

VACCINATION HESITATION: INVESTIGATING WHY PARENTS DECLINE PEDIATRIC  
INFLUENZA VACCINES IN JUNEAU, ALASKA

By

Lindsey Leder

APPROVED:

Project Committee

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Lisa Jackson, DNP, FNP, NP-C  
Chairperson

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Date

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Bethany Buchanan, DNP, FNP, NP-C  
Committee Member

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Date

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Michele Burdette-Taylor, PhD, RN-BC  
External Reviewer

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Date

ACCEPTED:

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Barbara Berner, EdD, APRN, FNP-BC, FAANP  
Director, School of Nursing

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Date

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Susan Kaplan, PhD, MBA, OT  
Senior Associate Dean, College of Health

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Date

VACCINATION HESITATION: INVESTIGATING WHY PARENTS DECLINE PEDIATRIC  
INFLUENZA VACCINES IN JUNEAU, ALASKA

A  
PROJECT

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By

Lindsey Leder, BSN

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### **Abstract**

The influenza virus is responsible for hundreds of childhood deaths and costs the health care system millions of dollars each year (Hassan, Lewis, Davis, Gebremariam, and Dombkowski, 2009). The influenza vaccine is the most effective intervention for prevention of pediatric influenza, yet many parents decline this vaccine for their children. Studies completed in various geographic locations cite different factors influencing parents who decline pediatric vaccinations. Alaska has the second lowest rate of influenza vaccination in the country (Center for Disease Control [CDC], 2012). The purpose of this project was to understand the factors that influence parental decision to refuse influenza vaccination in Juneau, Alaska. A modified version of the Childhood Influenza Immunization Questionnaire, an instrument based on the Health Belief Model, was utilized to collect data from a convenience sample of parents at a private pediatric practice in Juneau, AK. Statistical analysis revealed the only significant influencing factor on parents' decisions on whether to vaccinate against influenza was their perception of vaccine risk ( $p < .001$ ). Information obtained from this study will be used to educate local providers in the community with the goal of enabling said providers to overcome resistance to vaccination hesitancy based on parent perceptions.

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Juneau, Alaska

Influenza has the highest incidence of morbidity and mortality in children of all the vaccine-preventable diseases in the United States and is a costly financial burden (Piedra, 2013). From 2009 to 2013, over 800 children died from laboratory confirmed influenza (Center for Disease Control and Prevention [CDC], 2013b). Between 15-42% of children are infected annually and up to 29 of 100 outpatient visits for children are related to influenza (Munoz, 2014). Many of these children were healthy but not vaccinated (Piedra, 2013). During 2003 the costs associated with hospitalizations related to pediatric influenza totaled \$76.5 million (Hassan et al., 2009). Vaccination rates correlate with fewer hospitalizations in young children (Oster et al., 2010). During the 2013-14 season in Alaska there were 672 laboratory confirmed cases of influenza. Five of these cases resulted in death (Alaska Division of Public Health, 2014). Currently the most effective intervention available is vaccination, yet many parents decline the vaccination for their children (United States Department of Health and Human Services, 2014). When comparing the risks versus benefits of immunizing young children, even with the associated side effects, benefits outweighed the risks (Oster et al., 2010).

The Advisory Committee on Immunization Practices (ACIP), a branch of the CDC, is responsible for establishing and approving federal policy guidelines for pediatric vaccine recommendations. Current recommendations state that children six months and older should receive the influenza vaccine annually, providing the child presents no contraindications. The current literature agrees that children less than five years of age are at high risk of developing serious complications from influenza (CDC, 2013c). An expert

panel comprised of representatives from medical schools and national preventative health organizations recommends that the influenza vaccine should be required to decrease morbidity and mortality and increase group immunity, particularly for children (Schwartz et al., 2006). The federal government of the U.S. recommends, but does not yet require the influenza vaccine for children. The United Kingdom (UK) is moving toward universal requirement of the influenza vaccine. Findings by the Joint Committee on Vaccination and Immunisation report that “if just 30% of children had the flu vaccine... there could be 2000 fewer deaths and 11000 fewer hospitalizations due to the flu each year” in the UK (Craig, 2013, p. 432).

Despite conclusive research on the benefits of pediatric influenza vaccination, many parents continue to decide against vaccinating their children each year. According to the CDC, only 51% of children were vaccinated against influenza during the 2010-2011 season (2012). This fell below Healthy People 2020’s goal of 70% (U.S. Department of Health and Human Services, 2013). Alaska had one of the lowest influenza vaccination rates at only 37% in 2011, and had the highest overall rate of parents opting out of all vaccinations at 9% (Alaska Dispatch, 2011; CDC, 2012). This suggests that barriers to pediatric influenza vaccinations exist in Alaska that may be more unique than elsewhere in the country.

