



Child Health Analysis

2019 - 2022

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Introduction

The well-being of children is inextricably linked to the stability and health of our society. Protecting children is not only a moral imperative but also a crucial investment in the future of our communities. I will examine the "NHIS Child Summaries Health Statistics" dataset from the National Centers for Health Statistics in this research. The dataset wealth of pediatric health data offers a comprehensive lens through which we can examine the health status of children in the United States. The insights gleaned from this analysis hold the potential to inform healthcare policies, guide expert decision-making, and, ultimately, improve the health outcomes of future generations.

Data Overview

The "NHIS Child Summaries Health Statistics" dataset spans 2019 to 2022, containing 4024 rows and seven columns. It is a valuable resource from the National Health Interview Survey (NHIS), one of the nation's most extensive annual surveys, encompassing diverse American households. This dataset illuminates crucial facets of childhood vaccination rates, access to pediatric services, financial barriers to healthcare, and illness-induced school absenteeism across distinct regions and demographic groups. The data serves as a fundamental pillar for informed decision-making in child health policy and offers a comprehensive view of the multifaceted landscape of children's health.

Analysis

I analyzed in Excel by extracting key columns (Outcome, Group, Percentage, Lower BI, Upper CI, Title, Description, and Year) relevant to each insight. The dataset underwent a thorough cleaning process where I sorted and filtered the data, focusing on identifying missing values to uncover data gaps. To address these gaps in vaccination rate data, I employed the inference method with a thoughtful approach to ensure data completeness. Additionally, efforts were made to standardize data types and enhance overall dataset compatibility through necessary data transformations.

Insight 1: Impact of Vaccination Trends on Health

For this insight, the analysis examined the Influenza Vaccination Rate percentages for each year. A line chart was generated to visualize the trend in vaccination rates from 2019 to 2022.

Additionally, an investigation was conducted to determine whether a connection exists between individuals who receive the Influenza vaccination and those who experience school absenteeism due to illness or injury. To illustrate any potential correlation, a scatter plot was crafted.

Insight 2: Regional/Race Disparities in Medical Care Access and Health Patterns

For this insight, I analyzed the average percentage of children facing delays in accessing medical care due to financial constraints across different geographic regions. I comprehensively understood this issue by aggregating and computing mean values for each region. I created a customized bar chart to visually represent regional variations in delayed medical care.

Additionally, I explored the percentage of children reporting fair or poor health status, focusing on various racial and ethnic groups. Categorizing the data by ethnicity provided insights into health disparities. I used analytical skills to design a pie chart to highlight these disparities.

Insight 3: Financial Barriers to Healthcare and Child Health

For this insight, I analyzed the percentage of children experiencing delayed access to medical care due to cost and their corresponding health status from 2019 to 2022. I then computed the annual average percentage of delayed access to care and child health status. To visualize the connection between delayed access and health status, I generated a column chart to compare the trends over these four years visually.

In analyzing the relationship between insurance coverage and health outcomes, I focused on different insurance categories for a specific year. After calculating the average percentage of children covered by each insurance type, I created a bar chart to explore the connection between regional variations in insurance coverage and health outcomes. This chart allowed for comparing the percentages of children under various insurance categories and their respective health status.

Insight 4: Assessing the Impact of Special Services on Child Health and School Attendance

For this insight, I collected data from 2019 to 2022, categorized by age groups (0-4 years, 5-11 years, and 12-17 years), specifically focusing on the percentage of children using prescription medications, particularly those with chronic conditions. I computed the percentages for each age group across the

four years to discern any notable trends in prescription medication usage. To visually represent this analysis, I created a column chart.

Additionally, I explored the connection between children's health status and their engagement in special education or early intervention programs. This involved comparing the percentage averages for different demographic and socioeconomic groups and using a scatter plot with a logarithmic trend line to illustrate correlations.

Interpretation and Implication of Analysis Results

Insight 1

Children's vaccination rates have declined slightly in recent years. The percentage of children receiving influenza vaccinations decreased from 53.1% in 2019 to 45.9% in 2022 (see Figure 1).

There is a negative correlation between influenza vaccination rates and school absence rates. This means school absence rates decrease as influenza vaccination rates increase (see Figure 2).

This suggests that influenza vaccination can help to reduce school absenteeism due to illness.

