Targeting Pandemic Influenza Vaccine Reminders Using a Statewide Immunization Information System

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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 ≥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

Flu Vaccine	MCIR Vaccination Rate		
	Pre-reminder (8/1/2009 – 12/7/2009)	Post-reminder (12/8/2009 – 1/31/2010)	2009-2010 Season (8/1/2009 – 2/28/2009)
H1N1	18%	5%	24%
Seasonal	20%	4%	24%

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)

Study Group	Overall Group N	H1N1 Vaccine Receipt			Seasonal Flu Vaccine Receipt		
		N	%	OR (95% CI)	N	%	OR (95% CI)
High-risk, Reminder	142,383	9,280	6.5%	1.54 (1.49, 1.59)	6,786	4.8%	1.79 (1.72, 1.87)
High-risk, No reminder	6,234	227	3.6%	0.83 (0.73, 0.95)	203	3.3%	1.21 (1.04, 1.39)
Non-high-risk, No reminder	142,383	6,175	4.3%	Reference	3,869	2.7%	Reference

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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