In order to make impacts on morbidity, mortality, and the monetary consequences associated with pediatric influenza, it is important to understand the reasons parents decline vaccines for their children in Alaska. By understanding parental concerns, providers will then be able to provide education specific to their concerns.

### **Literature Review**

A multitude of studies have examined reasons parents chose not to vaccinate. While research does exist pertaining specifically to refusal of the influenza vaccine, there is a much larger body of research addressing vaccinations in general. The research addressing pediatric influenza vaccination is somewhat limited: no research has sought to differentiate the issues according to geographic location that could identify and account for state-to-state differences.

Electronic searches were completed in CINAHL, PubMed, Dissertations & Theses Full Text, and ProQuest Nursing & Allied Health Source databases. The search strategy utilized combinations of keywords for immunization, influenza pediatrics, and geographical location (Immunization OR Influenza OR Influenza Vaccination OR Child Rearing OR Parent-Child Relations OR Health Beliefs OR Behavior and Behavior Mechanisms OR Attitude to Health OR Geographic Locations OR Demography).

#### **Existing Geographical Immunization Information**

The literature search was void of research addressing geographical differences in the decision to vaccinate specifically for influenza. Additionally, no research has been completed in Alaska. The review of the literature found one study differentiating reasons for vaccine refusal according to geographical location. This study addressed geographical differences in the decision to vaccinate for all vaccine preventable disease. Whitehead, Cui, De, Ayers, and Effler (2007) identified risk factors for under-immunization by reviewing vaccine records in different area codes in Hawaii. Whitehead et. al found low education, language other than English as primary language and living in the Maui area were associated with lower vaccination rates.

### **Factors Influencing Vaccine Decision**

A synthesis of the literature concluded that the decision to vaccinate is complicated and multi-faceted. It is difficult to address parental fears due to “the complex interaction of education, societal, personal and other factors” that are influential in the decision to vaccinate children (Healy & Pickering, 2011, p. S128). Due to limited literature regarding factors influencing the choice to vaccinate specifically against influenza, studies were reviewed regarding all vaccinations. Seven major factors were involved in influencing the decision to vaccinate: health care provider influence, individualism and control, questioning vaccine safety, perceived susceptibility to influenza, social norm, media influence, and school-based influenza vaccinations.

**Health care provider influence.** Health care providers possess a strong influence regarding parents’ choice to vaccinate their children. Physician recommendation was a positive predictor of parents utilizing the pediatric influenza vaccination for their children and was found to be the greatest influencing factor in changing the minds of non-immunizers (Chen et al., 2011; Freed, Clark, Butchart, Singer & Davis, 2011; Gust, Darling, Kennedy & Schwartz, 2008; Miller, 2013; Robbins, Leask & Booy, 2010). Parents sought out health care professionals whom they trusted and felt were well informed with regard to vaccines (Ruijs et al., 2012; Smailbegovic, Laing, & Bedford, 2003). However, parents were often unsatisfied with the information said professionals provided and reported seeking information from other sources such as the Internet. Discovering the individual reasons parents refuse vaccinations is key for health care providers to develop rapport to and maintain a dialogue with vaccine-hesitant parents (Healy & Pickering, 2011).

**Individualism and control.** Parents desire the feeling of control and the ability to choose to vaccinate for certain diseases (Bond & Nolan, 2011). Parents also want to be perceived and treated as individuals when discussing vaccines for their children with their health care provider (Bond & Nolan, 2011; Smailbegovic et al., 2003). Reasons for declining vaccination are complex and varied, therefore health care providers should address individual specific concerns and questions from each parent (Smailbegovic et al., 2003).

**Questioning vaccine safety.** Fear is an influencing factor in parental decision to vaccinate. The CDC (2013a) identifies and provides information sheets for several known parental vaccination fears. The major parental fears regarding vaccinations include fear of autism, neurological conditions as side effects, vaccine ingredients, and sudden infant death syndrome. Multiple studies found parents fear the influenza vaccine causes a flu-like illness and side effects of the vaccine are more serious than the influenza virus itself (Daley et al., 2007; Freed, Clark, Butchart, Singer & Davis, 2010; Grant, 2003).

