CENTRALIZED HPV VACCINATION RECALL AMONG MICHIGAN ADOLESCENTS

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BACKGROUND
2013 Prevention and Public Health Fund Grant: Increasing Human Papillomavirus Vaccination Coverage Rates among Adolescents

- To improve HPV vaccination rates of children aged 11 through 18 years by:
  - Dissemination of centralized, statewide recall notices using MCIR
  - Classic style and follow-up AFIX meetings
  - An extensive communication campaign
  - Health care provider education and training
  - Joint stakeholder initiative
HPV VACCINE COVERAGE

- Recall was planned in 2014
- I+ Tdap and I+ MCV coverage ~ 85%
- HPV coverage
  - Females
    - 1+ ~ 50%
    - 3+ ~ 30%
  - Males
    - 1+ ~ 30%
    - 3+ ~ 10%
The Community Preventive Services Task Force indicates that the one of the most effective mechanisms to improve vaccination rates are through interventions that alert those who are:

- Eligible for vaccinations (reminders) or
- Are overdue (recalls)

Reminders and recalls are often conducted in tandem and can be delivered through a variety of modalities, including telephone, postal mail, email, SMS text message, or secure patient portals.
One factor that may contribute to the success of a recall is whether the source of these notifications is the patients’ individual primary care practice, or a more centralized health system or public health organization.

Barriers to the success of provider-based recalls have been documented:

- Limitations of staff time
- Cost
- National data suggest few providers conduct any type of reminder

Centralized recalls which typically originate from a health department or health system have been demonstrated as being more effective than practice-based reminders.
OBJECTIVES

- Increase HPV vaccination coverage by conducting a centralized, statewide HPV recall
- Evaluate the impact of the centralized, statewide recall on initiation and completion of the HPV vaccine series
- Determine if centralized recall letters using the existing recall functions in MCIR should be an ongoing strategy to improve HPV initiation and completion rates
MCIR is populated through a linkage with Vital Records birth data

State law requires that all vaccination doses administered in Michigan to children aged ≤ 19 years be reported to MCIR

- Parents or guardians may opt their child out of MCIR by written notice

MCIR has been a Centers for Disease Control and Prevention Sentinel Site since 2001

- Requires minimum standards of provider and patient participation, data quality, and timeliness

A key function of MCIR is the ability to assess a child’s status for each vaccine series and determine whether they are up-to-date, eligible, or overdue for the next recommended dose within a series

- MCIR has been programmed to make series assessments based on the schedule recommended by the Advisory Committee on Immunization Practices (ACIP)

- An exemption is for the first dose of HPV vaccine; for this dose, MCIR considers an adolescent overdue for the first dose of HPV vaccine at age 12 years, rather than 13 years
# MCIR SERIES ASSESSMENT EXAMPLE

<table>
<thead>
<tr>
<th>Series</th>
<th>Immunizations</th>
<th>Other</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTP/DTaP/DT/Td/Tdap</td>
<td>08/17/2004 Dtap</td>
<td></td>
<td>Up-To-Date Next Due 07/20/2026</td>
</tr>
<tr>
<td>MMR</td>
<td>08/17/2005 MMR, 09/04/2009 IPV</td>
<td></td>
<td>Series Complete</td>
</tr>
<tr>
<td>Varicella</td>
<td>05/17/2005 Varicella, 09/04/2009 Varicella</td>
<td></td>
<td>Series Complete</td>
</tr>
<tr>
<td>HPV</td>
<td></td>
<td>HPV DUE NOW</td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td></td>
<td>Hepatitis A DUE NOW</td>
<td></td>
</tr>
<tr>
<td>Seasonal Influenza</td>
<td></td>
<td>Seasonal Influenza DUE NOW</td>
<td></td>
</tr>
<tr>
<td>Meningococcal Conjugate</td>
<td>07/20/2016 Meningococcal Conjugate, MCV4</td>
<td></td>
<td>Up-To-Date Next Due 05/08/2020</td>
</tr>
</tbody>
</table>

- **Not currently due, but needs more doses**
- **No more doses are needed**
- **Overdue**
- **Not currently due, but needs more doses**
Based on its assessments, MCIR has the capability to recall adolescents overdue for any dose within any series.

