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## Improving Influenza Vaccination Rates Among Children Through Provider and Staff Education

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IMPROVING INFLUENZA VACCINATION RATES AMONG CHILDREN  
THROUGH PROVIDER AND STAFF EDUCATION

by

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Mississippi University for Women

April 25, 2023

A DNP Project submitted to the faculty of the College of Nursing in partial fulfillment of  
the requirements for the degree of Doctor of Nursing Practice in the graduate college at  
Mississippi University for Women

COLUMBUS, MISSISSIPPI

APRIL 25, 2023

Graduate Committee of Dorthy R. Bester  
hereby approves her research project as meeting partial  
fulfillment of the requirements for the Degree of  
Doctor of Nursing Practice

Date \_\_\_\_\_

Approved \_\_\_\_\_

Chair

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Director of Graduate Studies

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Dorothy R. Bester, FNP-C

Mississippi University for Women, 2023

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**Abstract**

Children younger than five are more likely to develop severe medical complications from the influenza virus. As of June 4<sup>th</sup>, 2021, the Centers for Disease Control and Prevention (CDC) reported 199 pediatric flu-related deaths for the 2019-2020 influenza season; seventy-eight percent of these deaths occurred in children who had not received a flu vaccination. The CDC annually recommends influenza (Flu) vaccination for all children ages 6 months through 18 years. Any child 6 months to 8 years old who had not received a previous dose of the flu vaccine or whose influenza vaccination history is unknown was recommended to receive a total of two doses of the vaccine four weeks apart. A quality improvement project was performed at three primary care clinics in Northeast Mississippi to improve flu vaccination rates among children 6 months to 18 years old.

**Methodology:** A 15-minute educational presentation was developed and presented to providers, clinical and non-clinical staff. The educational presentation was guided by the vaccine recommendations and guidelines of the Centers for Disease Control and Prevention. This educational intervention targeted 8 healthcare providers, 8 clinical staff, and 5 non-clinical staff. Text messages were sent weekly as a reminder to healthcare providers and staff to offer flu vaccines at every encounter. A monthly immunization

report was generated to collect data on total pediatric encounters and vaccines administered to the targeted age population.

**Results:** After completion of the 16-week implementation of the quality improvement project, data related to influenza immunization was compiled. This compiled data was compared to data from the previous influenza immunization season to determine if changes in adherence occurred from one year to the next. During this time 44 (19%) patients received the influenza vaccine, and 3 were found eligible for 2 doses. In 2021, during the same period, a total of 20 (12%) patients received the influenza vaccine, and no second-dose vaccines were documented.

## DEDICATION

I would have never made it through this journey without my faith in God, so first and foremost I would like to thank God. I dedicate this project study to my late father, Gene Joiner, who instilled in me a constant drive toward becoming my best self. I also dedicate this study to my immediate family; My husband Roger, children Rodrick and Blakely thanks for being my motivation to get through this very difficult journey. To my three best friends, my mom and two sisters; Marie, Angela, and Lateria, you all are my foundation. I would not have reached the academic success that I have if it was not for your constant efforts of encouragement and insistence. Thank you.

Finally, I would like to thank my DNP classmates who have been absolutely the best. You guys are a wonderful group of young women who I am privileged to know. I can honestly say we formed a true bond that will last a lifetime.

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I would like to express my sincere gratitude to Dr. Sally Pearson for starting me on the journey and guiding me through this process. You are a great listening ear and provided me with valuable feedback throughout my doctoral project. Thank you to Dr. Teresa Hamill who drove me to the finish line and made sure I stayed on task. I appreciate your willingness to be my chair after Dr. Pearson retired and I am truly thankful for your guidance. Dr. Phelon, Dr. Groves, Dr. Davidson, and Dr. Kemp, thank you for believing in me and nurturing me through this process. I am forever grateful for your kindness and mentorship.



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## IMPROVING INFLUENZA RATES AMONG CHILDREN THROUGH PROVIDER AND STAFF EDUCATION

Influenza (flu) is a highly contagious respiratory virus that affects millions each year. The Centers for Disease Control and Prevention (CDC), estimates from 2010-2020 the flu resulted in at least 9 million illnesses, 140,000 hospitalizations, and 12,000 deaths annually. Pediatric deaths, even though rare, represented 199 deaths for the 2019-2020 influenza season. Seventy-eight percent of these deaths occurred in children who had not received a flu vaccination in the 2019- 2020 flu season (CDC, 2021). The CDC estimated from October 1, 2021, through February 5, 2022, there were 2.2-3.7 million flu illnesses, 1-1.7 million flu medical visits, 22-44,000 flu hospitalizations, and 1300-1600 flu-related deaths.

### **Statement of Purpose**

The primary purpose of this quality improvement project was to implement an educational intervention for physicians, nurse practitioners, nurses, and office staff. The focus of the educational intervention was data from the CDC and the American Academy of Pediatrics (AAP) that support the benefits of pediatric patients receiving the flu vaccine. According to the Centers for Disease Control and Prevention, providers who make a strong influenza vaccine recommendation are one of the most important factors in patients/parents accepting the vaccine. The project's aim was to bring about a significant increase in the influenza vaccination rate in three primary care clinics and educate providers, office staff, and parents about the influenza vaccine and its benefits.

## **Background of Problem**

On average about eight percent of the United States (US) population become ill from influenza each season. Among those, children ages 0-17 years old are most likely to be sickened by the flu (CDC, 2021). A high percentage of influenza deaths occur in children who had not received a flu vaccination each flu season (CDC, 2021). The CDC reported during the 2019-2020 season, flu vaccination prevented an estimated 7.5 million influenza illnesses, 3.7 million influenza-associated medical visits, 105,000 influenza-associated hospitalizations, and 6,300 influenza-associated deaths. For the 2019-2020 season, the national influenza vaccination rate for children six months to 17 years was fifty-nine percent (Centers for Disease Control and Prevention, 2021). In Mississippi, forty-three percent of children six months to 17 years old were vaccinated against influenza during the 2019-2020 flu season.

