EVALUATION OF A PROVIDER EDUCATION PROGRAM TO INCREASE IMMUNIZATION RATES IN THE PEDIATRIC OFFICE SETTING

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INTRODUCTION

- Immunizations are one of the most successful contributions to modern public health in the prevention and eradication of debilitating diseases (Peck, Stanton, & Reynolds, 2014).
- Parental concerns: safety, efficacy, and lack of knowledge have led to the delay or decline of immunizations and reemergence of many vaccine preventable diseases (VPD) (LaVail & Kennedy, 2012).
- 300 children die each year of a VPD (CDC, 2015).
- Providers are the number one trusted source of health care information (LaVail & Kennedy, 2012).
- Provider educational interventions: increase in provider knowledge of immunizations increases parental knowledge increasing immunization rates and is less costly to implement (Owais et al., 2011;Williams et al., 2013).

PICOT

In the pediatric office setting **(P)** how does a provider education program to improve vaccination rates **(I)** compared to current office practice **(C)** affect vaccination rates **(O)** over 2 months **(T)**?

OBJECTIVES

75% of educational vaccine pamphlets distributed.

75% of providers found the intervention informative and reassuring to parents increasing rates .

15% improvement in immunization rates.

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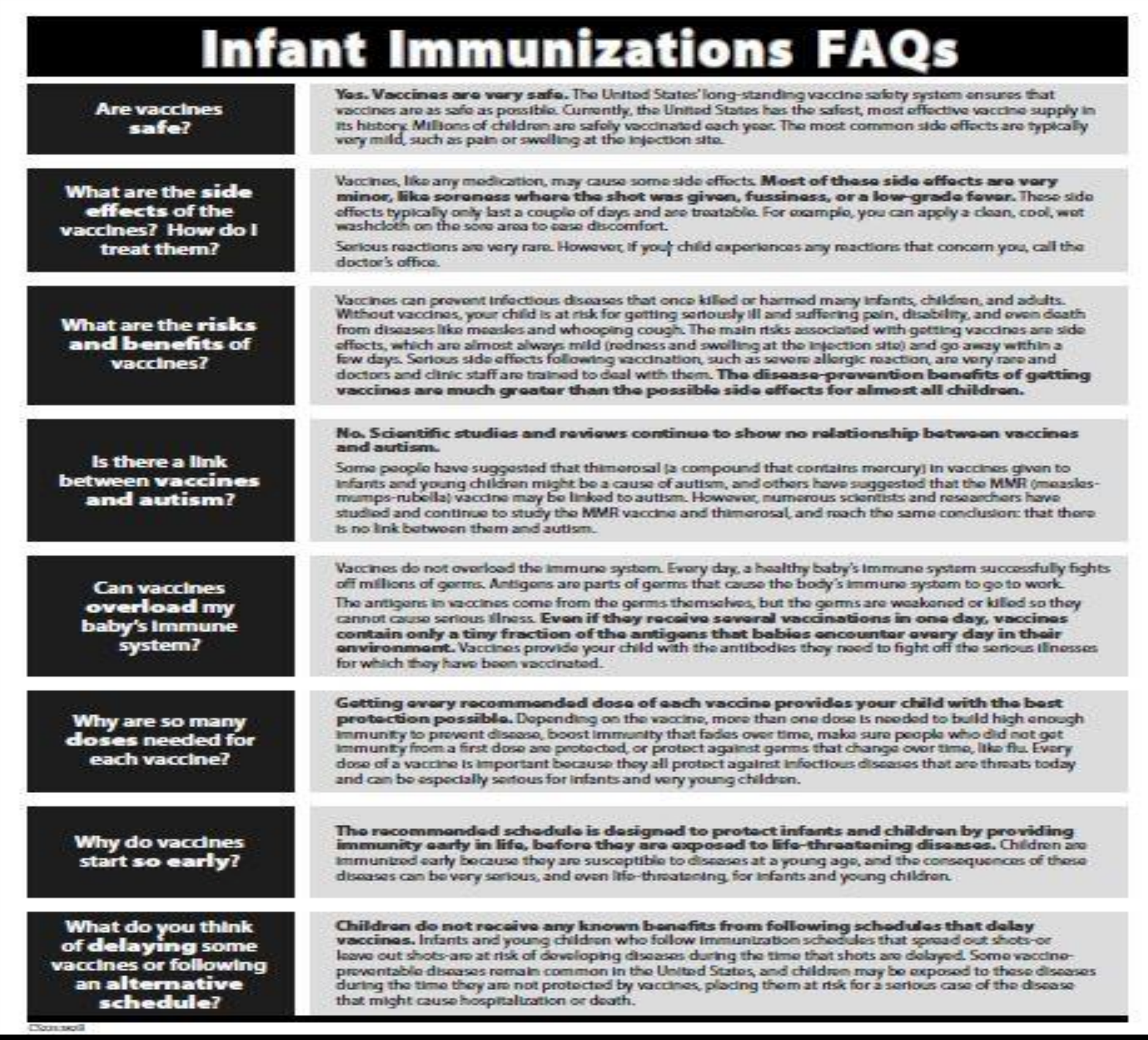
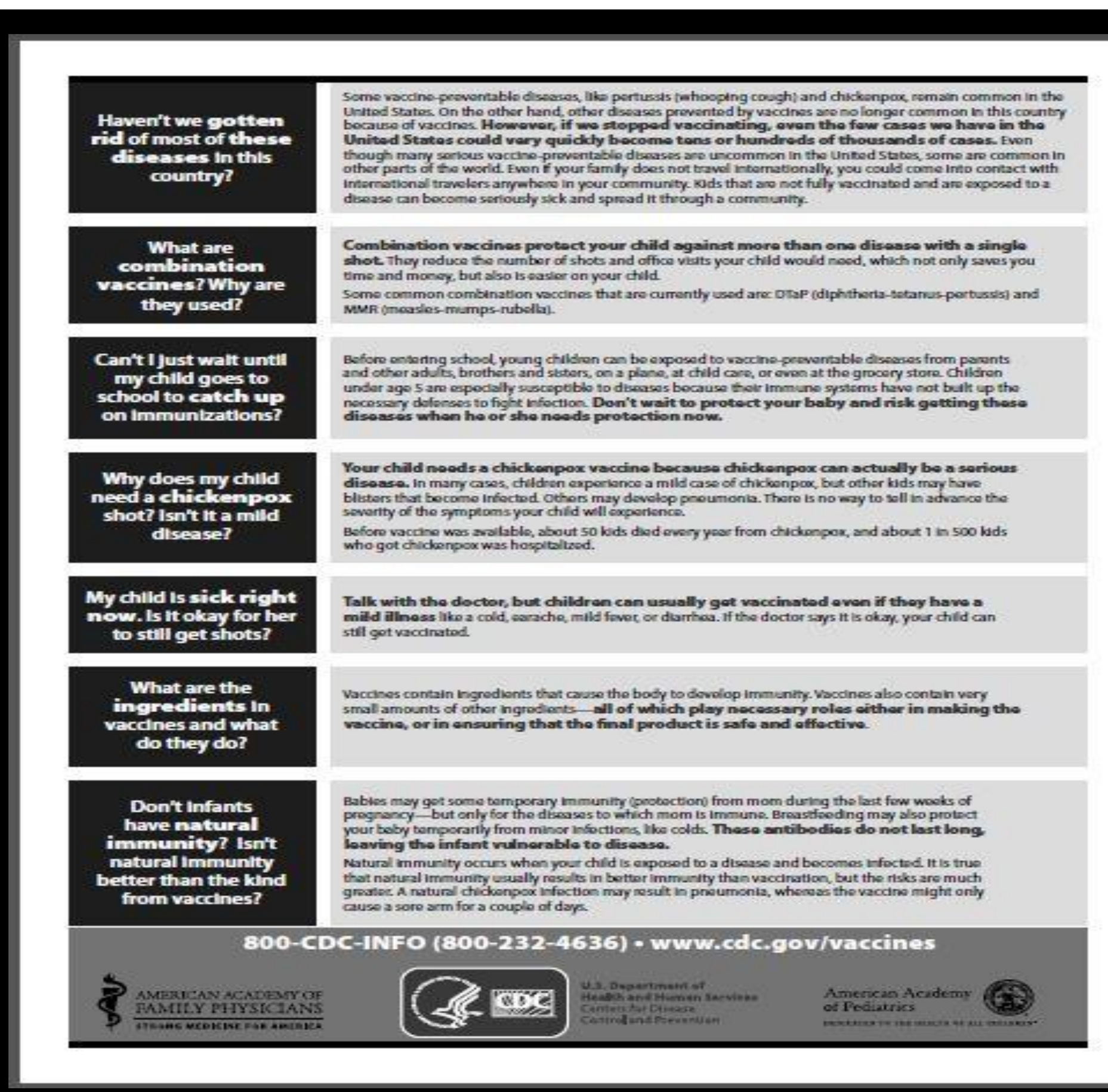
MATERIALS AND METHODS