Adolescents are eligible for a recall in the MCIR system if they have not:

- Been opted-out by a parent or guardian
- Been flagged as deceased
- Been flagged as migrant
- Been recalled within the previous 60 days
- Received two or fewer immunizations
- Been flagged by a provider to not receive recall notifications
- Had patient status set to Inactive at either the provider or jurisdictional level
- Been flagged with an invalid address
Adolescents were grouped by household, as determined by having an identical address in MCIR.

Households were randomized into two groups (recall, control) by county and age and gender of the oldest child within the household.

MCIR region determined the wave in which recall letters were sent.
The initial recall waves were aimed at adolescents who had already initiated, but not completed, the HPV series.

- At the time of the intervention (which commenced in December, 2014), ACIP recommendations indicated that adolescents should complete a 3 dose HPV series. Consequently, we recalled adolescents who had received two doses of HPV vaccine and were determined by MCIR to be overdue for their final (third) dose of HPV vaccine.

- We began our recall notification with MCIR regions 2 and 3; the same process was subsequently implemented for regions 4 and 5, followed by regions 1 and 6.

- The same procedure was subsequently employed for our recall aimed at adolescents 12 through 18 years who were overdue for their first dose of HPV vaccine.
NOTIFICATION LETTER

- Each eligible adolescent in the recall group was sent a standard, MCIR-generated letter and Q&A document by postal mail.
- The control group received the same mailing, lagged by at least 60 days following the notifications sent to the recall group in order to allow sufficient time for outcomes to be observed.
OUTCOMES

- Primary outcome
  - Administration and report to MCIR of an HPV vaccine dose within 60 days of mailing
- Additional outcome
  - Report of previously administered HPV vaccine doses to MCIR within 60 days of mailing
RESULTS
OVERALL RESULTS

### HPV Series Initiation
- **Recall**: 4% (n=212,345)
- **No Recall**: 3% (n=211,376)

### HPV Series Completion
- **Recall**: 12% (n=19,989)
- **No Recall**: 8% (n=19,306)

Legend:
- **Dose administered**
- **Historical dose entered**
## CUMULATIVE INCIDENCE (CI) AND RISK DIFFERENCE (RD) BY GROUP, HPV SERIES INITIATION

<table>
<thead>
<tr>
<th>HPV Series Initiation</th>
<th>Recall (n=212,345)</th>
<th>No Recall (n=211,376)</th>
<th>p-value</th>
<th>RD per 100</th>
<th>95% CL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>CI per 100</td>
<td>95% CL</td>
<td>n</td>
<td>CI per 100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8619</td>
<td>4.06</td>
<td>3.98, 4.14</td>
<td>6114</td>
<td>2.89</td>
</tr>
<tr>
<td><strong>Age Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 years</td>
<td>2737</td>
<td>7.90</td>
<td>7.62, 8.19</td>
<td>2263</td>
<td>6.54</td>
</tr>
<tr>
<td>13-15 years</td>
<td>3651</td>
<td>4.04</td>
<td>3.91, 4.17</td>
<td>2452</td>
<td>2.73</td>
</tr>
<tr>
<td>16-18 years</td>
<td>2231</td>
<td>2.55</td>
<td>2.45, 2.66</td>
<td>1399</td>
<td>1.61</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>3758</td>
<td>4.08</td>
<td>3.95, 4.21</td>
<td>2836</td>
<td>3.09</td>
</tr>
<tr>
<td>Male</td>
<td>4860</td>
<td>4.05</td>
<td>3.93, 4.16</td>
<td>3278</td>
<td>2.74</td>
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<tr>
<td>N/A</td>
<td>78</td>
<td>--</td>
<td>--</td>
<td>41</td>
<td>--</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 and 6</td>
<td>4237</td>
<td>3.57</td>
<td>3.47, 3.68</td>
<td>2945</td>
<td>2.49</td>
</tr>
<tr>
<td>2 and 3</td>
<td>2887</td>
<td>5.27</td>
<td>5.08, 5.45</td>
<td>2100</td>
<td>3.84</td>
</tr>
<tr>
<td>4 and 5</td>
<td>1495</td>
<td>3.84</td>
<td>3.65, 4.03</td>
<td>1069</td>
<td>2.78</td>
</tr>
</tbody>
</table>
### CUMULATIVE INCIDENCE (CI) AND RISK DIFFERENCE (RD) BY GROUP, HPV SERIES COMPLETION

