

Increasing Childhood Influenza Vaccination Rates: Interim Results on the Impact of the Childhood Influenza Vaccination Toolkit

Richard Zimmerman, MD, MPH, Kristin Hannibal, MD, Evelyn Reis, MD, Chyongchiou J. Lin, PhD, Annamore Matambanadzo, PhD, Judith A. Troy, MS, Kavitha Bhat-Schelbert, MD, Greg Gallik, MD, Mark Diamond, MD, Thomas G Lynch, MD, David Wolfson, MD, Ann O'Donnell, RN, Krissy K. Moehling, MPH, Mary Patricia Nowalk, PhD, RD

From the Departments of Family Medicine and Pediatrics, University of Pittsburgh, Pittsburgh, PA, the Children's Community Pediatrics, Pittsburgh, PA

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Overview

- Childhood influenza vaccination rates are modest
- Models are needed to implement the ACIP guidelines to vaccinated all persons ≥ 6 months of age
- Authors developed a toolkit
- Tested the toolkit in a randomized cluster trial in which the primary care practice is the unit of randomization
- 10 practices randomized into the intervention
- Interim results
- Parts of the toolkit follow

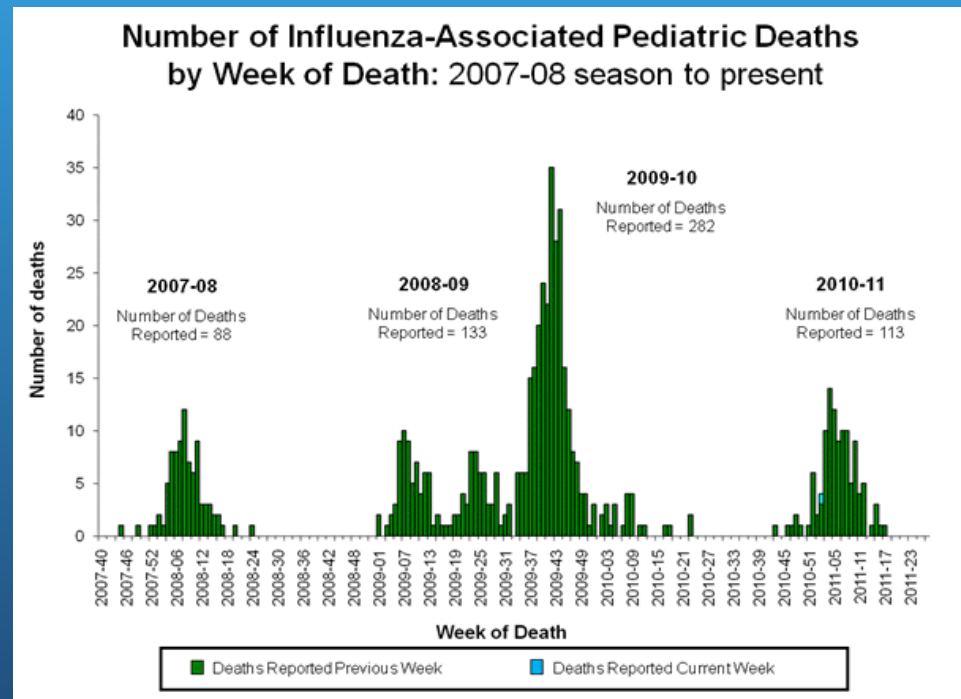
Impact of Influenza in Pre-Vaccination Era

- Attack Rates highest among children
 - 10%-20% of children annually.
- For visits for acute respiratory illness or fever, confirmed Influenza among children aged <5 years accounts for:
 - 10%-19% of office visits
 - 6%-29% of emergency department visits (*N Engl J Med* 2006; 355:31-40).
- 7-12 additional outpatient visits per 100 children aged <15 years (*N Engl J Med* 2000; 342:225-31).



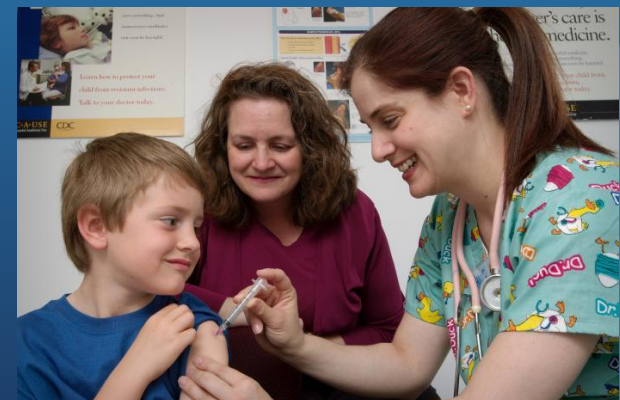
Burden of Influenza in children

- During 1979-2001, the U.S. estimated rate of influenza-associated hospitalizations among children aged <5 years averaged 108 per 100,000
 - (JAMA 2004; 292:1333-40).
- Over 1,000 children are estimated to have died due to the influenza pandemic
- Last year, 113 deaths



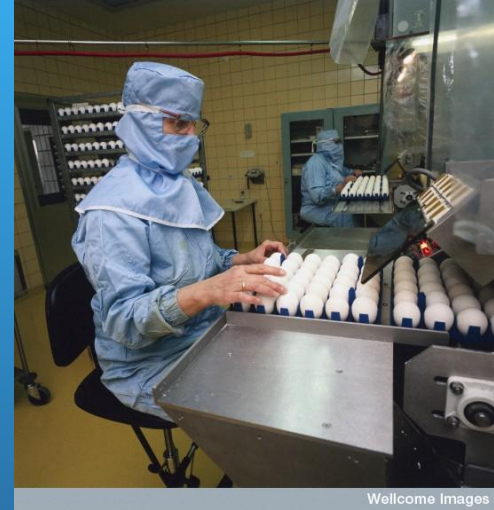
Influenza Vaccines for Children

- Recent meta-analysis of USA trials examined pooled efficacy with RT-PCR or CX confirmation
- 83% [69–91] for LAIV in children aged 6 months to 7 years with RT-PCR or CX
- 59% [95% CI 51–67] for TIV in adults aged 18–65 years
- Insufficient data for LAIV in older persons or TIV younger
 - Lancet ID, October 2011