- Design: Descriptive, longitudinal, quality improvement design. Baseline (n = 90, early fall) and two-month follow-up (n = 106, late fall) chart review.
- Tools: 30 minute provider educational session, distribution of parent vaccine educational handout, and post project provider survey.
- Measures: Using a confidence level of 95%, a maximum of 5% margin of error, a population size of 170, with a 50% response distribution, a minimum of 120 charts were required at baseline and follow-up review. However, the calculated sample size of 120 charts was not available for each time point, as such all available charts were utilized for the data analysis.
  - Nominal level data was analyzed with the Chi-square of Independence.
  - The *phi* coefficient (ϕ) was used as an index to describe the magnitude of the effect from the intervention with values .10, .30, and .50 corresponding to small, medium, and large respectively.
  - The level of significance was set at $p \leq .05$.



Infant Immunizations FAQs

Are vaccines **safe?**	**Yes. Vaccines are very safe.** The United States' long-standing vaccine safety system ensures that vaccines are as safe as possible. Currently, the United States has the safest, most effective vaccine supply in its history. Millions of children are safely vaccinated each year. The most common side effects are typically very mild, such as pain or swelling at the injection site.
What are the **side effects** of the vaccines? How do I treat them?	Vaccines, like any medication, may cause some side effects. **Most of these side effects are very minor, like soreness where the shot was given, fussiness, or a low-grade fever.** These side effects typically only last a couple of days and are treatable. For example, you can apply a clean, cool, wet washcloth on the sore area to ease discomfort. Serious reactions are very rare. However, if your child experiences any reactions that concern you, call the doctor's office.
What are the **risks and benefits** of vaccines?	Vaccines can prevent infectious diseases that once killed or harmed many infants, children, and adults. Without vaccines, your child is at risk for getting seriously ill and suffering pain, disability, and even death from diseases like measles and whooping cough. The main risks associated with getting vaccines are side effects, which are almost always mild (redness and swelling at the injection site) and go away within a few days. Serious side effects following vaccination, such as severe allergic reaction, are very rare and doctors and clinic staff are trained to deal with them. **The disease-prevention benefits of getting vaccines are much greater than the possible side effects for almost all children.**
Is there a link between **vaccines and autism?**	**No. Scientific studies and reviews continue to show no relationship between vaccines and autism.** Some people have suggested that thimerosal (a compound that contains mercury) in vaccines given to infants and young children might be a cause of autism, and others have suggested that the MMR (measles-mumps-rubella) vaccine may be linked to autism. However, numerous scientists and researchers have studied and continue to study the MMR vaccine and thimerosal, and reach the same conclusion: that there is no link between them and autism.
Can vaccines **overload** my baby's immune system?	Vaccines do not overload the immune system. Every day, a healthy baby's immune system successfully fights off millions of germs. Antigens are parts of germs that cause the body's immune system to go to work. The antigens in vaccines come from the germs themselves, but the germs are weakened or killed so they cannot cause serious illness. **Even if they receive several vaccinations in one day, vaccines contain only a tiny fraction of the antigens that babies encounter every day in their environment.** Vaccines provide your child with the antibodies they need to fight off the serious illnesses for which they have been vaccinated.
Why are so many **doses** needed for each vaccine?	**Getting every recommended dose of each vaccine provides your child with the best protection possible.** Depending on the vaccine, more than one dose is needed to build high enough immunity to prevent disease, boost immunity that fades over time, make sure people who did not get immunity from a first dose are protected, or protect against germs that change over time, like flu. Every dose of a vaccine is important because they all protect against infectious diseases that are threats today and can be especially serious for infants and very young children.
Why do vaccines start **so early?**	**The recommended schedule is designed to protect infants and children by providing immunity early in life, before they are exposed to life-threatening diseases.** Children are immunized early because they are susceptible to diseases at a young age, and the consequences of these diseases can be very serious, and even life-threatening, for infants and young children.
What do you think of **delaying** some vaccines or following an **alternative schedule?**	**Children do not receive any known benefits from following schedules that delay vaccines.** Infants and young children who follow immunization schedules that spread out shots-or leave out shots-are at risk of developing diseases during the time that shots are delayed. Some vaccine-preventable diseases remain common in the United States, and children may be exposed to these diseases during the time they are not protected by vaccines, placing them at risk for a serious case of the disease that might cause hospitalization or death.

