MICHIGAN WIC PILOT: YEAR 3 RESULTS

A Partnership Activity of the Michigan Women, Infants, and Children (WIC) Program, Altarum, McMillen Health, and Funded by the Delta Dental Foundation and the Michigan Health Endowment Fund

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ALTARUM

SOLUTIONS TO ADVANCE HEALTH

Michigan WIC Pilot Project

From 2016-2018 McMillen Health collaborated with Michigan Women, Infants, and Children (WIC), the Delta Dental Foundation, Michigan Health Endowment Fund, and Altarum to implement a WIC oral health pilot project throughout rural and urban Michigan. WIC clinic staff have received the *Brush* Early Childhood Oral Health Curriculum training and resources to integrate oral health education and dental referrals into the nutrition education provided to mothers with children. Year 3 pilot project results are as follows:

Staff from 29 clinics throughout rural Michigan received *Brush* training.

57.5% of WIC staff had never had training on dental health topics.

(4.6% indicated they had training, but it was not adequate.)

Over 40%

of 1 year olds in the trained WIC clinics had seen a dentist compared to 11% of children in the control group.

24% → 71%

Increase in comfort level with discussing oral health issues.

The 29 pilot clinics included in year 3 of this project had a total of 55,350 WIC visits.

30% of those visits included educational topics for the focus.

Brush visits made up **17%** of the educational visits.

47% of *Brush* visits

resulted in documented dental referrals.

For information on training or resources: info@brushdental.org

WIC Kit

This kit is designed for WIC staff to use while interacting one-on-one with caregivers. Includes resources to help caregivers understand the importance of early childhood oral health.

Each: $210.00

WIC Kit includes:

- Healthy Baby Teeth Flip Chart
- Foam Tooth Model
- Brush Magnetic My Plate Food and Smiles Curriculum Kit
- Digital Access to Parent Handouts
- Pediatric Mouth Model and Oversized Toothbrush
- Three Popular Children's Book Titles:
  - *I Brush! My Teeth by McMillen Health*
  - *Happy Teeth! Board Book by McMillen Health*
  - *Hazel Does Not Like to Brush Her Teeth by McMillen Health*

WIC Oral Health Training

This two-hour training seeks to give WIC staff the resources to discuss the connection between oral health and a healthy pregnancy. Participants will learn about the current state of oral health of young children and how healthy teeth relate to a child's health and nutritional status.

Available live or online!

Travel expenses or online connection fees may apply.

For information on training or resources:
info@brushdental.org

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Acknowledgments

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- Ionia County Health Department: Kelli Steffen
- Central Michigan Health Department: Kelly Conley

Introduction

In 2016, Altarum, Michigan Women, Infants, and Children (WIC), McMillen Health, and the Delta Dental Foundation collaborated to implement a WIC-oral health pilot project in urban Detroit. Staff in five WIC clinics—serving approximately 23,000 children, or 10% of the state's WIC participation—received the Brush Early Childhood Oral Health Curriculum training to integrate oral health education and dental referrals into the nutrition education provided to mothers with young children.

There were four overall goals to this pilot project:

- Empower WIC staff in the pilot clinics with the education and tools to support good oral health among their clients.
- Provide Brush training and resources to increase the comfort level among WIC staff in discussing oral health with their clients.
- Enable WIC staff to provide education and dental referrals to their clients to encourage them to implement these health behaviors with their families.
- Evaluate the success/benefits of the pilot activities to inform potential statewide implementation.

In visits with WIC staff following training, families received oral health education appropriate to their child's age, resources (toothbrush, floss, etc.), as well as a referral to a dentist based on zip code. Through the pilot, the impact of delivering a common message to WIC families about the importance of oral health and early preventive dental visits and integrating these key messages as complementary education within the nutrition education provided to WIC families, was assessed.

The 2016 implementation was an overwhelming success. Staff knowledge of oral health and comfort with discussing oral health issues increased considerably. Specifically, staff knowledge regarding the recommended age for a child's first dental visit increased from 43% to 95% and comfort level with discussing dental issues increased overall, with a large increase among WIC staff who indicated they were very comfortable (from 36% to 86%). Further, staff felt ready to implement what they learned in the training in their clinics. Among participating staff, 65% did not feel any barriers to implementing Brush oral health education resources into their clinic workflow, and 78% shared open-ended questions they would use to incorporate oral health into their interaction with clients.

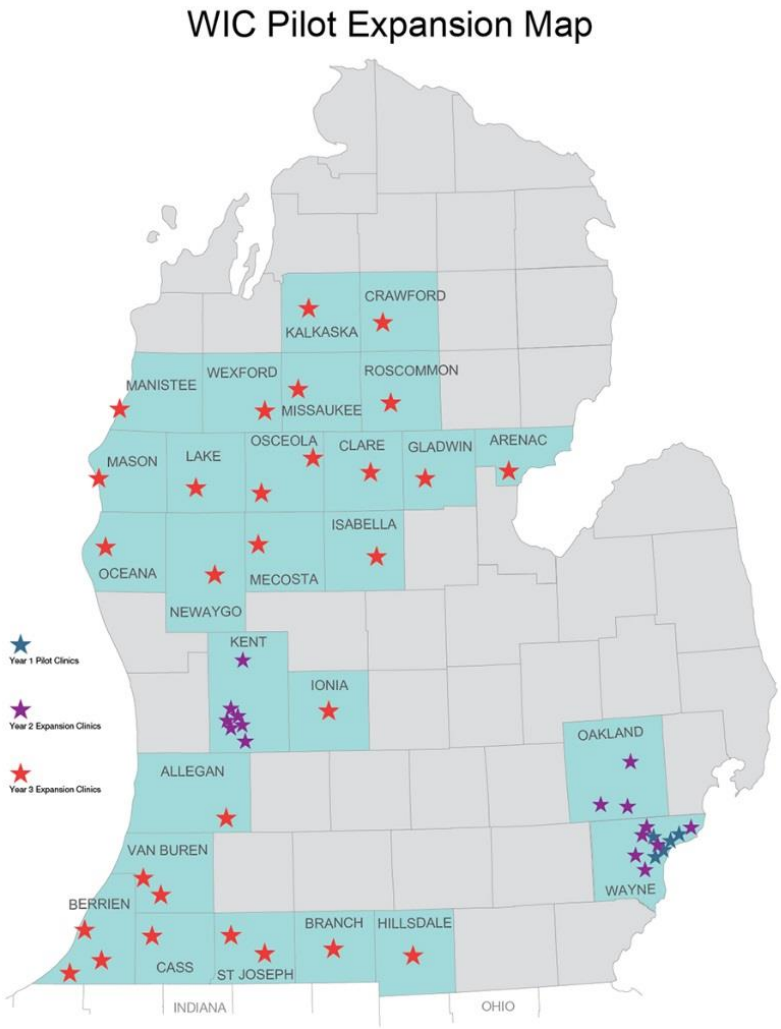
The training positively impacted the number of children seeing a dentist, increasing dental visits by 38% when compared to controls. The increase in dental visit rates was most pronounced for children aged 1 and 2 years, a group that has traditionally been least likely to have dental visits. More than 1,000 children successfully visited a dentist following the referral and most received preventive services. This is particularly important since numerous pediatric and dental organizations stress the importance of having children establish a dental home at an early age to minimize the occurrence of early childhood caries.