## **Personal Background**

The flu is much more hazardous than a common cold for children, possible complications include pneumonia, dehydration, brain dysfunction, and possibly death. This age group can transmit the flu to others and render complications to high-risk groups with serious medical problems. Children younger than five have a higher risk of developing severe medical complications from the influenza virus. Working in a family practice, there are a considerable number of pediatric patients. These patients usually present to the clinic as sick patients with cold symptoms. For the past several flu seasons, this researcher noticed that very few children present to the clinic for flu vaccinations

even though it can prevent the flu virus and protect from severe illness. The administration of the influenza vaccine to everyone six months and older remains the best strategy available for preventing illness from influenza and can reduce outpatient visits for influenza by fifty to seventy - percent (American Academy of Pediatrics, 2021). Any child 6 months to 8 years old who had not received a previous dose of the flu vaccine or whose influenza vaccination history is unknown was recommended to receive a total of two doses of the vaccine four weeks apart. The researcher became curious about how many flu vaccines were being administered at their current practice and found the number to be very low. The assumption was made that the flu vaccine was not being offered on a consistent basis.

### **Project Background**

When further investigating pediatric flu vaccine recommendations, the researcher found very clear guidelines from the CDC and AAP. These recommendations are released on an annual basis by both organizations and the Mississippi Department of Health. Even though the vaccine is recommended annually, the percentage of children receiving the vaccination is low. Getting vaccinated against the flu has been shown to reduce flu illnesses, doctor's visits, and missed work and school days and reduce the risk of flu-related hospitalization and death in children (CDC, 2021). Influenza is tracked by the Centers for Disease Control and Prevention on a weekly basis year-round. It remains difficult to measure the magnitude of influenza morbidity and mortality due to a required laboratory confirmation for diagnosis. The CDC has collaborated with state and local hospitals, clinics, health departments, and labs to collect information regarding where influenza activity is occurring and the impact it is having on illness, hospitalizations, and

deaths. Influenza surveillance is important for a variety of reasons which include detecting changes in the virus, formulation of yearly vaccines, and to monitor the effects influenza activity has on the population (CDC, 2021). As a researcher, understanding the prevalence of a disease is critical to patient education and ultimately affects the way we care for our patients. The influenza vaccine is the single most effective way to prevent influenza and its effects. Increasing influenza vaccines among children ages 6 months-18 years old will reduce the burden of flu on the population and healthcare system. The surveillance system used to track influenza activity provides a great educational tool for parents to understand how exposure to influenza increases the risk of contracting the virus. The researcher found a plethora of material available to providers and staff on the benefits of receiving the influenza vaccine. The researcher used publications from the CDC to educate providers and staff (See Appendices A & B). The publications cover appropriate wording, answering questions, and discussing the benefits.

### **Objectives for the Project**

Objectives for this project involved implementing an educational session for healthcare providers, clinical and non-clinical staff, on the importance of the flu vaccine, the consequences of not getting vaccinated, and the current guidelines for vaccinating children 6 months to 18 years old.

1. Develop an evidence-based education session for staff to discuss the risks and benefits of the influenza vaccination for the pediatric population.
2. Reduce barriers to low influenza vaccination rates.
3. Provide the influenza vaccine to unvaccinated children when appropriate.
4. Implement measurable increases in pediatric vaccination rates from the previous

year through an educational intervention.

**PICOT Question:** Will implementing an educational intervention targeting healthcare providers, clinical, and non-clinical staff increase pediatric influenza vaccination rates among patients from six months to 18 years old?

The key concepts and terminology identified in association with this project include the following:

- Educational intervention: A focused teaching session to provide information on a specific topic.
- Healthcare providers: A person who is trained and licensed to provide healthcare (CMS, 2022).
- Clinical staff: Registered nurses and Licensed practical nurses, nursing assistants  
Non-clinical staff: Registration clerk, administrative assistants
- Vaccination: The act of introducing a vaccine into the body to produce protection from a specific disease (CDC, 2021).
- Immunization rates: The number of children who become protected against a disease through vaccination.

### **Literature Review**

The literature review for this project included the impact of influenza morbidity and mortality, benefits of the influenza vaccine, promoting adherence, and strategies to increase influenza rates for ages 6 months to 18 years old. The review of the literature addresses the utilization of Nola Pender's Health Promotion Model (HPM) and how it

guided this quality improvement project. The purpose of the literature review is to gather relevant and pertinent data regarding the identified topic.

**Impact of influenza morbidity and mortality** In the US during the 2019-2020 flu season, there were 199 documented pediatric deaths under 18 years of age where pediatric patients tested positive for influenza. Data from the 2019-2020 influenza season indicated that 41 of those 199 pediatric influenza deaths were found in Region 4, which covers Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee (FluView, 2020). The rate of pediatric influenza-associated deaths in Region 4 increased from 1.5/1,000,000 in 2018-2019 to 2.9/1,000,000 in 2019-2020 (FluView, 2020). Influenza/Pneumonia is currently ranked the ninth leading cause of death in Mississippi. During the 2019-2020 flu season, there were approximately 40 influenza-associated deaths in the state of Mississippi.

**Benefits of influenza vaccinations** Influenza vaccination promotions typically target the elderly and high-risk groups. Bambery et al. (2018) article, "Influenza Vaccination Strategies Should Target Children", noted the benefits of increasing vaccination rates among children. Children suffer higher incidence rates of influenza than any other group and are major drivers of influenza in the community. The authors argued that if the goal of influenza prevention is to decrease mortality and morbidity, strategies to increase vaccinations should target children. School-based vaccination programs were identified as a key component in increasing vaccination rates among children. Offering free influenza vaccines during school hours would likely be an efficient way to decrease the consequences of the influenza epidemic. Strategies focused on children can be just as



effective if not more effective than strategies focused on the elderly (Bamberg et al., 2018).

