

## PURPOSE

Assess the impact of patient travel from one county to another for immunization against 2009 H1N1 influenza and identify characteristics associated with the providers and counties vaccinating non-county residents.

## BACKGROUND

➤ Vaccination is the single most effective way to prevent influenza infection.

➤ Planning for allocation of vaccine is difficult given the uncertainties surrounding the epidemiology of a novel disease and the demand for and availability of medical resources.

➤ During the 2009 H1N1 influenza pandemic when vaccine first became available it was in limited supply relative to demand.

➤ To ensure equitable access to immunization, vaccine was allocated in direct proportion to the populations of NYS's 57 counties, excluding NYC.

The impact of patient travel from one county to another for health care due to preference and/or proximity on consumption of resources has not been measured.

## METHODS

Characteristics of counties and the providers that immunized children <5yrs of age who reside in another county were investigated.

### Characteristics Assessed:

- Number of providers registered to receive H1N1 vaccine.
- Number of hospital beds.
- Type of providers.
- H1N1 doses allocated.
- Location of children's last non-H1N1 immunization.

### Time Period Assessed, October/November 2009:

- Demand was highest.
- Supply was lowest, equitable allocation was critical.

### Age Assessed, Children <5yrs of Age:

- NYS law: Immunizations to children <19yrs of age must be reported into NYSIIS\*.
- County of residence most accurate in NYSIIS\*.

### Data Sources and Software:

- New York State Immunization Information System (NYSIIS)\*
- Vaccine Management System (VACMAN).
- New York State Vaccine Order Management System (VOMS).
- New York State Division of Standards and Surveillance.
- Statistical Analysis Software(SAS), Microsoft Excel.



# 2009 H1N1 Influenza Pandemic

## Per Capita Allocation and Patient Travel for Vaccination

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## RESULTS

### Vaccine was allocated in proportion to county population. Vaccine was administered as counties received it.

- .02 STDEV for the % Doses Allocated by county (Doses Allocated/County Population) --(1,927,770 total H1N1 vaccine doses allocated).
- .02 STDEV for the % Doses administered to all children <19yrs of age by county (Doses Administered/County Population).
- .08 STDEV for the % Doses administered to all children <5yrs of age by county (Doses Administered/County Population <5yrs of age).

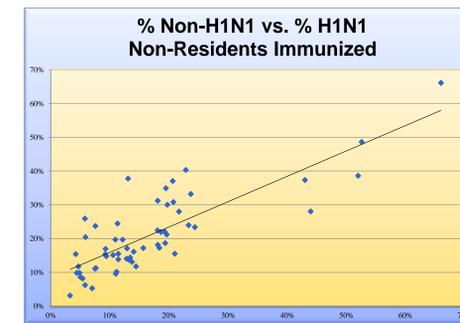
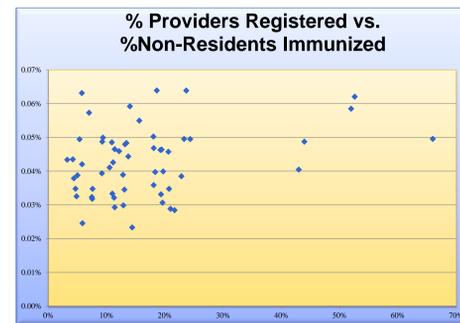
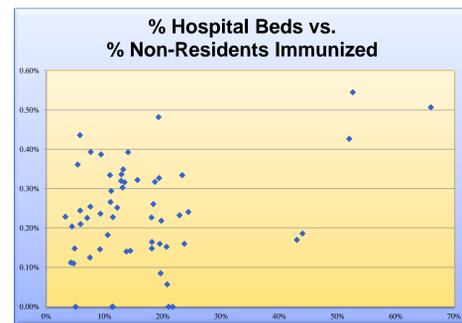
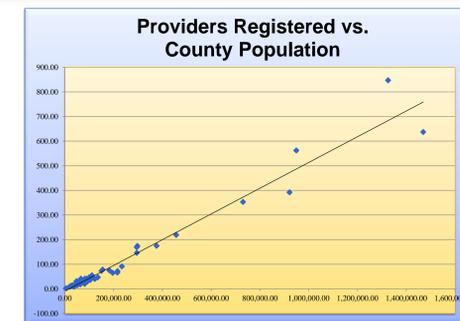
### Vaccine was not administered to residents <5yrs of age in proportion to county population.

- .29 STDEV for the % Doses administered to residents <5yrs of age by county (Doses Administered/County Population <5 yrs of age).