Figure 1

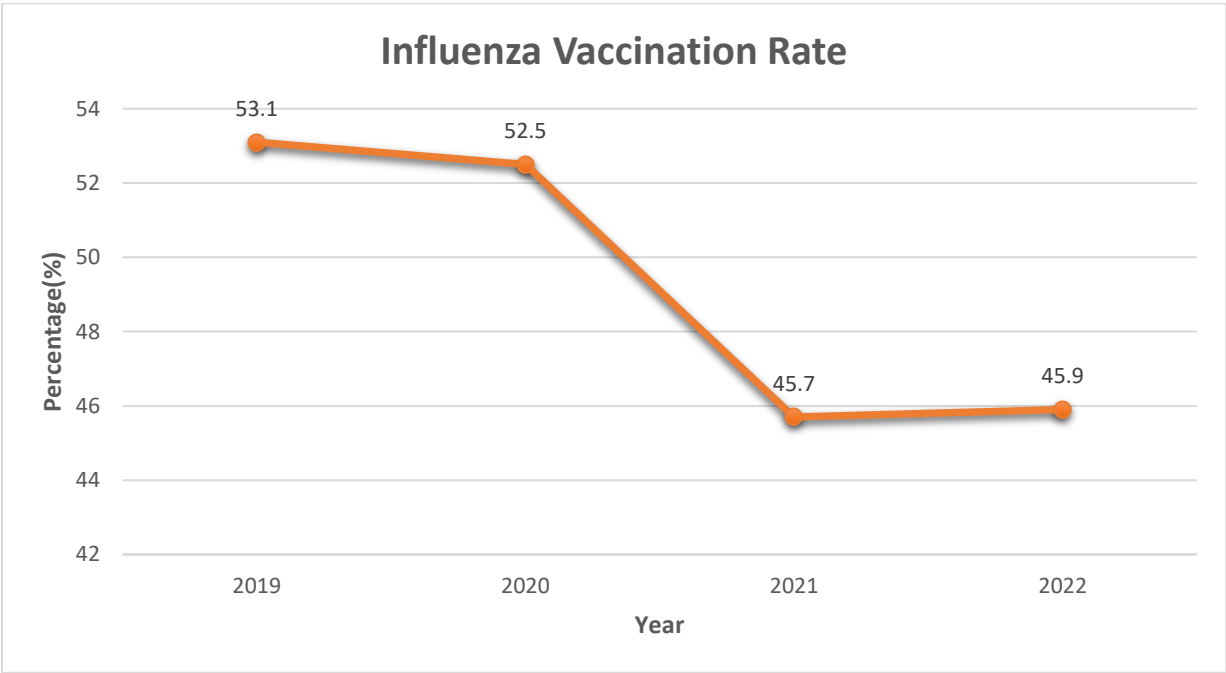
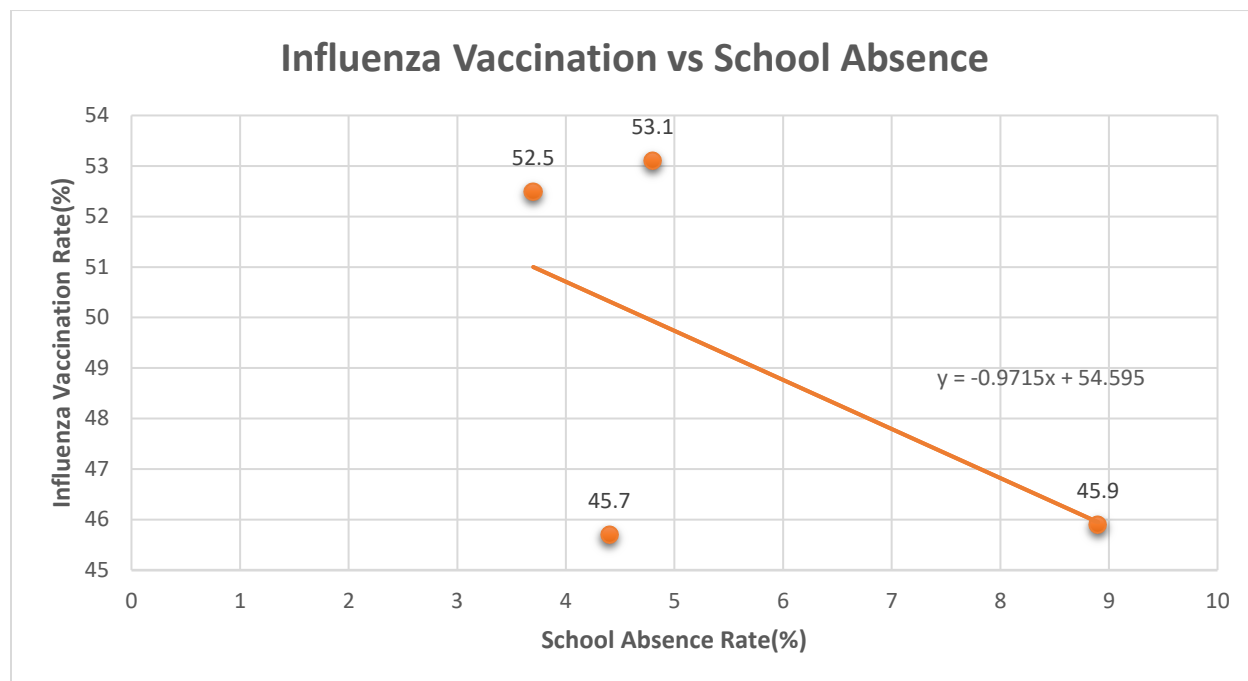