Flannery et al. (2017) examined the relationship between pediatric deaths and the influenza vaccine. Their study found that receiving the influenza vaccine was associated with a decreased risk of laboratory confirmed influenza associated pediatric deaths. They conducted a case cohort analysis and found from July 2010-June 2014, 291 deaths occurred in children between the ages 6 months and 17 years old in the United States, 75 of those had received an influenza vaccine prior to becoming ill. The overall vaccine effectiveness was sixty-five percent. Children with underlying high risk medical conditions represented 153 deaths during this same period (Flannery et al., 2017)

In a study by Kao et al. (2020) they examined the prevalence of laboratory confirmed influenza cases among sickle patients who had been vaccinated against the flu over five consecutive flu seasons. Patients six months to 21 years of age were studied to determine vaccination rates and estimated vaccine effectiveness against influenza. Over five consecutive flu seasons, there were 1,037 children with a diagnosis of sickle cell disease that were tested for influenza, 307 of those children had at least one influenza infection. Overall vaccine effectiveness was twenty-two and three percent. Vaccine effectiveness for patients with sickle cell disease was found to vary by season and age (Kao et al., 2020).

**Promoting adherence** The Centers for Disease Control and Prevention (2021) recommend children and adolescents get vaccinated annually against influenza however, vaccination rates are low. In a study by Werk et al. 2019, they “conducted a quality improvement project to improve vaccination rates and test the effects of two interventions

on vaccination guideline adherence” (Werk et al.,2019, p.1). A cluster randomized control trial with 11 primary care clinics was conducted by randomly assigning practice sites to 1 of 4 arms, (1) no intervention, (2) computerized clinical decision support for providers, (3) web-based training for providers, and (4) both clinical support and web-based training for providers. The study found fifty-five and eight percent of children and adolescents received the influenza vaccination, which showed an improvement compared to the previous influenza season. The study found the practice that used web-based training was most effective in promoting adherence to vaccination recommendations. Monthly reports of adherence also assisted in the overall improvement of vaccine adherence.

Chung et al., (2020), used a case-controlled study in 5 outpatient settings to determine vaccine effectiveness among fully and partially vaccinated children. The study included 7533 children over 4 flu seasons, who presented to these outpatient settings with complaints of acute respiratory tract infection. This study found the influenza vaccine was more effective with an initial two-dose sequence than only receiving one dose or being unvaccinated. The results of this study imply that the flu burden among children can be greatly reduced by improving adherence as well as administering a two-dose series of influenza vaccine.

In the article, “Improving Influenza Vaccination Rates Among Pediatric Hematology and Oncology Inpatients”, by Duval (2019), a quality improvement project was implemented in a large pediatric hospital. An influenza vaccine screening tool serves to identify eligible patients and allow electronic access to notify providers to order influenza vaccines by generating a physician order notification. The sample consisted of pediatric

inpatients older than 6 months of age admitted to and discharged from the hematology/oncology unit over 4 weeks. This project took place over a total 10-week period. Approximately 70 nurses from the hematology/oncology unit and float pool received training with a step-by-step display of how to complete the flu vaccine screening and administration process. Data analyses revealed the rate of influenza vaccine administration among eligible hematology/oncology patients was six percent pre-intervention and forty-four percent post-intervention. This study revealed the implementation of a well-designed influenza vaccine screening tool combined with an automatic trigger to communicate with the provider increases the likelihood that the patient will receive the influenza vaccine.

**Strategies to Increase Influenza Immunization Rates** Electronic health records systems can be beneficial in improving influenza vaccination rates among children 6 months to 18 years old. Lerner et al.,2021, evaluated the effectiveness of an electronic health record patient portal reminder in increasing pediatric influenza vaccination rates. They conducted an intention-to-treat randomized clinical trial of 22,046 children 6 months to 18 years of age in 53 primary care practices. Parents who were active portal users were randomly assigned to receive a precommitment message before the influenza season. Those who were due a second dose of the influenza vaccine were randomly assigned to receive a reminder or no reminder for a second vaccine. The results found the patient portal reminder did not increase first-dose influenza vaccinations but was effective in increasing the rate of second-dose influenza vaccines.

Increasing influenza immunization rates among children 6 months to 18 years old will potentially decrease serious complications related to influenza. Children two years of

age are at higher risk for hospitalization related to influenza complications. The literature review for this project found that targeting children for vaccine prevention strategies, reminder systems, such as text messages, and patient portal communications have been used to improve rates of influenza vaccines in the targeted population.

### **Theoretical Framework**

Nola Pender's Health Promotion model recognizes background factors that impact health behavior. The model emphasizes the active role the patient has in developing and sustaining healthy behaviors. The health promotion model is designed to assist Advanced Practice Nurses in understanding the determinants of health behaviors as a foundation to raise awareness of healthy lifestyles. The model's theoretical roots are derived from Albert Bandura's Social Cognitive Theory which believes thoughts, behavior, and environment interact. For people to alter how they behave, they must alter how they think as well. Pender deemed health as a pattern of effect, attitudes, activities, aspirations, and accomplishments (Butts & Rich, 2018). This theory is appropriate for this DNP project because getting vaccinated against influenza is promoting healthy behavior. Advanced practice nurses (APRNs) are tasked with educating patients, parents, and even other providers on the benefits of preventative health management. Preventative health management not only improves patients' outcomes but provides an opportunity for the health provider to encourage health-promoting behaviors and reinforce the benefits of change. The central focus of the health promotion model is on three major concepts: individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcome-health-promoting behavior (Butts & Rich, 2018).

#### **Individual characteristics and experiences**

This component involves a person's specific personality traits and experiences that contribute to individual actions. A person's prior behavior is a good influencer of their future behavior. Pender believed past behavior has a direct impact on health-promoting behavior by way of habit formation. Prior behavior and genetically acquired characteristics influence beliefs, affect, and enactment of health-promoting behavior. Age, race, socioeconomic status, and ethnicity are personal factors that can also impact health behaviors (Pender, 2011).

### **Behavior-specific cognition and affect**

This component of the health-promotion model identifies specific variables that are amenable to change and can be used to develop nursing interventions. "These specific variables include perceived benefits of action- the assumption of positive consequences of undertaking the health behavior; perceived barriers to action-personal costs, hurdles and negative aspects of engaging in the health behavior; perceived self-efficacy- a person's perceived capability to complete a task; and activity-related affect- subjective feeling states or emotions occurring prior to, during and following a specific health behavior." (Pender, 2011, p 4).

