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Major Article

Evaluation of low immunization coverage among the Amish population in rural Ohio

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Reason for refusal

Background: The Centers for Disease Control and Prevention's *Morbidity and Mortality Weekly Review* included childhood immunizations among the 10 great public health achievements in the United States in the 20th century. Despite this acknowledged success, childhood immunization rates continue to be much lower in select populations. Amish communities have persistently lower immunization rates. Recent outbreaks in Amish communities include a 2014 measles outbreak in Ohio, resulting in 368 cases reported. A recent outbreak of pertussis in an Amish community in Ohio resulted in the death of a 6-week-old Amish baby.

Methods: A study was designed to determine the knowledge, beliefs, attitudes, and opinions of Amish parents relative to the immunization of Amish children. Data were collected through a questionnaire. Each potential participant was mailed a copy of a letter describing the proposed study. The questionnaire, a copy of the current immunization schedule, and a return stamped envelope were also included in the mailed packet. The study sample consisted of 84 Amish individuals who voluntarily filled out and returned questionnaires.

Results: The findings from the data analysis demonstrated that fear, especially concern over too many recommended immunizations and immunizations overwhelming the child's system, was the most frequent reported reasons for not having children immunized according to recommendations.

Conclusions: Religious factors and access to care were not among reasons most reported. Designing an educational campaign for educating Amish parents on the risks and benefits of immunizations with focus on specific concerns may improve immunization rates.

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BACKGROUND

The Centers for Disease Control and Prevention (CDC) cited in the *Morbidity and Mortality Weekly Review* the success of immunizations as one of the top 10 public health achievements of the 20th century.¹ Despite this acknowledged success, childhood immunization rates continue to be much lower in select populations.² This

study examined one of those populations, the Amish community in Ashtabula County, Ohio.

Health People 2020's goal is to increase childhood immunization rates to $\geq 90\%$. Researchers have indicated that although immunization rates have increased during the last 20 years, coverage is still only approximately 77% nationwide.¹ Recent researchers have shown immunization rates for diseases such as measles have decreased over the last 5 years, and in 2014, more cases of measles were reported in the United States than had been reported in the previous decade.³

When parents decide not to immunize a child, it creates risk of disease for the unimmunized child, and others who may come in contact with the unimmunized child. All parents need to under-

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stand that contracting a vaccine-preventable disease is considered dangerous and may even cause death.

Global recognition

Globally vaccines are viewed as a cost-effective method to prevent disease and death.

Childhood immunization has proven to be a vital component of health promotion. Statistics reported in the year 2000 indicated the United States had achieved the lowest rates of vaccine-preventable diseases and the highest rates of immunization ever recorded.⁴ In the last 5 years, the United States had recognized an increase in the numbers of certain vaccine-preventable diseases, and a decrease in rates of certain immunizations. Multiple outbreaks of vaccine-preventable diseases, including pertussis, rubella, measles, varicella, and *Haemophilus influenzae*, have been reported in underimmunized Amish communities.^{5–7} Understanding select populations, such as the Amish, is crucial for prevention of disease outbreaks because underimmunized populations are suspected of being reservoirs for infection.

The outbreak

The Ohio Department of Health, with assistance from the CDC, the Holmes County Health Department, and the Knox County Health Department, began investigating a measles outbreak in Holmes and Knox counties in April 2014. A group of Amish individuals traveled to the Philippines in March of that same year on a mission trip. Two unvaccinated individuals became seriously ill shortly after returning from the trip. The CDC confirmed a diagnosis of measles. The number of measles cases confirmed in Holmes and Knox Counties in 2014 was 368. This outbreak contributed to the total number of cases in the United States, which increased to 592 in 2014.³

The community

Communities with low rates of immunization are particularly at risk for outbreaks of vaccine-preventable diseases. Many researchers have examined outbreaks among communities with low immunization rates similar to the Ohio measles outbreak.⁵ Many of the findings have been similar and are generally related to parents refusing immunization of their children based on common factors. Amish communities are often recognized as having a lower rate of immunization coverage than nearby non-Amish communities.⁷

Previous researchers have implied reasons for low immunization coverage may vary among Amish Communities.⁷ Amish individuals travel outside of their communities and can place others at risk for contracting vaccine-preventable diseases. Deaths have been reported related to some of the outbreaks.

METHODS

The purpose of this study was to gain information regarding the knowledge, attitudes, opinions, and beliefs of Amish parents residing in Ashtabula County and how these factors influence timely immunizations of Amish children. The theoretical framework was the PEN-3-Cultural Model, focusing on cultural influences, beliefs, and experiences in health behavior of individuals in a community. The development of a 20-question survey was guided by 4 research questions designed to evaluate any differences in Amish parents' decision to defer recommended childhood immunizations. Inferential statistics were used to draw conclusions from 84

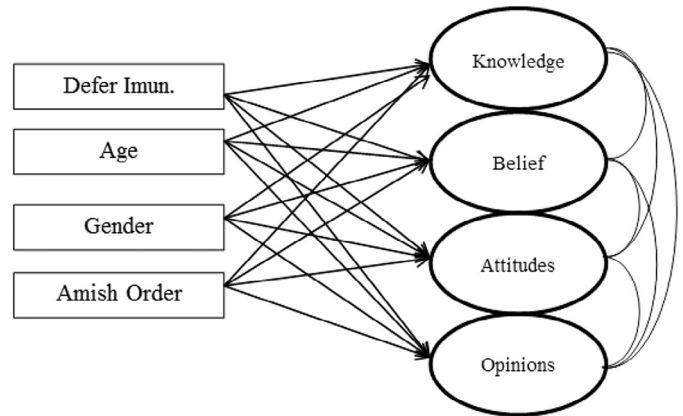


Fig 1. Theoretical model of the variables under study. *Imun.*, immunization.

individual surveys received. SPSS version 20.0 (SPSS, Chicago, IL) was used to code and tabulate scores collected from the survey and provide summarized values where applicable, including the mean, central tendency, variance, and SD. Multivariate analysis of variance (MANOVA) was used to evaluate these 4 research questions (Fig 1).

Research question 1: What is the difference in Amish parent's knowledge, belief, attitudes, and opinions toward childhood immunizations between those who immunize their children according to the recommended schedule and those who do not?

Null Hypothesis 1: There is no difference in Amish parent's knowledge, belief, attitudes, and opinions toward childhood immunizations between those who immunize their children according to the recommended schedule and those who do not.

Hypothesis 1: There is a difference in Amish parent's knowledge, belief, attitudes, and opinions toward childhood immunizations between those who immunize their children according to the recommended schedule and those who do not.

- Dependent variable: Knowledge of protective factors and safety factors, personal and philosophic beliefs, attitudes, and opinions regarding access barriers.
- Independent variable: Receive recommended immunizations on schedule (yes or no).
- Statistical analysis: MANOVA.

Research question 2: What is the difference in Amish parent's knowledge, belief, attitudes, and opinions toward childhood immunizations between those who immunize their children according to the recommended schedule and those who do not, and does the difference depend on age group?

Null Hypothesis 2: There is no difference in Amish parent's knowledge, belief, attitudes, and opinions toward childhood immunizations between those who immunize their children according to the recommended schedule and those who do not, and the difference is not affected by age group.

Hypothesis 2: There is a difference in Amish parent's knowledge, belief, attitudes, and opinions toward childhood immunizations between those who immunize their children according to the recommended schedule and those who do not, and the difference is affected by age group.

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