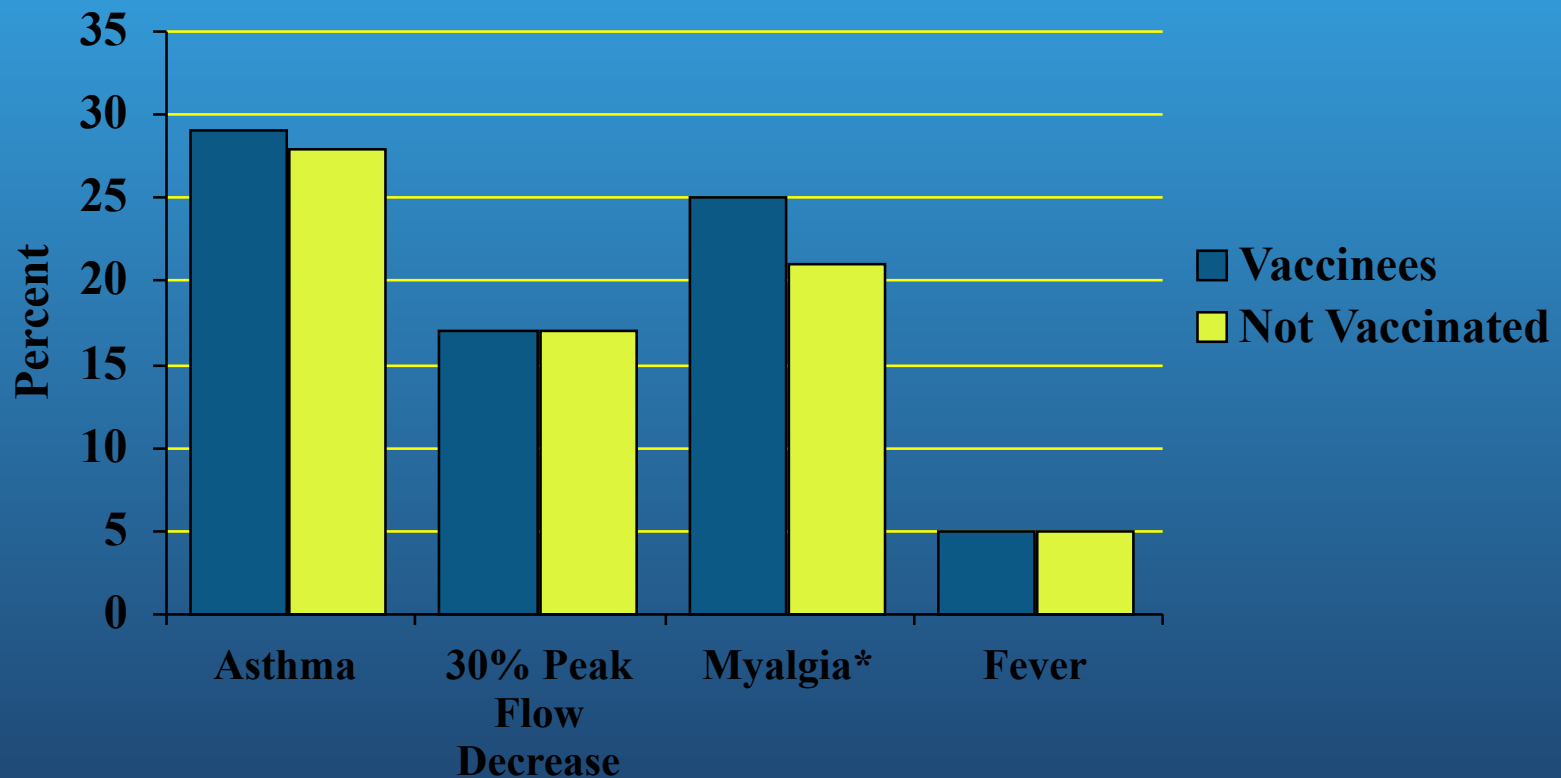


Influenza Vaccine Adverse Effects

- TIV:
 - Local reactions in 15%-20%
 - Uncommon: fever, malaise
 - Allergic reactions: rare
- LAIV:
 - Increased risk of asthma exacerbations in children 12-59 months of age
 - Cold-adapted so does not replicate well at core body temperature



