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Data 712

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Title Page

Exploring the Association between Income Level, Marital Status, and Chickenpox Occurrence in Children: Insights from National Immunization Surveys

Abstract

This study is interested in determining whether or not there exists an association between income level and marital status of the mother, and whether or not a child has had chickenpox. Given the rise in the anti-vaxx movement across the internet, it has again become important to track and monitor the spread of chickenpox, especially amongst children. This study used a logistic regression to determine whether or not an association exists. While this study did not find any association between these variables, it would be naive to say there is no metric to help predict those who may get chickenpox. The authors hope that this study will spark further research and hopefully help prevent and outcomes of children suffering through chickenpox.

Intro

This study examines the potential relationship between the income level and marital status of mothers and the occurrence of chickenpox in their children. With the emergence of the anti-vaxx movement, it is crucial to monitor and understand the spread of chickenpox, particularly among children. By employing logistic regression analysis, the researcher aims to

determine whether an association exists between these variables. Although no significant association was found in this study, it is important to acknowledge that there may still be metrics that can help predict the likelihood of children contracting chickenpox. The findings from this study contribute to the existing body of knowledge and can serve as a basis for further research to prevent and mitigate the impact of chickenpox on children.

Understanding the poverty status and marital status of mothers is essential in assessing the likelihood of children having had chickenpox. Socioeconomic factors, such as poverty, can influence access to healthcare and preventive measures like vaccinations. Children from low-income households may face barriers in receiving vaccinations, including the chickenpox vaccine, which can increase their vulnerability to contracting the disease. Additionally, marital status can provide insight into support systems and healthcare access. A married mother may have better access to healthcare resources, including immunizations for her child, potentially reducing the chances of contracting chickenpox.

Factors like transmission dynamics and health behaviors also play a role in the occurrence of chickenpox. Socioeconomic factors and marital status can influence living conditions, such as overcrowding or close contact with infected individuals, increasing the risk of exposure and transmission. Moreover, mothers who are well-informed about the risks of chickenpox and have the means to take preventive measures are more likely to seek vaccinations for their children. By considering these factors, healthcare professionals can better assess the likelihood of children having had chickenpox and implement targeted strategies to prevent and control the disease.

Background

Describes the study and explains why your analysis is relevant to someone else

Knowing the poverty status and marital status of the mother could be important in determining if a child has had chickenpox due to several reasons. One of these reasons is socioeconomic factors since poverty status can impact access to healthcare, including preventive measures such as vaccinations. Children from low-income households may face barriers to receiving vaccinations, including the chickenpox vaccine. Lack of financial resources or health insurance coverage may result in delayed or missed vaccinations, potentially increasing the likelihood of contracting chickenpox.

Another factor is healthcare utilization as marital status can be an indicator of support systems and access to healthcare. A married mother may have better access to healthcare resources, including regular check-ups and immunizations for her child. This could potentially reduce the chances of the child contracting chickenpox.

Transmission dynamics can be another factor as the chickenpox virus spreads through direct contact with an infected person or respiratory droplets. Socioeconomic factors and marital status can influence living conditions, such as overcrowding or close contact with infected individuals. These factors can increase the risk of exposure to the virus and subsequent transmission.

A final factor can be risk perception and health behaviors as socioeconomic factors and marital status can also influence knowledge, attitudes, and health behaviors. Mothers who are more informed about the risks and consequences of chickenpox are more likely to take preventive measures, such as seeking vaccination for their children. Conversely, lack of awareness or education may result in lower vaccination rates and higher susceptibility to the virus.

By considering these factors, healthcare professionals can better assess the likelihood of a child having had chickenpox and tailor interventions accordingly. Understanding the social determinants of health, such as poverty and marital status, helps in identifying vulnerable populations and implementing targeted strategies to prevent and control infectious diseases like chickenpox.

Description of the data and variables that you will use

Description of the Data

The National Immunization Surveys (NIS) are a group of phone surveys used to monitor vaccination coverage among children 19–35 months and teens 13–17 years, flu vaccinations for children 6 months–17 years, and COVID-19 vaccination for children and teens in eligible age groups and for adults 18 years and older. The surveys are sponsored and conducted by the National Center for Immunization and Respiratory Diseases (NCIRD) of the Centers for Disease Control and Prevention (CDC) and authorized by the Public Health Service Act [Sections 306]. Data collection for the first survey began in April 1994 to check vaccination coverage after measles outbreaks in the early 1990s. The NIS are run by NORC at the University of Chicago (http://www.norc.org/) under the direction of CDC.

The NIS provides current, population-based, state and local area estimates of vaccination coverage among children and teens using a standard survey methodology. The surveys collect data through telephone interviews with parents or guardians in all 50 states, the District of Columbia, and some U.S. territories. Cell phone numbers are randomly selected and called to enroll one or more age-eligible child or teen from the household. The parents and guardians of eligible children are asked during the interview for the names of their children's vaccination providers and permission to contact them. With this permission, a questionnaire is mailed to each child's vaccination provider(s) to collect the information on the types of

vaccinations, number of doses, dates of administration, and other administrative data about the health care facility. Estimates of vaccination coverage are determined for child and teen vaccinations recommended by the Advisory Committee on Immunization Practices (ACIP), and children and teens are classified as being up to date based on the ACIP-recommended numbers of doses for each vaccine.