As a result of the positive impact seen in 2016, the program was expanded to additional urban clinics for

the 2017 year. Michigan WIC staff from 16 clinics in Detroit, Oakland, Wayne, and Kent counties—serving an additional 46,000 children, or 20% of the state's WIC participation—received the Brush training during March, April, and May of 2017. This second year saw similar success; staff knowledge regarding the recommended age for a child's first dental visit increased from 60% to 99%. Comfort level with discussing dental issues increased overall, with a large increase among staff who indicated they were very comfortable (from 30% to 76%). Additionally, over 3,000 brush visits were recorded by staff across all three counties and 50% of those visits resulted in a dental referral.

Following the success of the first two years, the program was again expanded for a third year. Funded by the Delta Dental Foundation and the Michigan Health Endowment Fund, this third year targeted rural WIC clinics in dental health professional shortage areas. Staff from 29 clinics in 24 counties throughout rural Michigan received training during July and August of 2018.

Below is a map detailing the reach of our pilot activities thus far within the state of Michigan.



The following WIC clinics were trained as part of this rural expansion:

- Intercare: 4 clinics
  - Bangor, Otsego, Dowagiac, Paw Paw
  - Trained August 13th and 14th
- Berrien County Health Department: 3 clinics
  - Benton Harbor, Niles, Three Oaks
  - Trained August 16th
- Branch-Hillsdale-St. Joseph Community Health Agency (BHSJ): 4 clinics
  - Coldwater, Hillsdale, Sturgis, Three Rivers
  - Trained July 24th
- Ionia County Health Department: 1 clinic
  - Ionia
  - Trained December 14th (remote)
- District Health Department 10 (DHD10): 10 clinics
  - Grayling, Kalkaska, Baldwin, Manistee, Ludington, Big Rapids, Lake City, White Cloud, Hart, Cadillac
  - Trained July 13th
- Central Michigan Health Department: 7 clinics
  - Standish, Harrison, Gladwin, Mount Pleasant, Reed City, Mario, Prudenville
  - Trained September 5th

The following is an in-depth analysis of pre-post training surveys, qualitative post-implementation surveys, a focus group, and Medicaid enrollment, claims, and encounter data used to determine the impact of this third year, rural expansion.

Pre-Post Training Survey Results

BACKGROUND

Pre- and post-surveys were delivered to WIC staff before and after receiving the Brush training (see Appendix A). The surveys assessed changes in baseline knowledge and behaviors related to children's oral health among WIC staff. They also gathered WIC staff's feedback on the Brush training and resources provided as a pilot activity funded by the Delta Dental Foundation.

Staff received paper surveys for a pre- and post-training assessment in their training materials packets. In total, 90 staff attended the trainings and completed and returned both pre- and post-surveys.

KEY FINDINGS

Overall, WIC staff were very positive about the Brush training. When asked if they had any previous training on dental health topics, 57.5% indicated 'no', 4.6% indicated 'yes, and the training was NOT adequate', and 37.9% indicated 'yes, and the training was adequate', making the current Brush training an integral part to discussing oral health with clients.

Staff who received the Brush training were predominantly Competent Professional Authority (CPA) staff. CPA staff are classified by the United States Department of Agriculture WIC Federal Regulations, must

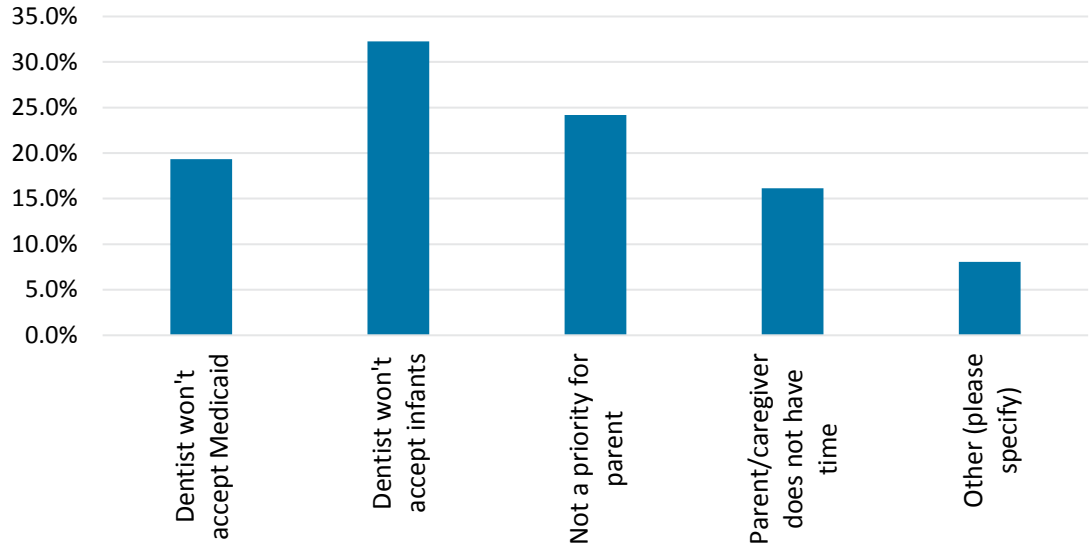
meet specific education qualifications, and are usually Registered Dietitians and Nurses. The length of time working in WIC varied amongst respondents, with 6-10 years, 11-20 years, and 2-5 years being most common.

Referrals to a Dentist

In the pre-survey, staff were asked if they currently placed dental referrals. 65.6% indicated yes, while 34.4% indicated no. Of the 92% that responded yes to currently placing referrals, 67% indicated they follow up on the referrals at a subsequent visit, while 33% said they do not.

Staff who follow up shared that clients face barriers when attempting to complete the referral. Common barriers include dentists who would not accept infants, parental priorities, as well as dentists who would not accept Medicaid. Figure 1 shows the full range of responses.

Figure 1. Feedback Received on Dental Referral



Training Impact: Knowledge & Comfort

WIC staff knowledge regarding the recommended age for a child's first dental visit (6 months to 1 year, or when teeth erupt) improved from 75% (pre-survey) to 100% (post-survey). Additionally, comfort level with discussing oral health issues increased significantly, with a large increase among WIC staff who indicated they were very comfortable—from 24% (pre-survey) to 71% (post-survey). Moreover, the 14% who indicated they were extremely uncomfortable or not very comfortable in the pre-survey decreased to 1%, or one respondent, in the post-survey.

Staff Feedback on Brush! Training

Feedback on the training was very positive, with 100% of staff indicating in the post-survey that they would recommend this Brush training to a colleague, a key finding considering the amount of WIC staff that had previously received training about oral health. When asked to describe their impression of the training in one statement, staff reported it was excellent, informative, well done, professional,

educational, helpful, and relevant or applicable to their clients.

Post-Training Thoughts on Implementation

Following the training, we wanted to explore how staff felt about taking what they had learned and applying it during WIC visits. We asked participants, "Do you feel barriers and/or challenges to implement the Brush resource materials, and other pilot activities, exist at your clinic?" The majority of WIC staff indicated 'no' (61.7%). However, 38.3% felt that barriers and/or challenges exist, and were asked to explain their experience. Some of the responses included: a lack of time with clients to cover everything, access to transportation in rural settings, issues with parent or caregiver motivation and compliance, and concerns regarding dentists' acceptance of the age one dental visit.