### **Behavioral outcome**

This component is the desired behavioral end result of the commitment to health-promoting behavior. Behaviors should result in improved health, enhanced functional ability, and better quality of life at all stages of development.

The implementation of an educational intervention targeting providers and clinical staff will hopefully translate into an increase in influenza vaccinations among children 6 months to 18 years old. An assumption is that healthcare professionals are a critical part

of the interpersonal environment and maintain an influence on individuals throughout their lifetime. Behavior-specific cognition and affect component of the health promotion model focuses on helping patients achieve higher levels of well-being and identifies background factors that influence health behaviors. Using this model to guide the current study better equips providers to develop interventions that not only increase provider self-efficacy but the patient/parent's self-efficacy also.

Self-efficacy is having self-confidence one can perform a task, by engaging providers in an educational intervention that stresses the benefits of getting children vaccinated, and the talking points to use with parents will increase their willingness to participate in the DNP project. Educating parents about the benefits of getting their children vaccinated against influenza, gives them the opportunity to perceive the benefits of getting the vaccine and address any perceived barriers with the providers. Increasing flu vaccination rates is an example of the practical use of a research model in the development of strategies to improve health-promoting behaviors. The Health Promotion Model demonstrates that interventions have the potential to increase engagement in preventative behaviors, it also encourages healthcare providers to educate patients as a way of preventing illness and achieving maximum health.

### **Project Implementation/Methodology**

This quality improvement project regarding improving influenza vaccinations among the pediatric population was reviewed by the Mississippi University for Women Institutional Review Board and was deemed not to be human subjects' research, but quality improvement. Discussions were held with the clinical administrator at Noxubee Medical Complex about the intended project and any perceived quality or process

problems in practice. It was determined that there were a small number of pediatric patients receiving influenza vaccines each flu season even though they were eligible. After reviewing the current guidelines for vaccinating children 6 months to 18 years old and the three clinics' pediatric influenza immunization data, it was determined there was a need to improve the rate of influenza vaccines among this age group. A 15-minute educational presentation was developed and presented to providers, clinical and non-clinical staff, during their lunch hour. Participation was voluntary.

The educational presentation was guided by the vaccine recommendations and guidelines of the Centers for Disease Control and Prevention, which recommends all children ages 6 months to 18 years old get a flu vaccine unless they have contraindications. Any child 6 months to 8 years old who had not received a previous dose of the flu vaccine was recommended to receive a total of two doses of the vaccine four weeks apart. This educational intervention targeted 8 healthcare providers, 8 clinical staff, and 5 non-clinical staff. The educational session included: (1) up-to-date information on the burden of influenza, (2) local and national statistics on the effects of the flu and vaccination rates, 3) safety and efficacy of influenza vaccinations, and (4) the review of parent education materials and talking points to parents.

Following the educational sessions, parental handouts were given to healthcare providers and staff. These handouts were given to all parents at every patient encounter from September 1, 2022, through December 31, 2022. The lobby of every clinic had flyers strategically placed to encourage influenza vaccinations for children ages 6 months to 18 years old. Text messages were sent weekly as a reminder to healthcare providers and staff to offer flu vaccines at every encounter. A monthly immunization report was

generated to collect data on total pediatric encounters and vaccines administered to the targeted age population. If a patient was vaccinated, their immunization record was checked to determine if a second dose was needed. If indicated the immunization nurse scheduled a follow-up appointment for the suggested time period. After completion of the 16-week implementation of the quality improvement project, data related to influenza immunization was compiled. This compiled data was compared to data from the previous influenza immunization season to determine if changes in adherence occurred from one year to the next.

### **Setting**

This quality improvement project was implemented at three primary care clinics in the Northeast region of Mississippi. The patient population was made up of approximately 3,000 active patients. Of the total active patients, approximately 730 were ages 6 months to 18 years old. Providers included two physicians and six family nurse practitioners. The clinical staff included three registered nurses and five licensed practical nurses. The non-clinical staff consists of five registration clerks/ front office staff that schedule appointments and register patients.

### **Data Collection Method**

The outcome of this project was determined by the percentage of influenza-unvaccinated children between the age of 6 months and 18 years who elected to receive the seasonal influenza vaccine after education and offering from providers and clinic staff during their clinic visit. The data includes the total number of patients registered in the clinics ages 6 months to 18 years, the number of patients who received the seasonal influenza vaccine in 2021, and the number of those who chose to receive the



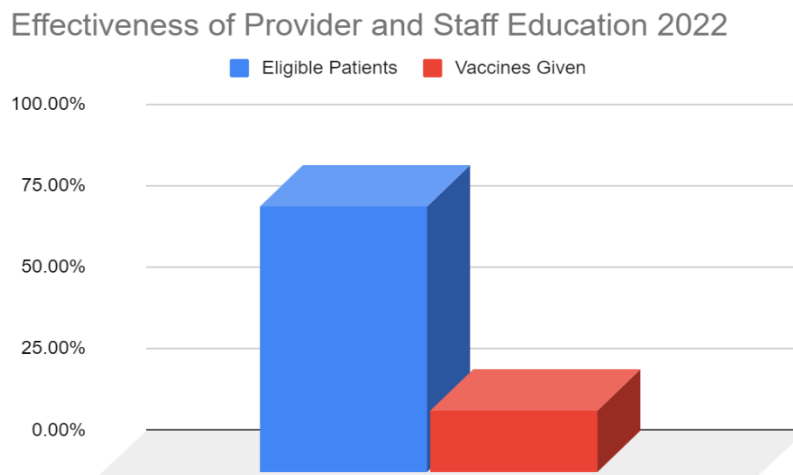
seasonal influenza vaccine in 2022. Immunization records of patients 6 months to 8 years old who had not been previously vaccinated were also examined to determine those who needed two doses of the influenza vaccine.

At the end of the project, the data required for this project was extracted from the electronic medical record (EMR) by the information technology department. This probe identified all patients ages 6 months to 18 years old who received an influenza immunization from September 1, 2022, to December 31, 2022. It was then determined how many children needed the two-dose series of the influenza vaccine and returned to receive the second immunization dose. Information was also extracted from a similar twelve-week period in 2021. The dates of this data collection were September 1, 2021, to December 31, 2021.