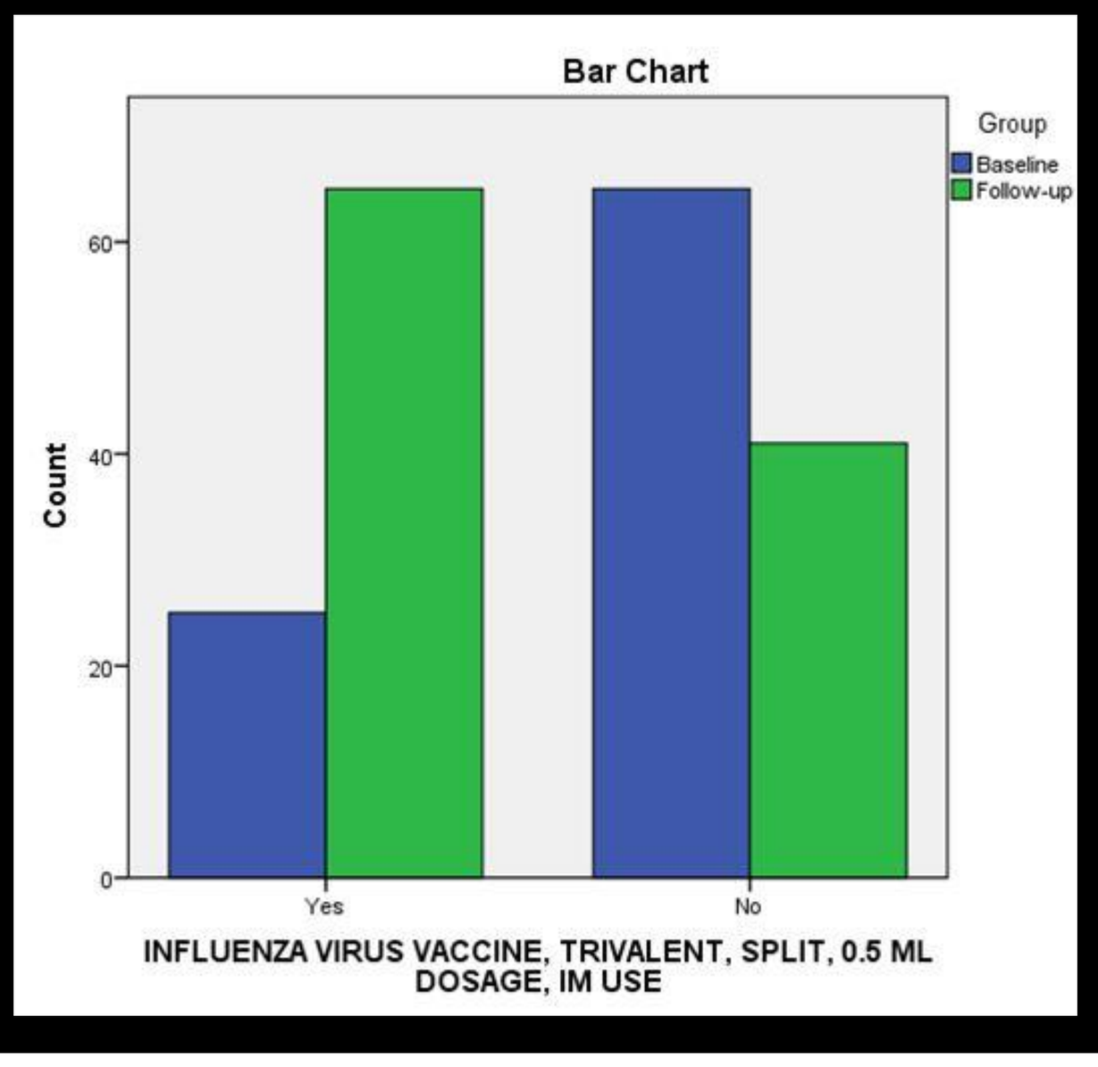


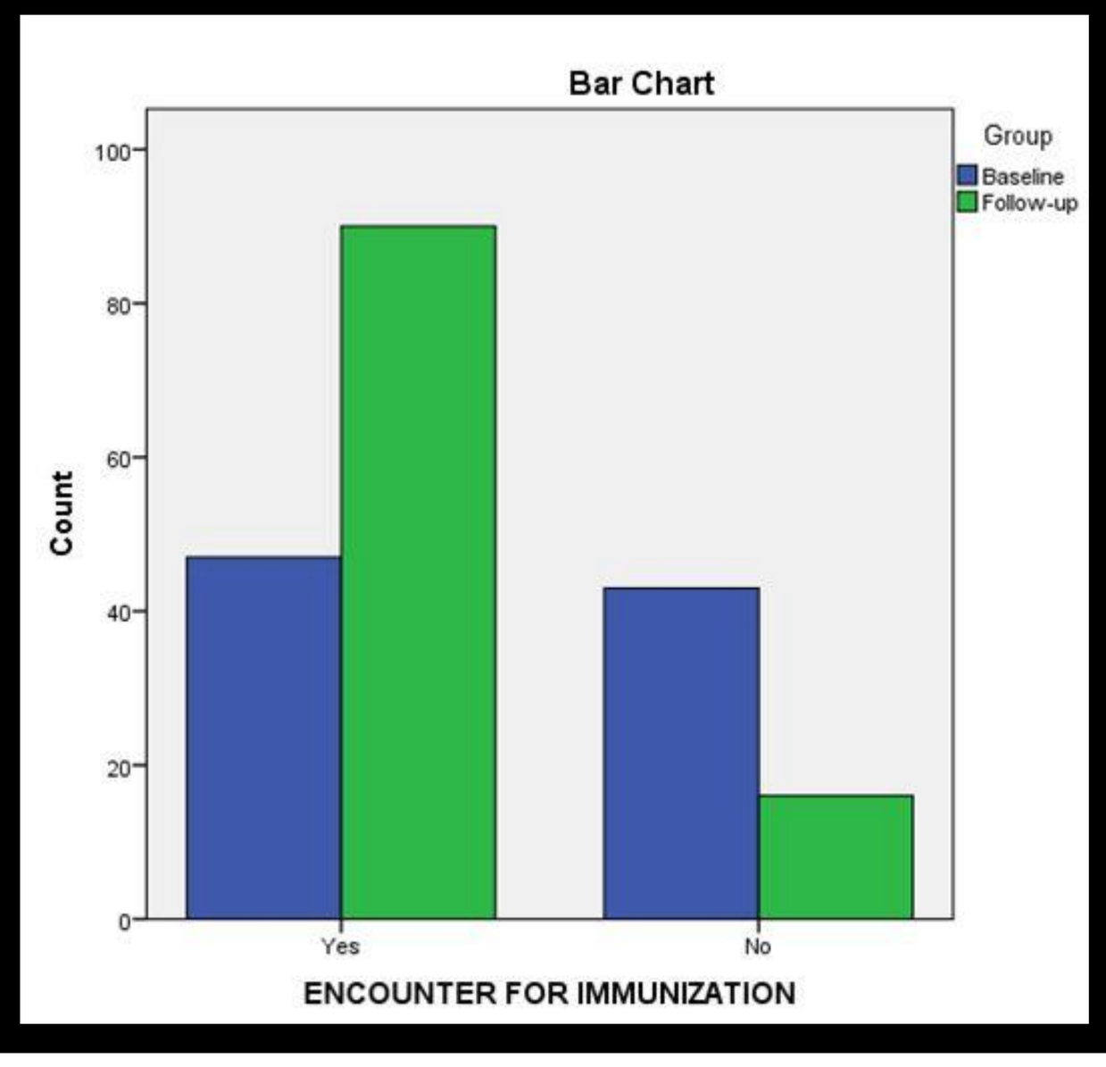
Haven't we **gotten rid** of most of **these diseases** in this country?	Some vaccine-preventable diseases, like pertussis (whooping cough) and chickenpox, remain common in the United States. On the other hand, other diseases prevented by vaccines are no longer common in this country because of vaccines. **However, if we stopped vaccinating, even the few cases we have in the United States could very quickly become tens or hundreds of thousands of cases.** Even though many serious vaccine-preventable diseases are uncommon in the United States, some are common in other parts of the world. Even if your family does not travel internationally, you could come into contact with international travelers anywhere in your community. Kids that are not fully vaccinated and are exposed to a disease can become seriously sick and spread it through a community.
What are **combination vaccines?** Why are they used?	**Combination vaccines protect your child against more than one disease with a single shot.** They reduce the number of shots and office visits your child would need, which not only saves you time and money, but also is easier on your child. Some common combination vaccines that are currently used are: DTaP (diphtheria-tetanus-pertussis) and MMR (measles-mumps-rubella).
