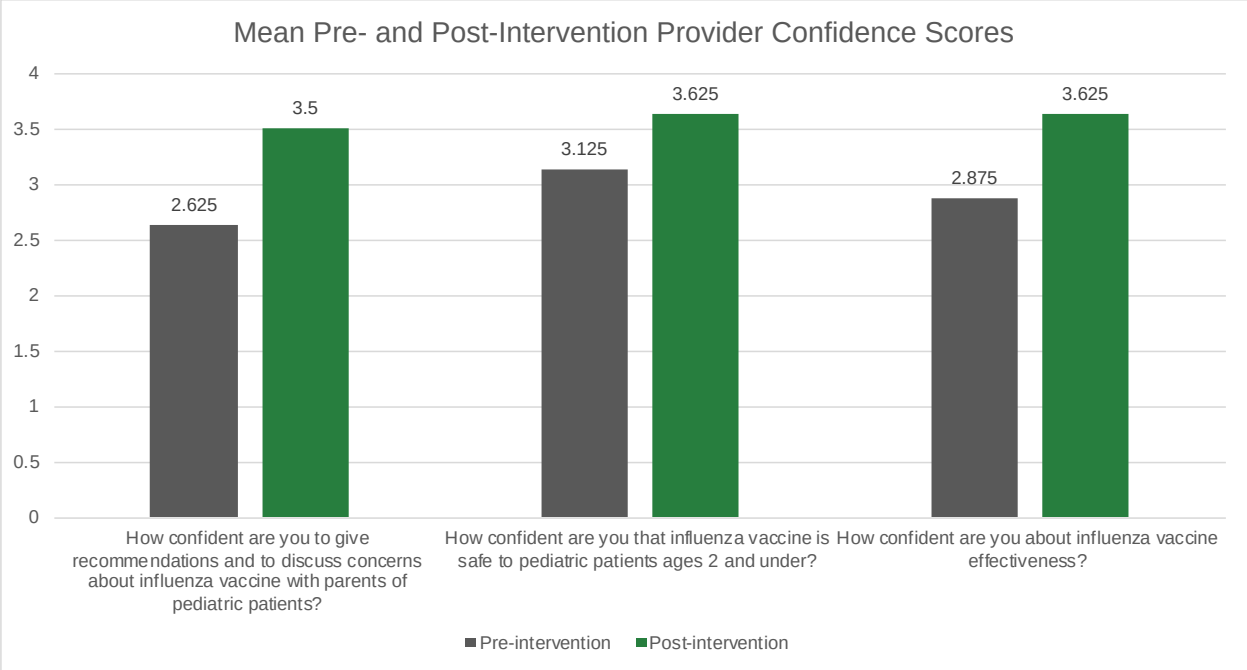
Table 1G

Provider Flu Vaccine Confidence Mean Scores

Question	Pre-survey Mean Score	Post-survey Mean Score	Mean Score difference
1. How confident are you to give recommendations and to discuss concerns about influenza vaccine with parents of pediatric patients?	2.625	3.5	+0.875
2. How confident are you that influenza vaccine is safe for pediatric patients ages 2 and under?	3.125	3.625	+0.5
3. How confident are you about influenza vaccine effectiveness?	2.875	3.625	+0.75

Figure 2G

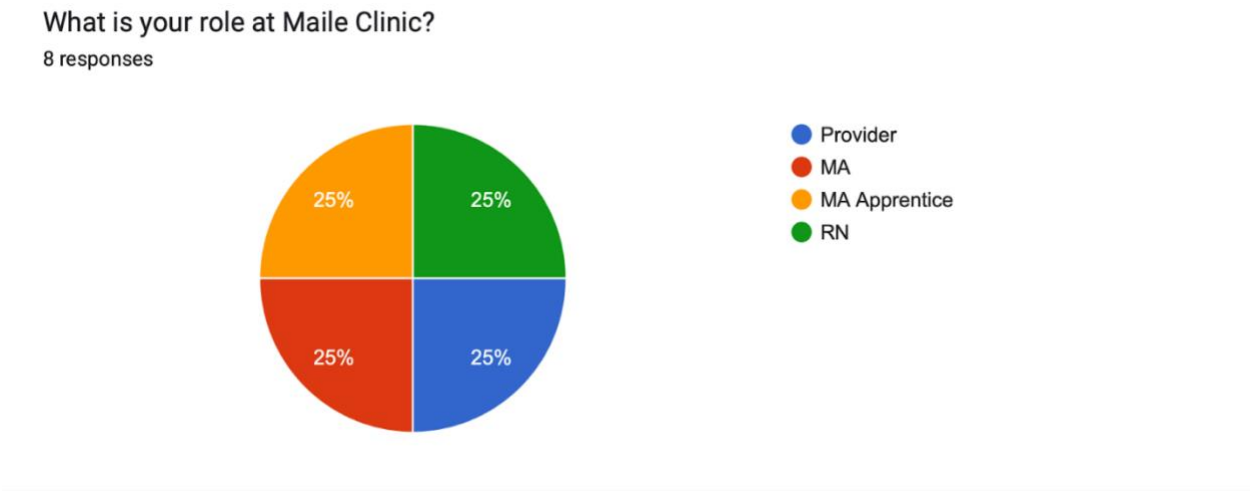
Pre- and Post-Survey Mean Scores Bar Graph

