Impact of a Clinical Interventions Bundle on Uptake of HPV Vaccine at an Urban, Hospital-based OB/GYN Clinic

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Disclosures

- No financial relationships or conflict of interest to disclose.

Background

- HPV vaccination rates remain low in the United States.

- Estimated vaccine coverage for American girls 13-17 yo (CDC, 2015):
  - 62.8% ≥ 1 dose
  - 41.9% ≥ 3 doses

Estimated vaccination coverage with selected vaccines and doses* among adolescents aged 13–17 years, by survey year — National Immunization Survey-Teen, United States, 2006–2015† (CDC, 2015)
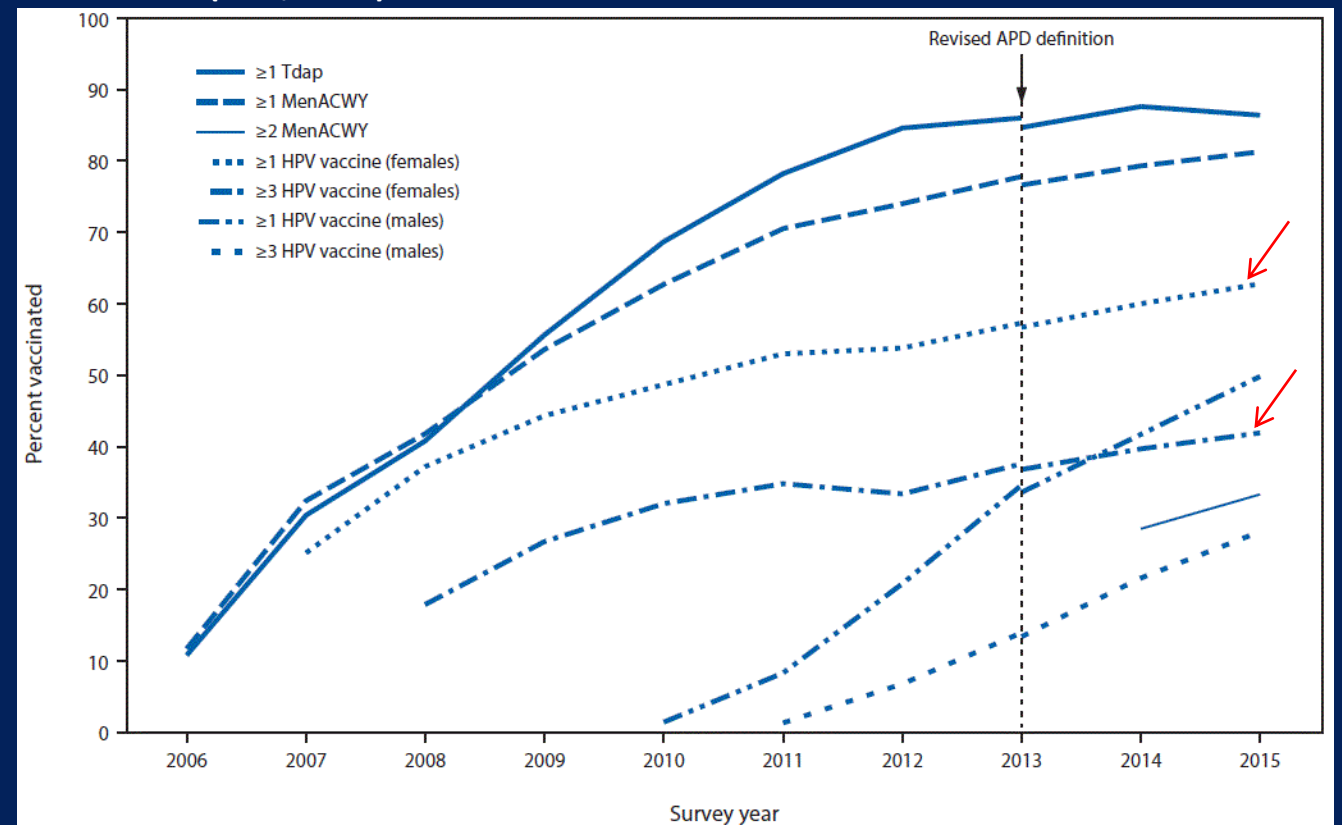
Barriers to Vaccination

- Several barriers to vaccination exist, including:

  - Lack of knowledge/awareness by patients/providers

  - Failure of providers to identify eligible patients and recommend the vaccine

  - Tendency by providers to minimize its importance

  - Lack of systems support

Evidence-Based Intervention Strategies

- Team-based approach and staff engagement
- Chart reviews and reminders for providers in patient charts
- Reminders and prompts in the EMR
- Elimination of unnecessary pre-vaccination requirements
- Removal of cost barriers for uninsured patients

Quality Improvement Initiative for HPV Immunization

- Single-site hospital-based ob/gyn clinic within a primary care center in an urban setting

- Serving a diverse, low-income patient population:
    - 37% black, 13% white, 1% Asian; 45% Hispanic
    - 73% Medicaid (2015), 13% uninsured

- Interdisciplinary provider team:
    - Patient-care associates (PCAs)
    - RNs
    - Nurse-midwives, APRNs, PAs, Attending & resident MDs

Clinic-Based Intervention Bundle
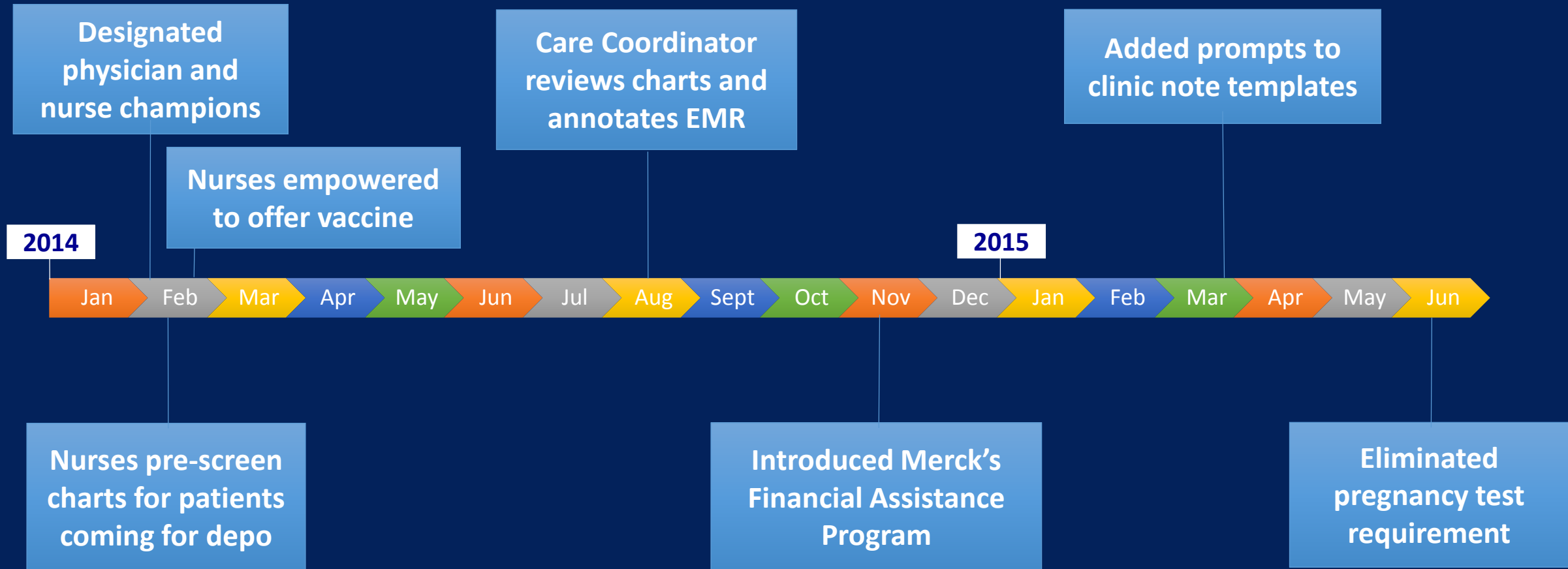
Objective and Hypothesis

- The aim of our study is to evaluate the impact of a clinical intervention bundle on uptake of HPV vaccine.

- Hypothesis:
    - The intervention bundle will be associated with a **decrease in missed opportunities** to administer the HPV vaccine, and an **increase in vaccine initiation and series completion rates** among eligible clinic patients.