<table>
<thead>
<tr>
<th>HPV Series Completion</th>
<th>Recall (n=19,989)</th>
<th>No Recall (n=19,306)</th>
<th>p-value</th>
<th>RD per 100</th>
<th>95% CL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td>2482</td>
<td>12.42</td>
<td>11.96, 12.87</td>
<td>1460</td>
<td>7.56</td>
</tr>
<tr>
<td><strong>Age Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-12 years</td>
<td>431</td>
<td>16.90</td>
<td>15.45, 18.36</td>
<td>273</td>
<td>11.38</td>
</tr>
<tr>
<td>13-15 years</td>
<td>1201</td>
<td>14.03</td>
<td>13.30, 14.79</td>
<td>678</td>
<td>8.14</td>
</tr>
<tr>
<td>16-18 years</td>
<td>850</td>
<td>9.57</td>
<td>8.96, 10.18</td>
<td>509</td>
<td>5.94</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1237</td>
<td>11.66</td>
<td>11.05, 12.27</td>
<td>738</td>
<td>7.20</td>
</tr>
<tr>
<td>Male</td>
<td>1244</td>
<td>13.28</td>
<td>12.59, 13.96</td>
<td>722</td>
<td>7.97</td>
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<tr>
<td>N/A</td>
<td>7</td>
<td>--</td>
<td>--</td>
<td>2</td>
<td>--</td>
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<tr>
<td><strong>Region</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 and 6</td>
<td>1350</td>
<td>12.57</td>
<td>11.95, 13.20</td>
<td>812</td>
<td>7.73</td>
</tr>
<tr>
<td>2 and 3</td>
<td>727</td>
<td>12.44</td>
<td>11.59, 13.28</td>
<td>426</td>
<td>7.51</td>
</tr>
<tr>
<td>4 and 5</td>
<td>405</td>
<td>11.88</td>
<td>10.80, 12.97</td>
<td>222</td>
<td>7.12</td>
</tr>
</tbody>
</table>
OVERALL EFFECT

- Using MCIR for a centralized, statewide recall mailing was effective for prompting the completion of the HPV vaccine series.
- While MCIR recall notification was also associated with increased HPV vaccine series initiation, the overall effect was modest.
  - Despite inclusion of a fact sheet developed to anticipate questions parents may have about the HPV vaccine:
    - Consistent with prior studies that have shown no commensurate increase in the acceptability of HPV vaccines, despite increased knowledge obtained through information sheets provided to parents.
    - Rather, HPV series initiation is demonstrably increased when providers take time to discuss the vaccine with parents, make a strong recommendation, and use presumptive language.
- Included all adolescents aged 12 through 18 years eligible for a recall who had not yet initiated the HPV vaccine series:
  - Address may not have been current,
  - May not have discussed the HPV vaccine with their provider, or
  - May have already refused the HPV vaccine were also included in the recall for series initiation.
Our findings indicate that the effect of HPV recall notification for both series initiation and completion varied across subgroups by age, gender, and geographic region of the state.

- Greatest among younger adolescents
  - Earlier completion of the HPV vaccine series is beneficial not only because vaccination at a younger age is associated with a stronger immune response, but also because the full benefit of the vaccine is achieved when the series is completed prior to exposure to HPV through sexual activity.
In both recalls, we noticed the greatest impact in regions 2 and 3.

This effect was small for series completion, but for initiation, we saw a 1.4% difference between the intervention and control groups in regions 2 and 3, compared to about a 1% difference in regions 1 and 6 and regions 4 and 5.

The intervention in regions 2 and 3 may have benefitted from the timing of the recall letter, which was mailed in early September and may have prompted parents to discuss the HPV vaccine at an already-scheduled back-to-school office visit.

- Most of the vaccines recommended for adolescents aged 11 through 12 years are administered in the fall.
- Future recall efforts may be timed to take advantage of this effect.
ACKNOWLEDGEMENTS

- Kevin Dombkowski
- Hannah Jary
- Stephanie Sanchez
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- Gerry Bragg
- Ian Hancke
- All the providers that use MCIR!
THANK YOU!