Staff were also asked in the post-survey how they envisioned incorporating Brush resource materials with their Client Centered Service (CCS) counseling approach. Many staff shared their ideas of how they would introduce the topic with their clients:

> *"Tell me about your infant's dental health routine."*
>
> *"What have you heard about oral health and pregnancy?"*
>
> *"Tell me how you encourage good dental care for your three year-old."*
>
> *"Do you have access to a dentist?"*
>
> *"How are you brushing your child's teeth?"*
>
> *"Do you help your little one to brush his/her teeth?"*
>
> *"Do you have a dental home?"*
>
> *"Tell me about your brushing routine at home…"*
>
> *"Do you have a family dentist?"*
>
> *"Show me how you brush your teeth…"*
>
> *"What are some ways you keep your child's teeth healthy?"*

Summary of Findings and Conclusions

Given the rural setting, these trainings targeted a much different audience than the trainings in Years 1 and 2 of the pilot, yet feedback was still very positive, with almost two-thirds of staff describing it as interesting and informative. Although a large number (62.1%) of the attendees had never received adequate previous oral health training, 100% indicated in the post-survey they would recommend this Brush training to a colleague. For those that had indicated receiving previous oral health training, many participated in the, "Varnish! Michigan-Babies Too!" program through the Michigan Department of Health and Human Services.

While staff indicated in the pre-training survey that dental referrals and follow-up are common in WIC, their awareness of and comfort with discussing oral health increased considerably as a result of the training. Staff knowledge regarding the recommended age for a child's first dental visit increased from 75% to 100%. Comfort level with discussing dental issues increased overall, with a large increase among staff who indicated they were very comfortable (from 24% to 71%).

Staff felt ready to implement this training in their clinics. When considering clinic workflow, 62% of participants did not feel they had any barriers to implementing the Brush oral health education and resources. 84% of participants shared open-ended questions they would use to incorporate oral health within a CCS counseling approach in their interaction with clients.

Post-Implementation Feedback from Staff

BACKGROUND

In order to gather information to help further assess WIC staff's perspective on the training and pilot activities, and obtain feedback to adjust and improve implementation processes, Altarum sought to conduct focus groups.

The focus groups were designed to gather information from clinic staff in the following areas:

1. To understand what staff feels is working well with implementing this new pilot activity
2. To understand what staff feels could be improved in the pilot activities, including both the initial training and clinic implementation
3. To understand how staff have been integrating this new oral health training with their CCS counseling approach, and the impact of the training on their comfort level in discussing oral health as a topic with families
4. To understand parent and caregivers' reception to the new delivery of this topic
5. To understand any barriers that staff have experienced, as well as to gather their input on how to overcome the indicated barriers

All clinics involved in trainings were contacted to schedule focus groups. However, due to the rural nature of these clinics, the vast majority were unable to accommodate a focus group in their schedules. Many of these clinics have very few staff available simultaneously and most are often booked out with clients. As a result, only one focus group was conducted with DHD10 in Cadillac, Michigan on November 30th. DHD10 had an all-day staff meeting scheduled, allowing time to speak with staff across their 10 clinics for one hour.

In order to capture feedback from the remaining clinics participating in this year 3 expansion, an online survey was created using Survey Monkey that included the questions in the focus group moderator guide (see Appendix B). The survey was distributed to WIC clinic coordinators and staff on December 18th and closed on January 11th, resulting in 25 responses from WIC staff.

Results from both the focus group and survey are discussed below.

WIC STAFF PERSPECTIVES

What Staff Feels is Working Well in Pilot Implementation

Similar to Year 1 and Year 2, the Brush curriculum visual aids for families (large mouth model, flip chart, magnet resource, poster, handouts) and incentives (child toothbrush, infant fingerbrush) were commonly reported as being very effective conversation starters with families, as well as staff's favorite part of the Brush training. Staff agreed the materials are loved by kids, and adequately assist staff in educating their clients about oral health.

Staff noted different strategies they use to incorporate the oral health topic into their client interactions, with many utilizing Brush resources to introduce the conversation:

> *"I try to put it [the flip chart] on what the next client is going to be and have it open to pique their interest…sometimes it makes them want to talk about it [oral health]."*
>
> *"I usually use giving them the free toothbrush as the intro into it. 'Would you like a free toothbrush? We have this program going…'"*
>
> *"I use the mouth model to ask parents, 'Have you taught them how to brush?"…And because the little kids like to brush…I'll ask them, 'Show me how you brush your teeth.'"*

As many of this year's participating clinics provide fluoride treatment to their clients, some staff indicated they review and ask questions about dental issues while administering the fluoride. Other staff mentioned doing the same while checking teeth during high risk counseling.

Staff reported they sometimes addressed oral health during client visits prior to participating in the Brush training, but appreciated the extra information they learned, guidance on specific messages to communicate during visits, and additional resources to share with clients. They also said they would recommend the Brush training to other WIC clinics that have not participated in the program.

THE MOST IMPACTFUL PART OF THE PILOT

Overwhelmingly, WIC staff felt that incentives are the most impactful part of the Brush pilot program as they act as conversation starters and create excitement with clients.

> *"I had a family come in yesterday…the first thing they asked was, 'Can I have more free toothpaste?'"*
>
> *"It's something different that WIC hasn't really focused on before, so when they walk out with a toothbrush or toothpaste, it's exciting for them."*

Some staff indicated the opportunity for clients to simply receive information they do not receive elsewhere is the most impactful part of the pilot:

> *"I don't think many of them get this type of education anywhere before school. Once they get into head start and all that, there's programs, but before that, there really isn't [oral health] education at the physician's office, at their well check…I feel like the parents are really appreciative for the information."*
>
> *"It's something different that WIC hasn't really focused on before, so when they walk out with a toothbrush or toothpaste, it's exciting for them."*

A few staff expressed that the education provided to clients may be more impactful than even the referrals, as it gives families the knowledge to engage in proper preventive oral health care with their young children at home.

What Staff Feels Could Be Improved Upon in the Pilot Activities

WIC staff mentioned they have successfully placed referrals to dentists, and many expressed they have heard during follow-up visits that clients utilize their referral and take their child to visit the dentist. However, most staff participating in the focus group were not aware of the drop-down list of dental providers who accept Healthy Kids Dental, and 24% of those responding to the survey indicated their clinic had not uploaded the dental referral list provided into their MI-WIC system. Additionally, some staff members shared:

> *"It took us a long time to get our list of dentists in the area who accept Healthy Kids Dental insurance."*
>
> *"There was such a delay between getting the training and then obtaining the materials that we lost our excitement in doing Brush. I also felt like by the time we started it, I had forgotten some of the information from the training. [We] need to be able to start right away."*

Due to struggles in the logistics of distributing referral lists and incentives, and making sure clinics uploaded their referral list, some clinics were delayed in receiving materials and being able to document referrals. This may indicate staff are not tracking referrals in a way that may be monitored through Brush pilot data.

One common challenge WIC staff experienced when placing referrals was the lack of dental providers accepting an age 1 dental visit. Staff also described additional challenges with the referral process, which included few dentists in rural areas; private dentists who may not accept Medicaid or have a

limited number of appointments for young children; and a lack of transportation, or delayed transportation, to the dentist's office.

Another common issue expressed was lack of time to dedicate to the oral health topic since WIC staff have various health services to complete and different health topics to address during the short visit. WIC staff also mentioned that it is difficult to speak with the client about oral health during a visit if they are uninterested in the topic.

RECOMMENDED PILOT CHANGES FROM STAFF FEEDBACK

It is clear from the responses that WIC staff were pleased with the training and the new resources they are able to offer their clients. Many of the recommended pilot changes from the Year 1 and Year 2 program were implemented prior to the Year 3 program training, which fine-tuned and refined the current pilot expansion training. Based on feedback from staff, only a few recommended changes exist:

Incentives:

- Incentives have been a popular feature of the Brush training program, and WIC staff mentioned that adding more incentives, such as cups, would be an improvement.
- Due to the rural setting, staff recommended incorporating transportation incentives or vouchers to help overcome the transportation barrier faced by rural clients.