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Study Design

- Chart review of patients seen from Feb 1, 2013 through Sept 30, 2016:

STUDY PERIOD	DATES	DESCRIPTION
Pre-implementation	Feb 1, 2013 – Jan 31, 2014	12-month period prior to interventions
During implementation	Feb 1, 2014 – June 30, 2015	17-month period during implementation of interventions
Post-implementation	July 1, 2015 – Sept 30, 2016	15-month period after implementation of last intervention

Inclusion/Exclusion Criteria

- Inclusion Criteria:
  - Patients eligible to receive the HPV vaccine (have had fewer than 3 doses)
  - Patients 18-26-years-old at the time of their clinic visit.

- Exclusion Criteria:
  - Pregnancy (including any patient with ongoing management of abnormal pregnancies such as ectopic or spontaneous abortions)
  - Documented completion of 3-dose vaccine series

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Data Analysis

- Descriptive analysis and comparison of the pre- and post-implementation patient populations using Chi-square and Mann-Whitney U tests.

- Interrupted time series models to analyze trends in missed opportunities, as well as initiation and series completion rates.

- Counterfactual predictions to assess the trends that would have been expected had the bundled interventions not been introduced.

Definitions

Missed Opportunity: A vaccine-eligible encounter when a patient was due for an HPV vaccine dose but none was administered.

Vaccine-Eligible Encounter: An encounter where the patient was between 18-26 years of age, not pregnant, was under-immunized (had previously received < 3 doses of the HPV vaccine), and was due for the vaccine.
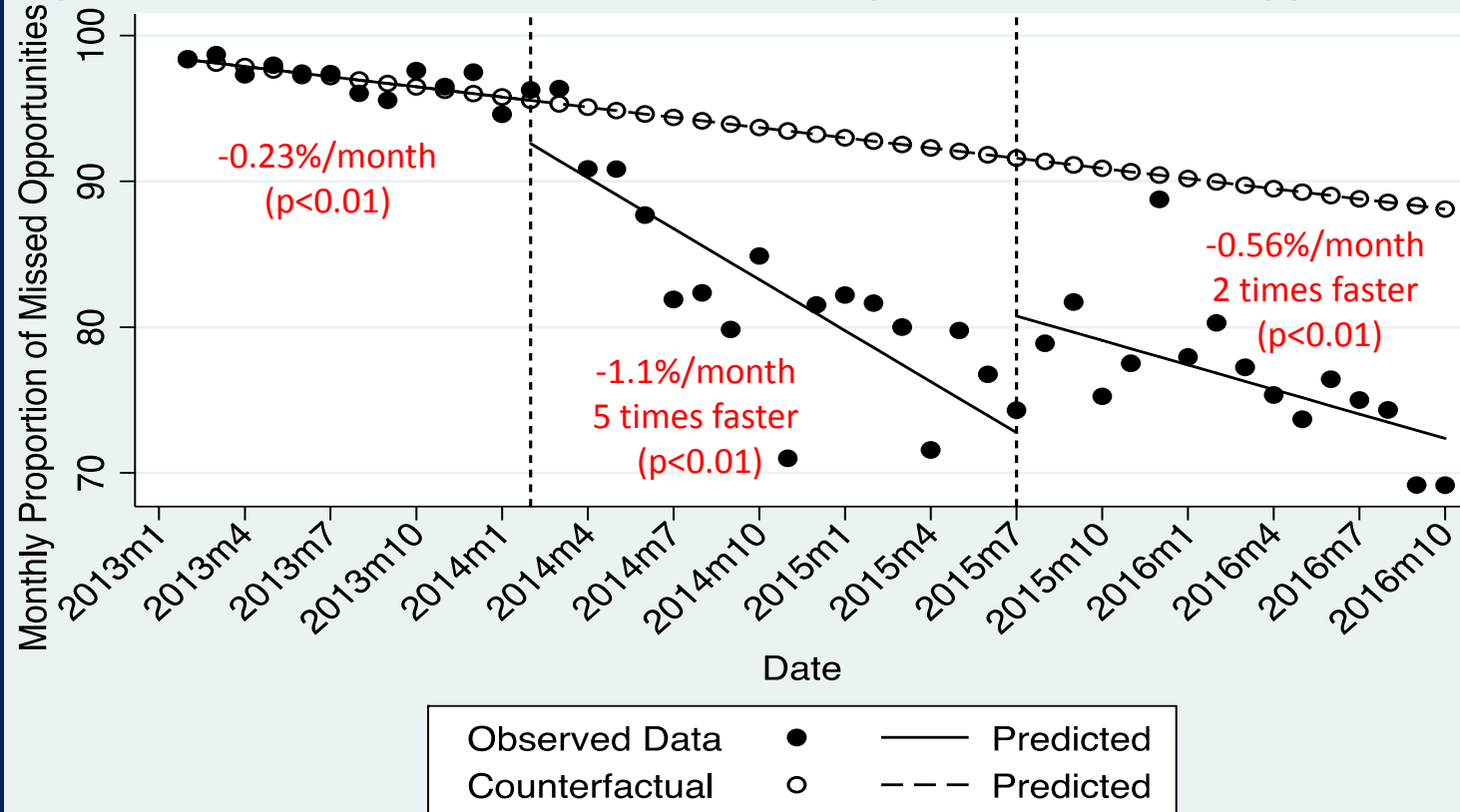
Results