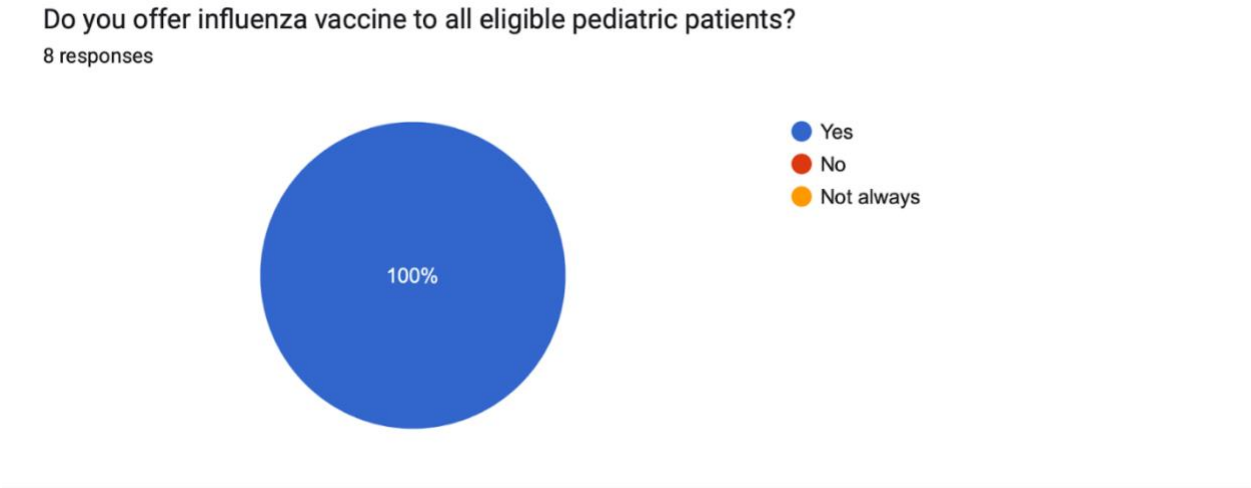


Note: This is a graphic representation of Table 1G.

Figure 3G

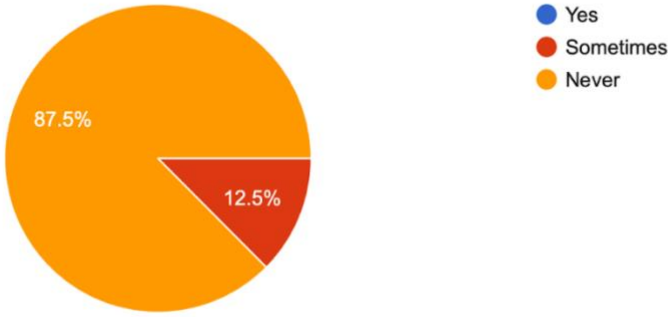
Pre-Survey Responses





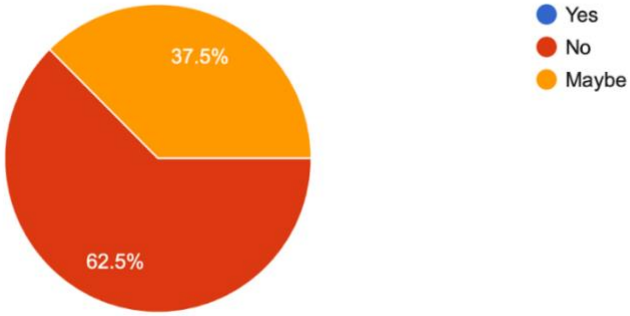
Do you see serious side effects from influenza vaccine in your patients?

8 responses



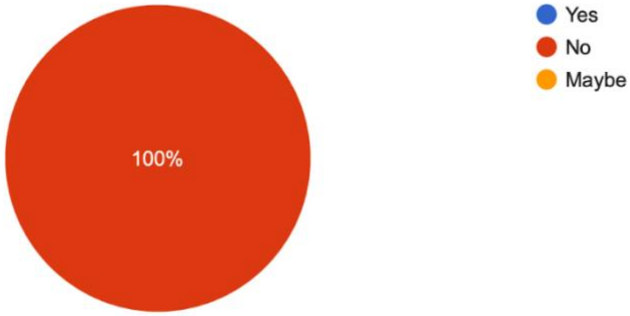
Do you believe that some vaccines cause autism, febrile seizures, Guillain-Barré syndrome?

8 responses



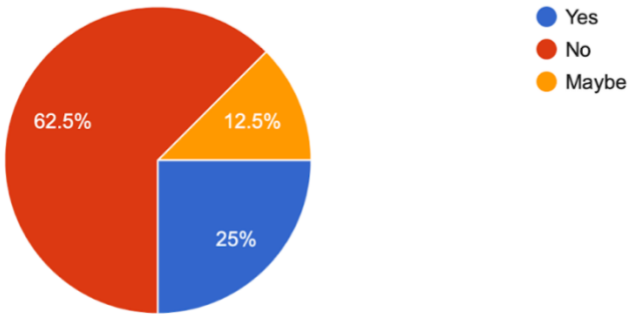
Do you believe that multiple vaccine administration reduces the effectiveness of the vaccines?

