Case Study of the ECC Initiative:

General Data Mart Workload Analysis for Site A and Site B Service Units

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Study Design

Primary Purpose

Inform decision making aimed at improvement of oral public health initiatives, while contributing to broader evidence base on successes/best practices for program implementation.

Program: IHS Early Childhood Caries Collaborative is a multi-faceted program designed to enhance knowledge about early childhood caries prevention and early intervention for all healthcare providers and the community.

Type of Evaluation: Program Effects Case Study

- A comparative study of the implementation of the ECC Initiative at two Indian Health Service (IHS) facilities' to assess impacts of 'best practices' in implementation, context and other factors on program outcomes.

Objectives:

- Examine the causal links between the program and observed effects/outcomes by review of two sites
- Identify implementation best practices which can be leveraged in future ECC initiatives
- Generate hypotheses for later studies

Evaluation Questions:

- What aspects of identified best practices of increased access, sealants and fluoride applications contributed to achieving goals in decreased decay prevalence?

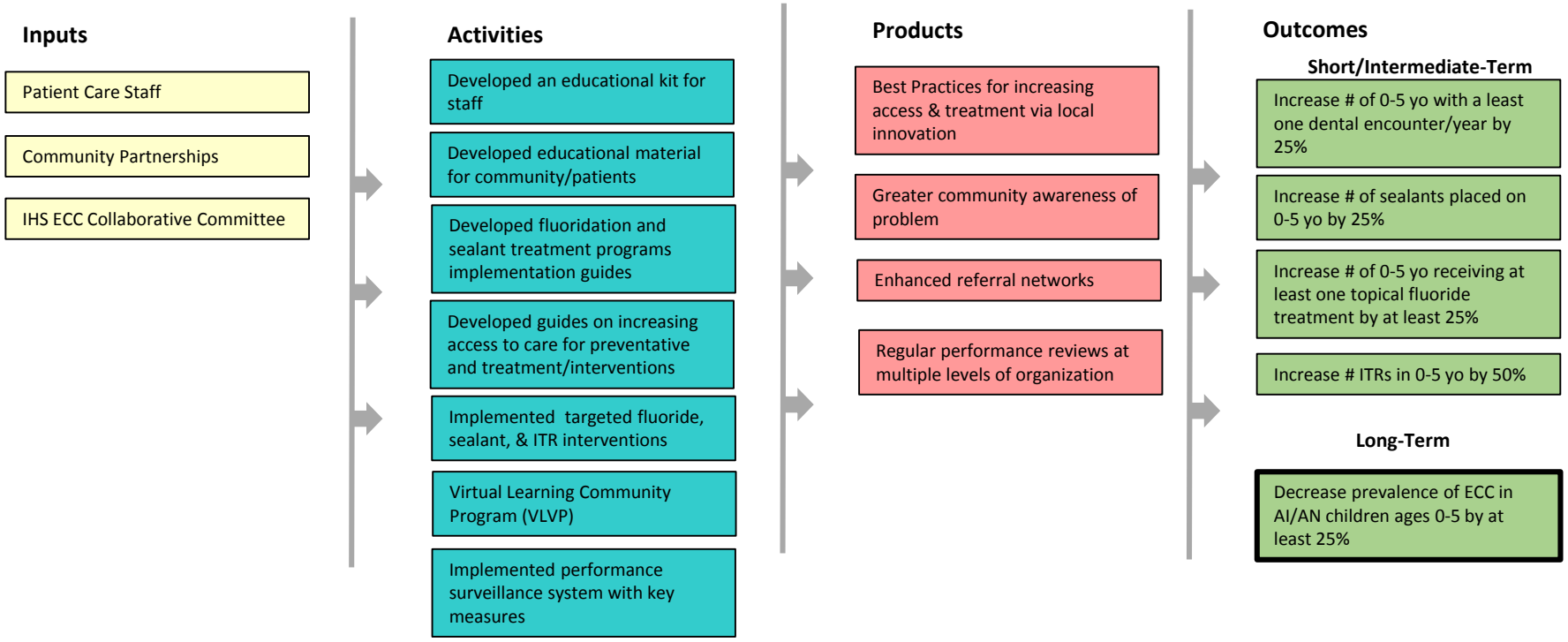
ECC Logic Model

Problem Statement

Despite oral public health efforts starting in the 1980's, high prevalence of dental decay in young AI/AN children persisted in 2009/2010