Safety of Inactivated Influenza Vaccine in 2032 Asthmatics



* $p < 0.001$

NEJM 2001; 345:1529-36

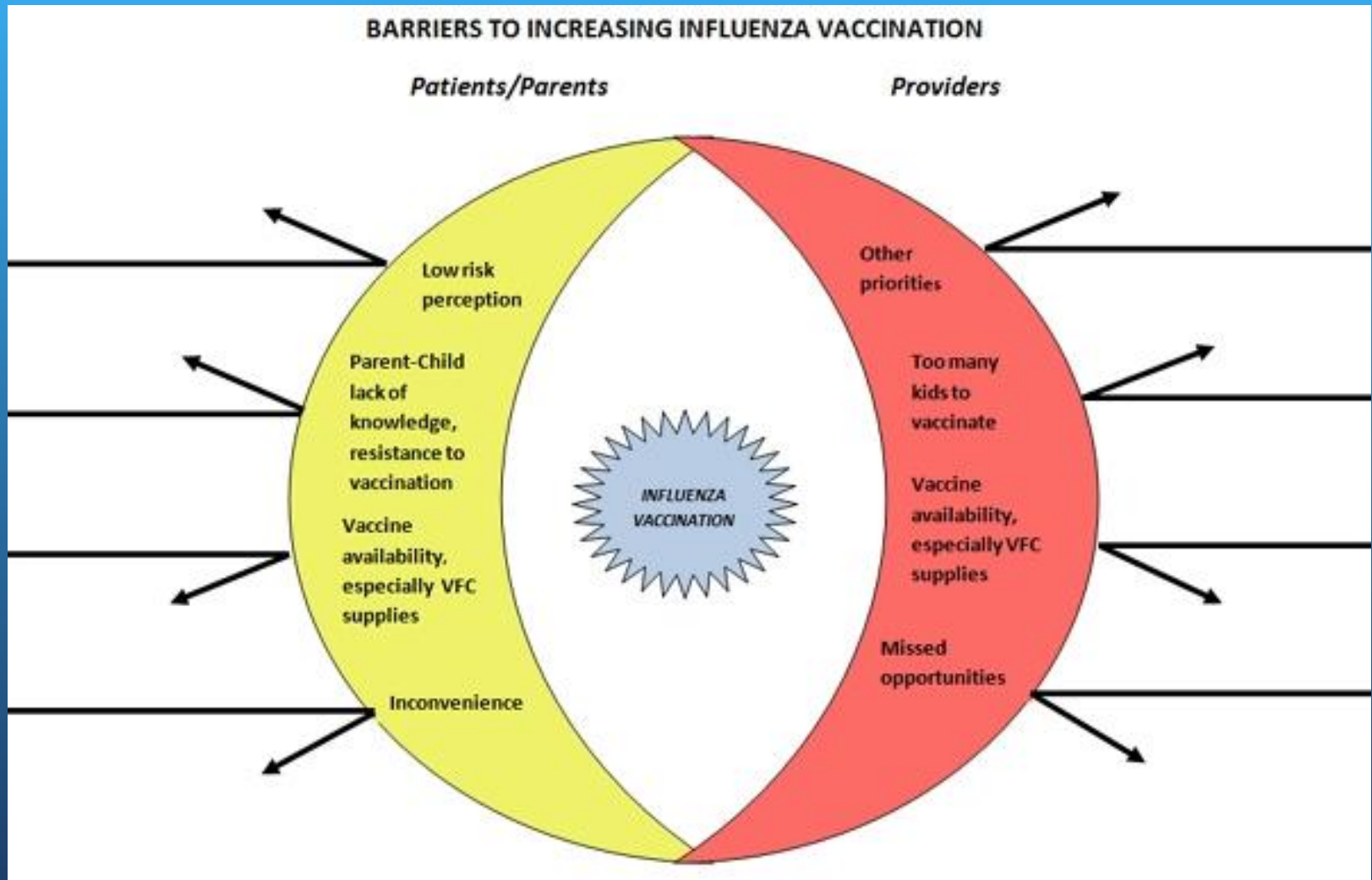
Contraindications and Precautions: TIV

- Severe allergy to eggs (cannot eat eggs)
 - Slight ovalbumin in current inactivated vaccine
 - If only hives after eggs, this is no longer considered valid vaccine allergy
 - Use TIV from provider familiar with potential manifestations of egg allergy
 - Observe for 30 minutes
 - Anaphylaxis, angioedema, recurrent emesis, those who required epinephrine, etc. should be referred to allergist and not vaccinated in primary care
- Severe allergy to any vaccine component or a prior dose
- Precaution: Acute, moderate-to-severe febrile illness (delay)
- Precaution: GBS within 6 weeks of previous influenza vaccine dose

Contraindications and Precautions: LAIV

- Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component, including egg protein
- Pregnancy
- Immunosuppression
- Certain chronic medical conditions (e.g., asthma)
- Precaution: Acute, moderate-to-severe febrile illness (delay)
- Precaution: GBS within 6 weeks of previous influenza vaccine dose

Barriers to Vaccination

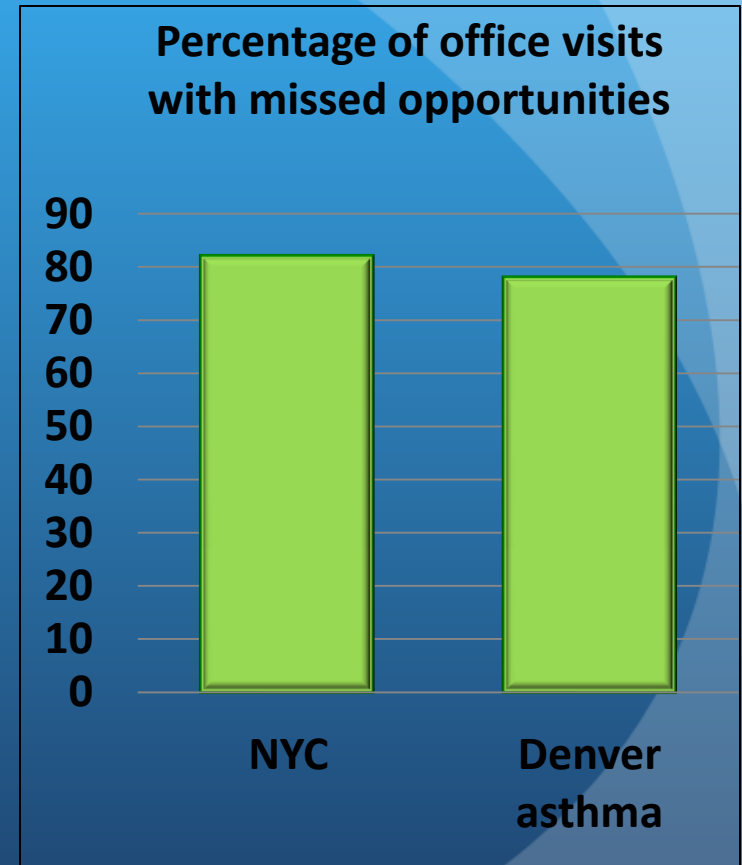


Patient Barrier: Accuracy of the Vaccination History

- Assume that the patient knows if *not* vaccinated
 - Zimmerman et al. found the sensitivity of patient self-report of influenza vaccination status was 98%
 - *Vaccine* 2003;21:1486-91
- Used medical record to confirm prior vaccination or document vaccination, if given