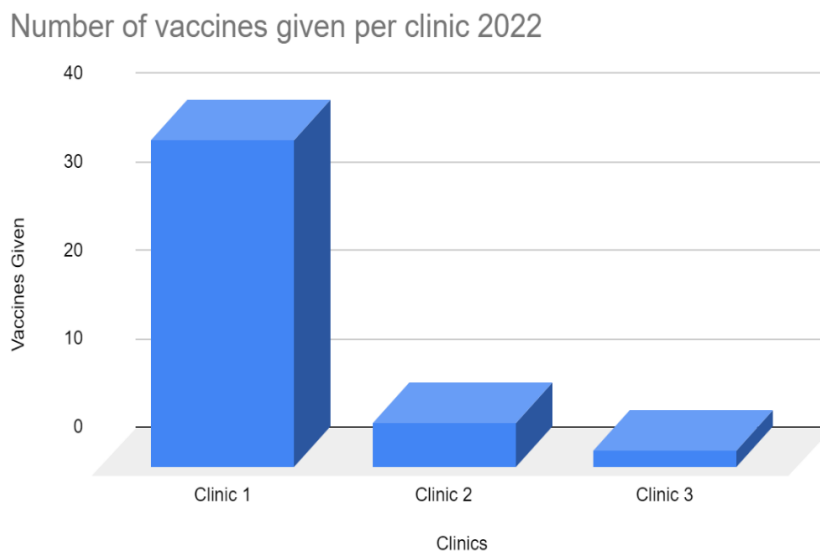
## **Results**

The goal of the project was to increase vaccination rates among children from 6 months to 18 years of age who presented unvaccinated to 3 primary care clinics at Noxubee Medical Complex during the months of September, October, November, and December 2022. During this time there were a total of 237 well-child pediatric visits within the three clinics, out of those visits 44 (19%) received the influenza vaccine (see Figure 1), and three were found eligible for two doses. Clinic 1 gave thirty-seven, clinic 2 gave five, and Clinic 3 gave two (see Figure 2). Follow-up appointments were made for those three patients to receive the second dose of the flu vaccine, one patient returned for the second dose. Eight patients were found to be previously vaccinated at another clinic. In 2021, during the same period, there were a total of 162 well-child pediatric visits

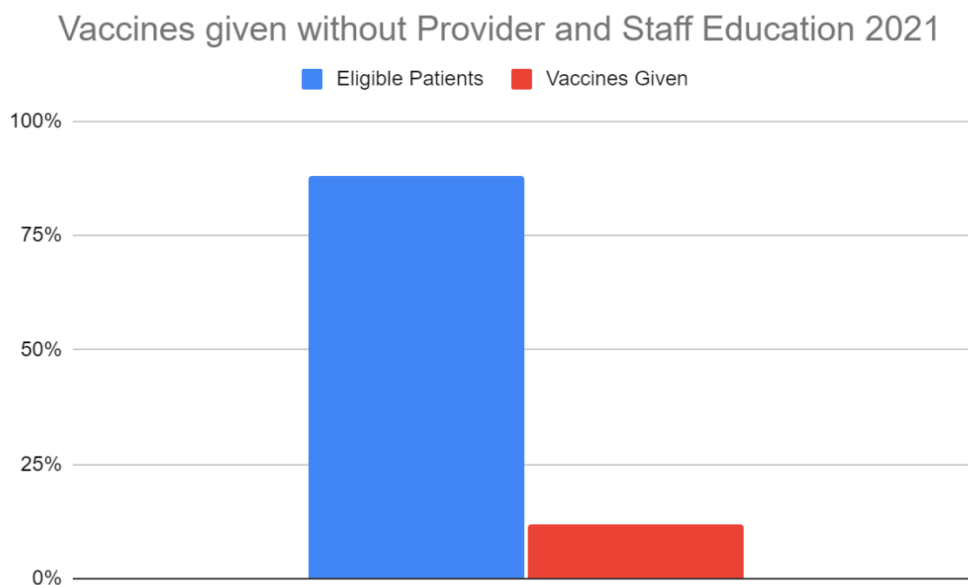
within the three clinics, and a total of 20 (12%) patients that received the influenza vaccine, no second dose vaccines were documented.



*Figure 1, Percentage of vaccines given compared to eligible patients in 2022.*

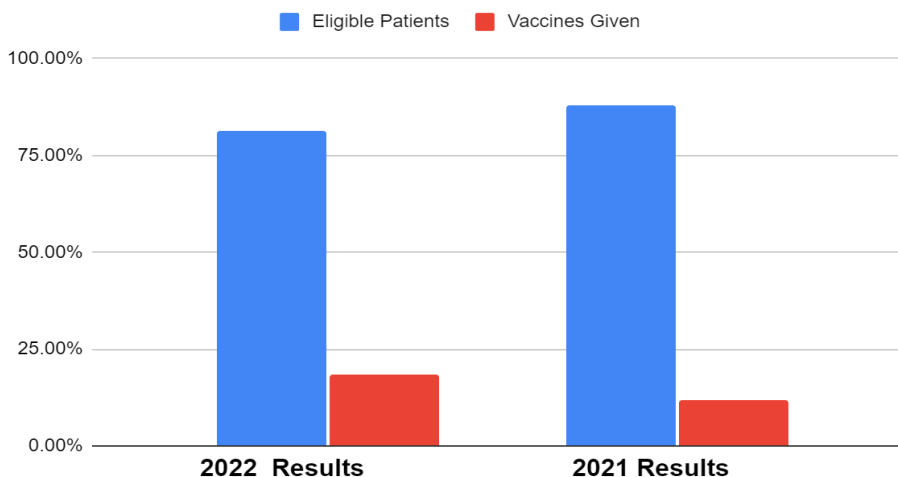


*Figure 2, Number of vaccines given per clinic.*



*Figure 3, Percentage of vaccines given compared to eligible patients in 2021.*

When comparing the 2021 and 2022 rates of influenza vaccine given during the specified timeframe there was an increase in the vaccination rate from twelve percent to nineteen percent respectively (see Figure 4). In the 2022 influenza season, out of the 237 well-child visits, 44 were agreeable to receiving the influenza vaccination. This data shows a positive effect of provider and staff education on improving the rates of influenza immunizations among the pediatric population.