Goal

Implement an oral public health initiative which addresses the multifactorial nature of rampant decay to decrease the prevalence[1]



Site Selection

		IHS Dental Directory			Preschool Survey Data (Service Unit)			Oral Health Data Mart (Facility)				
Facility	IHS Area	Number of dental operatories	Total Dental Clinic Staffing	Hygeniest & Dental Assistant Per Dentist	% with Decay Experience FY10 to FY14 Delta	% with Untreated Decay FY10 to FY14 Delta	% with Sealants FY14	Prevalance Rate FY10 to FY15 Delta	FY14 Visits	Sealents Per Patient FY14 (Ages 0-5)	ECC Access (Ages 0-5) FY14	ECC Access FY10 to FY15
Site C	Area M	6	17	2.5	-1.2	-9.6	2	0.00%	4,013	4.3	88	
Site A ★	Area N	14	31	1.7	6.9	-17.8	9	-0.12%	9,882	3.2	1,105	
Site D	Area N	14	20	3.25			5.3	0.09%	5,658	3.3	182	
Site E	Area N	26	37	4.8				0.24%	16,074	4.9	539	
Site B ★	Area O	14	21	3.25	-16.8	-26.8	16.6	0.00%	6,373	5.5	440	
Site F	Area N	24	48	6.4	-4.5	6.1	0	-2.52%	10,921	3.7	383	
Site G	Area O	10	16	4.5	0	0	5.9	0.14%	4,843	4.6	308	
Site H	Area P	17	13	4.5				-6.96%	7,898	5.3	412	
Site I	Area P	15	22	4	0.1	-16	2	-0.16%	6,767	6.1	227	
Site J	Area P	16	14	4.5	-4.8	8.8	21.8	0.00%	6,242	5.5	296	
Site K	Area R	6	12	2			13.2	0.00%	5,865	3.3	373	

The case study examined best practices in implementation. To assist in identifying sites with strong implementation, measures such as Access for 0-5 years olds were weighed heavily. Site A and Site B Service Units were selected.

Oral Health Survey of AI/AN Preschool Children

Site A

	2010	2011	2012	2013	2014	Progress 2010 - 2014		
Total Surveyed	93				179			
% with Decay Experience	83.90%				67.10%	↓	-17%	
% with Untreated Decay	74.20%				47.40%	↓	-27%	
% with Sealants	-				9%			

Site B

	2010	2011	2012	2013	2014	Progress 2010 - 2014		
Total Surveyed	181				108			
% with Decay Experience	79.50%				79.60%	–	0%	
% with Untreated Decay	60.90%				44.90%	↓	-16%	
% with Sealants	-				17%			

The Oral Health Survey (OHS) of American Indian/Alaska Native Preschool Children is a report of the nationwide Basic Screening Survey of AI/AN children 0-5 year-old . This survey assessed caries prevalence and untreated decay rates in this age group.

- The IHS ECC set a long-term goal to reduce prevalence by 25%
  - Of the sites selected, Site A was the only one to see improvements in prevalence
- For Site A, the OHS showed a 17% improvement in decay experience for children ages 0-5 between 2010 to 2014. Over this time, Site A had a 27% improvement in untreated decay for children ages 0-5
- For Site B, the OHS showed no progress on reducing decay experience between 2010 - 2014. Over this time, Site B had a 16% improvement in untreated decay.

Question for Analysis: How do trends in workload data for short-term outcomes explain improvements in prevalence and untreated decay?