8 responses



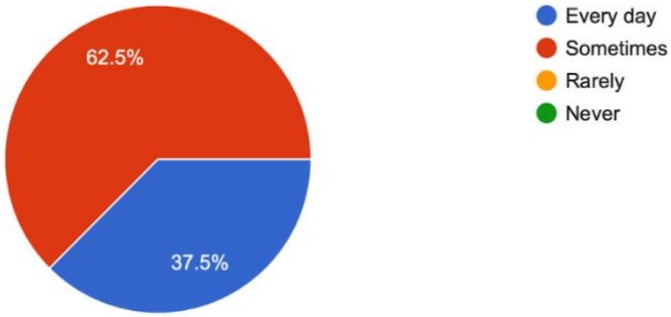
Do you believe that administering multiple vaccines at a single visit overwhelms the infant's immune system?

8 responses



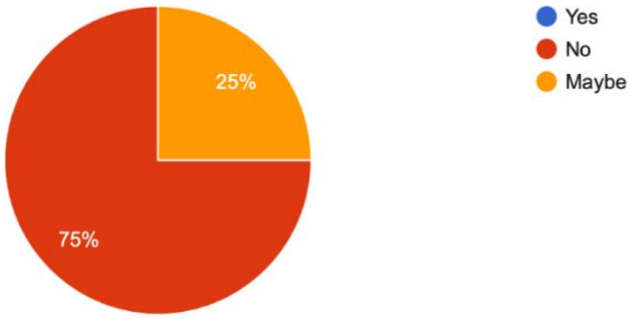
How often do you encounter vaccine hesitant parents?

8 responses



Do you consider yourself vaccine hesitant?

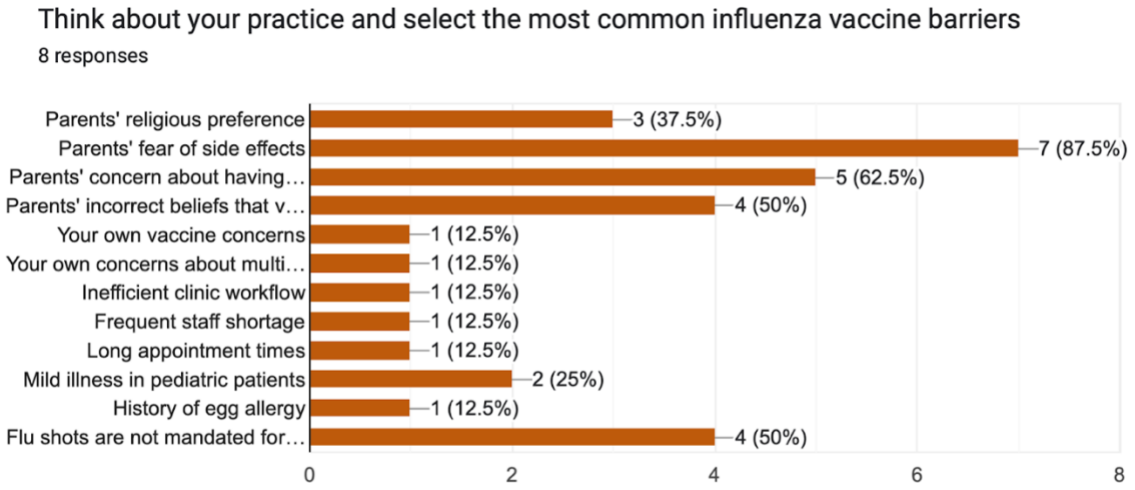
8 responses

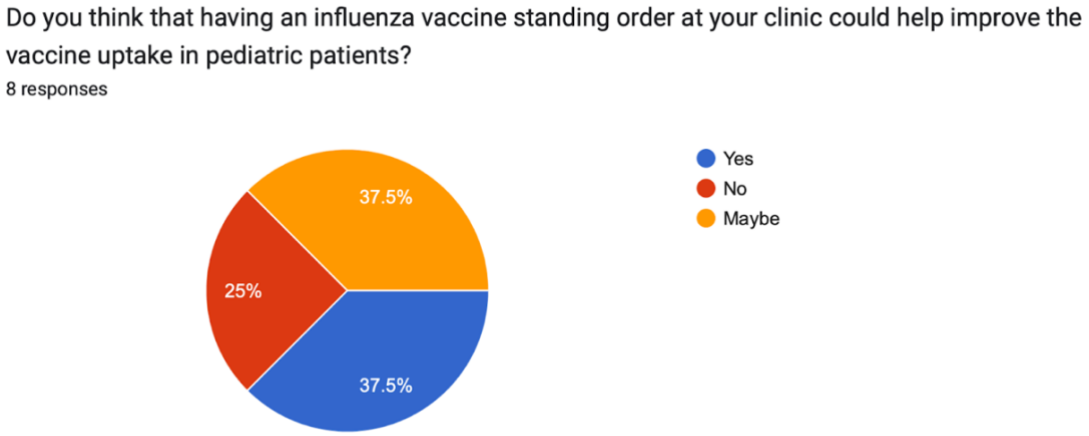


Which vaccines are parents mostly concerned about?