*Figure 4, Comparison chart 2022 compared to 2021.*

### **Discussion**

The problem that was addressed in this quality improvement project was low vaccination rates of influenza among the pediatric population at three primary care clinics in Northeast Mississippi. In 2022 during the months of September – December, nineteen percent of eligible pediatric patients received the influenza vaccine. Data collected during a similar 16-week period in 2021 found twelve percent of eligible pediatric patients received the influenza vaccine. The current national flu vaccination rate for children in this age group is fifty-eight and six percent, in Mississippi it is forty-two and nine percent.

### **Limitations**

Limitations for this project included that the influenza vaccines were not available until September 15th; 2 weeks after the project had started. The front office staff was not consistent with vaccination messaging which led to confusion for parents. The three clinics used in this QI project are not pediatric clinics, they are primary care and only one

clinic is designated as a Vaccine for Children (VFC) clinic. Many pediatric patients in this community utilize the local health department for vaccinations. During the implementation of this project, there was an increased number of flu cases in our community that can be traced back to a large community event. During the month of October alone, there were 75 confirmed cases of the flu among children 6 months to 18 years old. This not only affected the number of vaccinations given but it also was a key factor in parental hesitancy. Many parents expressed resistance to getting the vaccine because of the child's recent infection and the effectiveness of the vaccination.

### **Significance**

The American Academy of Pediatrics and the Centers for Disease Control and Prevention have goals to increase influenza vaccination rates. This is significant to nursing practice because increasing vaccination rates among children ages six months to 18 years old will significantly reduce morbidity and mortality. The CDC recommends that everyone six months and older receive the annual influenza vaccination (Centers for Disease Control and Prevention, 2021). Getting vaccinated against influenza is promoting healthy behavior. As healthcare providers, we are tasked with educating our patients, parents, and even other providers on the benefits of preventative health management. Preventative health management not only improves patients' outcomes but provides an opportunity for the health provider to encourage health-promoting behaviors and reinforce the benefits of change. Increasing vaccination rates for influenza (flu) among children will significantly reduce morbidity and mortality however, undervaccination is common. According to the Centers for Disease Control (2021), children younger than five have a higher risk of developing severe medical complications from the influenza

virus. Vaccinations are designed to prevent disease and promote health. In Mississippi, children with Medicaid can receive the influenza vaccination with their yearly well-child exam free of charge. Most health plans include influenza vaccinations as part of their preventive health benefit at no cost. Provider education and patient/parent buy-in are critical in increasing the rates of vaccination against influenza.

### **Implications for Practice**

The results from this project support provider and staff education for improving pediatric influenza vaccination rates. Promoting healthy behavior among the pediatric population through education is supported by the outcomes of this quality improvement project. Identifying the problem of low influenza vaccination rate among the pediatric population; developing and implementing a health promotion concept, resulted in an increase in pediatric vaccines given compared to the previous year. Providers are trusted professionals and have tremendous influence over parents. Offering facts about the vaccine and being open to questions is the most effective way to increase flu vaccination rates.

### **Nursing**

This quality improvement project was able to show provider and staff education led to improved health outcomes for the patient population. Providers and nursing staff are encouraged to educate themselves on the current guidelines and offer the influenza vaccine at every visit and provide printed educational information to parents. The Health Promotion Model was the theoretical framework for my project, promoting healthy behavior while patients are younger has the potential to yield healthy behaviors as adults.

### **Nursing Research**

This project was small however it is relevant in nursing research. It is recommended that future research obtain a large sample size and look specifically at pediatric clinics and not primary care. Provider vaccine hesitancy should also be considered if this project was to be implemented on a larger scale. Increasing influenza vaccination rates among this patient population not only improves health outcomes for children but for the general population as well.

### **Community**

This quality improvement project exposes the need for more community outreach to promote vaccine education. Outreach to schools, churches, and local businesses would allow more people to be educated on the facts and benefits of the influenza vaccine. Influenza is a viral infection that negatively affects millions every year. Community reinforcement will result in a lower number of infections and increase numbers of vaccines given. This will also allow patients and parents to take an active part in their healthcare.

### **Budget/Cost**

This project had minimal cost aside from personal time dedicated to its completion. The research was conducted for academic purposes, and the researcher was not reimbursed for time spent on the project however, it was calculated in the cost below. The gross estimates for travel, material, and complimentary food for participants are also listed.

<b>Expense</b>	<b>Estimated Cost</b>
Time spent on project	10 hrs. per week x 10 month = \$20,000
Travel to present project to participants	\$50

Printing materials for distribution when presenting.	\$100
Breakfasts/Lunches for clinics	\$150
<b>Total</b>	\$20,300

### **Conclusion**

The outcomes of this project indicate that providers and staff can improve the rate of influenza vaccines among the pediatric population. The influenza virus affects millions of people each year. The pediatric population has a higher risk of developing severe medical complications from the influenza virus. These complications can lead to hospitalization or death. Improving influenza vaccination rates are an important action to improving patient health outcomes. This quality improvement project was able to show an increase in vaccination rates, providing vaccines to nineteen percent of eligible unvaccinated patients. However, even though there were some improvements it was still lower than the state average. Increasing the rate of pediatric influenza vaccinations given in the outpatient setting encourages healthy behaviors and reduces the chances of getting the flu or getting severely ill from the influenza virus. Annual provider and staff education along with parental and community outreach would benefit future projects. Promoting healthy behavior among all patient populations will ultimately result in better health outcomes.



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## Appendix A

### Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP)—United States, 2022-23

#### Summary of Recommendations

For additional information: *MMWR Recomm Rep* 2022;71(No. RR-1), at <https://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/flu.html>. This document is available in HTML format at <https://www.cdc.gov/flu/professionals/acip/summary/summary-recommendations.htm>.

#### GROUPS RECOMMENDED FOR VACCINATION

- Routine annual influenza vaccination is recommended for all persons aged  $\geq 6$  months who do not have contraindications.
- If supply is limited, see priority groups in the ACIP statement.