Parents also fear long-term side effects of vaccinations such as causing autism, immune system weakening or other neurologic adverse events (Diekema, 2005; Grant, 2009). Although negated through hundreds of well-designed research studies including sources such as the Institute of Medicine, CDC, and the American Academy of Pediatrics, there are still parents who fear childhood vaccinations cause autism (CDC, 2014; DeStefano, Price, & Weintraub, 2013; Freed et al., 2010). Parents also fear the possibility that vaccines overwhelm and weaken the immune system (Bond & Nolan, 2011; Offit et al., 2002). The number of Internet searches about the neurological side effects of vaccines, such as Guillain-Barre Syndrome, has risen significantly in recent years. This suggests

growing fears specifically regarding neurologically adverse events associated with vaccinations (Miller et al., 2011).

**Perceived susceptibility to influenza.** Many parents do not believe their children will ever be exposed to vaccine-preventable diseases (Smailbegovic et al., 2003). Belief that a child was at risk of contracting influenza was found to be an influencing factor in a parent's decision to vaccinate (Flood et al., 2010). Parents who believed their children were at risk for contracting influenza were more likely to vaccinate, while those who did not believe their children were susceptible were less likely to vaccinate (Miller 2013).

**Social norm.** Social norm was found to be a common influencing factor in the choice to vaccinate (Ruijs et al., 2012). Peer influence was an important factor in parents' likelihood to vaccinate (Allison et al., 2010; Frew, Hixson, del Rio, Esteves-Jaramillo & Omer, 2011). Freed et al. (2011) also found that family and friends were significant sources of trustworthy vaccine safety information for parents, particularly for White and Hispanic families.

**Media influence.** An influencing factor for many parents is information from media sources (Chen et al., 2011; Offit & Jew, 2003; Torun, Torun & Catak, 2010). Offit and Jew (2003) stated that the news and popular media could alarm parents with stories about harmful ingredients in vaccinations. Torun et al. found the year that a combination vaccine was issued for Influenza A and H1N1 even healthcare workers were unlikely to vaccinate their children due to negative media influence (2010). Research by Freed et al. (2011) argued that mothers in particular put their trust for vaccination safety information in news, media and celebrity opinion.

**School-based influenza vaccination.** Children play a large role in spreading influenza in the school and home setting. Research has demonstrated that school-based vaccination programs increase flu vaccination rates as well as herd immunity (Barclay, 2008; Painter et al., 2011). One year after implementation of a school-based influenza program, researchers saw evidence of improved herd immunity in the community (Barclay, 2008). Another study found that school-based vaccine programs not only increase vaccine rates, but also decreased rates of influenza in the households of those children (King et al., 2006). Families in the school-based influenza vaccination program had significantly lower missed work days and school absentee days, leading to the conclusion that school based vaccine programs have benefits beyond the children receiving the vaccinations (King et al., 2006).

### **Theoretical Framework**

The Health Belief Model (HBM) serves as the theoretical framework for this study. The HBM has been used in a number of studies, many specific to vaccination behavior (Miller, 2013). This model establishes a greater understanding of health decisions by individuals (Smailbegovic et al., 2003). The HBM theorizes that a people's perception regarding health problems, and beliefs about benefits, barriers and self-efficacy explain their participation, or lack of participation, in behaviors that promote health (Miller, 2013). The constructs of the HBM include perceived susceptibility of disease, perceived severity of disease, perceived benefits of the intervention, perceived system barriers and cues to action. System barriers include ability to obtain an appointment with a provider, attend an appointment and pay for health care services. Cues to action include education, media, symptoms of disease, and encompass influencing factors that can motivate an individual to

take action and partake in a health care intervention, in this case the influenza vaccination. Cues to action impact behavior when the perceived threat is heightened increasing perceived susceptibility and severity. Individuals will more likely partake in “preventive health care if they are motivated and knowledgeable, believe they are vulnerable and the disease is threatening, believe the intervention is effective, and barriers do not outweigh the benefits.” (Miller, 2013, p.10).

### **Significance to Nursing**

Primary care providers are the most influential factor in convincing vaccine-hesitant parents to vaccinate (Healy & Pickerling, 2011). When care is nurse directed, as opposed to physician directed, patient satisfaction and compliance increases (Fund & Swanson-Hill, 2014). Nurse Practitioners (NPs) are present not only in pediatric clinic and hospital settings, but also school-based clinics where education and campaigns targeting parental concerns can be implemented. NPs serve as primary providers for many pediatric patients and are in an ideal position to provide relevant education and insight about the importance and safety of vaccines. NPs in Alaska have a wide scope of practice allowing them to see patients and manage care independently. Education for NPs focuses not only the curative but also the preventative model of medicine and emphasizes awareness of differences in social factors, culture, environment and family dynamics to allow for sensitive and individualized care (Fund & Swanson-Hill, 2014).