Figure 2**Insight 2**

There are significant regional disparities in access to pediatric care. Children in the South are most likely to get medical care delayed due to cost, followed by children in the West and the Midwest. Children in the Northeast are least likely to get delayed medical care due to cost (see Figure 3).

Children who are American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, or multiple races are most likely to have fair or poor health status. Children who are Asian, single race, Hispanic or Latino, Not Hispanic or Latino, non-Hispanic, or white are least likely to have fair or poor health status (see Figure 4).

These findings suggest that there is a need for targeted interventions to address the regional and racial/ethnic disparities in access to pediatric care and child health status.

Figure 3

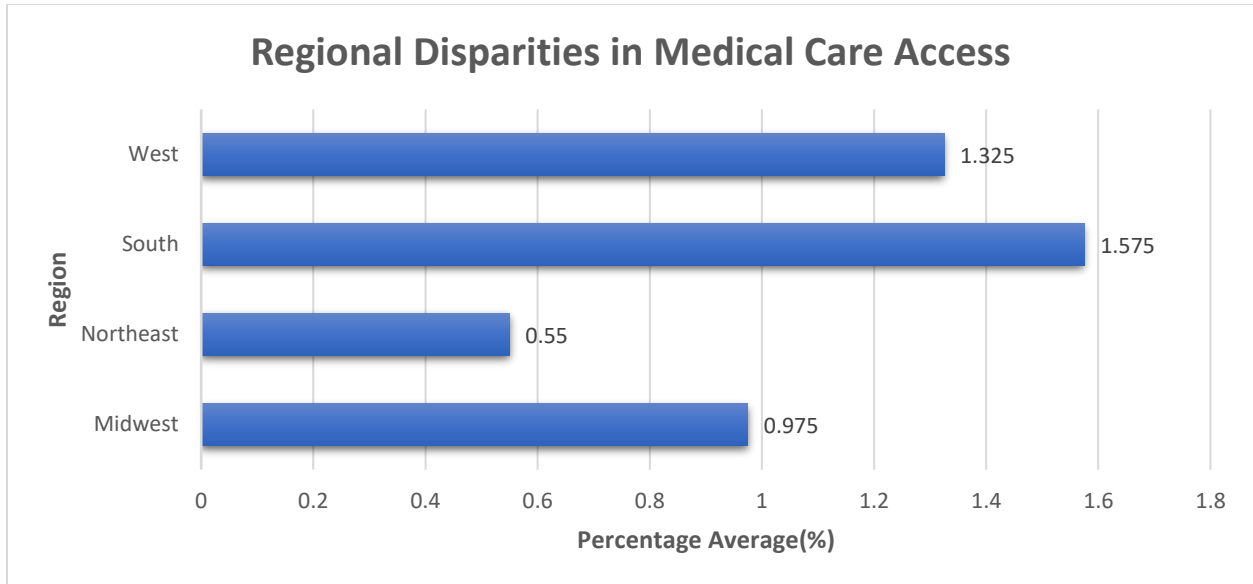
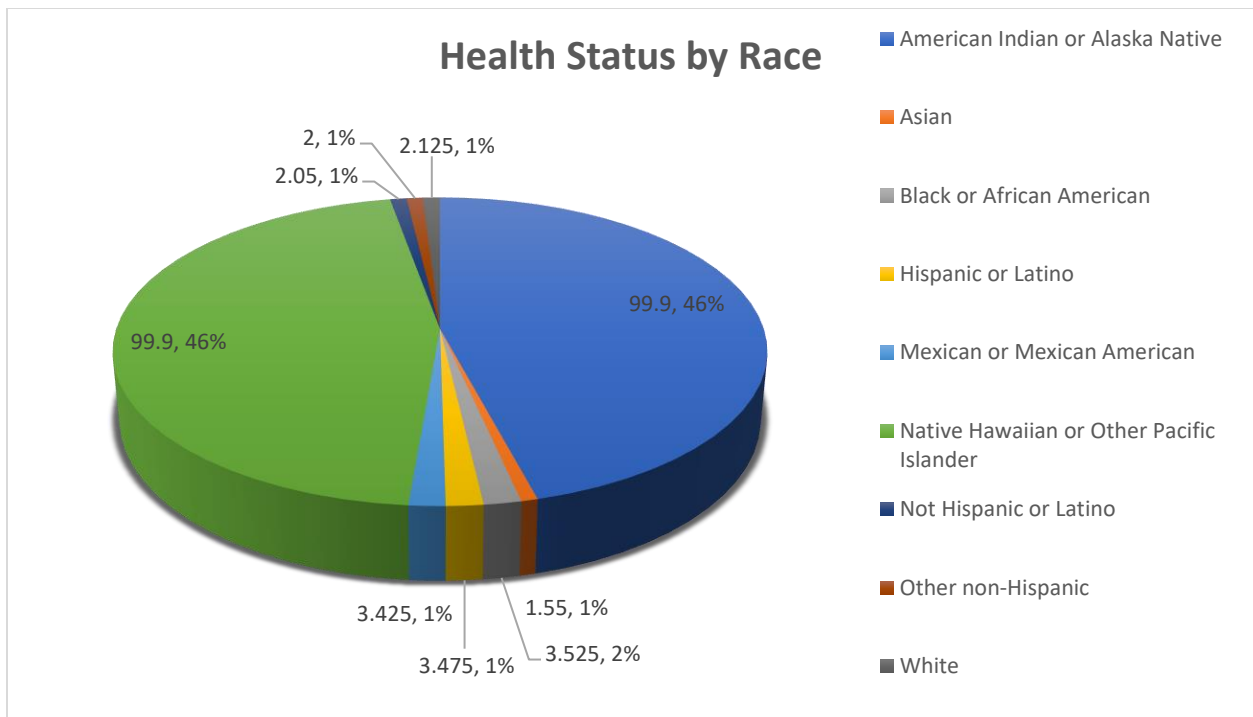


Figure 4



Insight 3

Delayed access to medical care due to cost is a significant concern in the United States, with 1.1% of children experiencing this issue in 2022. Notably, children who delay medical care due to cost are more likely to have fair or poor health status, with a total average health status score of 2.4% for all children (see Figure 5).

Notably, uninsured children and those with Medicaid or other public health insurance are more prone to delaying medical care due to cost compared to children with private insurance. Precisely, 26.26% of uninsured children, 4% of children with Medicaid or other public health insurance, 1.35% with private insurance, and 50.76% with additional coverage encountered this challenge (see Figure 6).

These findings underscore the pressing need for targeted interventions to improve access to affordable healthcare for children in the United States.