Data Source: GDM March 11, 2016

Access

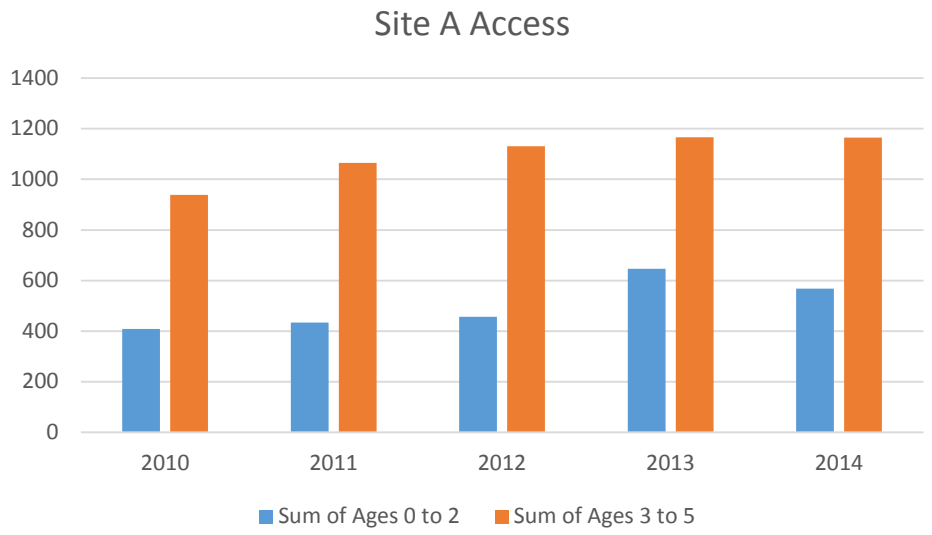
Measure Description

- ECC Access data from the IHS Oral Health Data Mart monitors dental encounters with ADA Codes for First Visit of the Fiscal Year By Patient (0000) and Screening of Patient (0190)
- Data from the GDM includes all ECC Access codes and Assessment of Patient (0191)
- Both aim to measure number of children ages 0-5 seen by an IHS dentist

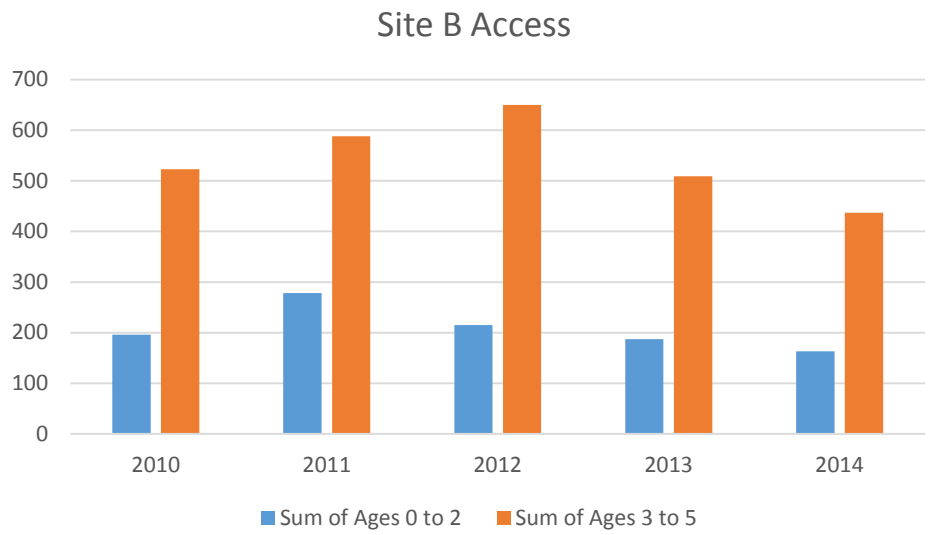
Observations

- Site A increased the number of children ages 0-5 seen from 2010-2015 by 29%. Meeting ECC's target of 25%
- Site A's increased access was the greatest for ages 0-2
- The cause of the Site B decreased access is unknown at this time