### **Study Rationale**

Research regarding reasons parents refuse influenza vaccination for their children varies by different geographical locations. A significant literature gap exists in exploring vaccine hesitation according to geographic location. According to the Alaska State

Department of Epidemiology's Immunization Program Manager, no research has been completed in-state regarding reasons given when parents decline influenza vaccination for their children (G. Yett, personal communication, June 13, 2014). Health care providers are the most influential factor in changing the minds of parents resistant to vaccination. Understanding why Alaskan parents refuse influenza vaccination for their children can promote targeted information in the state to alleviate fears and concerns.

## **Methods**

### **Human Subject Rights and Protection**

This study followed the stipulations set forth by the University of Alaska Anchorage Institutional Review Board (IRB). The IRB granted an exempt status for this research based on no foreseeable risks to participants. Participants' rights were outlined in the letter they received with the survey. Risks of participation were no greater than the risk experienced in every day life. The survey was completely voluntary and anonymous with no identifying data.

### **Purpose Statement and Research Questions**

The purpose of this study was to understand the factors that influence parents' decisions to refuse influenza vaccination in Juneau, Alaska. This information will allow providers to implement targeted education, thus decreasing barriers to vaccination and thus increasing childhood influenza vaccination rates. The following research questions were addressed:

1. What is the association between parents' likelihood to vaccinate and perceived vaccine risk?

2. What is the relationship between perceived system barriers (e.g. ability to obtain an appointment with a provider or ability to attend an appointment) and intent to vaccinate?
3. What is the association between cues to action (e.g. education, media, and symptoms of disease) and parents' intent to vaccinate their children?
4. Do specific demographics in Juneau, AK, (e.g. parental age, parental level of education, child age, previous influenza immunization status, type of insurance, and parent ethnicity) affect the likelihood of parents vaccinating their children for influenza? Instrument

The Childhood Influenza Immunization Questionnaire (CIIQ) was developed to determine parents' perceptions of influenza risk related to vaccination and likelihood to vaccinate (Miller, 2013). The original instrument included questions from six concepts influencing parents' decision to vaccinate for influenza that were derived from the HBM. Miller (2013) completed a pilot study and follow up study testing the CIIQ for clarity, consistency, reliability and validity. Additional questions were added to the CIIQ based on the information Miller identified in her follow-up study. However, in the final instrument only three concepts were found to be internally consistent statistically.

Permission was obtained from the researcher to modify the CIIQ, utilizing only the questions from the three concepts found to be both internally and externally consistent (J.A. Miller, personal communication, May 17, 2014) (*Appendix A*). The resulting instrument was a twelve-question Likert scale survey, which determined how perceived vaccine risk, cues to action and perceived system barriers affect likelihood to vaccinate. The questions were randomized; all the questions from one category did not appear

together (Miller, 2013). In addition to the modified CIIQ, six demographic questions were asked specific to Juneau, Alaska. Miller (2013) designed the CIIQ to be used at a 10:1 ratio of sample size to parameter. The modified CIIQ has seven parameters: three coefficients and four variables. Thus a sample size of 70 participants was needed. To compensate for potential missing data, the  $N$  was set at 100. The Modified CIIQ can be found in *Appendix B*.

### **Recruitment**

The modified CIIQ was offered as an optional survey to clients who presented for appointment at a Juneau pediatric office of approximately 5,000 patients. The participants were a convenience sample. The client could take a clipboard with a letter from the researcher (*Appendix C*) describing the study's purpose, risks, benefits, confidentiality, voluntary participation as well as contact information of the researcher. This letter also stated that by turning in a completed survey the client consented to participation in the research study. Once completed, the client placed the survey in a sealed box provided by the researcher. The researcher collected surveys on a weekly basis between October 6, 2014 and December 5, 2014.

### **Data Analysis**

**Description of sample.** One hundred surveys were collected and entered into SPSS predictive analytics software Version 22 for data analysis. Parental age ranged from 25 to 63 years with a mean of 38.27 ( $SD = 8.16$  years). Participants were predominantly white ( $n = 64, 72.7\%$ ), had private insurance ( $n = 65, 65.7\%$ ) and were well educated with most ( $n = 70, 71.4\%$ ) having at least some post-secondary education. The average years of education was 15.73 years ( $SD = 2.78$  years), with a range of 17 years. The age of the child ranged from 4 months to 17 years with a mean of 6.52 years ( $SD = 4.68$  years), The majority of

parents reported they had vaccinated their children for influenza the previous year ( $n = 72$ , 72%). See table 1 for more detailed information on sample demographics.