#### TIMING OF VACCINATION

- For most persons who need only one dose of influenza vaccine for the season, vaccination should ideally be offered during September or October. However, vaccination should continue throughout the season as long as influenza viruses are circulating.
- Vaccination during July and August is not recommended for most groups. Considerations include:
  - For most adults (particularly those aged  $\geq 65$  years) and pregnant persons in the first or second trimester, vaccination during July and August should be avoided unless there is concern that later vaccination might not be possible.
  - Children 6 months through 8 years who require 2 doses (Figure) should receive the first dose as soon as vaccine is available.
  - Vaccination during July and August can be considered for children of any age who require only 1 dose.
  - Vaccination in July and August can be considered for pregnant persons who are in the third trimester during those months (see also *Influenza Vaccination in Pregnancy*, this page).

#### APPROVED AGES AND DOSE VOLUMES

- Approved ages and dose volumes for intramuscular influenza vaccines (IIV4s and RIV4):

Vaccine	Approved Ages	Dose volume
Afluria Quadrivalent	6 through 35 months $\geq 3$ years	0.25 mL 0.5 mL
Fluarix Quadrivalent	$\geq 6$ months	0.5 mL
FluLaval Quadrivalent	$\geq 6$ months	0.5 mL
Fluzone Quadrivalent	6 through 35 months $\geq 3$ years	0.5 mL (see below) 0.5 mL
Fluceivax Quadrivalent	$\geq 6$ months	0.5 mL
Flublok Quadrivalent	$\geq 18$ years	0.5 mL
Fluzone High-Dose Quadrivalent	$\geq 65$ years	0.7 mL
Fluad Quadrivalent	$\geq 65$ years	0.5 mL

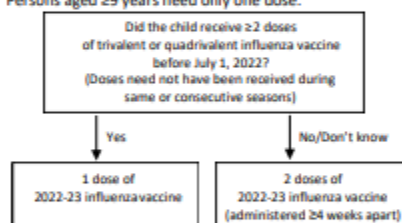
- The approved dose volume per the package insert for Fluzone Quadrivalent is either 0.25 mL or 0.5 mL for ages 6 through 35 months. However, 0.25mL prefilled syringes are not available.
- If a dose less than the necessary volume is administered:
  - If the error is discovered immediately (before the recipient has left the vaccination setting), administer the remaining additional volume needed.
  - If it is difficult to measure the remaining needed volume, or if the error is discovered after the recipient has left the vaccination setting, administer a repeat full dose.
- Healthy non-pregnant persons aged 2 through 49 years may alternatively receive 0.2 mL of LAIV4, 0.1 mL per nostril, using the supplied intranasal sprayer (Table 3, page 4)

#### INFLUENZA VACCINATION IN PREGNANCY

- Persons who are pregnant or who might be pregnant during the influenza season should receive influenza vaccine.
- Any age-appropriate IIV4 or RIV4 may be given in any trimester.
- LAIV4 should not be used during pregnancy but can be used postpartum.

#### NUMBER OF DOSES FOR AGES 6 MONTHS THROUGH 8 YEARS

- Determine the number of doses needed based on child's age at time of first dose of 2022–23 influenza vaccine and number of doses of influenza vaccine received in previous seasons (Figure).
  - Children aged 6 months through 8 years who have previously received  $\geq 2$  total doses of trivalent or quadrivalent influenza vaccine  $\geq 4$  weeks apart before July 1, 2022 need 1 dose of 2022-23 influenza vaccine. The two previous doses do not need to have been received in the same or consecutive influenza seasons.
  - Children aged 6 months through 8 years who have not previously received  $\geq 2$  total doses of trivalent or quadrivalent influenza vaccine  $\geq 4$  weeks apart before July 1, 2022 or whose influenza vaccination history is unknown need 2 doses of 2022-23 influenza vaccine, given  $\geq 4$  weeks apart.
- For children aged 8 years who require 2 doses, both doses should be administered even if the child turns age 9 years between dose 1 and dose 2.
- Persons aged  $\geq 9$  years need only one dose.



#### ADULTS AGED $\geq 65$ YEARS

- ACIP recommends that adults aged  $\geq 65$  years preferentially receive any one of the following higher dose or adjuvanted influenza vaccines: quadrivalent high-dose inactivated influenza vaccine (HD-IIV4), quadrivalent recombinant influenza vaccine (RIV4), or quadrivalent adjuvanted inactivated influenza vaccine (aIIV4). If none of these three vaccines is available at an opportunity for vaccine administration, then any other age-appropriate influenza vaccine should be used.
- Data support greater potential benefit of HD-IIV3, aIIV3, or RIV4 relative to standard-dose unadjuvanted IIVs in this age group, with the most data available for HD-IIV3; but comparisons of these vaccines with one another are limited.

#### VACCINATION OF PERSONS WITH COVID-19

- Persons in isolation for COVID-19 or in quarantine for known or suspected exposures should not be vaccinated if vaccination will pose an exposure risk to others in the vaccination setting.
- For persons who are moderately or severely ill, vaccination should be deferred until they have recovered.
- For persons who are mildly ill or asymptomatic, deferral might be considered to avoid confusing COVID-19 illness symptoms with postvaccination reactions.

#### PERSONS WITH CHRONIC MEDICAL CONDITIONS

- LAIV4 is not recommended for persons with some chronic medical conditions (Table 3, page 4).

## Appendix B

## Make a Strong Influenza Vaccine Recommendation

**FIGHT FLU**


### Information for Health Care Professionals

**CDC recommends everyone 6 months and older get an influenza vaccine every year. Influenza vaccine has been shown to prevent millions of influenza illnesses, tens of thousands of hospitalizations, and thousands of deaths each year.**

#### Your Vaccine Recommendation is Critical

As a health care professional (HCP), your strong recommendation is a critical factor in whether your patients get an influenza vaccine. Children younger than 5 years of age – especially those younger than 2 years – are at higher risk of developing serious [influenza-related complications](#). An influenza vaccine offers the best defense against influenza and its potentially serious complications and spreading it to others. Getting vaccinated can reduce influenza illnesses, doctor's visits, missed work and school days, and prevent influenza-related hospitalizations and deaths.

