Targeting Pandemic Influenza Vaccine Reminders Using a Statewide Immunization Information System

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National Immunization Conference Online
March 26-28, 2012
Background

• Children with chronic conditions are at increased risk for influenza ("flu") and related complications

• For the 2009-2010 season, pandemic H1N1 and seasonal flu vaccines were both recommended for all children
Background

- In 2006, the Michigan Department of Community Health (MDCH) began using Medicaid claims data to identify children with chronic (“high-risk”) conditions in the Michigan Care Improvement Registry (MCIR)

- During the 2009-2010 season, MCIR was used to conduct reminder / recall for H1N1 and seasonal flu vaccination
Objective

• To retrospectively evaluate the feasibility and utility of targeting flu vaccine reminders to children with chronic conditions during a pandemic using a statewide immunization information system (IIS)
Identification of High-Risk Children

• MDCH queried MCIR in November 2009 to identify children:
  – with $\geq 1$ chronic condition based on the existing MCIR high-risk indicator
  – with no H1N1 or seasonal flu vaccine doses recorded for the 2009 flu season

• N=202,133 children
Mailed Reminder Notification

- Reminder letters outlined:
  - the increased risk from H1N1 influenza disease
  - the importance of children receiving both the H1N1 and seasonal flu vaccines
- Letters were mailed 12/7/2009
- Undeliverable reminders were tracked
Evaluation Methods

• We retrospectively evaluated the use of flu vaccine reminders during the 2009-2010 season

• In June 2010, we calculated flu vaccination rates in MCIR:
  – prior to reminder mailing (9/1/09-12/7/09)
  – following reminders (12/8/09-1/31/10)
  – overall rates as of 2/28/10
Evaluation Methods

- For this evaluation, we excluded children:
  - aged <6 months or >18 years (n=22,871)
  - who received ≥1 dose prior to reminder mailing date (n=26,600)
  - who were otherwise ineligible (e.g., deceased) (n=4,045)

- We identified a comparison group of non-high-risk children, matched on birth month/year and county to high-risk children receiving a reminder
Evaluation Methods

• Analyses compared three groups:
  – high-risk children, deliverable reminder (n= 142,383)
  – high-risk children, undeliverable reminder (n= 6,234)
  – non-high-risk children, no reminder (n= 142,383)

• Primary outcome was MCIR evidence of H1N1 or seasonal flu vaccination following reminder notification (12/8/09-1/31/10)
Results

• During the period 12/8/09-1/31/10 among the study population:
  – 5% received ≥1 H1N1 dose (n=15,682)
  – 4% received ≥1 seasonal flu vaccine (n=10,858)

• Of those vaccinated:
  – H1N1 only: 46%
  – seasonal flu only: 22%
  – both vaccines: 32%

*Pre-, post-, and overall 2009-2010 flu season vaccination rates shown in Table 1*
Table 1: Pre-, Post-, and Overall 2009-2010 Flu Vaccination Rates

<table>
<thead>
<tr>
<th>Flu Vaccine</th>
<th>MCIR Vaccination Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-reminder</td>
</tr>
<tr>
<td>H1N1</td>
<td>18%</td>
</tr>
<tr>
<td>Seasonal</td>
<td>20%</td>
</tr>
</tbody>
</table>
Flu Vaccine Receipt by Child Characteristics

- For both H1N1 and seasonal flu, vaccine receipt was higher among younger children (6-23 months) vs all other age groups.
- Vaccine receipt was lower in urban areas (vs rural) for H1N1 vaccine, but higher for seasonal flu vaccine.
Flu Vaccine Receipt by Study Group

By reminder status

• Vaccine receipt was higher for reminder vs no reminder groups

By vaccine

• H1N1 vaccine receipt was higher vs seasonal flu for each of the 3 study groups

Vaccine receipt by study group shown in Table 2
Flu Vaccine Receipt by Study Group

**By high-risk status**

- Seasonal flu vaccine receipt was higher for high-risk groups vs the non-high-risk group.
- Among those with no reminder, H1N1 vaccine receipt was higher for the non-high-risk than the high-risk group.

*Multivariate logistic regression results shown in Table 2*
Table 2: Influenza Vaccine Receipt by Study Group

Post-reminder period (12/8/09-1/31/10)

<table>
<thead>
<tr>
<th>Study Group</th>
<th>Overall Group</th>
<th>H1N1 Vaccine Receipt</th>
<th>Seasonal Flu Vaccine Receipt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>High-risk, Reminder</td>
<td>142,383</td>
<td>9,280</td>
<td>6.5%</td>
</tr>
<tr>
<td>High-risk, No reminder</td>
<td>6,234</td>
<td>227</td>
<td>3.6%</td>
</tr>
<tr>
<td>Non-high-risk, No reminder</td>
<td>142,383</td>
<td>6,175</td>
<td>4.3%</td>
</tr>
</tbody>
</table>
Additional Context

• Flu vaccination rates for children across the entire 2009-2010 season were lower in MCIR vs other sources of state-specific coverage data:
  – H1N1: MCIR 24% vs CDC 33%
  – Seasonal: MCIR 24% vs CDC 37%

• May reflect incomplete dose reporting in MCIR
• Affects accuracy of eligibility determination for mid-season reminders
Conclusions

• The existing MCIR high-risk indicator enabled targeted reminders for priority cases during a pandemic

• Flu vaccine reminders were associated with higher flu vaccination rates among high-risk children who were unvaccinated at mid-season
Conclusions

• Given inconsistent flu vaccine reporting during the 2009-2010 pandemic, the efficiency of IIS-based reminder / recall efforts for children may have been lower than in typical flu seasons
Implications/Challenges

- Incomplete reporting to an IIS limits the ability to target reminders during pandemic events and measurement of reminder effectiveness.

- Future initiatives should consider strategies to improve the timeliness and completeness of flu vaccine reporting to an IIS during pandemic events.
Questions?

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