Figure 5

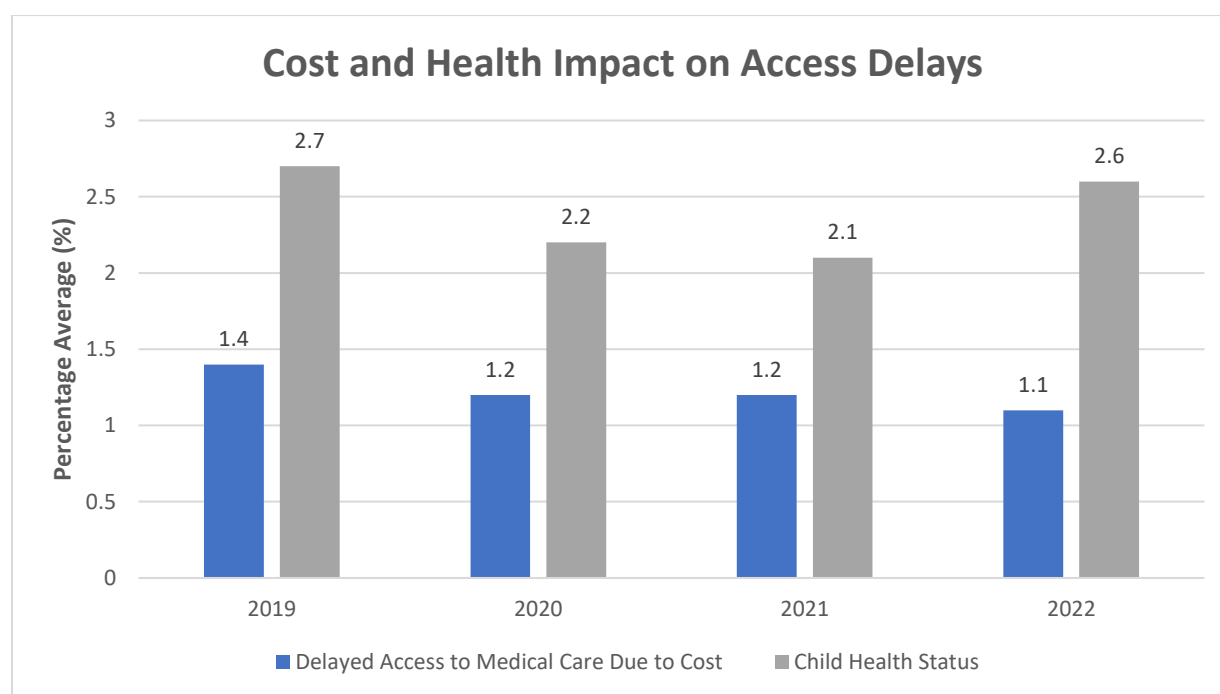
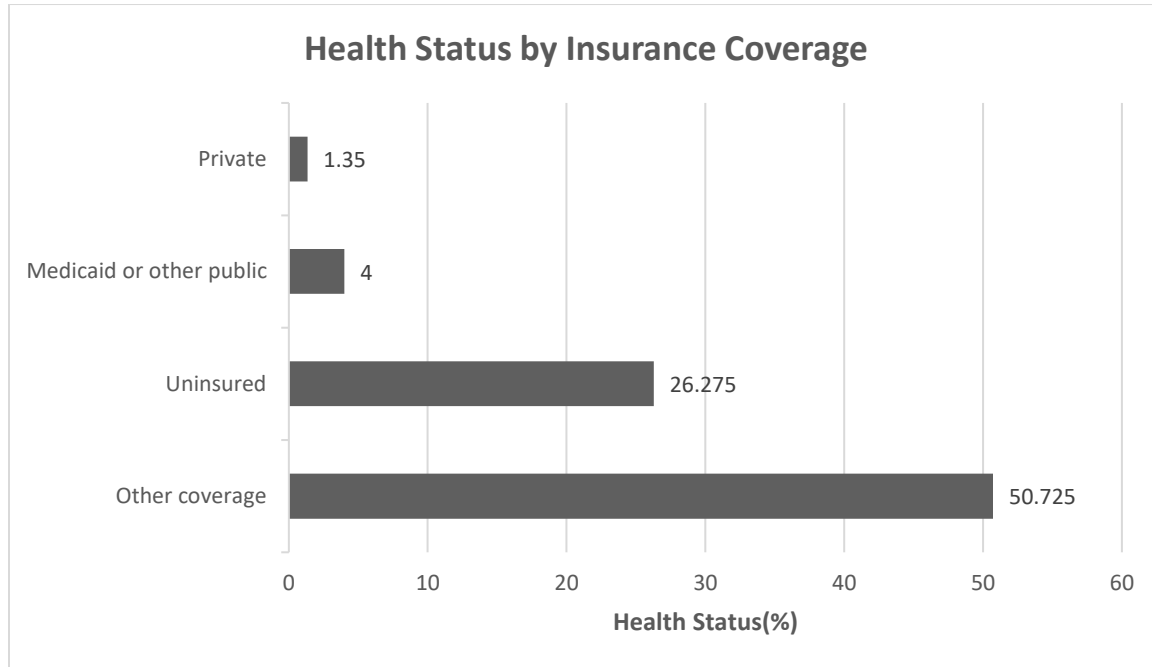


Figure 6**Insight 4**

The analysis of prescription medication uses in children, particularly those with chronic conditions like asthma or ADHD, reveals significant trends. For instance, in 2019, children aged 5-11 had the highest medication usage at 39.8%, compared to 34.7% for those aged 0-4 and 36.1% for those aged 12-17 (see Figure 7). This emphasizes the need for tailored healthcare strategies, especially for children aged 5-11 with chronic conditions.