**Table 1. Sample Demographics**

<b>Characteristic</b>	<b>Result</b>	<b>N</b>
Parental Average Age ( $\pm$ SD)	38.27 ( $\pm$ 8.16)	99
Child Age ( $\pm$ SD)	6.52 ( $\pm$ 4.69)	100
Parental Education Level ( $\pm$ SD)	15.73 ( $\pm$ 2.78)	98
Insurance Type		99
Private Insurance ( $\pm$ %)	65 ( $\pm$ 65.7)	
Denali Care ( $\pm$ %)	9 ( $\pm$ 9.1)	
TriCare ( $\pm$ %)	7 ( $\pm$ 7.1)	
Other ( $\pm$ %)	6 ( $\pm$ 6.1)	
None ( $\pm$ %)	3 ( $\pm$ 3.0)	
Multiple Insurance Types ( $\pm$ %)	2 ( $\pm$ 2.0)	
Denali Care + Private ( $\pm$ %)	7 ( $\pm$ 7.1)	
Parental Race		88
American Indian or Alaska Native ( $\pm$ %)	2 ( $\pm$ 2.3)	
Asian ( $\pm$ %)	4 ( $\pm$ 4.5)	
Hispanic or Latino ( $\pm$ %)	4 ( $\pm$ 4.5)	
Native Hawaiian or Pacific Islander ( $\pm$ %)	1 ( $\pm$ 1.1)	
White ( $\pm$ %)	64 ( $\pm$ 72.7)	
Other ( $\pm$ %)	3 ( $\pm$ 3.4)	
More than one race circled ( $\pm$ %)	10 ( $\pm$ 11.4)	

**Data analysis.** A Spearman's Rho correlation was utilized for analysis of the ordinal data associated with the research questions. The additional assumption of the Spearman's Rho was met assuming a monotonic relationship between the two variables being correlated.

**What is the association between parents' likelihood to vaccinate and perceived vaccine risk?** The perceived vaccine risk scale included five, five point likert items. Participants were asked to indicate how much they agreed/disagreed with each statement. The perceived vaccine risk score was determined by adding the scores together. Higher scores indicated more perception that the influenza vaccine was a risk to their child. A Spearman's Rho correlation found a significant moderate negative correlation between parents' intent to vaccinate and perceived vaccine risk,  $r_s = -.371$  ( $N = 100$ ),  $p < .001$ . The higher the parents' perceived risk of the influenza vaccination, the less likely they were to vaccinate their children. All five items in the Perceived Risk subscale had statically significant correlations with intent to vaccinate.

**What is the relationship between perceived system barriers (e.g. ability to obtain an appointment with a provider or ability to attend an appointment) and intent to vaccinate?** Spearman's Rho found the Perceived System Barriers subscale was not related with intent to vaccinate,  $r_s = -.065$  ( $N = 100$ ),  $p = .522$ . Parents were asked to rate how much they agreed/disagreed with each statement. Higher scores indicated greater perception of barriers to obtaining the flu vaccine for their child. The barriers subscale only had two likert items and neither was correlated with intent to vaccinate.

**What is the association between cues to action (e.g. education, media, and symptoms of disease) and parents' intent to vaccinate their children?** No significant relationship was found between Cues to Action and parents' intent to vaccinate,  $r_s = -.097$  (N = 100),  $p = .338$ . The Cues to Action subscale included five likert items where parents were asked to rate how much they agreed/disagreed with each statement. These items were reverse coded so that higher scores indicated cues to action not influencing parents' decision to vaccination. None of these likert items individually correlated with intent to vaccinate.

**Do specific demographics in Juneau, AK, (e.g. parental age, parental level of education, child age, previous influenza immunization status, type of insurance, and parent ethnicity) affect the likelihood of parents vaccinating their children for influenza?** None of the descriptive statistics correlated with parental intent to vaccinate. For parental age, child age and parental level of education, a Spearman's Rho correlation was utilized due to one variable being ordinal and the other being interval data. Race, insurance type and previous influenza immunization status could not be analyzed due to non-representative numbers in some of the categories. No correlation was found between parental age and intent to vaccinate,  $r_s = .112$  (N = 99),  $p = .269$ , between the child's age and parents' intent to vaccinate,  $r_s = .084$  (N = 100),  $p = .407$ , nor between parental level of education and intent to vaccinate  $r_s = -.006$  (N = 98),  $p = .957$ .

**Reliability.** Cronbach's alpha was conducted to determine the reliability of each CIIQ subscale. Both the Perceived Risk and Cues to Action had satisfactory reliability, with Cronbach's alphas of .76 and .78 respectively. However, the Perceived System Barriers

subscale had a Cronbach's alpha of .561. This may be due to the subscale having only two individual items.