Can't I just wait until my child goes to school to **catch up** on immunizations?	Before entering school, young children can be exposed to vaccine-preventable diseases from parents and other adults, brothers and sisters, on a plane, at child care, or even at the grocery store. Children under age 5 are especially susceptible to diseases because their immune systems have not built up the necessary defenses to fight infection. **Don't wait to protect your baby and risk getting these diseases when he or she needs protection now.**
Why does my child need a **chickenpox** shot? Isn't it a mild disease?	**Your child needs a chickenpox vaccine because chickenpox can actually be a serious disease.** In many cases, children experience a mild case of chickenpox, but other kids may have blisters that become infected. Others may develop pneumonia. There is no way to tell in advance the severity of the symptoms your child will experience. Before vaccine was available, about 50 kids died every year from chickenpox, and about 1 in 500 kids who got chickenpox was hospitalized.
My child is **sick right now.** Is it okay for her to still get shots?	**Talk with the doctor, but children can usually get vaccinated even if they have a mild illness** like a cold, earache, mild fever, or diarrhea. If the doctor says it is okay, your child can still get vaccinated.
What are the **ingredients** in vaccines and what do they do?	Vaccines contain ingredients that cause the body to develop immunity. Vaccines also contain very small amounts of other ingredients—**all of which play necessary roles either in making the vaccine, or in ensuring that the final product is safe and effective.**
Don't infants have **natural immunity?** Isn't natural immunity better than the kind from vaccines?	Babies may get some temporary immunity (protection) from mom during the last few weeks of pregnancy—but only for the diseases to which mom is immune. Breastfeeding may also protect your baby temporarily from minor infections, like colds. **These antibodies do not last long, leaving the infant vulnerable to disease.** Natural immunity occurs when your child is exposed to a disease and becomes infected. It is true that natural immunity usually results in better immunity than vaccination, but the risks are much greater. A natural chickenpox infection may result in pneumonia, whereas the vaccine might only cause a sore arm for a couple of days.

