Results

In the United States, states that have high population density also tend to have high vaccination rates. Only 1 state, Virginia, was not integrated in to high population density and lack of these states also lack high vaccination rate. The midly of the United States has a low population density, but has a very high vaccination rate. This means that states with low population density and high vaccination rate may have seen the effects of herd immunity. Because the data is restricted to just one year, 2019 it is not possible to conclude if these trends will continue or if they will be reversed in the future.

Discussion

This hypothesis was based on the trends of vaccination rate that are currently being analyzed. Social distancing is a possible hypothesis by looking at the seeding of herd immunity. Vaccinations work through the process of herd immunity. There is a threshold percent (HIT) of the population that needs to be vaccinated or else the virus can spread again through a lack of immunity. The data was joined together and then to the US state tiger files. A field was added to create the population density of the states in the United States.

Methods

For the analysis of flu vaccination and population density, vaccination cut off points were decided using the standard deviations for the mean. The data were joined together and then to the US state tiger files. A field was added to create the population density of the states in the United States. The data was sourced from various databases. Polio vaccination data was sourced from the WHO database. The World Bank Income (GDP) data was sourced from the World Bank Open Data. The US state population data was sourced from the US Census Bureau. The area of each state was sourced through ESRI and the US Census Bureau. The US state income data was sourced through the US CDC database.

For the analysis of the income and vaccination rate, income cut off points were calculated using the 2012 income data. High income group (HIG) reached the HIT for polio, and lower income group (LIG) was far below the HIT. From these cut off points, the population density was calculated. This will result in the creation of 4 bivariate choropleth maps. These maps show the states where the population density reaches the HIT for high vaccination and low population density. The income levels of World Bank income group (High, Upper middle, Lower middle, Lower) were used to split the population into different economic levels.

Results

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