Examining the relationship between children in special education or early intervention programs and their overall health status provides valuable insights (see Figure 8). The data indicates a positive correlation, with children aged 0-4 in these programs reporting a fair or poor health status of 3.575%, while those aged 5-11 had a health status of 10.575%. This highlights the potential positive impact of such programs on child health.

Figure 7

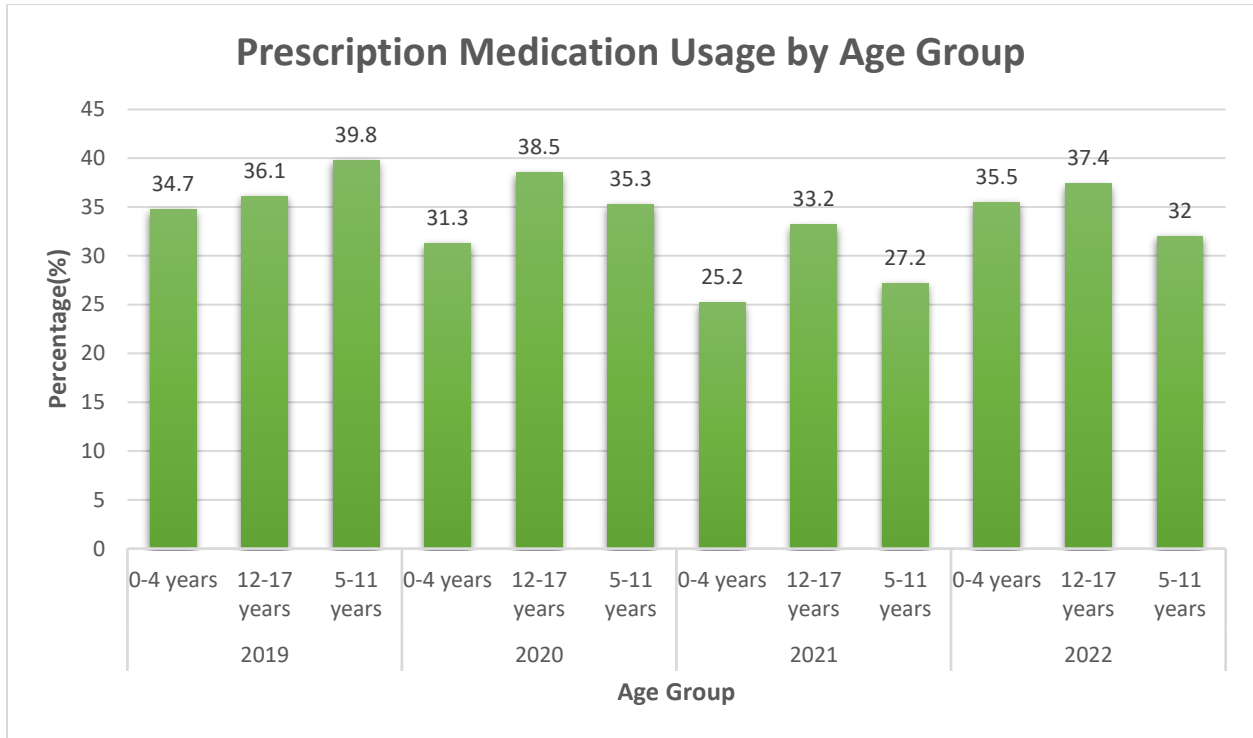
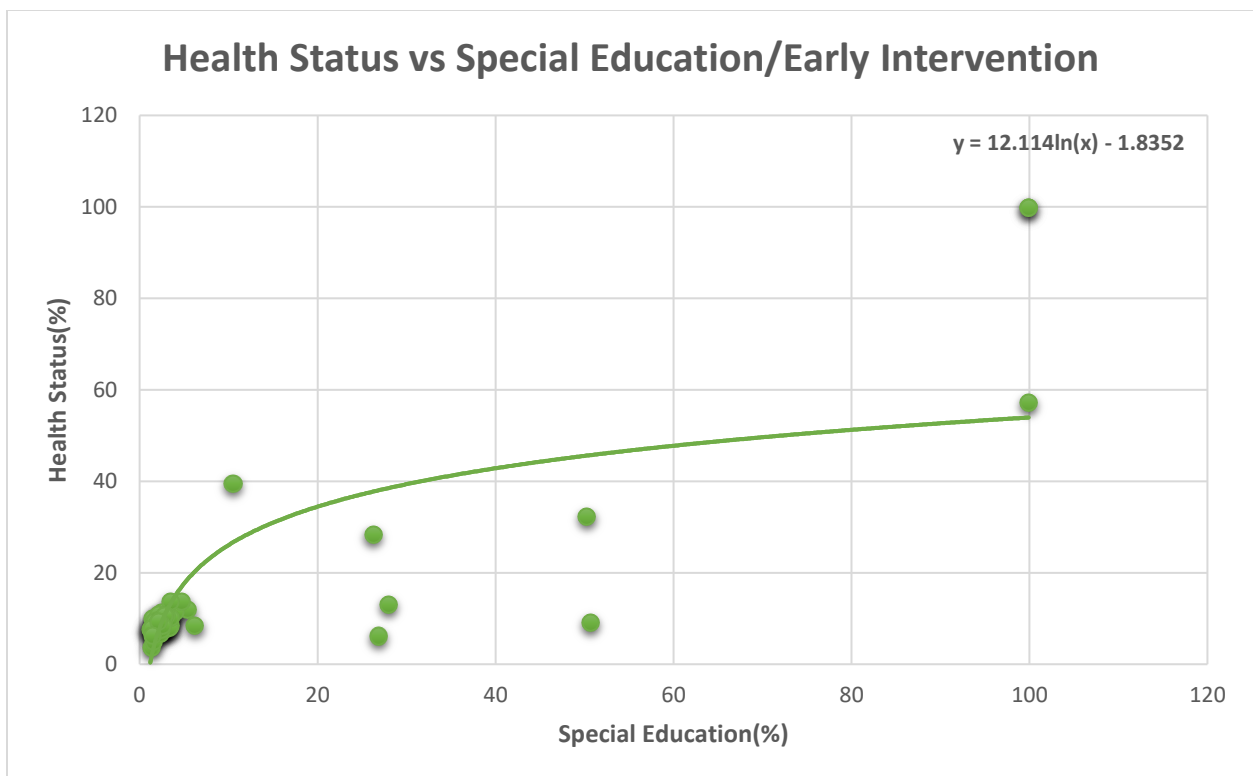