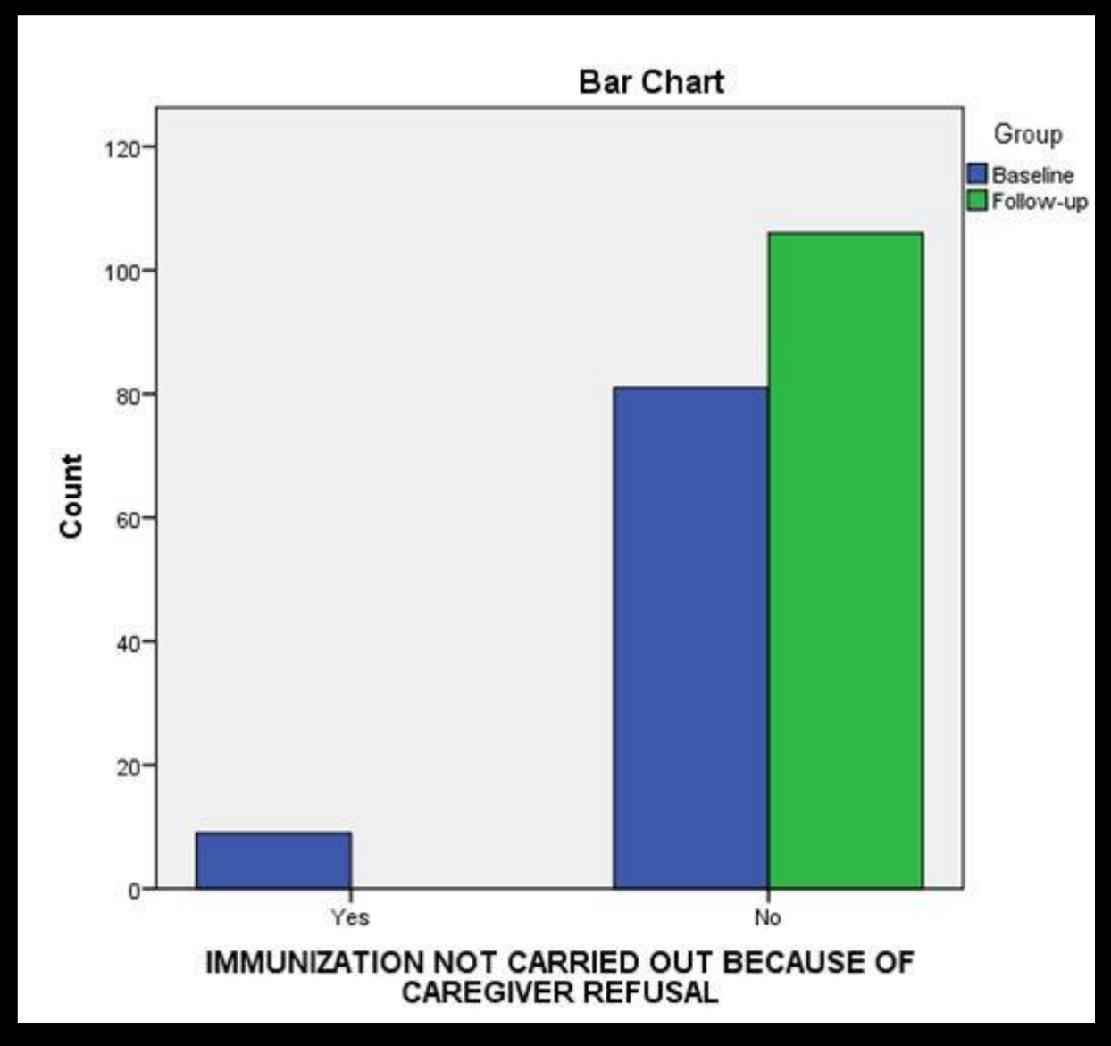
800-CDC-INFO (800-232-4636) • www.cdc.gov/vaccines