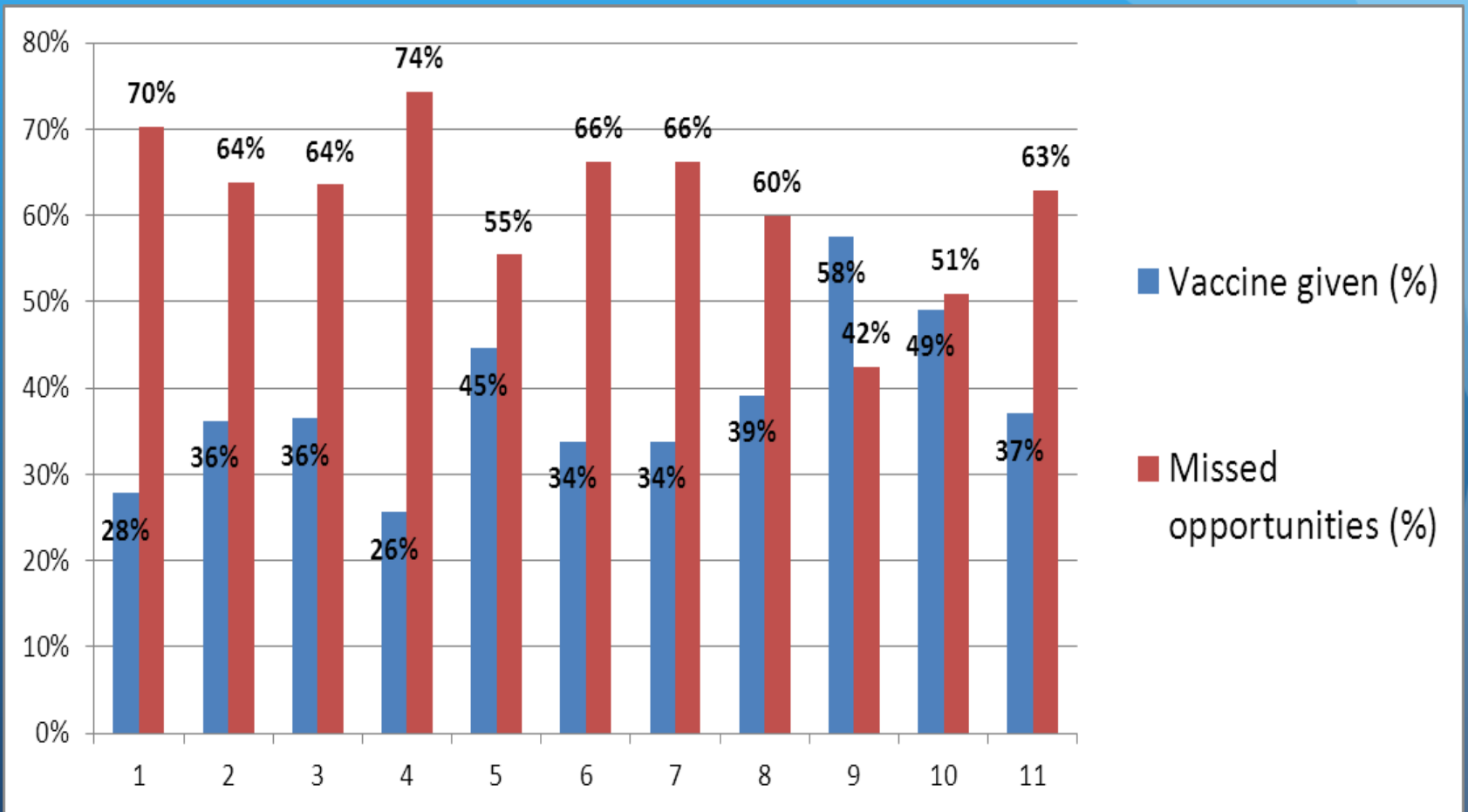
Clinic Barrier: Missed Opportunities

- Examples
 - Sports & drivers physicals
 - Acute care visits
 - Chronic care visits
- References
 - Pediatrics 2007; 119:e580-6
 - *Arch Pediatr Adolesc Med.* 2005;159:986-991

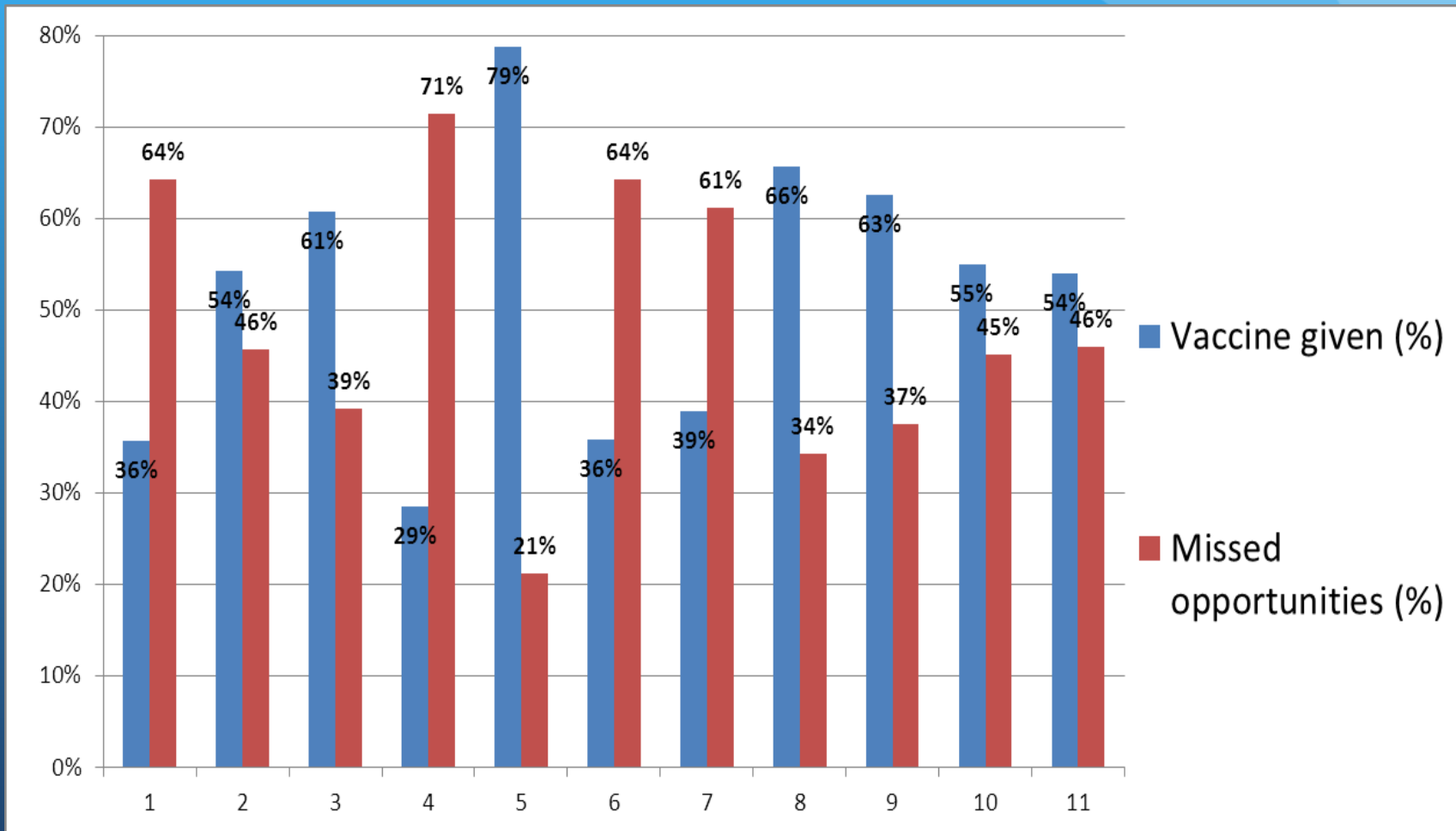


Vaccine 2004; 22:3457-63

Potential Missed Opportunities Data from Pittsburgh



Potential Missed Opportunities Data from Pittsburgh (cont'd)

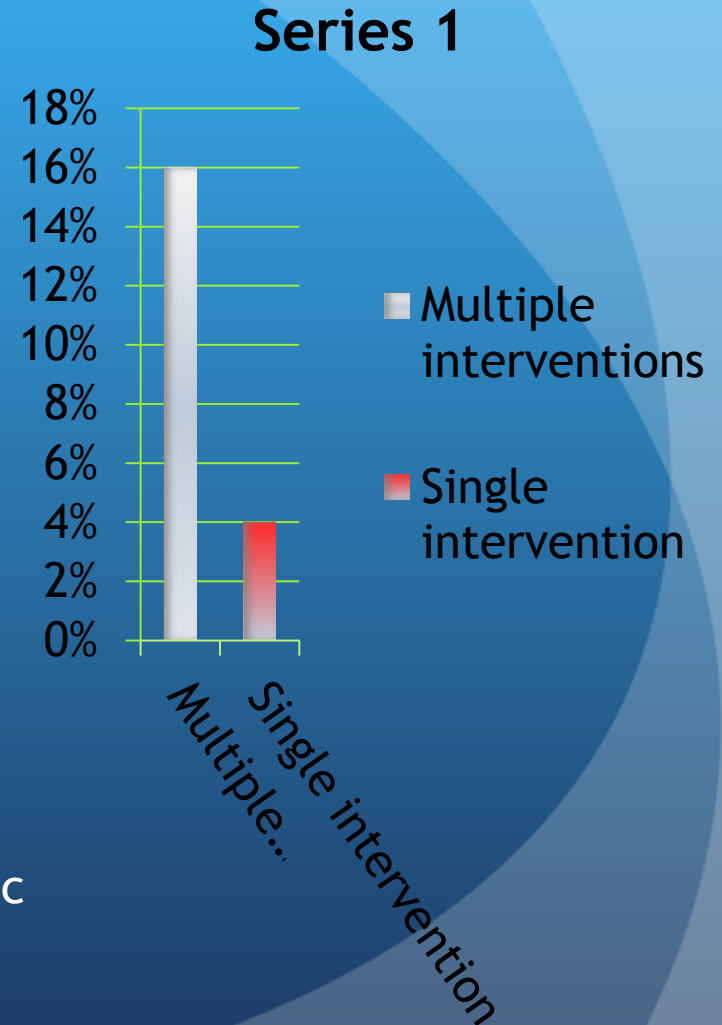


Evidence for Methods to Increase Vaccination Rates

- Task Force for Community Preventive Services (TFCPS) conducted systematic literature review and meta-analysis
- Evidence rankings based on 62 studies
- www.thecommunityguide.org
 - Ndiaye SM, Hopkins DP, Shefer AM, Hinman AR, Briss PA, Rodewald L, et al, Task Force on Community Preventive Services.

