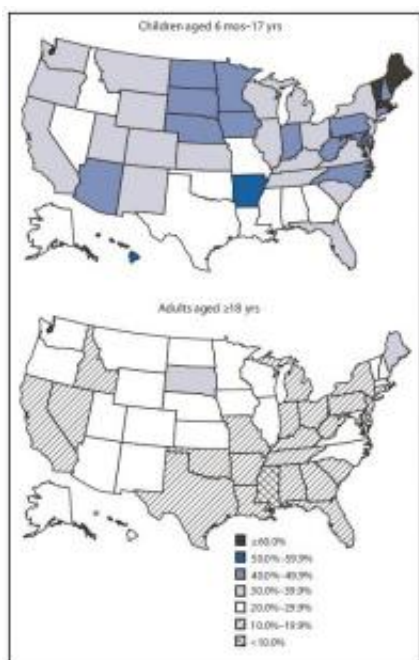


Strengthening routine flu vaccination and health programs may improve pandemic vaccinations

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These are maps showing the estimated H1N1 flu vaccination coverage among children and adults by age group and state from October 2009 until January 2010. Credit: CDC/MMWR Series

Strengthening routine influenza vaccination and health programs may help states improve their vaccination coverage against future pandemics or other health emergencies, a new study suggests.

The study -- conducted by researchers at the Georgia Institute of Technology in collaboration with the [Centers for Disease Control and Prevention](#) (CDC) -- examined factors that may have contributed to the striking state-by-state variation in U.S. H1N1 [flu vaccination](#) rates. The results of the study were revealed on Oct. 26 at the 32nd Annual Meeting of the Society for Medical Decision Making.

"Health officials in states that reported lower H1N1 [vaccination rates](#) should learn from states with high vaccination rates during the 2009 event to increase their rates during the next pandemic or significant health emergency," said Julie Swann, an associate professor in Georgia Tech's H. Milton Stewart School of Industrial and Systems Engineering. Swann also held a joint appointment at the CDC for six months last year through its Preparedness Modeling Unit.

CDC Immunization Services Division Branch Chief Pascale Wortley and Georgia Tech graduate student Carlo Davila Payan worked with Swann on this project.

Among American adults, H1N1 vaccine coverage ranged from a high of 34 percent in South Dakota to a low of nine percent in Mississippi. The research team found that states with higher past seasonal influenza vaccination coverage or use of other preventive health services in adults showed higher 2009 H1N1 vaccination rates.

"These findings suggest that an increase in health-seeking behavior may increase vaccination rates during a pandemic," noted Swann. "If we could encourage more adults to be vaccinated against flu each year, we might have more success in protecting them from the next pandemic."

Lower adult H1N1 vaccination coverage was observed in states where the disease circulated for a long period of time. That might have occurred because if someone in a household already had influenza,

others in the household did not feel the need to get vaccinated, explained Swann.

In terms of supply chain factors, vaccination coverage was lower in states where more time was required to order allocated doses. The team noted that time lags in the system may be a function of efficiency or differences in system processes across states, suggesting monitoring and potential system design changes.

For high-risk adults -- those with underlying medical conditions that make them more susceptible to severe outcomes from influenza infection -- coverage ranged from 10 to 47 percent across the country. While the yearly acceptance of seasonal flu vaccination affected the likelihood of H1N1 vaccination for this group as well, the study found that states with a large percentage of individuals medically underserved by health professionals showed lower coverage for H1N1 immunization.

"This shows that the public health issues such as not having enough primary care providers or having high poverty in an area not only have an impact on daily primary care, but also emergency pandemic care as well," said Swann.

Among children aged six months to 17 years, vaccine coverage ranged from a high of 85 percent in Rhode Island to a low of 21 percent in Georgia. In this group, the researchers found that states with a higher percentage of children showed lower vaccination coverage. Conversely, a focus on school vaccination or a high number of doses sent to or administered in public access areas positively impacted the H1N1 vaccine coverage.

"Accounting for the relative size of a state's child population in allocating vaccine could improve vaccination coverage of children, in a scenario where children are targeted, especially if children of some ages

require two doses of the vaccine, which was the case with the H1N1 vaccine," said Swann.

In terms of supply chain factors, vaccination for children was associated positively with the number of shipments per location. According to the research team, repeated distribution to the same sites could represent underlying system differences related to the efficiency of those states, the use of school vaccination programs or their ability to monitor vaccine use and redistribute to providers who were vaccinating quickly.

In this study, the researchers were able to explain more than 75 percent of the variation in state-specific vaccination coverage of adults or children with regression models that included only statistically significant variables.

Some of the state-specific data that the research team collected in their search for factors that influenced H1N1 vaccination coverage included:

- Demographic data -- e.g. race, education level and income
- State and government data -- e.g. number of counties and federal dollars per capita
- Health indicators -- e.g. seasonal flu vaccination rates and number of healthcare providers
- H1N1 surveys -- e.g. how the vaccine was allocated (by the state or locally) and the availability of doses in public settings
- CDC allocation and shipment data -- e.g. number of vaccination sites and peak week of Influenza-like illness activity

While the study found relevant factors, the researchers note that the recommendations of the study are based on data collected during a vaccine shortage situation and may not apply to a non-shortage situation. In addition, even though the team collected as much data as they could on state infrastructures and decision-making processes, complete data from every state was not available.

"Ultimately, the study suggests factors that public health agencies might consider monitoring in an emergency vaccination program with limited [vaccine](#) supply, and several other aspects public health systems could consider when designing systems," added Swann.

Provided by Georgia Institute of Technology

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