Site A



Site B



Data source: GDM March 11, 2016

Sealants

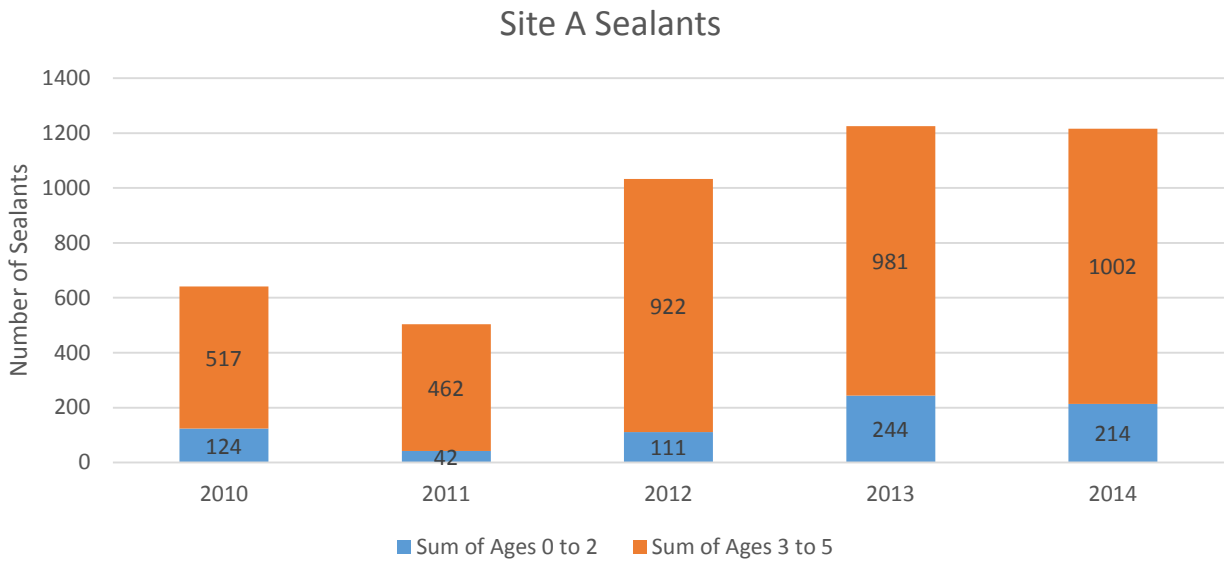
Measure Description

- Sealants are part of the ECC's caries stabilization strategy. The IHS Oral Health Data Mart tracks ADA Codes 1351 to identify sealant patients.
- ECC Set a goal to increase the number of sealant recipients by 25%

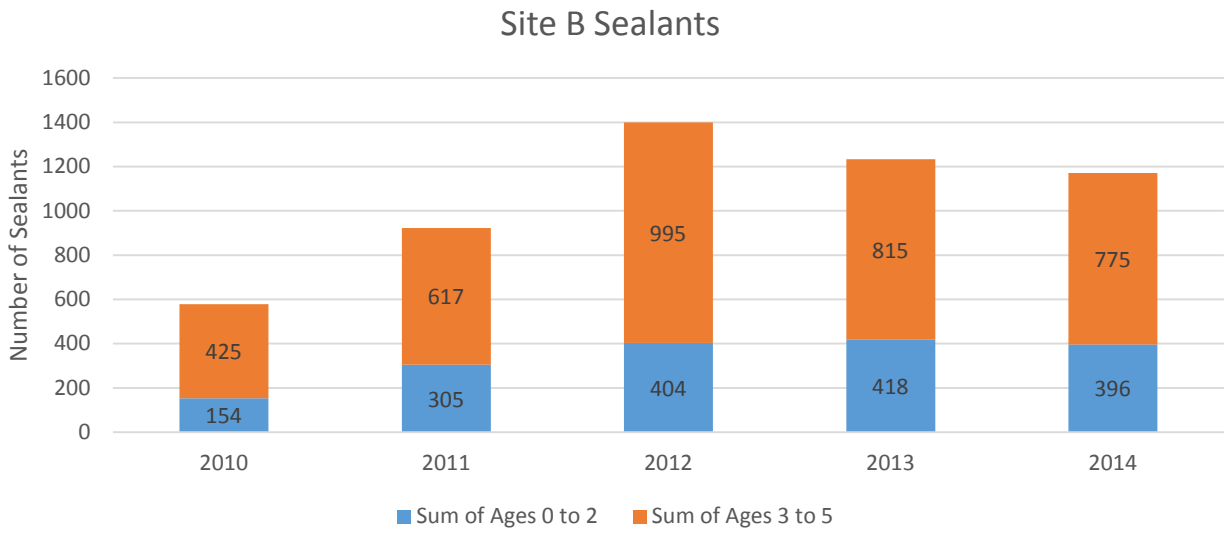
Observations

- Both sites exceeded the ECC goal of increasing number of sealants by 25%
- Site A increased the number of sealants on children ages 0-5 by 90% from 2010-2014
- Site B increased the number of sealant on children ages 0-5 by 102% from 2010-2014