AMERICAN ACADEMY OF FAMILY PHYSICIANS — U.S. Department of Health and Human Services, Centers for Disease Control and Prevention — American Academy of Pediatrics

RESULTS







•**Influenza Vaccine 0.5 mL:** At baseline 25 vaccines (28%) were administered compared to 65 vaccines (61%) administered in the follow-up group. This moderate increase in vaccine administration was statistically and clinically significant, χ^2 (1) = 22.1, p = .000, Φ = .3. Patients in the follow-up group were almost two times more likely to receive the influenza vaccine, OR = 1.87, 95% CI [1.42, 2.45].

•**Encounter for Immunization:** At baseline there were 47 visits (52%) to the clinic for immunization administration compared to 90 visits (80%) in the follow-up group. This moderate to large increase in encounters for vaccine administration was statistically and clinically significant, χ^2 (1) = 24.7, p = .000, Φ = .4. Patients in the follow-up group were almost two and a half times more likely to have a clinic visit for immunization administration, OR = 2.42, 95% CI [1.57, 3.74].

•**Parent Refusal:** At baseline there were nine parents (10%) who refused vaccines for their child compared to zero (0%) in the follow-up group. This small to moderate decrease in vaccine refusal was statistically and clinically significant, χ^2 (1) = 11.1, p = .001, Φ = .2. Patients in the follow-up group were two times more likely not to refuse vaccine administration for their child, OR = 2.30, 95% CI [1.96, 2.72].

IMMUNIZATION RESULTS

Vaccine Codes	Baseline	Follow-up	*p*=	*phi*	OR	Comments
Immunization Administration through 18 years 1st	68%	36%	.000	.3	2.06	
Immunization Administration through 18 years Addl						CPT code not used in clinic.
Hepatitis A	23%	6%	.000	.2	1.90	
Human Papillomavirus	18%	18%	.61	.04	1.10	
Hemophilus Influenza (HIB)						Vaccine not used in clinic.
Influenza Virus 0.25 mL	33%	0%	.000	.2	2.26	
Influenza Virus 0.5 mL	28%	61%	.000	.3	1.87	
Rotavirus	9%	9%	.90	.01	1.03	
DTaP/HIB/IPV	21%	9%	.02	.2	1.54	
Pneumococcal Conjugate	21%	9%	.02	.2	1.54	
DTaP <7 years						Vaccine not used in clinic.
IPV Inactivated	7%	0%	.000	.2	2.27	
Tdap						Vaccine not used in clinic.
Varicella	22%	15%	.19	.09	1.27	
DTaP/HepB/IPV	11%	6%	.17	.1	1.40	
Hepatitis B	1%	0%	.28	.08	2.19	
Measles, Mumps, and Rubella	22%	15%	.19	.09	1.27	
Measles, Mumps, Rubella, and Varicella						Vaccine not used in clinic.
Meningococcal						Vaccine not used in clinic.
Encounter for Immunization	52%	85%	.000	.4	2.42	
Parent Refusal	10%	0%	.001	.2	2.30	

CONCLUSIONS

- **Objective 1 Met – More than 75% of educational vaccine pamphlets (100%) were distributed to parents upon arrival to the clinic.**
- **Objective 2 Met – More than 75% of providers (100%) found the educational intervention informative and reassuring to parents to increase immunization practice.**
- **Objective 3 Not met – The 15% improvement in immunization rates was not met as there was a 70% decline in over-all immunization administration in the follow-up review.**
- **Statistical and clinical significant improvement in administration of the influenza vaccine, encounters for immunization administration, and a decrease in parent refusal of vaccines was achieved.**
- **An educational intervention for providers and distribution of educational handouts has the ability to impact immunization rates while increasing confidence in immunization administration.**

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