8 responses

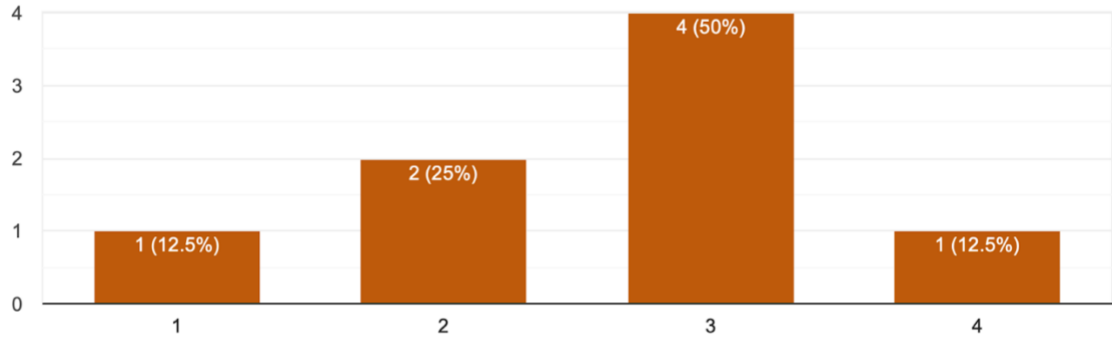
COVID
covid and MMR
Flu and covid-19 vaccines
Covid-19, flu
COVID-19
Flu and Covid
COVID
Flu


Think about your practice and select the most common influenza vaccine barriers
8 responses
Parents' religious preference
3 (37.5%)
Parents' fear of side effects
7 (87.5%)
Parents' concern about having…
5 (62.5%)
Parents' incorrect beliefs that v…
4 (50%)
Your own vaccine concerns
1 (12.5%)
Your own concerns about multi…
1 (12.5%)
Inefficient clinic workflow
1 (12.5%)
Frequent staff shortage
1 (12.5%)
Long appointment times
1 (12.5%)
Mild illness in pediatric patients
2 (25%)
History of egg allergy
1 (12.5%)
Flu shots are not mandated for…
4 (50%)
0
2
4
6
8


Do you think that having an influenza vaccine standing order at your clinic could help improve the vaccine uptake in pediatric patients?
8 responses
37.5%
25%
37.5%
Yes
No
Maybe

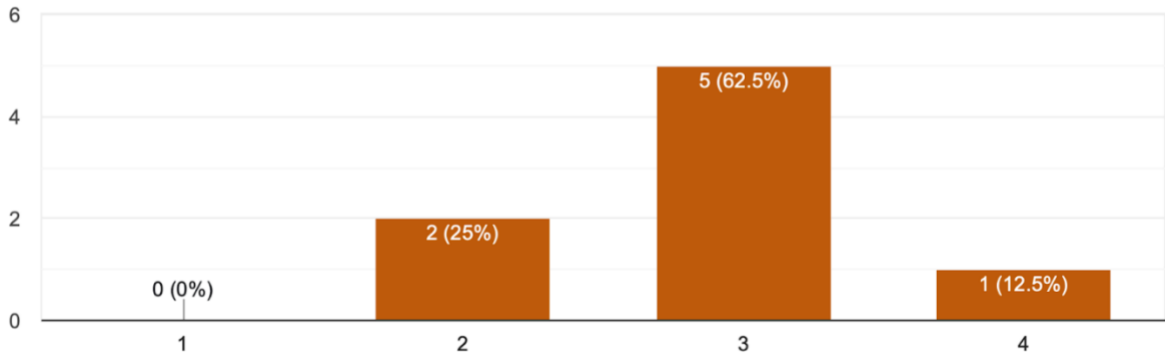
How confident are you to give recommendations and to discuss concerns about influenza vaccine with parents of pediatric patients?

8 responses



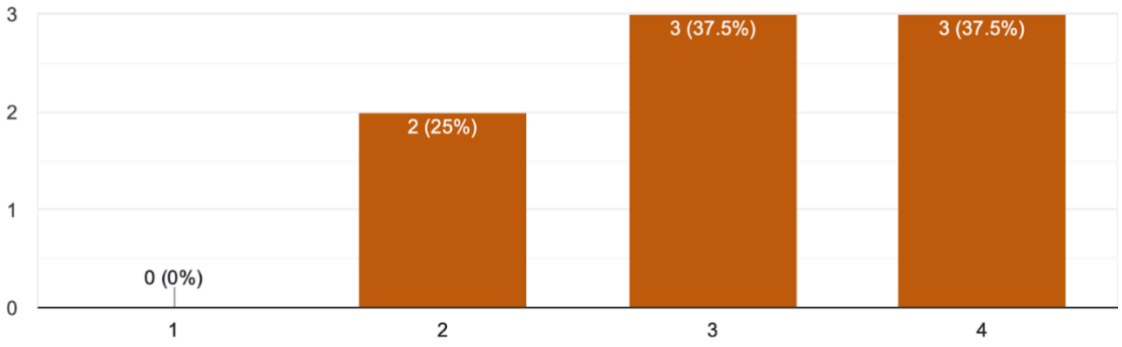
How confident are you about influenza vaccine effectiveness?