### **Study Outcomes**

These data serve as a starting point for understanding the reasons parents declined influenza vaccinations in Juneau, AK. The sample demographics were similar to the census data for Juneau from 2013 (U.S. Department of Commerce, 2013). Due to the convenience sampling, the data may not translate to a broader population within Alaska. At this time tracking information for influenza vaccine rates within individual cities and areas within the state are not available (T.L. Franklin, personal communication, April 17, 2014).

This study evaluated the correlation between five separate items related to perception of vaccine risk. The items with the strongest correlation with parents' intent to vaccinate were: perception that the influenza vaccine is unsafe for children, and the perception that side effects of the influenza vaccine are worse than the flu itself. Each of the other items - knowing of a bad reaction to the flu vaccine, the perception that the flu vaccine weakens the immune system, and the perception that the vaccine had unsafe ingredients - had clinically significant correlations with parents' intent to vaccinate; although the correlations were not as strong as the other two previously identified items on the survey. The results from this survey indicate that education for parents should focus on safety of the vaccine, and on dispelling common misconceptions regarding influenza vaccination risks. The cues to action and Barriers items on the survey did not have statistically significant correlations with parents' intent to vaccinate; education and efforts regarding these areas may be better spent on vaccine risk.

While the literature review found that health care provider influence was the most influencing factor in parents' decision to vaccinate, results from this survey show that perceived vaccination risk is the only clinically significant correlation with parental intent to vaccinate. It is not clear why results from the survey did not show health care provider influence as a significant influencing factor. This could be due to the limited sample, the opinion of the patients at the particular practice where the survey was collected or perhaps this is unique to the geographic area. Since none of the cues to action were found to be significant influencing factors, it begs the question: what are the cues to action for this population? What information do parents trust to educate them? Perceived vaccine risk was the significant influencing factor of those factors analyzed. Where do parents obtain information regarding vaccination risk? What sources are affecting the decision to vaccinate if not health care providers? Possibly the lack of parents influenced by health providers contributes to the low numbers of children vaccinated against influenza in Alaska. Health care providers are in an ideal position to educate parents regarding their perceived risk of influenza vaccination. These are all questions that should be explored in future research.

### **Future Study Implications**

While this study identified perceptions of vaccine risk as an educational priority, the implications for further study are abundant. One limitation of this study was utilizing a local convenience sample as the study population; surveys should be completed at different locations and randomized as much as possible in order to ensure the data can translate to broader populations. Differences in location should also be identified in order to study if

data differs significantly by geographic locations. A larger sample may determine if demographics are influencing factors by providing further variation in population.

This study looked at three specific areas of influence regarding influenza vaccination: perceptions of vaccine risk, cues to action and barriers to vaccination. The Perceived System Barriers category was not found to be reliable due to limited items within the subscale of the modified CIIQ. It would be beneficial to discover more influential factors in this subscale to further improve the instrument that was utilized in this study. Future research could focus on other categories that may be influential in addressing vaccine hesitancy. Understanding influential factors is only the beginning; interventions should be implemented and examined to determine their effectiveness. This study only looked at only the influenza vaccine, but the issue of parental refusal of pediatric vaccination spans across all vaccine-treatable disease. Future research could focus on factors that influence parental decisions to vaccinate as a whole.

### **Dissemination**

The findings of this study are relevant locally where the convenience sample was collected. The results were shared with local pediatric providers via posters delivered to their clinics. These posters included the abstract, study findings and literature review. The posters emphasized the key role providers have in educating influenza vaccine-hesitant parents. This project will also be submitted to the American Journal of Public Health for publication.

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## Appendices

### Appendix A: Email Communication with J. A. Miller, author of CIIQ

Email: [Julie.Miller1@cchmc.org](mailto:Julie.Miller1@cchmc.org)<mailto:[Julie.Miller1@cchmc.org](mailto:Julie.Miller1@cchmc.org)> From: Lindsey Mondich [[lnmondich@alaska.edu](mailto:lnmondich@alaska.edu)<mailto:[lnmondich@alaska.edu](mailto:lnmondich@alaska.edu)>]  
Sent: Wednesday, January 29, 2014 7:06 PM  
To: Miller, Julie  
Subject: Thesis on Childhood Influenza

Good Afternoon Dr. Miller,

I am a Family Nurse Practitioner student at University of Alaska Anchorage and am currently in my final semesters working on my thesis. My focus is determining why parents choose not to vaccinate their children for influenza specifically in southeast Alaska. I came across your research "Factors Influencing Influenza Vaccination of Children" but our library databases do not allow me to view more than the abstract. I am very interested in including your findings in my literature review and also asking your permission to utilize the questionnaire you developed.

Thank you so much for your time.