Evidence Review: Task Force on Community Preventive Services

- Increase Patient (Client) Demand
 - Patient reminder and recall systems
 - Clinic based patient education
- Enhance Access
 - Office hours express clinics
 - Non office hours express clinics
- Provider Reminders and/or Modified Office Systems
 - Standing orders programs (SOPs)
 - Best practice alerts in EMRs
- Combination of 2 or 3 strategic approaches led to a 16% point increase in rates.
- Multiple interventions *within* a single strategic approach increase rates only 4% points.



4 Pillars of a Successful Influenza Vaccination Program

1. Convenient vaccination programs
2. Patient notification about availability of convenient programs
3. Enhanced office vaccination systems
4. Motivation - immunization champion in the office tracks progress towards a set goal



Pillar 1: Convenient Influenza Vaccination Programs

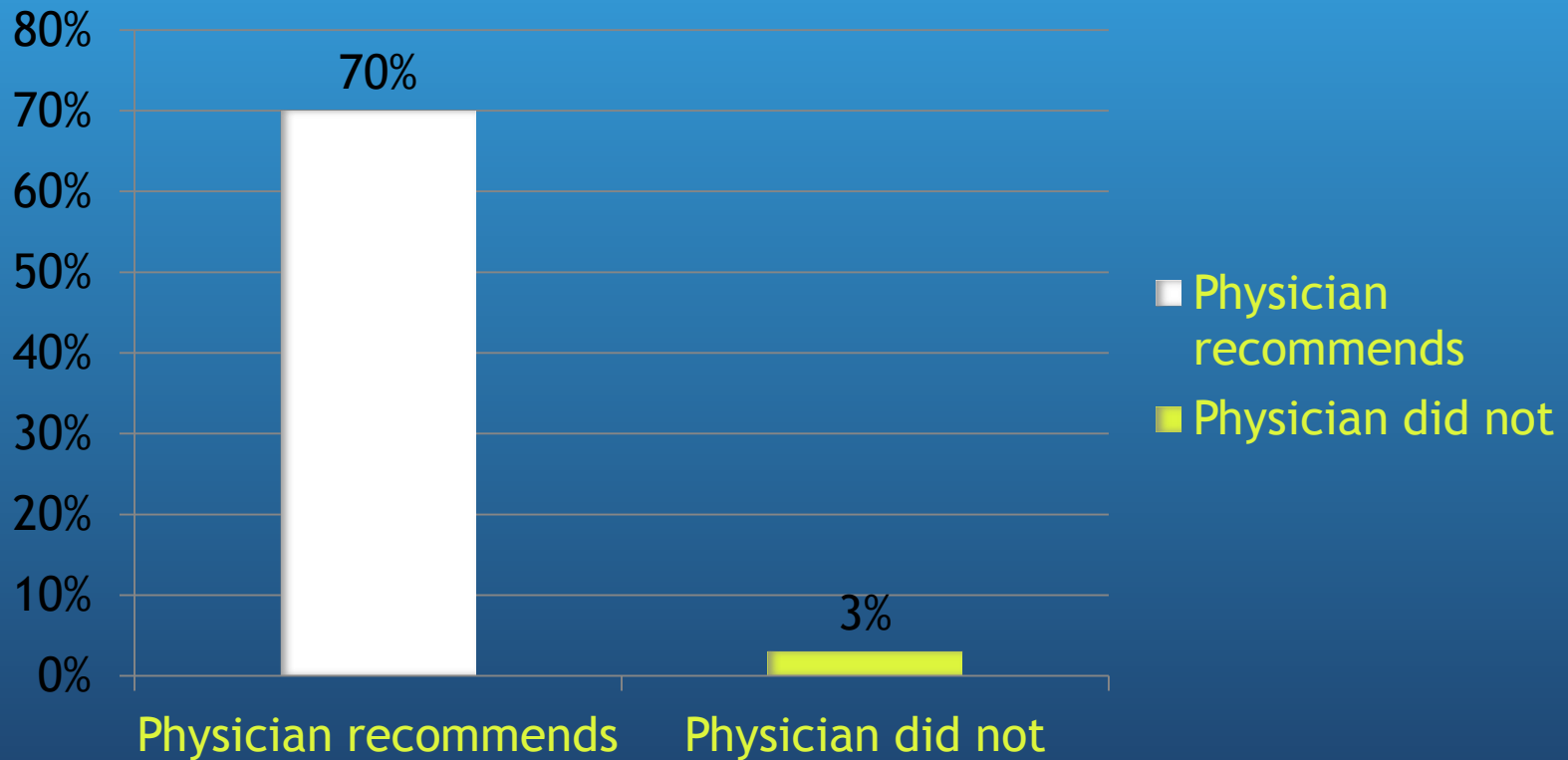
- **Extended vaccination season**
 - Starts when vaccine arrives
 - Continues into the influenza disease season for unvaccinated
 - Season unpredictable & some benefit possible
 - 2 waves may occur
- **Express vaccination services**
 - Vaccination only services
 - Options:
 - Dedicated efficient evening or weekend express services
 - Express walk-in vaccination station
 - Dedicated daytime walk-in or scheduled vaccinations during non-peak days

Pillar 2: Patient Notification about Convenient Vaccination Services

- Notification Methods
 - Autodialer
 - Mail
 - Email/text
 - Office posters/videos
 - Answering service “on-hold” messages
- Data show importance of physician recommendation in patient acceptance

Effect of Clinician Recommendation on Influenza Vaccination in Hospitalized Children

Vaccination Rate



Pediatrics 2001;108:e99

Pillar 3: Enhance Office Vaccination Systems

- **Assessment of influenza vaccination as a routine part of the office visit by nursing staff. Options include:**
 - Best practice alerts in EMR
 - Health maintenance or immunization tab review
 - Routinely address “Is influenza vaccination status up-to-date” as part of vital signs
- **Empowering staff to vaccinate by standing orders programs (SOPs)**
- **Combination of assessment & SOPs should reduce missed opportunities**