Site A



Site B



Data source: GDM March 11, 2016

Fluoride

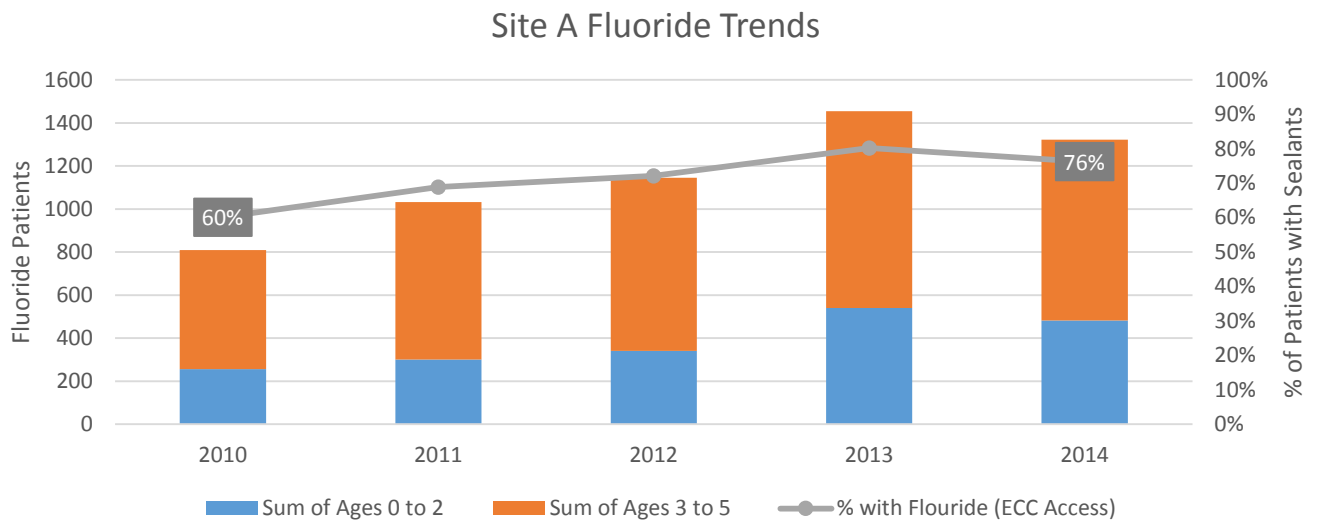
Measure Description

- The ECC Initiative leveraged findings from research that prove the application of fluoride varnish to be an effective method of reducing early childhood caries. ECC set a goal to increased number of fluoride recipients by 25%
- The IHS Oral Health Data Mart tracks ADA Code 1203, 1206 or ICD9 Code V07.31 for fluoride varnish application
- Both aim to measure number of children ages 0-5 receiving a fluoride application