Maximizing time:

- Since lack of time was a barrier, WIC staff recommended the following improvements to the Brush training program:
    - Shorter messages about oral health, and
    - A short video about oral health that can be displayed on the television in waiting rooms.

All project partners are working collaboratively to ensure these changes and feedback are reviewed and incorporated into additional pilot expansions if necessary to maximize success.

Brush Education Visit & Dental Referral Analysis

OBJECTIVES AND APPROACH

Data from the WIC program office from January 1, 2018 through May 17, 2019 were used to assess the frequency and characteristics of Brush curriculum educational (Brush) visits and dental referrals following the Brush training. The data were provided by the State of Michigan WIC Program for 29 WIC clinics that participated in this year's training. These data were compared to overall measures of WIC visit data to determine the relative frequency of Brush visits compared to the total number of visits at each clinic. These program utilization data were then linked to Michigan Medicaid enrollment and utilization data to estimate the percent of children referred by WIC who had a dental visit following the referral. In order to determine whether this WIC pilot program increased the rate of dental visits, these dental visit rates for WIC clients referred to a dental practice were compared to rates observed for a

matched control group. This project was approved by the Michigan Department of Health and Human Services (MDHHS) Institutional Review Board.

METHODS

WIC referral data were obtained for each client referred to a dentist and characterized in terms of age of client, WIC clinic, referral month, number of referrals, dental organizations referred to, and the percent of all WIC client visits resulting in a dental referral.

Preliminary Analysis of WIC Dental Referral Completion Rates

WIC client-level data were linked to Medicaid enrollment and claims encounter data based on the Medicaid ID to determine the percent of referrals that resulted in a dental visit. Validity checks were performed by comparing the Medicaid enrollment age with the WIC-reported age. Medicaid enrollment age was defined as the age at the time of the visit data based on the patient's date of birth. The WIC data reported age, but not date of birth. A WIC case that was linked to Medicaid enrollment data based on Medicaid ID was deemed valid if there was both an exact match on Medicaid age and the WIC age varied by no more than one year. The analyses reported here are preliminary results based on WIC clinic visit dates from July 1, 2018 through September 30, 2018 and represent less than half of the total Brush visit dental referrals that were made between July 1, 2018 and May 17, 2019. The number of clinics selected for linkage to Medicaid data was restricted to ensure at least 90 days of follow-up to be able to estimate the percent of dental referrals that actually had a claim for dental treatment.

Statistical Analysis

Descriptive data on the total number of WIC visits, Education visits, Brush visits, and referrals to dentists are reported for each of the 29 clinics, and aggregated to the 6 regions the clinics are in. No statistical analysis was performed for the descriptive analysis. All visits were reported for the period of July 1, 2018 through May 17, 2019. A logistic regression was estimated to test for the association of the Brush training program with changes in frequency of dental visits. Cases were defined as WIC clients with a dental referral in 2018 from one of the 29 participating WIC clinics. Controls were selected from all Medicaid enrolled children under 5 years residing in any of the 24 counties the clinics are located in. Children with a WIC visit for any reason were excluded from the control population. An index date was defined for cases that did not have a WIC visit resulting in a dental referral as either the date of the first WIC visit where no referral was made or randomly assigned as the 15th of the month in a randomly selected month in July through September 2018 for those enrollees where there was no evidence of a WIC visit at all. Since we had Medicaid claims data through the end of 2018 only, we restricted the logistic analysis to include cases with a WIC visit in either July, August, or September of 2018. This permitted a follow-up of 3 months to determine subsequent visits to a dentist. Independent variables for the logistic regression included age at the index date, gender, race/ethnicity, month of index date, and a variable representing whether the child had any dental visits in the 6 months before the index month.

In order to be able to report dental visits for the six months prior to the index month and 3 months following the index month, we further required individuals to have a minimum of 9 months of eligibility

during the 10 month period surrounding the index date (six months before the index month, the index month, and three months after the index month). The outcome measure used for this analysis was a dichotomous variable indicating any dental visit within 3 months following dental referral for cases or index date for controls.

Measures

Program utilization measures included the number of client visits, the number of client visits that involved an educational intervention, the number of educational visits that focused on the Brush curriculum (Brush visits), and the number of referrals to dental providers.

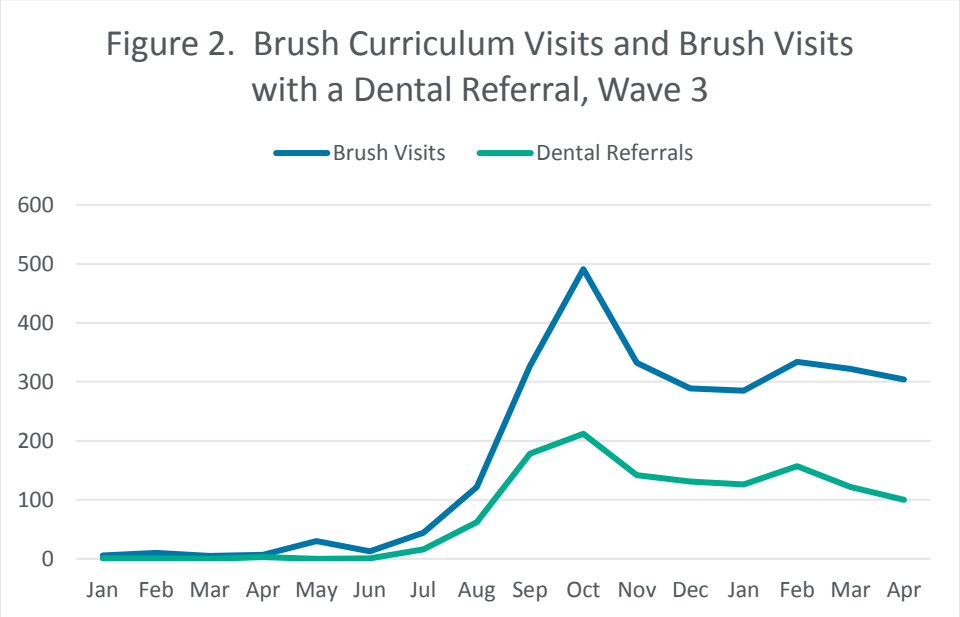
For determining whether a dental referral was associated with a subsequent dental visit, the percent of individuals who had a claim for dental services in 1, 2, and 3 months following the referral date was calculated. Medicaid dental and professional claims and encounter data for 2018 were searched for evidence of dental claims with a Current Dental Terminology (CDT) code (prefix='D') to indicate a dental claim. Both dental and professional (medical) claims were searched because some dental services are provided in medical settings (physician office and outpatient settings). For example, the State of Michigan reimburses physician offices for oral health screens (CDT code D0190). Any claim with a CDT code prefix 'D' where the rendering provider specialty indicated the provider was not a dental provider (e.g., pediatrician, family medicine) was excluded. In addition, for those individuals who had a dental visit in either the 6 months prior to the index date or the six months following the index date, the type of service provided was summarized as either preventive (two-digit CDT code 'D1'), restorative (CDT code 'D2'), or other (all other CDT codes).