### Children <5yrs of Age in New York State (NYS), excluding NYC:

- 30% Received at least one H1N1 immunization (190,824/631,039).
  - 56% Received their first non-H1N1 immunization in October or November 2009 (104,192/190,824).
    - 85% Did have a non-H1N1 vaccination reported in NYSIIS (88,721/104,192).
- 7% Received H1N1 immunization in a different county than non-H1N1 (6,400/88,721).
- 17% Received H1N1 immunization in a different county than they reside (14,670/88,721).
- 18% Received non-H1N1 immunization in a different county than they reside (15,928/88,721).

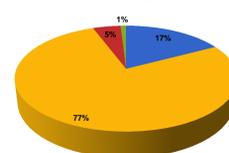
**Note:** Three charts below- The denominator for % Hospital Beds and Providers Registered is county population. The denominator for % Non-Residents immunized is the total number immunized in a county.



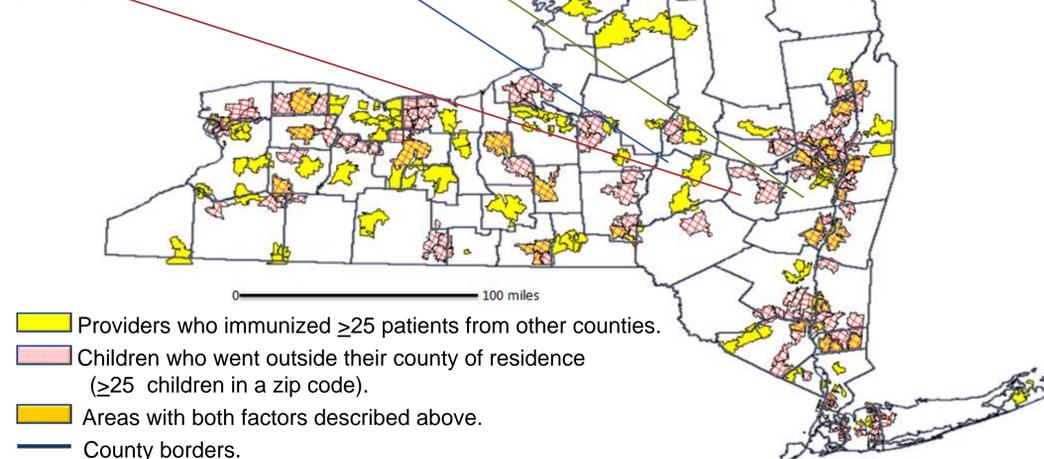
Provider Types	% H1N1 Non-Res Immunized	% H1N1 Total Immunized
Private Practices	55%	80%
LHDs	24%	11%
All Other	21%	9%

### Children <5yrs of Age Immunized Against H1N1 Influenza (Oct-Nov 2009)

■ Non-County Residents ■ County Residents  
■ Unknown ■ Out-of-State



**Example:** 79% of immunized children <5yrs of age who reside in Schoharie county were vaccinated in Otsego and Albany counties.



## CONCLUSIONS

➤ A large number of children regularly receive their vaccinations outside their county of residence.

➤ Private providers were primarily responsible for immunizing children who reside in other counties, not LHDs.

➤ The number of residents, hospital beds, and providers in a given county do not always represent the extent to which non-residents seek vaccinations in that county.

➤ The vaccination burden for counties is higher or lower depending on the location of providers relative to patient population centers (see map).

Per capita allocation does ensure that the providers in a county have equitable access to vaccine relative to the population, but it does not always ensure that the population in a county has equitable access to vaccination.

Equitable and efficient allocation of medical resources may be improved by taking into consideration the location where children historically seek health care services. For vaccinations, NYSIIS data may be used to predict where people seek immunizations. Further study could assist in identification of more ways to ensure that medical resources are allocated in a manner that creates equitable access to health care, one of the primary goals of the health sector.

## LIMITATIONS

➤ Vaccinations for 1,500 children could not be included because of missing or incorrect data reported into NYSIIS.

➤ Results are limited to children <5yrs of age. Future studies should be completed to determine if the results apply to other age groups.

➤ The last non-H1N1 vaccination could have been administered on the same day as the first H1N1 vaccination, and consequently may not accurately represent the location where non-H1N1 immunizations are regularly administered.

➤ The patient travel patterns observed during the 2009 H1N1 influenza pandemic can only be used to estimate where patients will be immunized in a pandemic similar in nature.