- Total 4,035 women with 6,451 vaccine-eligible encounters

- Demographics:
  - Median age 23 yo
  - 47% Black, 40% Hispanic
  - 14% Spanish-speaking
  - 84% Unmarried
  - 80% Public Insurance

- Significantly more women were white (15% vs 10%) and had public insurance (85% vs 75%) in the post- compared with pre-implementation group

Results

Impact of Bundled Interventions on the Proportion of Missed Opportunities

-0.23%/month (p<0.01)

-1.1%/month 5 times faster (p<0.01)

-0.56%/month 2 times faster (p<0.01)

Monthly Proportion of Missed Opportunities

Date

| Observed Data | ● | —— | Predicted |
| Counterfactual | ○ | – – – | Predicted |

Regression with Newey-West standard errors - lag(1)

98.5% → 88.1% → 69.2%

Results

Impact of Bundled Interventions on Initiation Rate

0.02%/month
(p=0.74)

0.9%/month
(p<0.01)

0.21%/month
8 times faster
(p<0.01)

18.4%

1.9%

Monthly Initiation Rate per 100 Women

Date

Observed Data ● —— Predicted
Counterfactual ○ – – – Predicted

Results

Impact of Bundled Interventions on Completion Rate

0.68%/month (p=0.05)

2.4%/month (p<0.01)

-0.11%/month (p<0.01)