RESULTS

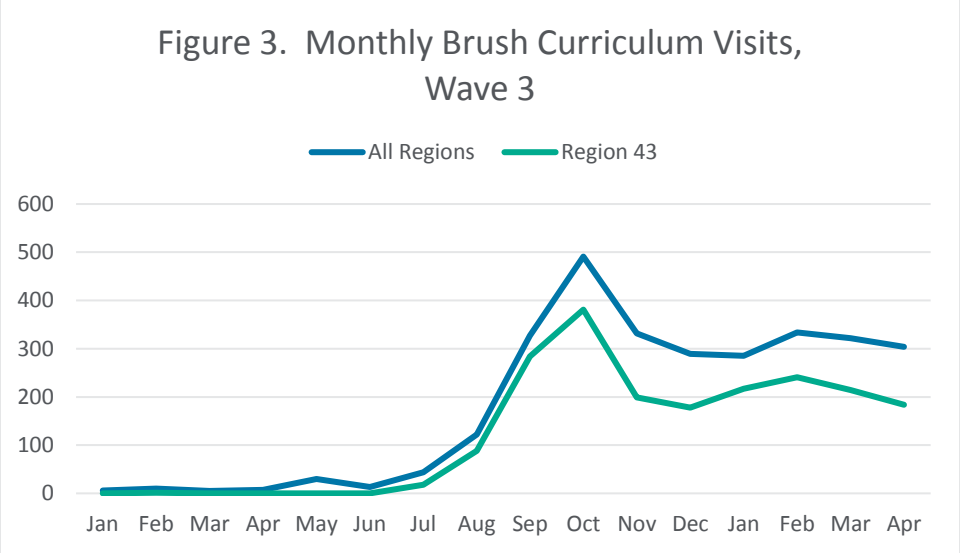
The 29 pilot clinics included in this analysis recorded a total of 55,350 visits from July 1, 2018 through May 17, 2019 of which 16,719 (30%) were visits where an educational topic was the focus. Brush visits made up 17% of all educational visits, with a total of 2,777 recorded. 47% (1,297) of all Brush visits resulted in a documented dental referral (Table 1). Two-thirds of the Brush visits and 90% of the dental referrals were performed by the 10 clinics in DHD10. Very few Brush visits were performed at the Ionia County Health Department and this may reflect the fact that they did not receive the incentives provided to other participants. Most of the counties this year's clinics operate in are rural with a National Center for Health Statistics (NCHS) rural-urban designation of 4-6 (small metro to noncore).

Table 1. WIC Visits by Region – July 1, 2018 through April 17, 2019												
WIC Region		Total Visits		EDU Visits			Brush Visits			Dental Referrals		
		N	Mean Age	N	% of Total Visits	Mean Age	N	% of EDU Visits	Mean Age	N	% of Brush Visits	Mean Age
06	Central Michigan Health Department	11,457	2.3	3,905	34%	2.5	65	2%	2.1	21	32%	2.5
11	Berrien County Health Dept.	8,241	2.4	2,808	34%	2.5	172	6%	2.4	9	5%	2.8
12	Branch-Hillsdale-St Joseph Comm. Health Agency	10,955	2.3	4,191	38%	2.5	67	2%	2.5	11	16%	2.0
15	InterCare	9,709	2.3	2,591	27%	2.4	575	22%	2.3	92	16%	2.4
37	Ionia County Health Dept.	2,145	2.3	5	0%		4	80%	3.2	1	25%	
43	District Health Department #10	12,843	2.2	3,219	25%	2.4	1,894	59%	2.4	1,163	61%	2.8
Total All Regions		55,350	2.3	16,719	30%	2.4	2,777	17%	2.3	1,297	47%	2.8

Training of clinics began in July 2018, but the number of monthly Brush visits did not increase substantially until September and October (Figure 2).



Clinics from DHD10 provided two thirds of the Brush visits (Figure 3).

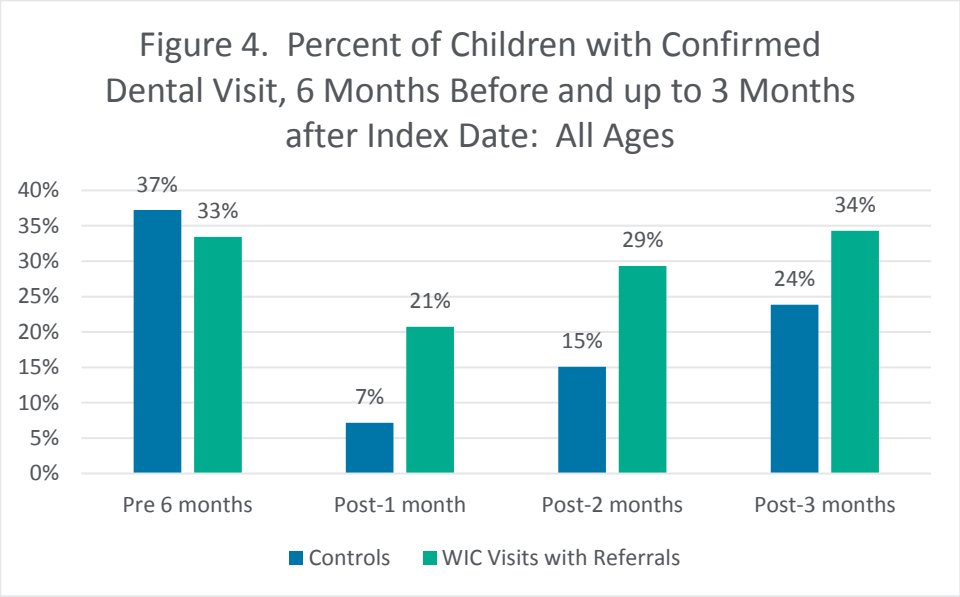


Effect of Referrals on Dental Visits

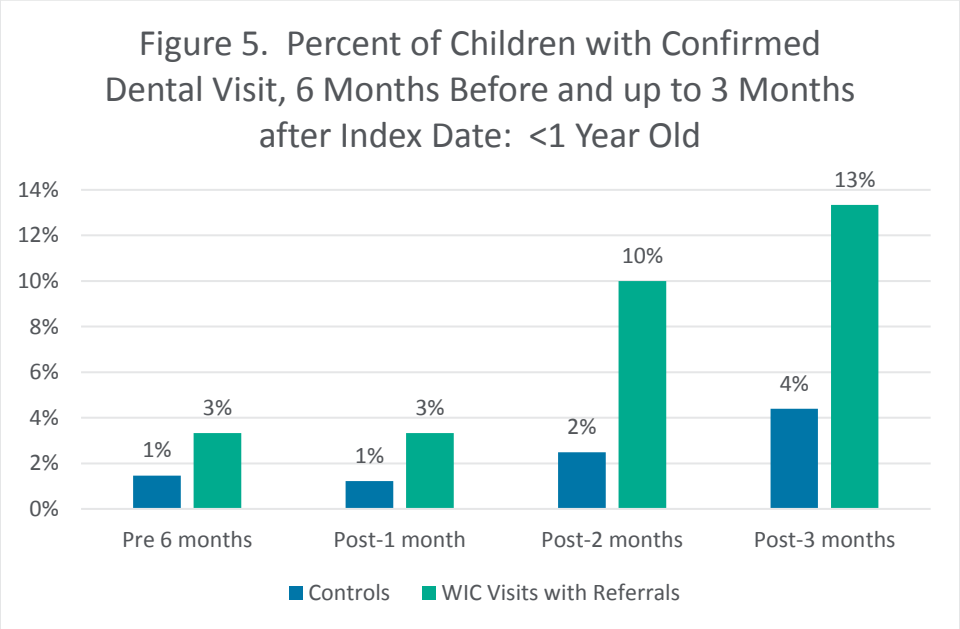
To determine the percent of WIC dental referrals that resulted in a dental visit we merged WIC program data with Medicaid claims and encounter data for cases with a WIC visit date from July 1, 2018 to September 30, 2018. This time frame was selected to ensure at least 3 months of follow-up for evaluating subsequent dental visits in the Medicaid claims data that covered dates of service through December 31, 2018. A total of 490 WIC cases were identified during this period with 254 (52%) referred to a dentist. Of the 254 referrals, Medicaid data were mapped to 173 cases (68%). In 7 cases (3%) a valid Medicaid ID was not available in the WIC program data. In 74 cases (29%), a valid Medicaid ID was present, but the number of months of eligibility was less than 11.