8 responses



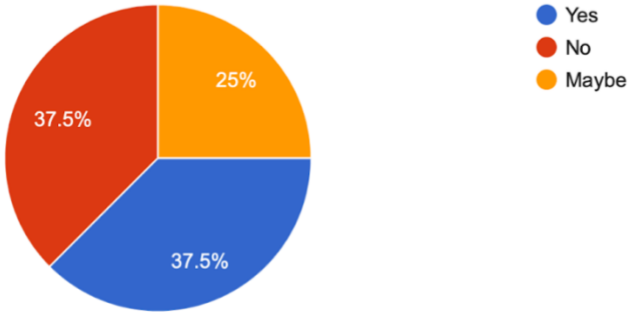
How confident are you that influenza vaccine is safe to pediatric patients ages 2 and under?

8 responses



Do you feel that you need more training about influenza vaccine to help you feel more confident about it?

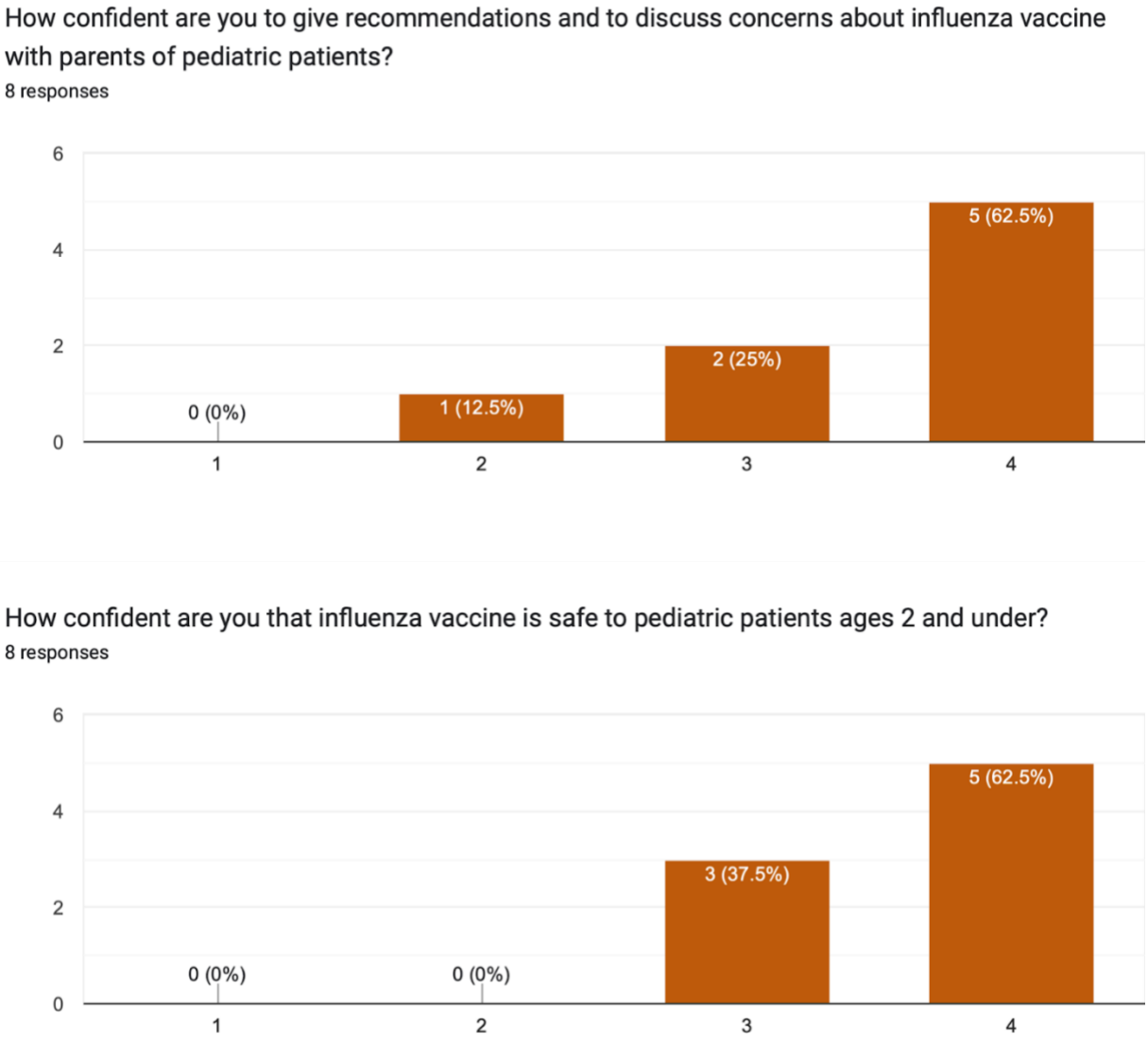
8 responses



Note: Google Forms Screen Shot Images.