41.6%

1.5%

Monthly Completion Rate Per 100 Women
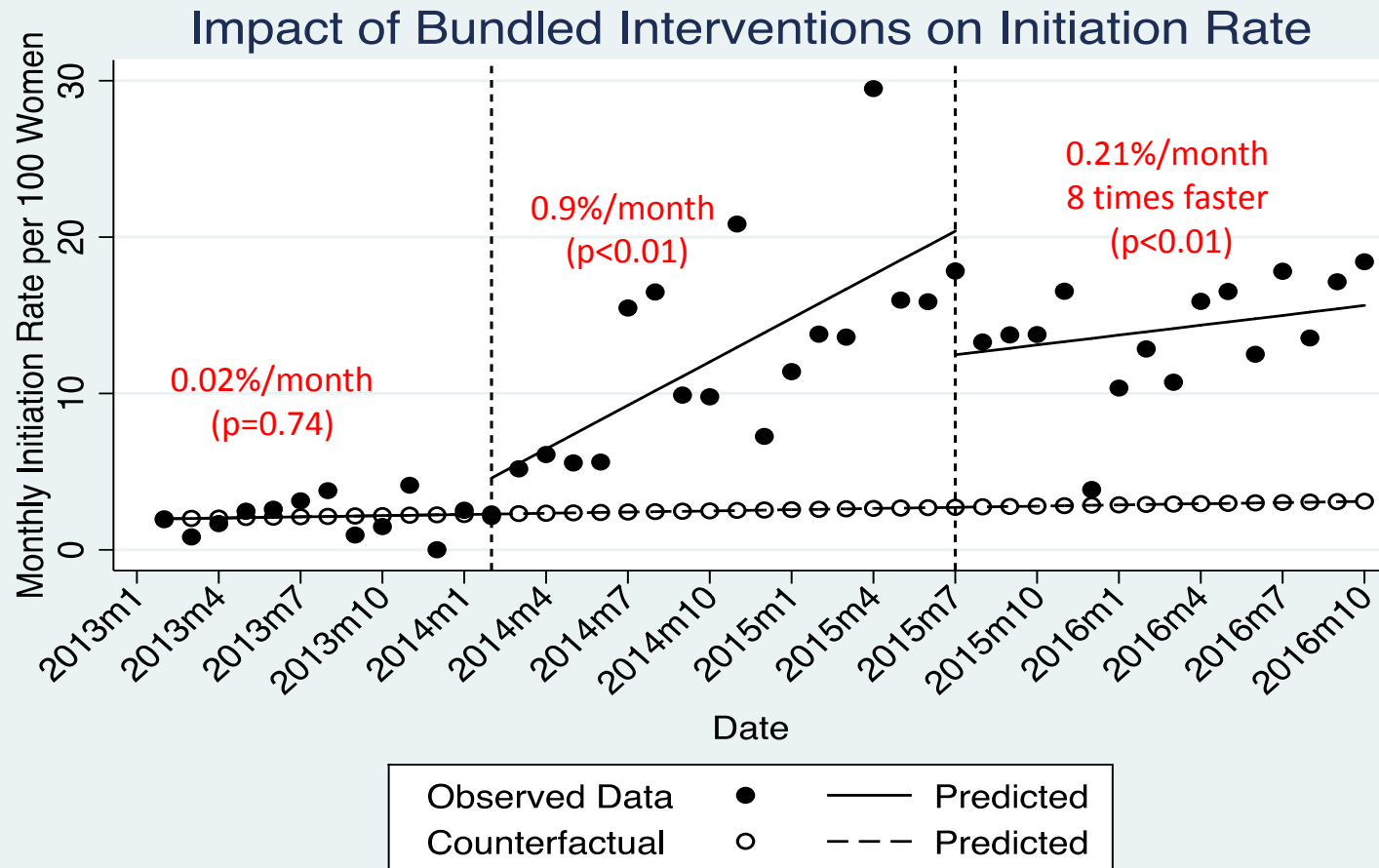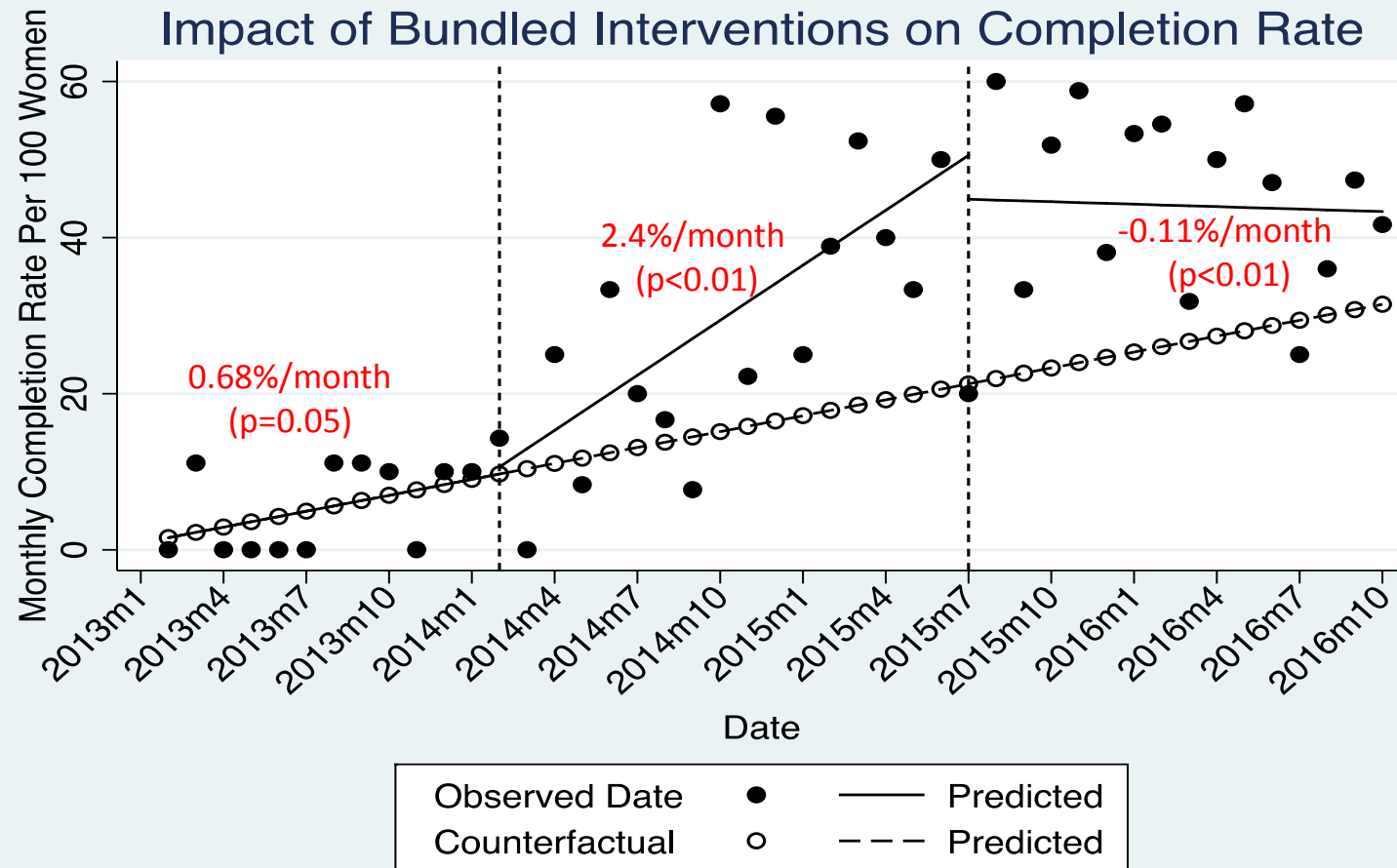
Date