An observational control population of children continuously enrolled in Medicaid in 2018 of age less than 5 years residing in the same county as the Year 3 clinics. Children who had any WIC visit at any time in 2018 (whether referred to a dentist or not) were excluded from the control population. Cases were followed for 90 days after the visit date when they were referred to a dentist to determine whether a claim for dental service was filed. Controls were randomly assigned an index date of either July 15, August 15, or September 15, 2018 and followed for 90 days to determine how frequently dental claims are filed in a similar population. The hypothesis is that for a given age, children who received a WIC referral are more likely to have a subsequent dental visit in the 90 days following that referral than children who have not had a WIC visit.

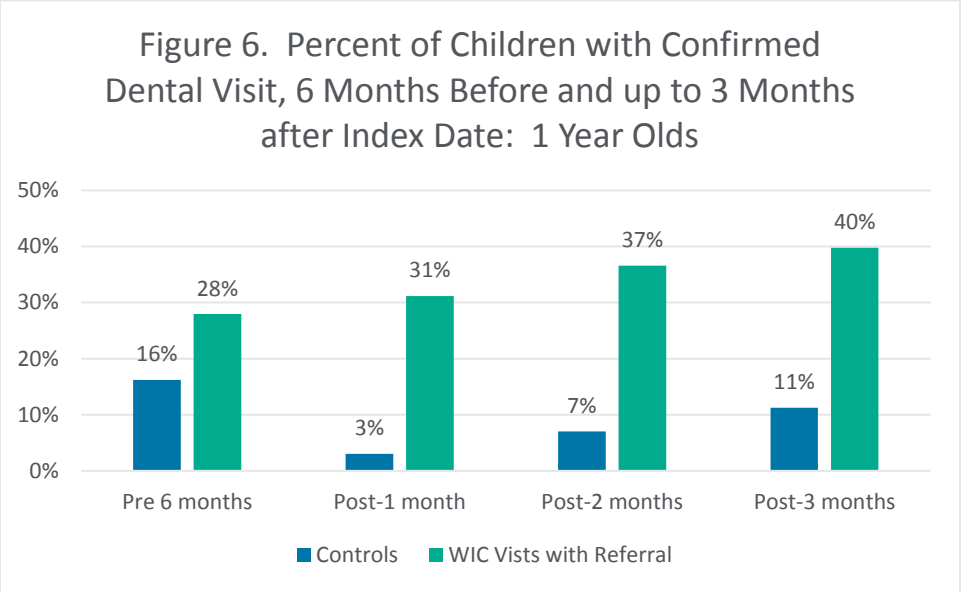
Compared to controls, those referred to a dentist by WIC were more likely to have a dental visit in the first three months following the referral (Figure 4).



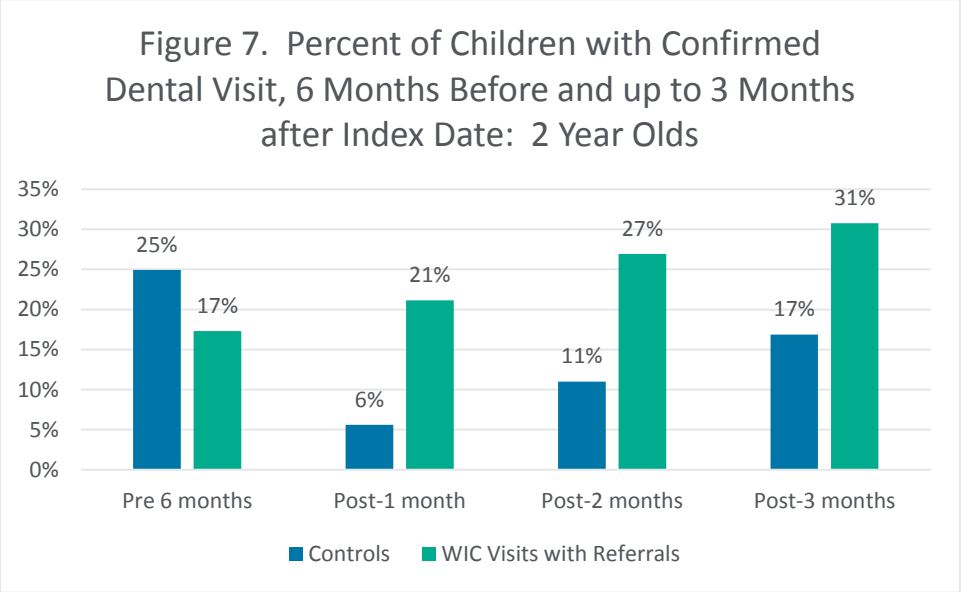
Among children less than one year old at the time of the WIC visit with dental referral (and corresponding index visit for controls), WIC-referred children were three times more likely to have seen a dentist in the three months following referral than controls (Figure 5).



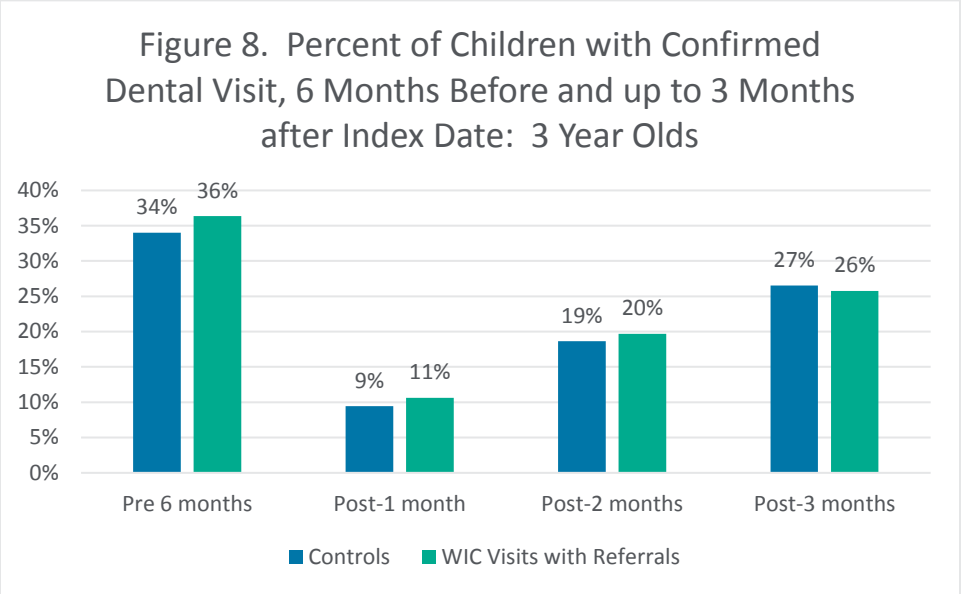
One year old children referred by a WIC clinic to a dentist were nearly four times more likely to see a dentist in the three months following the referral compared to controls (Figure 6).