Procedure for SOPs

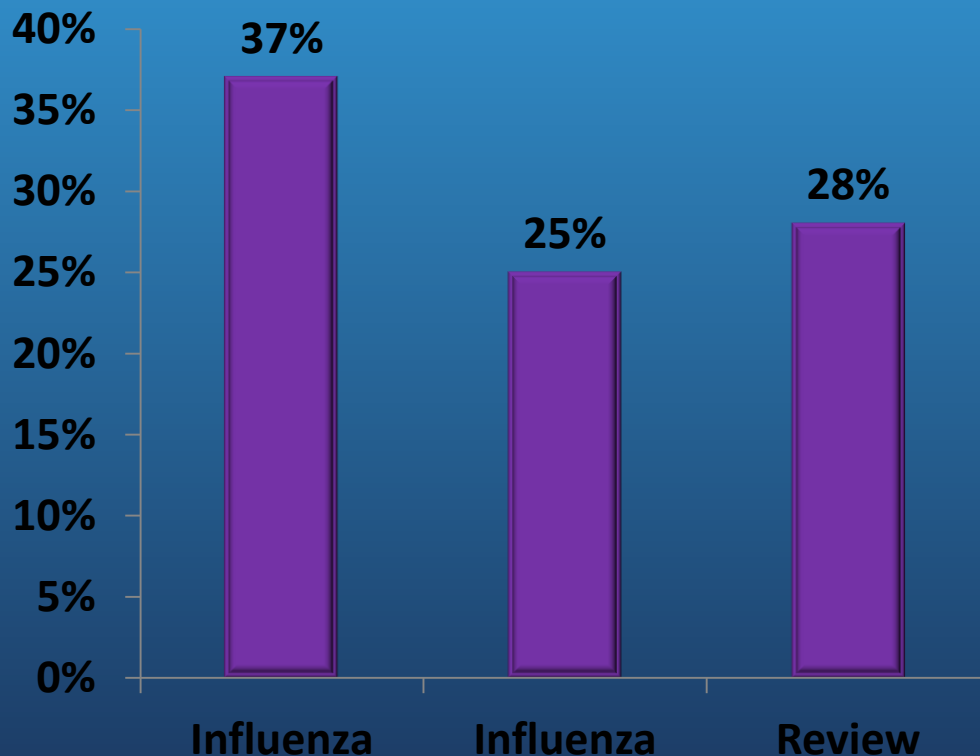
- **Recommend vaccination**
 - “Your doctor wants you to have the flu vaccine - may I give it to you?”
 - “Your doctor strongly recommends flu vaccines. May I give it to you?”
- **Screen for contraindications and precautions**
- **Provide appropriate vaccine information Statement**
- **Administer vaccine**
- **Document vaccine administration**

SOPs Are a Solution to Missed Opportunities

- SOPs empower non-physician medical personnel to assess each patient's immunization status and administer vaccines without direct physician involvement at the time of the interaction
- Not a pre-printed individual patient order but a clinician-approved protocol that applies to all eligible patients

Impact of Standing Orders Programs (SOPs)

Percentage increases in vaccination rates due to SOPs from the scientific literature



References in order:

- *Pharmacotherapy* 2007;27:729-733
- *Journal of American Geriatric Society* 2005;53:1008-1010
- *American Journal of Preventive Medicine* 2000;18(1S):92-6

Pillar 4: Motivation: Office's Immunization Champion Charts Progress Towards a Set Goal

- Tracking weekly progress toward a set immunization goal
- Immunization Champion is needed to foster and track motivation
- Monitoring progress towards goals is key
 - Share progress with team
 - Monitoring provides satisfaction if achievement good and motivation to change is lacking
 - Consider rewards for competition

Methods - Implementation of 4 Pillars Toolkit

- Stratified, randomized cluster trial in diverse pediatric and family medicine practices
- Cross-over design
 - 10 Intervention Year 1 sites
 - 10 Intervention Year 2 sites
- Goal of 25% increase in vaccination rates set for each site

Methods - Obtaining vaccination rates

- Data collection:
 - Weekly e-record reports (August - December 2011) included:
 - # of children (6 months - 18 years) seen
 - # of children vaccinated
 - # of children not vaccinated
 - # of children not due for vaccination
- Calculations:
 - Weekly % vaccinated
 - Weekly % missed opportunities
 - Cumulative totals
 - Comparative site standing

Methods -Views on 4 Pillars Toolkit

- Conducted a mid-season refresher (December 2011) with Intervention Year 1 sites
 - Online video reviewing Toolkit (12 minutes)
 - Online survey asking site staff to assess toolkit (ease, use, concerns, usefulness)

