

# Childhood Vaccine Status and Correlation with Common Non-vaccine Preventable Illnesses: Improving Health Outcomes

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## Purpose:

To determine if there is a difference in common childhood illnesses dependent on vaccination status.

## Background

- CDC has a Healthy People 2020 goal of an 80% vaccine rate for the U.S. - baseline rate of 44.3% (2009).
- Increasing trend in vaccine delay or hesitancy
  - Success of the vaccines - decrease in vaccine preventable illness
  - Trust issues
  - Potential side effects
  - Addition of new vaccines
  - Fear of altered immune system function

## Literature Review

Schmitz et al. (2011). German Health Interview & Survey of children and adolescents. Looked at NV children compared to FV for health issues, focusing on allergic diseases (atopy) and common childhood illnesses (cold/flu). Their theory was vaccines overburden the immune system leading to increased illness in the FV group. They found a difference but it was not statistically significant.

Siqqiqi, et al. (2013). Reviewed epidemiology of vaccine hesitancy in the US. Supported background literature on reasons for this and recommended a study evaluating if delaying vaccines correlated with vaccine preventable diseases. Continued surveillance of hesitancy reasons will equip healthcare providers with the best info to use for educational purposes.

Bystrom, et al. (2014). Qualitative study on parental decision making on vaccinating. Found both vaccinating and non vaccinating parents wanted info on vaccine safety and immune system outcomes from nonbiased sources.

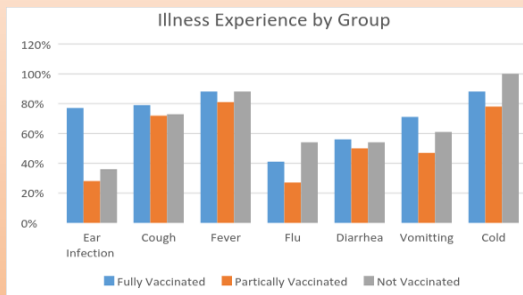
Kiraly et al. (2016). Found evidence that vaccines given early in life have potential to alter immune system. Children with delayed DTaP had reduced occurrence of eczema.

## Methods

Survey (IRB-FY2015-123)  
Parents of kids aged 12 months - 7 years  
3 groups: FV, PV, NV  
Convenience sample  
Descriptive stats (IBM SPSS Statistics 23 software)

## Results

Response rate of the survey was 97.6 %; 111 participants.  
Equitable distribution between the groups.  
The mean age of all children was calculated at 3.5 (SD 2.0) with a median of 3.0.  
The FV group showed statistical difference (p=0.000) in ear infections when compared to the PV group and the NV group.  
A second statistical association was observed between the three groups and influenza (flu) (p=0.056)  
The NV group had a statistically relevant finding (p=0.023) with a 40.8% occurrence of colds (n=40) in comparison to FV (30.6%; n=30) and PV (28.6%; n=28).  
No statistical association between daycare attendance and illness experienced (n=33).  
Children who attended a private school were (statistically) significantly more likely to experience cough (p=0.020); children who attended home school were (statistically) significantly more likely to experience flu (p=0.047).  
Mean number of office visits for FV group is 6 (SD 5); PV group is 7 (SD 4); NV group is 6 (SD 4).  
Parental attitudes towards vaccine choice was analyzed. There was a trend (p=0.08) for a higher response rate among parents choosing not to vaccinate (86.4%) compared with the response rates of parents with children who were partially immunized (63.9%) or fully immunized (70.5%). Research was one of the top three reasons for not vaccinating or vaccinating in all three groups.



## Discussion

- The statistically significant difference of ear infections between the FV group in comparison with the other two groups was unanticipated - relevance of this finding needs to be supported with further research.
- Surprised to find that there was no statistically significant difference for daycare attendance and illness.
- The findings of this study are consistent with previous studies for the reasons behind parental choices in regards to vaccine decisions, with concerns about safety, side effects, and trust in previous studies and literature being listed as consistently important
- Flu occurrence was statistically significant in the NV group and the home schooled group
- In comparison to the studies in the literature reviewed, this was the only study to use 3 groups (FV, PV, NV)
- Was not large enough to find the same eczema result that Kiraly et al. (2016) had but did show a potential trend

## Conclusion/Relevance

There was a difference between the groups in occurrence of ear infections, flu, and colds, however no other significant difference was found. Future studies utilizing a larger sample size that would allow for determination of association with specific age would be helpful.

**Clinical relevance:** Many parents question the possible association between childhood vaccines and immune function and have a distrust of current research. This study showed that most common childhood illnesses are equitable across the population and not dependent on vaccine status.

## References

- Byström, E., Lindstrand, A., Likhite, N., Butler, R., & Emmelin, M. (2014). Parental attitudes and decision-making regarding MMR vaccination in an anthroposophic community in Sweden – A qualitative study. *Vaccine*, 32, 6752–6757. <http://doi.org/10.1016/j.vaccine.2014.10.011>
- Kiraly, N., Koplin, J. J., Crawford, N. W., Bannister, S., Flanagan, K. L., Holt, P. G., ... Allen, K. J. (2016). Timing of routine infant vaccinations and risk of food allergy and eczema at one year of age. *Allergy*, n/a–n/a. <http://doi.org/10.1111/all.12830>
- Schmitz, R., Poethko-Müller, C., Reiter, S., Schlaud, M., & Twisselmann, B. (2011). Vaccination status and health in children and adolescents. *Deutsches Arzteblatt International*, 108(7), 99–104 pp. <http://doi.org/10.3238/arztebl.2011.0099>
- Siddiqui, M., Salmon, D. A., & Omer, S. B. (2013). Epidemiology of vaccine hesitancy in the United States. *Human Vaccines & Immunotherapeutics*, 9(12), 2643–2648. <http://doi.org/10.4161/hv.27243>