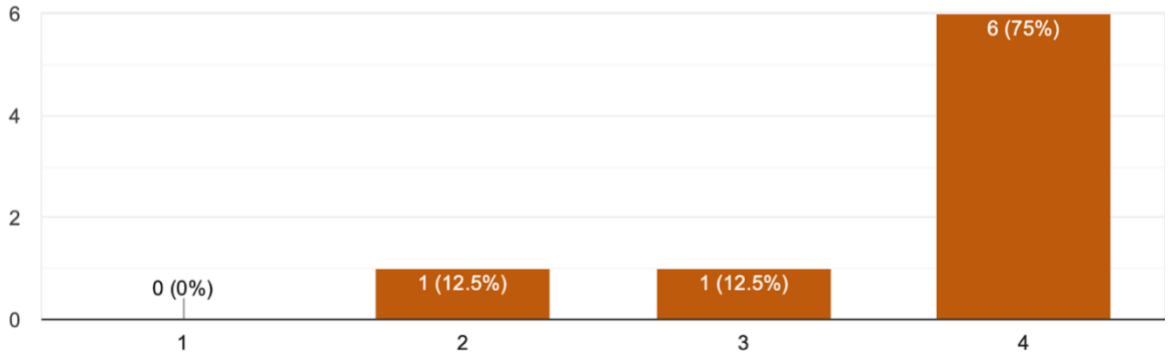
Figure 4G

Post Survey Responses



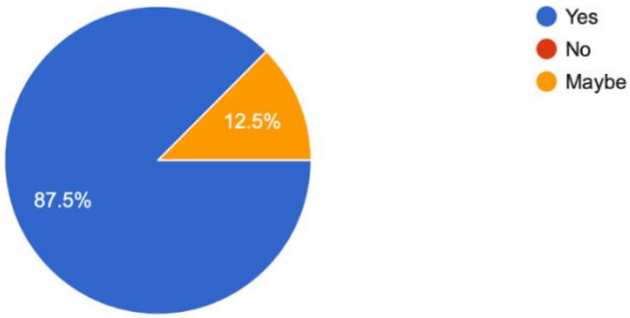
How confident are you about influenza vaccine effectiveness?

8 responses



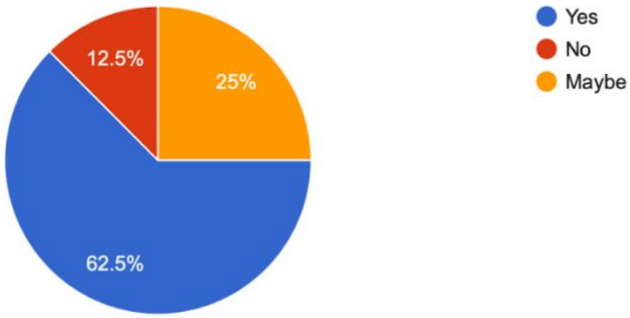
Did the training you received help you feel more confident about the influenza vaccine?

8 responses



Will you be open to receive additional education and resources on vaccination in the future?

