

## Appendix

**Table A-1.** Intervention strategies used to increase childhood influenza vaccination rates

| Strategy  | Description   | Group   |
|---|---|---|
| <b>Provider and community interventions</b>                                 |   |   |
| Pre-intervention visits   | Investigators visited intervention practice to introduce the study and toolkit at a staff meeting and brainstorm ideas for implementing the 4 pillars in practical and meaningful ways for each practice.   | Intervention sites  |
| Mid-season refresher  | Staff was offered the opportunity to view a short online slide presentation mid-influenza season, and answer a short survey for which they received participant payment.  | Intervention sites  |
| Weekly reports  | The Immunization Champion (IC) received weekly graphs from September through mid-December from the research staff depicting the number of vaccines given and missed opportunities to vaccinate.<br>The graphs compared actual values with a goal set by the investigators.  | Intervention sites  |
| Videos  | The investigators developed two videos based on focus group findings to encourage teens and younger children to be vaccinated. The teen video was advertised in practices using fliers with a headline to catch teens' attention and a QR code for direct linking to smart phones. A second video was a 30 second public service announcement, produced in collaboration with the county health department and a local television station, and featured a local child celebrity. It played on intervention practices' waiting room electronic message boards and aired 280 times on TV from early September through March 2012. | Intervention sites and general public for TV public service announcements |
| Community outreach  | The research team conducted community outreach, primarily in disadvantaged communities, to reach groups with traditionally low vaccination rates, visiting places of worship, community centers and social service agencies, distributing fliers and talking with people gathered there.  | General public in organizations serving disadvantaged communities         |
| <b>Vaccine supply/policy interventions</b>                                  |   |   |
| Early delivery of Vaccines for Children (VFC) and donated influenza vaccine | Selective early delivery of VFC influenza vaccine to Intervention practices and the delivery of 50-750 doses of donated influenza vaccine for administration to VFC children which arrived in the Intervention practices at approximately the same time. Practices were encouraged to extend the vaccination season by vaccinating as soon as supplies arrived until the end of February.   | Intervention sites  |
| Borrowing of commercial vaccine for   | Investigators received permission for practices to borrow commercial supplies of vaccine to administer to VFC patients until VFC supplies arrived.  | Intervention sites  |

VFC patients

#### 4 Pillars Toolkit

| <b>Pillar 1</b>   |  |                    |
|---|--|--------------------|
| <b>Convenient vaccination services</b>  | Practices were encouraged to reduce access barriers by offering convenient influenza vaccination services such as after-hours vaccine clinics, walk-in vaccination, dedicated vaccination stations, designated vaccination only hours and vaccination offered at any non-febrile illness visit.  | Intervention sites |
| Convenient influenza vaccination  |  |                    |
| <b>Pillar 2</b>   |  |                    |
| <b>Notification of parents/patients about the importance of influenza vaccination and the availability of vaccine</b> |  |                    |
| Office posters  | The research team downloaded influenza vaccination posters from the CDC website and provided at least enough to post in each practice's exam rooms. Offices were encouraged to create their own posters and fliers to reminder patient, parents and providers.   | Intervention sites |
| Patient reminders   | Practices were strongly encouraged to notify all parents/patients of the availability of influenza vaccine, date and time of any influenza vaccination clinics, and physician recommendations to be vaccinated. Practices could use any appropriate means, e.g., autodialed phone calls, emails, text messages, "on-hold" messages, fliers, social media, verbal reminders at check-in, etc. | Intervention sites |
| Autodialed phone messages   | The research team worked with the practices to send one or more autodialed message in September, October and December to the entire patient population or a subset (e.g., those still not vaccinated by a certain date) of each practice.  | Intervention sites |
| <b>Pillar 3</b>   |  |                    |
| <b>Enhanced office systems to facilitate influenza immunization</b>   |  |                    |
| Physician prompts   | The electronic medical record (EMR) was programmed to generate a physician prompt called a best practice alert (BPA) which would appear on the computer screen whenever an unvaccinated child was being seen.  | Intervention sites |
| Vaccination as part of vital signs  | Practices were to make influenza vaccination routine by having clinical support staff assess immunization status as part of the process of rooming patients and recording vital signs, and by incorporating SOPs into the practice.  | Intervention sites |
| Standing Order Protocols (SOPs)   | Staff would inform the parent, obtain consent, give the Vaccine Information Sheet and prepare the vaccine, and when feasible, vaccinate eligible children without the need for a specific physician's order.   | Intervention sites |
| <b>Pillar 4</b>   |  |                    |
| <b>Motivation through an office immunization champion</b>   |  |                    |

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Immunization  
champion (IC)

The IC in each practice was an enthusiastic motivator who used her or his time and energy to provide feedback, encourage competition and energize the staff to keep up the efforts throughout the season. The IC shared weekly graphs from September through mid-December depicting the number of vaccines given and missed opportunities to vaccinate and discussed ways to improve or sustain efforts. The graphs compared actual values with a goal.