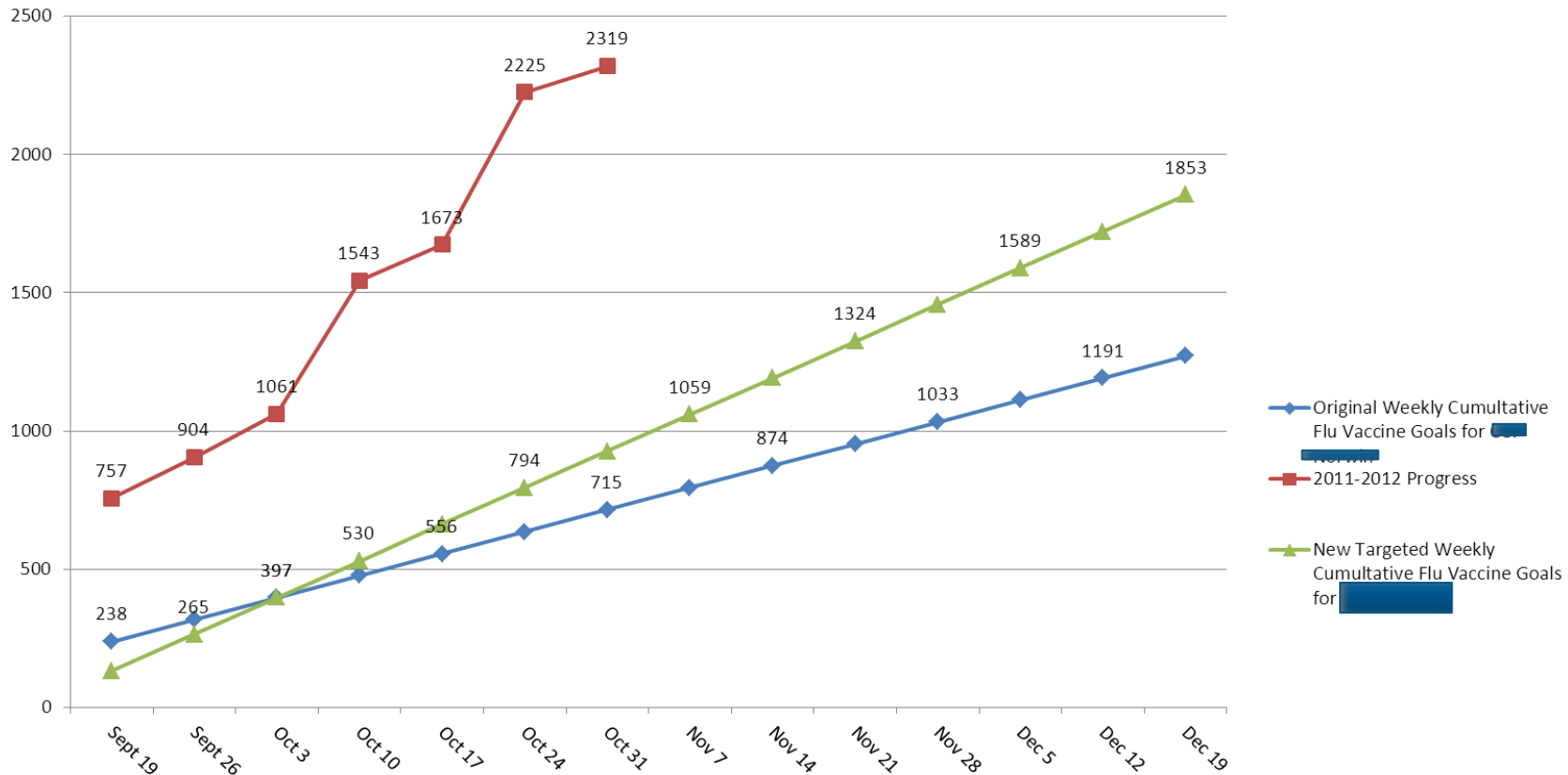
Results - Vaccination rates

Interim data presented on Intervention Year 1 sites only

- Eight of ten practices reached more than 100% increase in influenza vaccination rates (range: 106-449%)
- Qualitative feedback on comparative site standing and cumulative total graphs from office immunization champions highlighted these weekly graphs as a key factor for sites increasing rates

Success in Pittsburgh

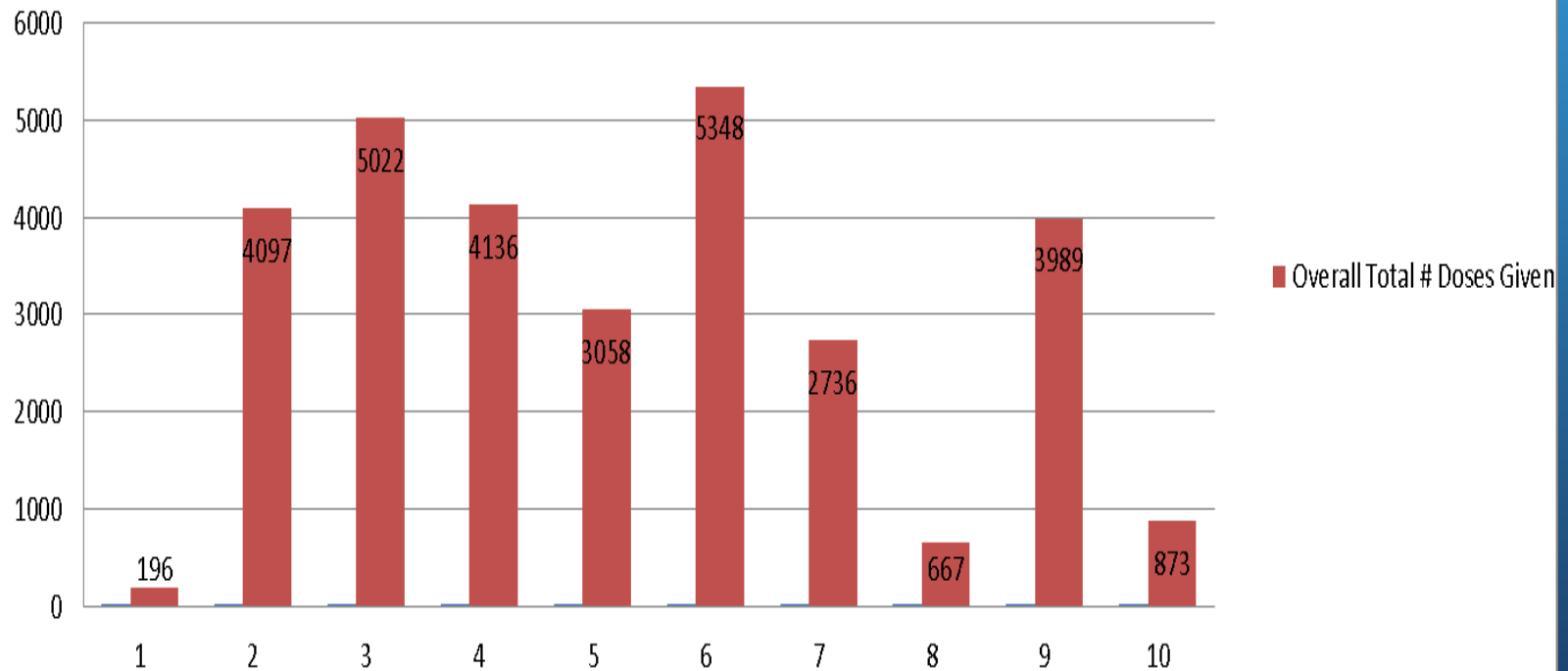
How well are we vaccinating children against influenza?