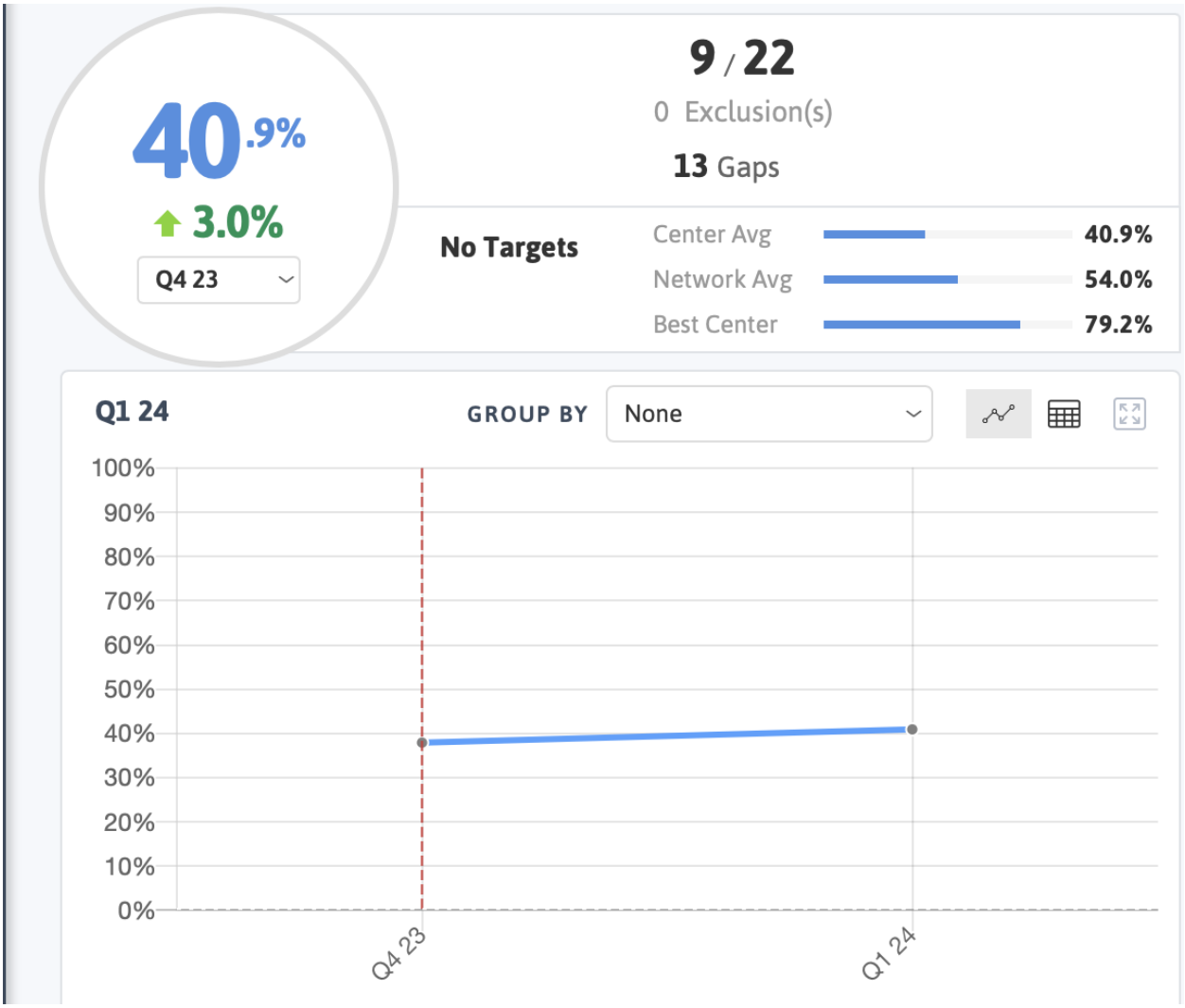
8 responses



Note: Google Forms Screen Shot Images.

Figure 5G

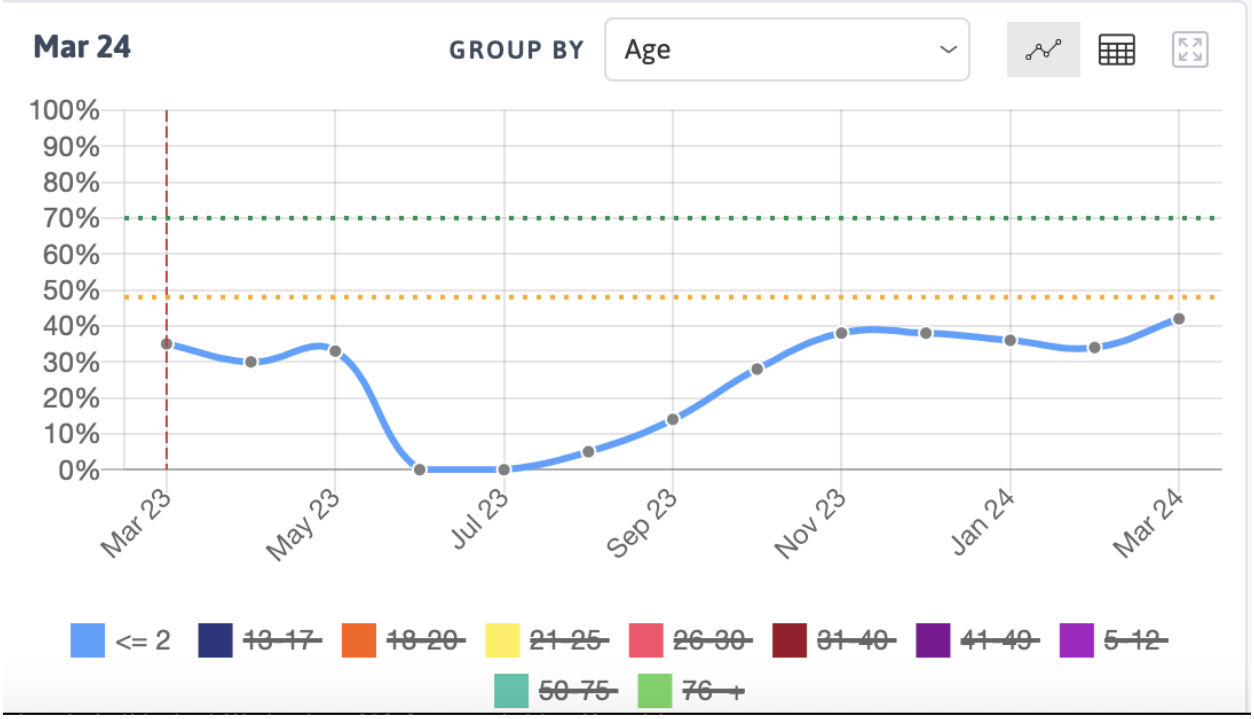
2024 Quarter 1 Childhood Flu Immunization Status UDS Measure at WHC (%Patients <=2 years of age who received 2 doses of Flu vaccine)



Note: Azara Report Screenshot. Q4 December 2023 value: 37.9%, Q1 March 2024 value: 40.9%, total 3% increase.