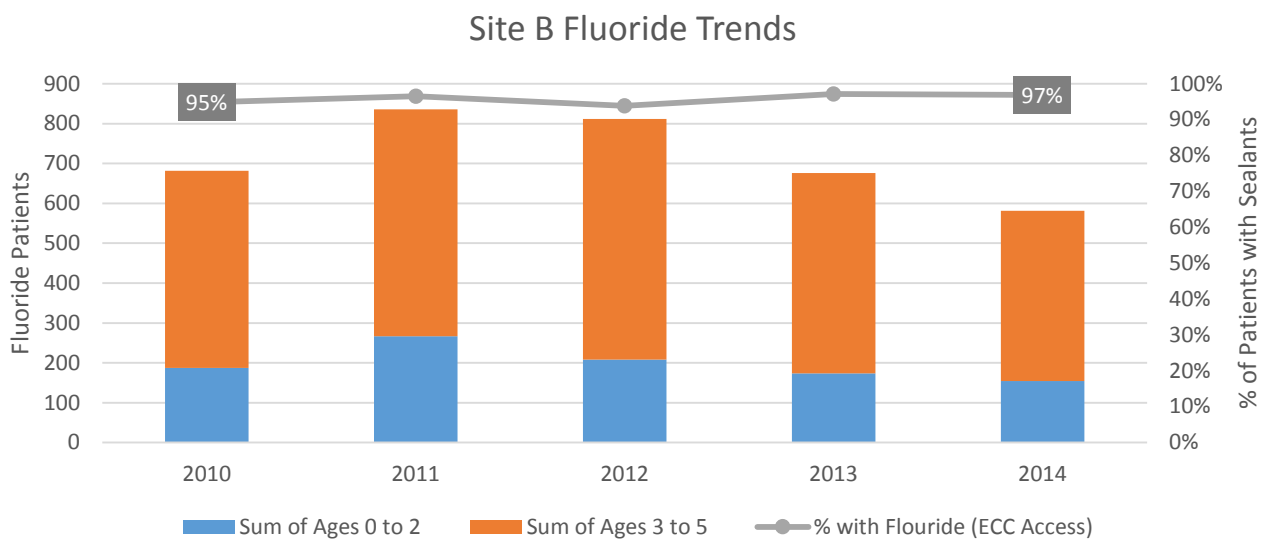
Observations

- Site A increased the number of children ages 0-5 receiving fluoride application from 2010-2015 by 88%, exceeding the ECC goal
- Site A's increased fluoride was the greatest for ages 0-2
- Site A averaged 1.4 fluoride applications per patient. And 72% of children seen received fluoride
- The cause of the Site B decreased fluoride patients may be due to decreased access.
- Site B averaged 3.3 fluoride applications per patient. And 96% of children seen received fluoride.

Site A



Site B



Data source: GDM March 11, 2016

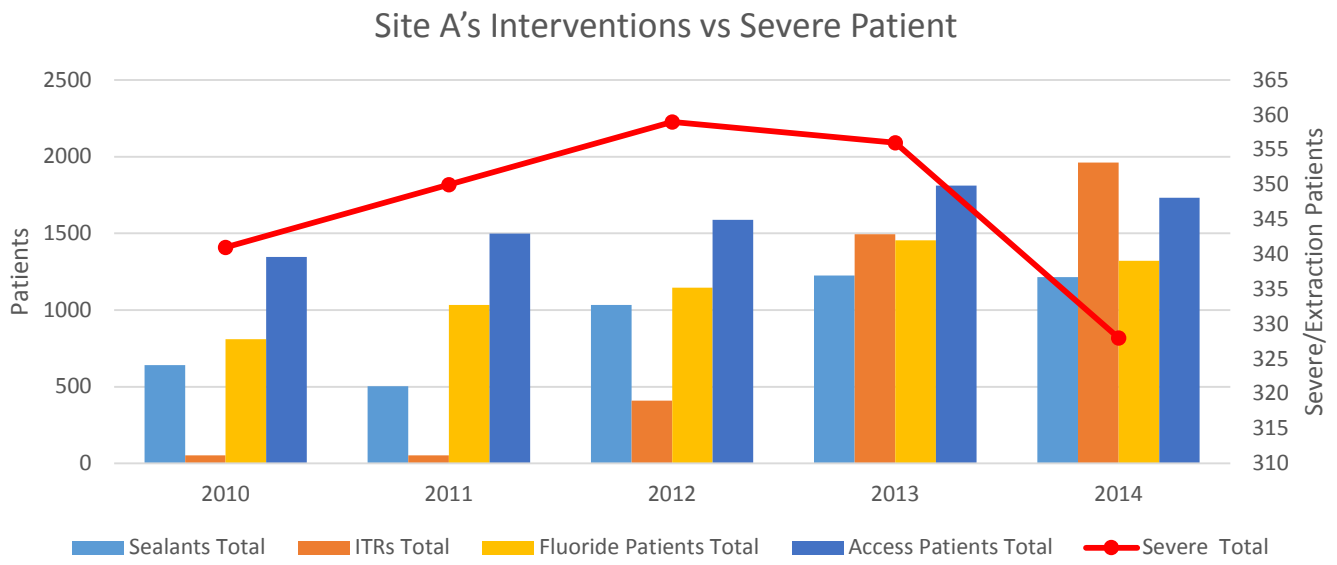
Site A: ECC Outcomes Analysis

Measure Description

- Correlation measures linear association between two variables on a scale of -1 to 1
- Positive correlation means that high values of x are associated with high values of y. Negative correlation means that high values with x are associated with low values of y
- The analysis summarized trends in ECC activities and Severe Patients (ADA Codes 7111 and 7140 Extraction) from 2010-2014
- The desired outcome is a negative correlation between the interventions and severe patients

Observations

- From 2010 to 2014, Site A had a 4% reduction in Severe Patients
- Site A's workload data shows a large negative correlation between ITRs and severe patients --- As number of ITRs increased the number of severe patients decreased
- Site A's workload data shows a small negative correlation between number of children with sealants and severe patients --- As the number of children with sealants increased the number of severe patients decreased
- For Site A, Ages 0-2 responded desirably to all interventions. Ages 3-5 had the desired response just for ITR.