Plot your total vaccines given and compare your progress with the target

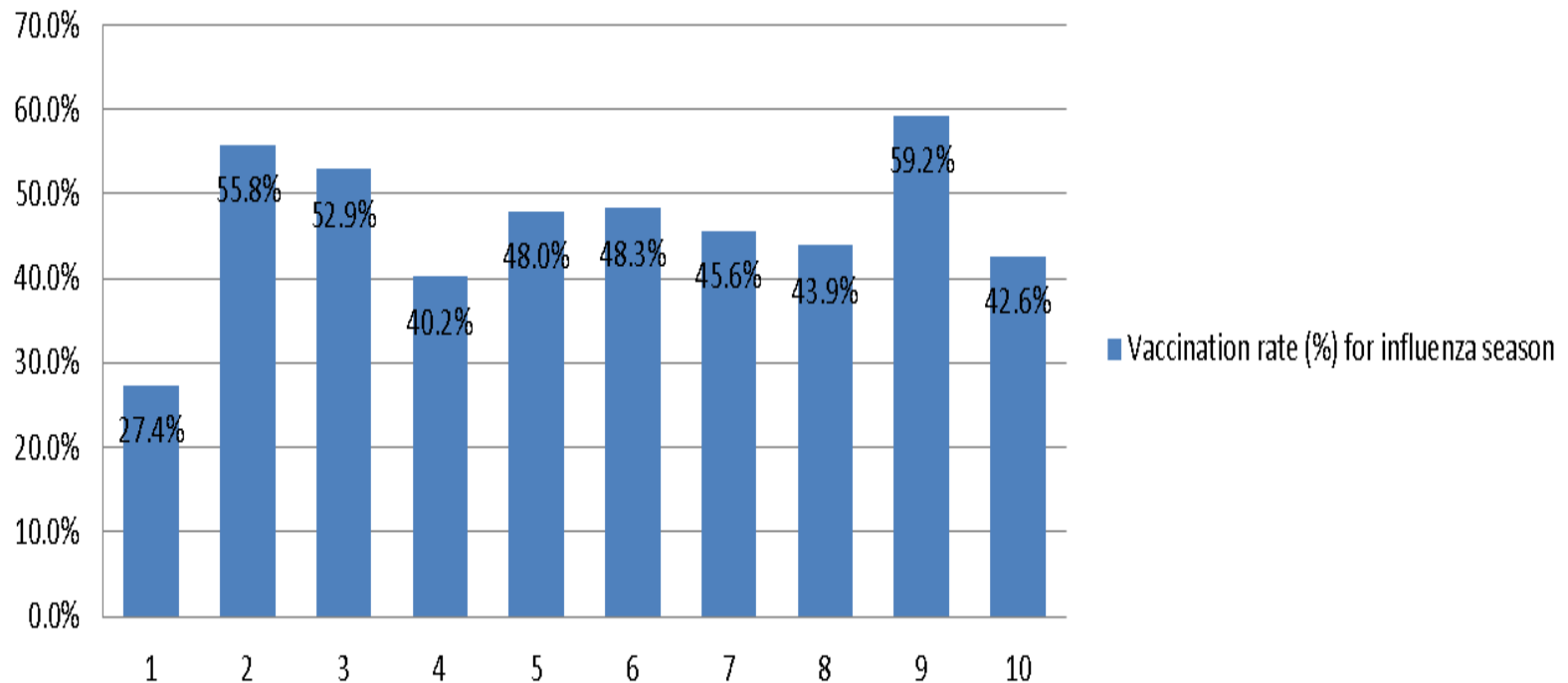
Success in Pittsburgh

Total # of Childhood Influenza Vaccination Doses Given by Intervention Year 1 sites (August - December 2011)



Success in Pittsburgh

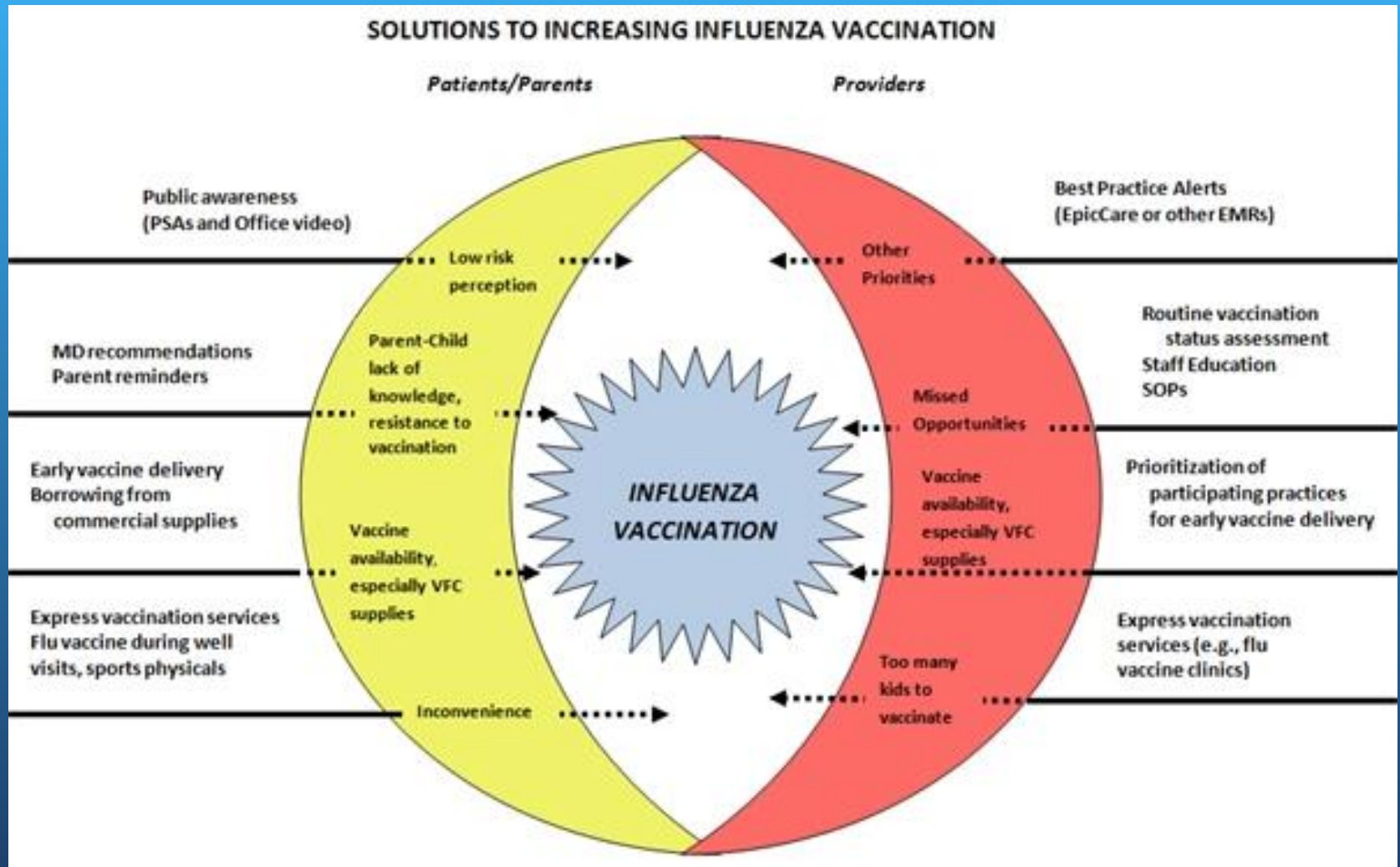
Overall Childhood Influenza Vaccination rate (%) for Intervention Year 1 Sites (August-December 2011)



Results - Clinical staff views on 4 Pillars Toolkit

- Enthusiasm for the intervention project was high
 - 93% believed that practice improvement in delivering childhood influenza vaccination was due to implementing toolkit recommendations
 - 98% recommended that they continue to use the toolkit at their practice
- 88% supported using convenient express vaccination services
- 91% agreed that patient education and notification of clinic immunization scheduling helped patient awareness
- 81% believed an on-site immunization champion to track rates and provide motivation helped to increase rates

Conclusion - Overcoming Barriers



Conclusion - 4 Pillars Toolkit Intervention based upon TFCPS recommendations

- The 4 Pillars Toolkit recommendations are designed to work within standard medical practice and the unique culture of each site it is implemented in, in improving care
- Use of the 4 Pillar Toolkit and expanded vaccination season resulted in substantially increased childhood influenza vaccination rates in our 10 Intervention Year 1 sites based on preliminary results