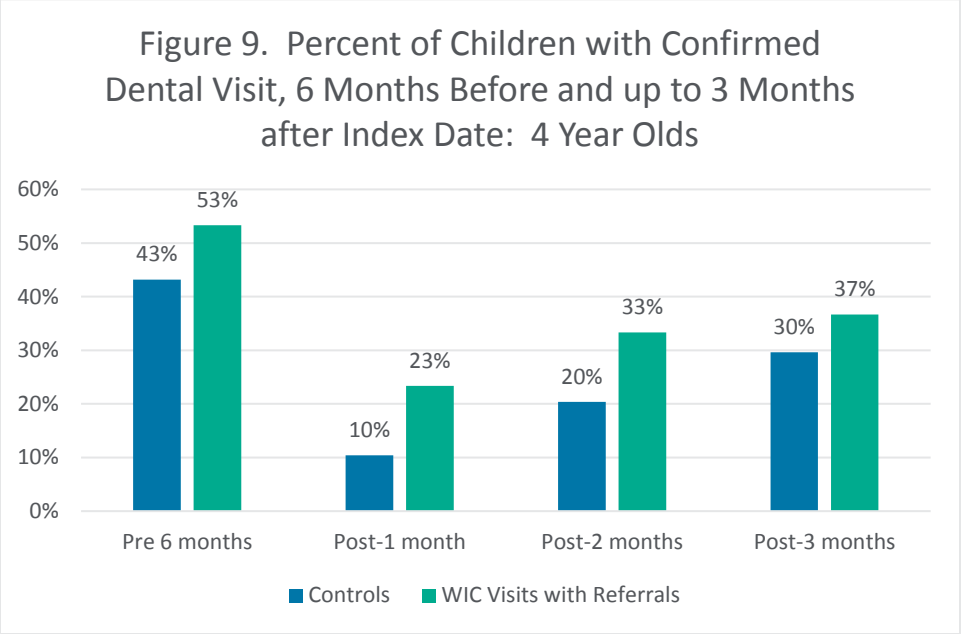


Two year old children were more likely to see a dentist when referred by a WIC clinic, but the frequency of dental visits among controls increased compared to children less than 2 years (Figure 7).



At ages 3 and 5, both cases and controls appear to have similar rates of dental visits (Figure 8, Figure 9).





Logistic Regression Analysis

Results of the logistic regression analyses are summarized in Table 2, where the dependent variable equals 1 if a dental visit occurred within 3 months following the index visit and 0 if not. WIC referral, age, visit month, dental visit in prior 6 months, and race/ethnicity were significant predictors of dental visit in the 3 months following the index visit (actual referral date for WIC referred cases). Dental referral at a WIC Brush visit was significantly associated with an increase in subsequent dental visits for clinics in

DHD10, but not in the other regions. We note, however, that clinics in other regions accounted for only 10% of all dental referrals, so there may not be sufficient data for these regions to allow for an adequate test of whether dental referrals by WIC clinics actually resulted in an increase in dental visits. The odds ratio of 1.66 indicates that children referred to the dentist at a WIC Brush visit were 66% more likely to have a dental visit in the subsequent 3 months than children of similar ages enrolled in Medicaid in similar counties, controlling for other factors. Hispanics were more likely and Other/Unknown race/ethnicity were less likely than Whites to have a dental visit in the 3 months after the index visit and there was no significant difference in dental visit rates between Black and White individuals in this sample.

Table 2. Logistic Regression Results (Dependent Variable Dental Visit in 3 Months Post Visit/Index Date

Parameter	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	-2.8126	1.3287	4.481	0.0343
Case (WIC Referred vs Control)	0.254	0.089	8.1439	0.0043
Age at Visit Date	0.423	0.0193	481.2276	<.0001
Visit Month	0.00815	0.0299	0.0743	0.7851
Gender	0.0428	0.0244	3.0937	0.0786
Dental Visit in Prior 6 Months	0.7907	0.0526	226.1301	<.0001
Black vs White	-0.00836	0.0689	0.0147	0.9034
Hispanic vs White	0.2345	0.0602	15.1705	<.0001
Other/Unknown vs White	-0.2007	0.0752	7.1294	0.0076

DISCUSSION

The Brush training resulted in nearly 3,000 instances where the Brush curriculum topic was the focus on an educational visit, though the frequency by which the training was applied varied widely from clinic to clinic. Clinics in DHD10 and InterCare consistently implemented the Brush curriculum. Across all clinics, Brush visits resulted in a dental referral roughly half of the time.

These dental referrals were associated with an increase in dental visits within 3 months of the referral

date, particularly for DHD10. We emphasize that the Medicaid data relating to dental visits is limited to 2018 and these results should be viewed as preliminary.

There are a number of limitations to this analysis that should be kept in mind. No randomization was employed in this study so the results observed reflect association of referrals and subsequent dental visits, but there are other potential explanations for the results observed. The follow-up period for assessing visits to dentists was limited due to having Medicaid claims data through the end of 2018 which limited the referrals assessed to those occurring before October, 2018. This dramatically limited the number of cases that could be analyzed. It is possible that this analysis is subject to selection bias where the children of parents who go to WIC clinics are for some reason more likely to visit the dentist regardless of referrals compared to those who do not go to WIC clinics. While we have tried to control for the most likely factors associated with dental visits (e.g., age, prior visits), there a likely to be other, unobserved, factors such as transportation barriers or parental use of dentists that have not been taken into account.

Conclusion

SUMMARY

Immediately following training, staff feedback was overwhelmingly positive, with 100% indicating they would recommend this Brush training to a colleague. More importantly, both knowledge and comfort level increased, and staff felt ready to implement this training in their clinics.

After implementing the pilot activities for approximately 6 months, staff feedback remained largely positive. Respondents indicated the Brush visual aids, resources, and incentives are well received by clients, and parents react positively to the topic of oral health. However, staff expressed concerns with dentist acceptance of the age one dental visit and clinic time constraints.

Overall, from July 1, 2018 to May 17, 2019, nearly 3,000 Brush education topics were recorded by WIC staff. Across all clinics, once a Brush education topic was included in a nutrition counseling session, children were referred to the dentist roughly 50% of the time. Importantly, these referrals were associated with an increase in dental visits within 3 months of the referral date.

LESSONS LEARNED

We have a variety of lessons learned from the third-year expansion that can be applied moving forward for additional expansions.

- The accurate and timely availability of incentives is important to the implementation of pilot activities. Qualitative staff feedback indicates the availability of incentives can influence whether or not a Brush visit will occur, as incentives are good conversation starters. WIC staff have indicated the importance of getting incentives out to clinics early to generate excitement, keep up momentum from training, and drive participation.
- Similarly, efficiently providing dental referral lists also spurs staff participation. Dental referral completion rates were highest in DHD10 where lists of dentists known to accept young children

were available and integrated into the Brush visits promptly. Michigan WIC has offered to explore the option of doing batch uploads of the referral lists directly into the system, which would reduce the burden and time constraints on WIC staff manually uploading these lists, and would allow for the inclusion of information about using these referral lists in the training. Another potential option in the future would be integration of Michigan's Dental Registry into the Michigan WIC system.