Site A Correlation Analysis

	Access Patients Total	Sealants Total	Fluoride Patients Total	ITRs Total
Severe Total	0.05	-0.07	0.09	**-0.41**
Age 0-2	**-0.23**	**-0.56**	**-0.24**	**-0.26**
Age 3-5	0.17	0.29	0.26	-0.07

Data source: GDM March 11, 2016

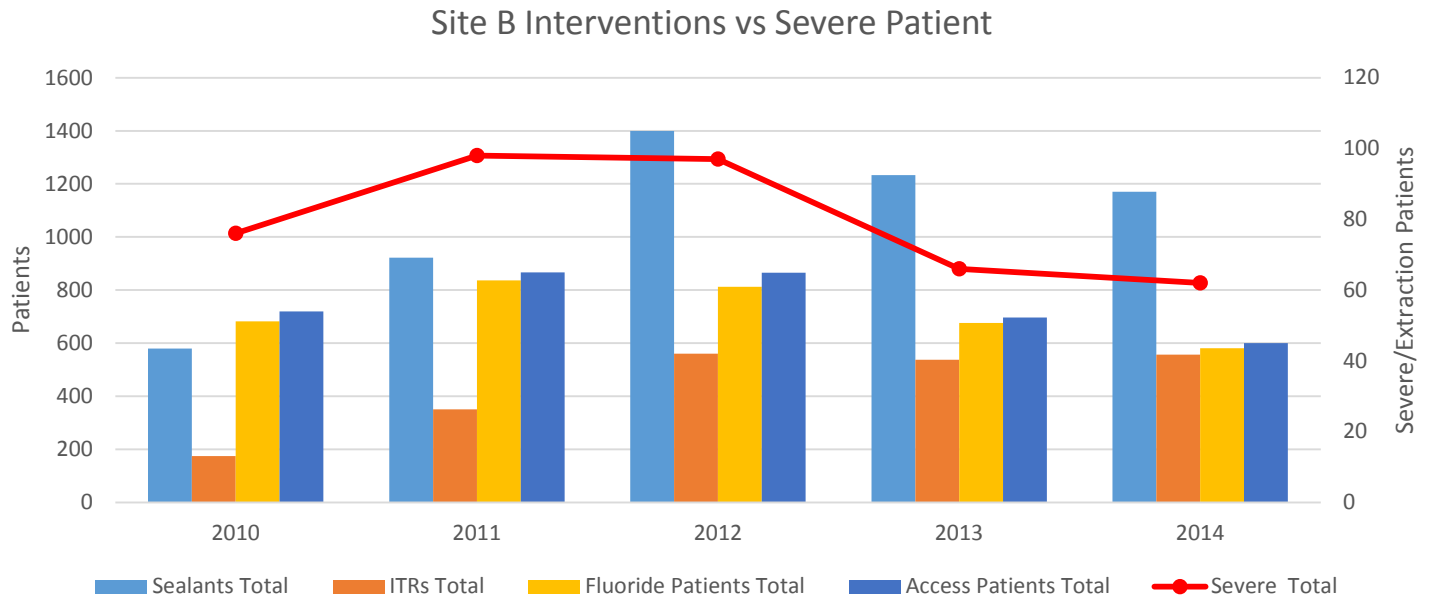
Site B: ECC Outcomes Analysis

Measure Description

- Correlation measures linear association between two variables on a scale of -1 to 1
- Positive correlation means that high values of x are associated with high values of y. Negative correlation means that high values with x are associated with low values of y
- The analysis summarized trends in ECC activities and Severe Patients from 2010-2014
- The desired outcome is a negative correlation between the interventions and severe patients

Observations

- From 2010 to 2014, Site B had a 18% reduction in Severe Patients age 0-5
- Site B workload data shows a small negative correlation between ITRs and severe patients --- As number of ITRs increased the number of severe patients decreased
- For Site B, Ages 0-2 had the greatest desired response to sealants, with a small response to ITRs. Ages 3-5 had the greatest response to ITRs.
- Because Site B experienced a drop in access and fluorides, correlations between severe patients and those interventions are difficult to explain