-Lindsey Leder, FNP Student

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On Wed, Jan 29, 2014 at 3:24 PM, Miller, Julie <[Julie.Miller1@cchmc.org](mailto:Julie.Miller1@cchmc.org)<mailto:[Julie.Miller1@cchmc.org](mailto:Julie.Miller1@cchmc.org)>> wrote:  
Hi Lindsey,

I have attached a PDF of my dissertation for your review. You do have my permission to use the CIIQ as long as you do not make any changes to the tool and reference appropriately (the final tool is in the back of the document). If you need further assistance or have any other questions please do not hesitate to email me. Good luck!

Julie

Julie Miller, PhD, APRN, PNP-BC, FNP-C  
Nurse Practitioner, Emergency Medicine  
Cincinnati Children's Hospital Medical Center  
3333 Burnet Ave.  
Cincinnati, Ohio 45229-3026  
Pager [513-736-0227](tel:513-736-0227)<tel:[513-736-0227](tel:513-736-0227)>

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-----Original Message-----

From: Lindsey Mondich  
To: Julie Miller  
Subject: Re: Thesis on Childhood Influenza  
Sent: Jan 29, 2014 7:35 PM

Hello Dr. Miller,

I cannot even express how helpful this is, thank you so much for your assistance and extremely fast response. I will not make changes to the tool and will be sure to appropriately reference it. I will be sure to let you know if I have further questions.

Again, thank you so much! I greatly appreciate it.

-Lindsey Leder

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On Thu, Jan 30, 2014 at 12:30 PM, Miller, Julie <[Julie.Miller1@cchmc.org](mailto:Julie.Miller1@cchmc.org)> wrote:  
Lindsey,

Attached is the revised tool. You may change the demographic section if you would like, as that will not

alter the psychometrics of the tool. I would be interested in your results-do you mind emailing me the abstract when available?

Thanks,  
Julie

Julie Miller, PhD, APRN, PNP-BC, FNP-C  
Nurse Practitioner, Emergency Medicine  
Cincinnati Children's Hospital Medical Center  
3333 Burnet Ave.  
Cincinnati, Ohio 45229-3026  
Pager [513-736-0227](tel:513-736-0227)  
Email: [Julie.Miller1@cchmc.org](mailto:Julie.Miller1@cchmc.org)

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On Thu, Jan 30, 2014 at 12:32 PM, Lindsey Mondich <[lnmondich@alaska.edu](mailto:lnmondich@alaska.edu)> wrote:  
Good Afternoon Dr. Miller,

I would be happy to email you the abstract when it is complete. I expect it to be this summer. Thank you again for your assistance.

-Lindsey Leder

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**From:** Lindsey Mondich [mailto:[lnmondich@alaska.edu](mailto:lnmondich@alaska.edu)]  
**Sent:** Thursday, April 17, 2014 02:41 PM  
**To:** Miller, Julie  
**Subject:** Re: Thesis on Childhood Influenza

Good Morning Dr. Miller,

I have continued to move forward with my thesis project and after speaking with my advisor we have decided to narrow the scope of the study a bit to test only perceived System Barriers, Vaccine risk and cues to action. I was hoping to obtain your permission to use only the items in these categories on your instrument. I will not alter the tool at all, I will just be using only the relevant portion of it with your permission. Thank you so much for your time!

-Lindsey Leder, FNP-s

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On Thu, May 17, 2014 at 12:21 PM, Miller, Julie <[Julie.Miller1@cchmc.org](mailto:Julie.Miller1@cchmc.org)> wrote:

Hi Lindsey,  
Yes, you have my permission. Good luck!  
Julie

**Appendix B: The Modified Childhood Influenza Immunization Questionnaire**

**Modified Childhood Influenza Immunization Questionnaire (CIIQ)**

**Directions:** The following items are intended to assess what factors affect your decision to have your child get the flu vaccine. Circle the number to indicate whether you strongly disagree (1), disagree (2), neither agree or disagree (3), agree (4), or strongly agree (5).

**If you are here with more than one child** with an appointment, please complete the questionnaire for the older child.

	<b>1</b> Strongly Disagree	<b>2</b> Disagree	<b>3</b> Neither Agree or Disagree	<b>4</b> Agree	<b>5</b> Strongly Agree
The flu vaccine weakens the immune system.	1	2	3	4	5
My child’s healthcare provider telling me my child should get the flu vaccine affects my decision to vaccinate my child against the flu.	1	2	3	4	5
Side-effects from the flu vaccine are worse than the flu itself.	1	2	3	4	5
News or internet sites stressing the importance of the flu vaccine for children affects my decision to vaccinate my child against the flu.	1	2	3	4	5
The flu vaccine is <b>not</b> safe to give to children.	1	2	3	4	5
My child’s school or daycare telling me my child should get the flu vaccine affects my decision to vaccinate my child against the flu.	1	2	3	4	5
The flu vaccine contains ingredients that are not safe.	1	2	3	4	5
It is difficult to find the time to bring my child to the healthcare provider’s office to get the flu vaccine.	1	2	3	4	5
Transportation problems make it hard to bring my child to the healthcare provider’s office to get the flu vaccine.	1	2	3	4	5
Family members wanting my child to get the flu vaccine affects my decision to vaccinate my child against the flu.	1	2	3	4	5
I or someone I know had a bad reaction to the flu vaccine.	1	2	3	4	5
My child will get the flu vaccine <b>this</b> flu season.	Very Unlikely	Unlikely	Unsure	Likely	Very Likely