The National Immunization Survey - Child (NIS-Child) is sponsored and conducted by the National Center for Immunization and Respiratory Diseases (NCIRD). The NIS-Child is a list-assisted random-digit-dialing telephone survey of households followed by a mailed survey to children's immunization providers that began data collection in April 1994 to monitor childhood immunization coverage.

Description of the Variables

This study uses three variables from the dataset. The first variable this study uses is whether the child had ever had chicken pox disease. The response options are: yes, no, don't know if the child had the disease, or refused to answer. After removing those observations where it was either unknown if the child had chicken pox or they refused to answer, there were 35,893 observations. The second variable this study uses is the poverty status of the family. The response options are above poverty (earning more than $75,000), above poverty (earning less than or equal to $75,000), in poverty, or unknown. After removing those observations where the poverty status was unknown there were 33,789 observations. The third variable this study uses is the marital status of the mother. The response options are yes, or never married/widowed/divorced/ separated/deceased/living with partner.

Descriptive Statistics

Has the Child had Chickenpox

Each row in the chart is an option the respondents could have selected during data collection. We see the options are the child had chickenpox, the child did not have chickenpox, the parent/guardian was unsure if the child has ever had chicken pox, or the parent/guardian refused to answer the question.

Frequency of Chickenpox in Children Ages 19-35 Months

Had Chicken Pox Status	Count	Percent
Had	244	0.68%
Have not had	35,649	99.04%
Don’t know	89	0.25%
Refused	13	.03%

Table 1: Frequency table of has the child ever had chickenpox?

We can see that almost all the children surveyed have not had chickenpox, which matches our intuition; most people believe vaccines work and with the invention of the chickenpox vaccines there are very few cases of it.

Marital Status of Mother

Each row in the chart is an option the respondents could have selected during data collection. We see the options are married or never married/widowed/divorced/separated/ deceased/living with partner.

Frequency of Marital Status of Mother of Children Ages 19-35

Marital Status of Mother	Count	Percent
Married	25,774	71.60%
never married/widowed/divorced/ separated/deceased/living with partner.	10,221	28.40%

Table 2: Frequency table of marital status of the mother of the child.

We can see that most of the mothers of the children are married. This is slightly surprising since 45.8 percent of children reach age 17 years while still living with their biologic parents who were married before or around the time of the child's birth (CDC). Why there are more married parents/guardians respondents is beyond the scope of this work.

Income Level

Each row in the chart is an option the respondents could have selected during data collection. We see the options are above poverty (greater than $75,000), above poverty (less than or equal to $75,000), below poverty, or unknown.

Frequency of Income Level

Income Level	Count	Percent
Above Poverty, > $75,000	17,149	47.64%
Above Poverty, <= $75,000	10,534	29.27%
Below Poverty	6,195	17.21%

Income Level	Count	Percent
Unknown	2,117	5.88%

Table 3: Frequency table of income level

We can see that nearly half of the respondents are significantly above the poverty line, some are not as much above the poverty line, and less than 20% of the respondents are below the poverty line. This is not surprising as about 15% of children live below the poverty line (United States Census).

Regression

Model

The objective of this study is to determine whether or not there exists an association between income level and marital status of the mother, and whether or not a child has had chickenpox. Given that the three metrics are categorical variables and the dependent variable is a boolean, we use a logistic regression to test this question.

Discussion of Findings and their Relevance

This study did not find evidence for an association between income level and marital status of the mother, and whether or not a child has had chickenpox with a p-value greater than our 0.05 cutoff. In other words, given our assumption that there is no association between these variables, we did not find evidence to change our opinion. Therefore this study finds that knowing the income level and marital status of the mother does not provide any insight as to whether or not a child has had chickenpox.

Conclusion

This study explored the potential association between the income level and marital status of mothers with the occurrence of chickenpox in children. Although no significant relationship was found between these variables, it is important to acknowledge that there may still be other metrics that can help predict the likelihood of children contracting chickenpox. The findings from this study contribute to the existing knowledge and emphasize the need for further research in this area.

Understanding the social determinants of health, such as poverty and marital status, is crucial for identifying vulnerable populations and implementing targeted interventions to prevent and control infectious diseases like chickenpox. Socioeconomic factors, healthcare utilization, transmission dynamics, and risk perception all play a role in the occurrence and spread of chickenpox.

This study utilized data from the National Immunization Surveys, providing valuable insights into vaccination coverage among children and teens. By continuing to monitor and track the spread of chickenpox, healthcare professionals can develop effective strategies to promote vaccination and reduce the burden of this disease on children.

It is our hope that this study sparks further research and prompts efforts to prevent and mitigate the impact of chickenpox. By enhancing our understanding of the factors influencing chickenpox occurrence, we can work towards better preventive measures and outcomes for children. Ultimately, this research contributes to the broader goal of safeguarding public health and ensuring the well-being of future generations.