Figure 8



Conclusion

In summary, this analysis has delved into child health using the "NHIS Child Summaries Health Statistics" dataset. Notable findings encompass declining vaccination rates, regional and racial disparities in medical care access, financial barriers to healthcare, and the impact of exceptional services on child health. These revelations underscore the need for precise, data-informed policies and interventions to enhance child health and mitigate disparities.

Appendix

Data Source: <https://data.cdc.gov/NCHS/NHIS-Child-Summary-Health-Statistics/wxz7-ekz9>

Data Dictionary -

- **Year (Numeric):** The year the data was collected.
- **Group (Categorical):** The dataset has different demographic groups or age categories.
- **Percentage (%) (Numeric):** The percentage value associated with various health-related outcomes.
- **Lower BI (Numeric):** The lower confidence interval bound for the percentage.
- **Upper CI (Numeric):** The upper bound of the confidence interval for the percentage.
- **Title (Text):** A title or label describing the health-related outcome being measured.
- **Description (Text):** A brief description of the health-related outcome.

Data Validation and Cleaning Process -

- **Sorting and Filtering:** The data was sorted and filtered to identify missing values and gaps, and relevant columns were selected for the analysis. This step aimed to reveal areas in the dataset that required attention.
- **Handling Missing Data:** The inference method addressed missing vaccination rate data. This involved carefully considering filling in the gaps to ensure data completeness.
- **Splitting Data:** Confidence Interval data was divided into lower and upper confidence intervals, ensuring a more detailed analysis.
- **Data Type Standardization:** Efforts were made to standardize data types to enhance overall dataset compatibility. This included transforming and simplifying date formats.
- **Duplication Checks:** Checks were conducted to ensure every study's uniqueness and protect against potential bias.