Observed Date ● ——— Predicted
Counterfactual ○ – – – Predicted

Study Limitations

- Lack of control group and use of a pre- and post-design
- Retrospective study with possibly incomplete immunization records
- Dynamic nature of data inputs in EMR

Summary

- Implementation of our intervention bundle was feasible and was associated with
  - a reduction in missed opportunities to administer the HPV vaccine.
  - improvement in vaccine series initiation and completion.

- While the proportion of women who completed the series was higher at the end of the study period, the rate of series completion slowed.

- Despite improvements, the overall proportion of under-vaccinated patients in our clinic remains high.

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Future Directions

- Compare our vaccination rates during the study period with those seen in similar OB/GYN clinics in our region.

- Evaluate impact of individual bundle elements.

- Develop/improve specific, targeted interventions that were most effective or have potential to have largest impact.

- Introduce new interventions (standing orders, provider audit/feedback).

- Consider adaptation of these interventions for application in other similar urban, hospital-based clinics.

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Clinic patients and providers

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Thank you!

Questions?

Extra Slides

Definitions

Proportion of Missed Opportunities:

Missed opportunities/Total # of vaccine-eligible encounters per month.

Initiation Rate:

Women who received 1st dose/ Total # of women who never received a dose per 100 women per month.

Completion Rate:

Women who received 3rd dose/Total # women who had previously received 2 doses per 100 women per month.

Merck Financial Assistance Program

Complete online form:

-No additional documentation needed;

-Must provide annual household income;

Form is faxed:

-Response in 15-30 min

-Vaccine order placed in EMR

-Vaccine is administered.

Repeat process for each dose.

Table 1. Characteristics of Patients at least 1 Vaccine-Eligible Encounter Pre and Post-Intervention N=2,202

	Pre-Intervention	Post-Intervention
Total, No. (%)	928 (42.1)	1,274 (57.9)
Age, median (IQR), y	23 (21-25)	23 (21-25)
Race,* No. (%)	874 (94.2)	1191 (93.5)
Hispanic	354 (40.5)	449 (37.7)
White	89 (10.2)	179 (15.0)
Black	418 (47.8)	543 (45.6)
Other	14 (1.6)	20 (1.7)
Religion, No. (%)	894 (96.3)	1173 (92.1)
Protestant	365 (40.8)	441 (37.6)
Catholic	194 (21.7)	229 (19.5)
Muslim	22 (2.5)	39 (3.3)
Other	15 (1.7)	24 (2.1)
No Religion	298 (33.3)	440 (38.0)
Language, No. (%)	927 (99.8)	1272 (99.8)
English	755 (81.5)	1045 (82.1)
Spanish	140 (15.1)	161 (12.6)
Arabic	8 (0.9)	13 (4.2)
Marital Status, No. (%)	928 (100)	1269 (99.6)
Married	144 (15.5)	163 (12.8)
Single	765 (82.4)	1078 (85.0)
Other	19 (2.0)	28 (2.2)
Insurance,* No. (%)	928 (100)	1274 (100)
Private	75 (8.1)	75 (5.9)
Public	691 (74.5)	1086 (85.2)
Uninsured	162 (17.5)	113 (8.9)
Smoking status	898 (96.7)	1243 (97.6)
Previous or Current smoker	390 (43.4)	467 (37.6)

* $p < 0.05$