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Intervention  
sites

**Table A-2.** Variables related to influenza vaccination status by hierarchical linear modeling

| <b>Variable</b>   | <b>Model without Interaction Term</b> | <b>Model with age &amp; Intervention Interaction Term</b> | <b>Model with Race &amp; Intervention Interaction Term</b> | <b>Model with Age &amp; Race &amp; Intervention Interaction Term</b> |
|---|---------------------------------------|---|--|--|
|   | <b>Coefficient</b>                    | <b>Coefficient</b>  | <b>Coefficient</b>   | <b>Coefficient</b>   |
| Patient level variables                                       |                                       |   |  |  |
| Age group (ref = 6–23 months)                                 |                                       |   |  |  |
| 2–8 years   | –0.77*                                | –0.74*  | –0.78*   | –0.74*   |
| 9–18 years  | –1.42*                                | –1.45*  | –1.42*   | –1.51*   |
| Non-white race (ref = white)                                  |                                       |   |  |  |
| Commercial health insurance (ref = public/self-pay/uninsured) | 0.23*                                 | 0.23*   | 0.23*  | 0.23*  |
| Practice level variables                                      |                                       |   |  |  |
| Pre-intervention vaccination rate (unit = 10% increase)       | 2.32*                                 | 2.31*   | 2.35*  | 2.37*  |
| Intervention (ref. = Control)                                 | 0.23**                                | 0.23**  | 0.19**   | 0.20**   |
| Interaction   |                                       |   |  |  |
| Age group and intervention, $p < 0.01$                        |                                       |   |  |  |
| Age 6–23 months and intervention                              |                                       | 0.00  |  |  |
| Age (2–8 years) and intervention                              |                                       | –0.07   |  |  |
| Age (9–18 years) and intervention                             |                                       | 0.06  |  |  |
| Age 6–23 months and control                                   |                                       | 0.00  |  |  |

|   |       |
|---|-------|
| Age (2–8 years) and control                             | 0.00  |
| Age (9–18 years) and control                            | 0.00  |
| Race and intervention, $p < 0.01$                       |       |
| Race (non-white) and intervention                       | 0.13  |
| Race (white) and intervention                           | 0.00  |
| Race (non-white) and control                            | 0.00  |
| Race (white) and control                                | 0.00  |
| Age group and race and intervention, $p < 0.01$         |       |
| Race (non-white) and Age (6–23 months) and intervention | 0.12  |
| Race (non-white) and age (6–23 months) and control      | 0.00  |
| Race (white) and age (6–23 months) and intervention     | 0.00  |
| Race (white) and age (6–23 months), control             | 0.00  |
| Race (non-white) and age (2–8 years) and intervention   | 0.05  |
| Race (non-white) and age (2–8 years) and control        | –0.03 |
| Race (white) and age (2–8 years) and intervention       | –0.07 |
| Race (white) and age (2–8 years) and control            | 0.00  |

|  |      |
|--|------|
| Race (non-white) and age (9–18 years) and intervention | 0.44 |
| Race (non-white) and age (9–18 years) and control      | 0.26 |
| Race (white) and age (9–18 years) and intervention     | 0.04 |
| Race (white) and age (9–18 years) and control          | 0.00 |

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\* $p < 0.001$ ; \*\* $p < 0.05$

The intraclass correlation coefficient (ICC) equals 0.008

**Table A-3.** Values for Figure 2, percent non-white children, pre-intervention and intervention year vaccination rates in ascending order by pre-intervention rate

| <b>Site</b>               | <b>Non-white Children (%)</b> | <b>Pre-intervention vaccination rate (%)</b> | <b>Intervention vaccination rate (%)</b> |
|---------------------------|-------------------------------|--|--|
| <b>Intervention sites</b> |                               |  |  |
| 1                         | 14                            | 14   | 23                                       |
| 7                         | 85                            | 21   | 38                                       |
| 10                        | 61                            | 26   | 41                                       |
| 6                         | 84                            | 35   | 57                                       |
| 2                         | 6                             | 39   | 48                                       |
| 5                         | 7                             | 39   | 51                                       |
| 9                         | 11                            | 45   | 55                                       |
| 8                         | 7                             | 50   | 56                                       |
| 4                         | 29                            | 58   | 59                                       |
| 3                         | 6                             | 64   | 64                                       |
| <b>Control sites</b>      |                               |  |  |
| 15                        | 61                            | 15   | 24                                       |
| 18                        | 29                            | 28   | 37                                       |
| 17                        | 29                            | 29   | 34                                       |
| 14                        | 6                             | 32   | 29                                       |
| 11                        | 5                             | 43   | 51                                       |
| 19                        | 36                            | 44   | 49                                       |
| 16                        | 13                            | 52   | 56                                       |
| 13                        | 7                             | 53   | 55                                       |
| 20                        | 9                             | 55   | 56                                       |
| 12                        | 31                            | 63   | 63                                       |