Figure 6G

Flu Vaccine Uptake at WHC March 2023- March 2024 in Pediatric Patients (non-UDS, includes all patients <= 2 y.o. who received at least one dose of flu vaccine)



Note: Azara Report Screenshot. March 2023 value: 35%, March 2024 value: 42%. Total 7% increase.

Appendix H

Project Poster

University of Hawai'i at Mānoa
Nancy Atmospera-Walch School of Nursing

Improving Pediatric Provider Confidence in Influenza Vaccines

Tatiana Luke, BSN, RN

INTRODUCTION

- In 2022-23 80% of pediatric flu-related deaths occurred in children who were not fully vaccinated.
- Children younger than 5 are at an increased risk of flu complications
- One of the most effective ways to prevent flu complications is by getting flu immunization.
- WHC FQHC influenza immunization rate in pediatric patients is about 40% which is below HP2030 target level of 70%.

LITERATURE SEARCH

Barriers to Immunization
- parental and provider vaccine hesitancy
- health system barriers and other.

Strategies for Increasing Childhood Flu Vaccination
- Patient education
- Provider education
- Multiple interventions are beneficial

PURPOSE AND OBJECTIVES

To increase pediatric clinic provider confidence in flu vaccines and to reduce provider vaccine hesitancy by providing a 15-minute educational intervention and a patient information handout.

PICOT

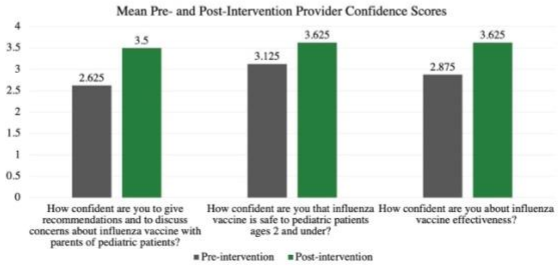
Will providing influenza vaccine education to healthcare staff at a rural primary care clinic improve health care provider confidence in flu vaccines compared to current standard of care?

METHODS

- **Setting**: Pediatric clinic at at rural clinic in Hawaii
- **Timeline**: January – March 2024
- **Participants(N=8):** 2 providers, 2 RNs, 2 MAs, and 2 MA apprentices at a FQHC
- **Methods**:
  - Pre- and post-surveys were used to assess provider flu vaccine confidence and their perceived immunization barriers at WHC
  - Narrated 15-minute PowerPoint presentation and patient education handout was provided
- **Data collected:**
  - Provider flu vaccine confidence mean scores
  - Perceived barriers to flu vaccine uptake in pediatric clinic
  - Pediatric flu immunization rates

RESULTS

- Parents were mostly concerned with Flu and Covid-19 vaccines, compared to all other vaccines
- Parents fear side effects, multiple vaccine coadministration, and having child vaccinated during mild illness.
- Parents decline vaccines due to religious preference and due to flu vaccine not being mandated at school.
- Clinic issues have been also named as a barrier to immunization:
  - workflow issues, staff shortage
  - provider vaccine concerns
  - 75% of participants believed that having flu vaccine standing order at their clinic would help with flu vaccine uptake
- Providers had incorrect beliefs about vaccines and had reservations about vaccine safety
- 37% of participants encountered vaccine hesitant parents daily, and 62% stated that they saw them sometimes
- 25% of participants identified themselves as vaccine hesitant
- Over 60% of participants believed that they needed more training about flu vaccine prior to education implementation
- And over 80% of participants were open to receiving more information about vaccination in the future
- Childhood flu immunization UDS measure in Q1 2024 showed increase of **3%**
- Childhood flu immunization measure comparing March 2023 and March 2024 showed **7%** increase



CONCLUSION

- Flu vaccine is safe and effective in preventing flu related complications and death in pediatric patients.
- Flu and COVID-19 vaccines triggered the most concerns and hesitancy in parents of pediatric patients at the FQHC
- Literature showed that addressing vaccine hesitancy in patients and providers may help improving flu immunization uptake.
- A confident provider is more likely to convince parents to accept flu vaccine and to promote trust.
- Providers at FQHC expressed willingness to receive more information about flu vaccine prior to education
- Providers were open to receiving more information about vaccines in the future.
- Providing education to health care staff at FQHC was associated with an increased scores in self-perceived flu vaccine confidence level.

ACKNOWLEDGEMENTS

Thank you to Project Chair: Deborah Mattheus, who was readily available for advice and who offered her continued support throughout the project.
Thank you to content expert, Mary Oneha, who generously offered her expertise and allowed to use the site.
And thank you to the third reader, Michele Bray, who gave valuable insights and encouragement.

REFERENCES

Scan QR code for references