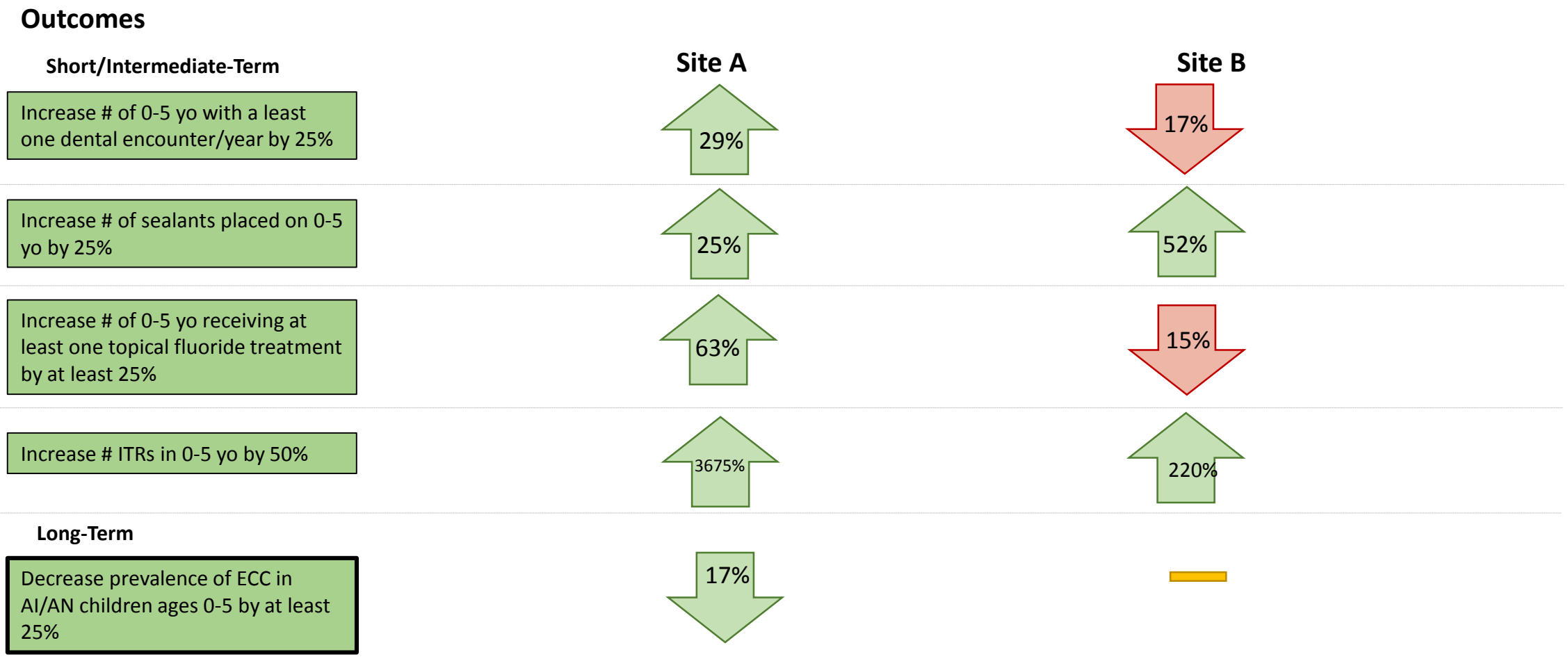
Site B Correlation Analysis

	Access Patients Total	Sealants Total	Fluoride Patients Total	ITRs Total
Severe Total	0.98	0.04	0.97	**-0.17**
Age 0-2	0.82	-0.11	0.85	-0.04
Age 3-5	0.91	0.09	0.91	-0.23

Data source: GDM March 11, 2016

Summary

- Analysis of the GDM workload data for Site A and Site B Service Unit reveal that ITRs had the greatest impact on reducing the number of severe patients ages 0-5



Next Steps

- Closeout ECC Evaluation
  - Provide raw data files and analysis to the program
  - Finalize Findings Brief

- Cohort Study on children born in 2010
  - Have GDM workload for 2010-2015 for all children born during FY 2015
    - 17, 273 unique Registration IDs
    - 72,599 encounters
  - Time to Event Analysis with events as Restoration or Extraction