1. How old are you? \_\_\_\_\_ years old
2. How many years have **you** attended school beginning with first grade? \_\_\_\_\_ number of years
3. How old is the child you are filling out the questionnaire for? \_\_\_\_\_ years (for children under 2 years of age, put age in months).
4. Did your child get a flu vaccine last flu season?    Yes            No            N/A

5. Please circle the type of insurance your child has.

Private (for example Aetna, Humana, Cigna)    Denali Kid Care    Tricare    Obamacare    None

Other \_\_\_\_\_

6. Please circle the ethnicity/race of your child. (Circle all that apply)

American Indian or Alaska Native    Asian    Black or African American

Hispanic or Latino    Native Hawaiian or other Pacific Islander    White

Other \_\_\_\_\_

**Thank you for participating in the study. Please put your questionnaire in the provided box.**

## Appendix C: Information Letter for Participants

**Title of Study:** Vaccination Hesitation: Investigating why Parents Decline Pediatric Influenza Vaccines in Juneau, Alaska.

**Introduction:** You are being asked to take part in a research study. Please read this paper carefully and ask questions about anything that you do not understand.

**Who is doing this research study?** Lindsey Leder, RN, a Family Nurse Practitioner student of the University of Alaska Anchorage, is conducting this research study. Her Committee Chair in this study is Lisa Jackson, DNP, FNP, clinical faculty UAA Graduate Family Nurse Practitioner Program.

**What is the purpose of this research study?** The purpose of this research study is to determine factors associated with parents' decision to vaccinate children against influenza and the relationships between those factors.

**Who will be in this research study?** About 50-150 people will take part in this study. Parents coming to the office while the study is being conducted will be invited to participate.

You may be in this study if:

- You are 18 years of age or older
- You are able to read and write English
- You are the parent or legal guardian of one or more children ages 6 months to 17 years

You may not participate if:

- You have been told by your child's healthcare provider that your child cannot get the flu vaccine.

**What will you be asked to do in this research study, and how long will it take?** You will be asked to complete a questionnaire. It will take about 5-10 minutes. You will complete the questionnaire in the waiting room or exam room and place the completed questionnaire in the box in the waiting room.

**Are there any risks to being in this research study?** There are no direct risks; the study is anonymous. The risk is not expected to be more than you would have in daily life. The results of your questionnaire will be kept private and will not be shown to your healthcare provider.

**Are there any benefits from being in this research study?** You will not get any benefit from taking part in this study. Being in this study may provide researchers with a better understanding of the factors associated with parents' decision to vaccinate children against influenza and the relationships between those factors.

**Do you have choices about taking part in this research study?** If you do not want to take part in this research study you may turn in a blank questionnaire in the collection box anonymously.

**How will your research information be kept confidential?** Information in your study will be kept private. No information will be collected in the questionnaire that will allow you to be identified.

**What are your legal rights in this research study?** Nothing in this consent form waives any legal rights you may have. This consent form also does not release the investigator, the institution, or its agents from liability for negligence.

**What if you have questions about this research study?** If you have any questions or concerns about this research study, please contact Lindsey Leder at [lnmondich@alaska.edu](mailto:lnmondich@alaska.edu).

The UAA Institutional Review Board reviews all research projects that involve human participants to be sure the rights and welfare of participants are protected.

**Do you HAVE to take part in this research study?** No one is required to participate in this research study. Refusing to take part will NOT cause any penalty or loss of benefits that you would otherwise have. You may start and then change your mind and stop at any time. Your questionnaire should be put in the box in the waiting area whether complete or incomplete. Incomplete surveys are counted in the total number of participants in this study and are therefore important to the researcher.

BY TURNING IN YOUR COMPLETED QUESTIONNAIRE YOU INDICATE YOUR CONSENT FOR YOUR ANSWERS TO BE USED IN THIS RESEARCH STUDY. PLEASE KEEP THIS INFORMATION SHEET FOR YOUR REFERENCE.