#### Children 6 months-17 years Need an Influenza Vaccine

Millions of children get sick with seasonal influenza, thousands are hospitalized, and some children die from influenza each year.

- Influenza vaccine can be life-saving in children.
- Among reported pediatric deaths since 2004, about 80 percent of the deaths have occurred among children who were not fully vaccinated against influenza.
- Children aged 6 months up to their 5th birthday – even those who are healthy – are at higher risk of developing serious influenza complications simply because of their age. Children of any age with certain long-term health problems, such as asthma, diabetes, or neurological and neurodevelopmental conditions, also are at higher risk for complications from influenza.



#### When to Vaccinate

CDC recommends that influenza vaccination should be offered in September or October. However, vaccination should continue throughout influenza season as long as influenza viruses are circulating, even into January or later. Children and pregnant people in their third trimester can be vaccinated as soon as influenza vaccine is available—even if this is in July or August. Adults, and especially those older than 65, should not be vaccinated early (in July or August) as immunity wanes more quickly in this age group.

Some children 6 months through 8 years of age require two doses of influenza vaccine. Children 6 months through 8 years getting vaccinated for the first time, and those who have only previously received one dose of vaccine, should get two doses of vaccine this season. The first dose should be given as soon as vaccine becomes available.

The second dose should be given at least 28 days after the first dose. The first dose “primes” the immune system; the second dose provides immune protection. Children who only get one dose but need two doses can have reduced or no protection from a single dose of flu vaccine. All children who have previously received two doses of vaccine (at any time) only need one dose of vaccine this season.

If you do not offer vaccine at your facility, make an influenza vaccine referral, and then follow up with each patient during subsequent appointments to ensure they got vaccinated. If the patient remains unvaccinated, repeat the recommendation/referral and try to identify and address any questions or concerns.

#### How to Make a Strong Influenza Vaccine Recommendation

Based on years of research into vaccine motivators, CDC has developed a mnemonic device to help HCPs make a strong vaccine recommendation. This method known as “SHARE” can help you to make a strong vaccine recommendation and provide important information to help patients make informed decisions about vaccinations.



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Centers for Disease  
Control and Prevention

**S- SHARE** why an influenza vaccine is right for the patient given their age, health status, lifestyle, occupation, or other risk factors.

*"This vaccine can protect you and your family from getting sick from flu. By getting a flu vaccine today, you'll be protecting yourself and the people around you, like your children and parents, who are more vulnerable to serious flu-illness,*

**H- HIGHLIGHT** positive experiences with influenza vaccines (personal or in your practice), as appropriate, to reinforce the benefits and strengthen confidence in influenza vaccination.

*"In addition to recommending a yearly flu vaccine to my patients, I get one each year to protect myself and my family from flu."*

**A- ADDRESS** patients' questions and any concerns about influenza vaccines, including for example, side effects, safety, and vaccine effectiveness in plain and understandable language. Acknowledge that while people who get an influenza vaccine may still get sick, there are studies to show that their illness may be less severe.

*"A flu vaccine cannot cause flu infection. The most common side effects of an influenza vaccine are mild, like redness, swelling, soreness, or low-grade fever for a flu shot. This should go away within a few days. Flu vaccines protect against flu illness but aren't 100% effective, so even if you get vaccinated you might still become sick with flu. It's important to get your flu vaccine because studies show that even if you do get sick, vaccination may make your flu illness less severe."*

**R- REMIND** patients that influenza vaccines help protect them and their loved ones from serious influenza illness and complications.

*"Flu activity is going to start to pick up, and CDC says to expect more cases in the coming months. That is why I want to make sure I help protect you and your loved ones against flu and its potentially serious complications."*

**E- EXPLAIN** the potential costs of getting influenza, including potential serious health effects for the patient and time lost (such as missing work or family obligations), financial costs, and potentially spreading flu to more vulnerable family and friends.

*"It's important to vaccinate your children this season because flu vaccination can reduce potential flu illnesses, doctor visits, hospitalizations and even death. Vaccination can also keep your children from missing school, and you from missing work due to flu, and can protect those around you who are more vulnerable to potentially serious flu complications."*

### Types of Vaccines Available for Children 6 months-17 years

For the 2021-2022 influenza season, providers may choose to administer any licensed, age appropriate influenza vaccine – inactivated influenza vaccine (IIV4) or live attenuated influenza vaccine (LAIV4):

Vaccine type	Vaccine description	Recommended for*
Quadrivalent (4-component) Inactivated Influenza Vaccine (IIV4)	Injectable inactivated vaccine containing the influenza A(H1N1), (H3N2) and two influenza B lineage viruses predicted to be most common	People 6 months and older
Quadrivalent Live Attenuated Influenza Vaccine (LAIV4)	Intranasal live attenuated vaccine containing the influenza A(H1N1), (H3N2) and two influenza B lineage viruses predicted to be most common	Healthy non-pregnant people 2 through 49 years of age
Quadrivalent Cell Culture-Based Inactivated Influenza Vaccine (ccIIV4)	Injectable influenza vaccine produced without the use of influenza viruses or eggs; containing the influenza A(H1N1), (H3N2) and two influenza B lineage viruses predicted to be most common	People 2 years and older

\*Licensed ages vary for different brands; consult package insert for appropriate ages for specific vaccines

For more information, visit: [www.cdc.gov/flu](http://www.cdc.gov/flu)  
or call 1-800-CDC-INFO

*Appendix C*

To: Dorthy Bester and Dr. Sally Pearson

From: Irene Pintado, IRB Chair *I.P*

Date: 04/13/2022

Project: Strategies for improving influenza vaccination rates among children through provider and staff education

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The Mississippi University for Women IRB committee has determined that your project, Strategies for improving influenza vaccination rates among children through provider and staff education, is exempt under 45 CFR 46.101 (b)(4). This project is a quality assurance project.

If any changes are made to the study, the Committee must be notified. If the project is still running twelve months after the date of this memo, please be advised that we will need an update for our files.

Good luck with your work!

## Appendix D

**Search Strategy Map**