- A booster shot, or pulse check, consisting of both a check in with staff as well as a MI-WIC and Medicaid data extraction, would be greatly beneficial during the implementation phase. This would allow us to ensure that WIC staff are equipped with the resources and tools they need to provide Brush visits and complete referrals (i.e., incentives and referral lists), and provide an opportunity to address barriers to implementation. It would also allow a chance to follow up with WIC staff to reiterate the importance of the topic and documentation within the system.
- Similar to the first two years of this program, dentists' acceptance of 1-year olds, and WIC staff members' fear of referring to dentists without knowing whether they will accept the referral, continues to be a barrier to implementation. This year we were able to provide WIC staff with referral lists that included dentists who are known to accept young patients as well as Healthy Kids Dental to increase WIC staff's confidence in providing referrals. We would recommend providing these referrals lists with additional details (i.e., dental provider accepting children under the age of three) for future expansions.
- Consistent with previous years, WIC staff continue to express that time is always a barrier when implementing additional education activities in WIC. However, WIC staff recognize the importance of children's oral health and appreciate the ability to provide clients with this important information during nutrition counseling sessions.

Thank you to everyone involved, especially to the Delta Dental Foundation and the Michigan Health Endowment Fund for providing funding for our third expansion year targeting rural WIC clinics in dental health professional shortage areas.

Appendix A: Pre and Post-Training Surveys

***Brush!* Resource Materials Pre-Training Survey**

1. **What is your job title?** _____

2. **How long have you worked in WIC?**
   - ☐ 0-5 months
   - ☐ 6-11 months
   - ☐ 12-23 months
   - ☐ 2-5 years
   - ☐ 6-10 years
   - ☐ 11-20 years
   - ☐ 21+ years

3. **Have you had any previous training on oral/dental health topics?**
   - ☐ YES, and the training was adequate
   - ☐ YES, and the training was NOT adequate
   - ☐ NO

If yes, please describe the training: _____

4. **What is the recommended age for a child's first dental visit?** _____

5. **How comfortable are you discussing dental issues with clients now?**
   - ☐ Very Comfortable
   - ☐ Somewhat Comfortable
   - ☐ Neutral
   - ☐ Not Very Comfortable
   - ☐ Extremely Uncomfortable

6. **Do you typically/routinely refer clients to dental services?**
   - ☐ YES
   - ☐ NO

If **NO**, why not? (Check all that apply)

- ☐ Client does not have a dental risk
- ☐ Client has too many other risks
- ☐ Client is not interested
- ☐ Client does not want to take child to a dentist or go to a dentist
- ☐ Do not know of any dental clinics to refer to
- ☐ Do not have time during the clinic visit
- ☐ Other _____

7. **Do you follow-up on dental referrals at the next clinic visit?**
   - ☐ YES
   - ☐ NO

If **YES**, what feedback do you get?

If **NO**, why not? (Check all that apply)

- ☐ Dentist won't take Medicaid
- ☐ Dentist won't accept infants
- ☐ Not a priority for parent
- ☐ Parent does not have time
- ☐ Other _____
- ☐ No documentation of referral
- ☐ No time
- ☐ I forgot

Other _____

***Brush!* Resource Materials Post-Training Survey**

1. Please describe your impression of this training in one statement (or just a few words).

_____

2. What was your favorite part of the *Brush* Training?

_____

3. What was your least favorite part of the *Brush* Training?

_____

4. Would you recommend this training to your coworkers who did not attend, or to colleagues in other WIC Local Agencies?
   - ☐ YES
   - ☐ NO. Why not? _____

5. Do you feel barriers and/or challenges to implementing the *Brush* resource materials, and other pilot activities, exist at your clinic?
   - ☐ NO
   - ☐ YES. Please describe _____

6. What is the recommended age for a child's first dental visit? _____

7. Now that you've completed the *Brush* training, how comfortable do you think you will be discussing dental issues with clients?
   - ☐ Very Comfortable
   - ☐ Somewhat Comfortable
   - ☐ Neutral
   - ☐ Not Very Comfortable
   - ☐ Extremely Uncomfortable

8. How do you envision incorporating the *Brush* resource materials with your CCS counseling approach? For example, what open-ended questions could you use to introduce the oral health topic?

   _____

Appendix B: Post-Implementation Survey

It's been a few months since the initial BRUSH! training, and we'd like to hear about your experience with this oral health pilot project. Your responses will help us modify and better inform the next pilot expansion, so we greatly appreciate your willingness to help. Thank you!

1. What are your favorite parts about the BRUSH! oral health pilot project? (i.e., visuals, incentives, oral health training)

   _____

2. What are your least favorite parts?

   _____

3. What resources from the BRUSH! pilot project have you found *most* impactful?
   - ☐ Flip Chart
   - ☐ Mouth Model and Toothbrush
   - ☐ Magnetic MyPlate Food & Smiles Kit
   - ☐ Foam Tooth
   - ☐ Educational Handouts
   - ☐ Incentives (i.e., toothbrushes, gum brushes)
   - ☐ Other (please specify): _____

4. What resources from the BRUSH! pilot project have you found *least* impactful?
   - ☐ Flip Chart
   - ☐ Mouth Model and Toothbrush
   - ☐ Magnetic MyPlate Food & Smiles Kit
   - ☐ Foam Tooth
   - ☐ Educational Handouts
   - ☐ Incentives (i.e., toothbrushes, gum brushes)
   - ☐ Other (please specify): _____

5. Describe your comfort level in discussing oral health issues with families.
    - ☐ Very Comfortable
    - ☐ Somewhat Comfortable
    - ☐ Neutral
    - ☐ Somewhat Uncomfortable
    - ☐ Very Uncomfortable

    Comments: _____

6. During your education counseling sessions around oral health, what are you most consistently doing or discussing with clients?

    _____

7. Did you find it easy or difficult to incorporate the BRUSH! curriculum with your CCS counseling approach?
    - ☐ Very Easy
    - ☐ Easy
    - ☐ Neither Easy nor Difficult
    - ☐ Difficult
    - ☐ Very Difficult

8. Can you share any open-ended questions you use to introduce the oral health topic?

    _____

9. How have parents and caregivers been reacting to this topic?
    - ☐ Very Positive
    - ☐ Positive
    - ☐ Neutral
    - ☐ Negative
    - ☐ Very Negative

    Please specify: _____

10. What kind of questions or concerns regarding oral health care are you getting from families?

    _____

11. Have you been able to find a dental referral that is relatively close?
    - ☐ Yes
    - ☐ No

    Please provide more information: _____

12. Has your clinic uploaded the dental referral list provided by Michigan WIC into the MI-WIC system? (a list of dentists that accept Healthy Kids Dental in your area)
    - ☐ Yes
    - ☐ No

    Comments: _____

13. Do you find this referral list helpful in providing dental referrals?
    - ☐ Yes
    - ☐ No

    Comments: _____

14. Do you know if your clients have gone to the dentist once referred? What feedback have you received from moms at subsequent WIC appointments after their visit to the dentist?
    - ☐ Yes
    - ☐ No

    What feedback have you received? _____

15. Are you continuing to provide dental referrals?
    - ☐ Yes
    - ☐ No

    Please provide more information: _____

16. We've been told transportation can be a barrier for clients to get to dental visits. Have you found this to be a common barrier? Are there other barriers clients are reporting?
    - ☐ Yes – having transportation issues
    - ☐ No – not having transportation issues

    Any other issues clients are reporting as barriers to getting to the dentist?

    _____

17. Please share any barriers or challenges you encountered in offering the BRUSH! education or dental referrals. Please share any ways we might help to overcome these barriers/challenges.

    _____

18. Please share anything else about your experience in implementing the BRUSH! oral health pilot project. We appreciate your participation, and thank you.