Published in final edited form as:

J Public Health Manag Pract. 2018 ; 24(3): e9–e18. doi:10.1097/PHH.0000000000000582.

Building a Pediatric Oral Health Training Curriculum for Community Health Workers

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Abstract

Objectives—Community health workers (CHWs) are a promising approach to oral health promotion in high-risk populations. This manuscript describes the process of creating a pediatric oral health CHW training curriculum.

Design—Existing curricula were identified through outreach efforts to experts in the oral health and CHW fields, as well as PubMed and Google searches. After coding basic information, curricula were mapped to defined oral health domains. Then group discussion was employed to determine final curriculum contents.

Setting—United States

Inclusion Criteria—Curricula were included if they addressed oral health, were in English or Spanish, involved United States populations, did not target dental clinicians, and if sufficient data could be obtained.

Main Outcome Measures—Curricula were evaluated for delivery format, number of hours, target audience, inclusion of CHWs, completeness, and oral health content.

Results—Eighteen unique curricula were identified; 14 (78%) were CHW specific. Pathological factors, caries formation, toothbrushing basics, flossing, nutrition, sugar sweetened beverages, oral health recommendations, baby bottle tooth decay, fluoride treatments, and fluoride were covered to some extent in 75% of curricula. More than half did not mention types of teeth, oral health during pregnancy, anti-fluoride, cultural humility, and special needs populations. After comparing

CONFLICTS OF INTEREST

The authors have no conflicts of interest to report.

CHW curricula to non-CHW curricula, the original 26 oral health domains were condensed into 10 CHW training domains.

Conclusions—Using existing evidence and expert insight, an oral health CHW training curriculum outline was created that emphasizes behaviors, social support, and navigation assistance to promote preventive oral health behaviors in families of young children. The process of creating this curriculum and its basic elements can be applied to other disease areas. Clearly defined trainings that are made publicly available, such as this one, support efforts to standardize the CHW field in preparation for CHW certification and reimbursement in the future.

INTRODUCTION

Dental caries result from a complex multi-factorial process where acid-producing bacteria colonize tooth surfaces and result in localized, progressively destructive decay of the teeth.^{1–2} Caries in children are associated with pain, more severe infections, malnutrition, speech difficulties, poor school performance, cosmetic problems, and an overall lower quality of life.^{3–5} The most common chronic disease of childhood, dental caries affect roughly half of children aged 11 years and below.⁶ Over 80% of this disease burden disproportionately lies within lower socioeconomic, minority, Medicaid-insured groups.^{7–9} Caries prevalence in Illinois surpasses national estimates with state and local level health surveillance data reporting that 52% and 51% of Illinois and Chicago-area 3rd-graders respectively have dental caries.¹⁰ One out of five of these children have untreated decay.¹⁰ These disparities are partly attributable to poor dental care access and associated low utilization rates, especially among young children.^{11–15} In Illinois, 10,370 dentists and 8,425 dental hygienists had active licenses as of July 2016 but only one in five Illinois dentists are registered Medicaid providers.^{16–17} Data from 2013 show that 55% of Illinois children with Medicaid had a dental visit in the past 12 months¹⁸; over one third of Illinois children who have seen a dentist did not start dental visits until they were five years old.¹⁹

Community health workers (CHWs) are one potential approach to reduce these disparities. CHWs define themselves as frontline public health workers who serve as liaisons between health and social services and community residents to facilitate access to services and improve the quality and cultural competence of service delivery.²⁰ CHWs target community and personal self-efficacy by empowering community members to identify their own needs and implement their own solutions.^{21–23} CHWs are often employed by community-based organizations and hospital systems to provide health education, information, and service navigation.²⁰

While CHW programs have been well studied in the areas of diabetes and asthma,^{24–29} they are relatively new in pediatric oral health and represent a promising approach to oral health promotion, particularly among children with documented disparities. Caregiver directed oral health education has been shown to have a positive effect on knowledge, intended behavioral change (including snacking and sugar intake), and caries prevalence.^{30–32} CHWs deliver education in addition to social support and navigation services which are important for low income families³³ but it remains unclear if oral health CHWs can influence knowledge and behaviors.³³ Coordinated Oral health Promotion (CO-OP) Chicago is a research study that

aims to test the ability of oral health CHWs to improve child oral health preventive behaviors for high risk infants and toddlers. One of the first steps in this process is the development of a CHW training curriculum targeting pediatric oral health promotion. Because limited formal certification or licensing programs for CHWs exist nationally or locally,³⁴ training curriculums are developed for individual programs and are not standardized for any disease area. CHWs require training in disease-specific content, building relationships, self-advocacy, teamwork and conflict resolution, crisis and emergency management, and home visitation before going into the field.^{34–35} The purpose of this manuscript is to describe the process for creating the disease-specific content for a pediatric oral health CHW curriculum that can be used by CO-OP Chicago and other programs aiming to deploy oral health CHWs.

METHODS

The overall development plan was to analyze existing curricula to determine what had been done to date and what existing curriculum authors thought was important, and then to compare our expert opinions with those of these others to form a final curriculum. Before the start of this program, the investigative team had written and implemented multiple CHW curricula in other disease areas in the past and had previously used their experiences to build an oral health CHW curriculum for the Coordination of HEalthcare for Complex Kids (CHECK) project (1C1CMS331342). The plan for CO-OP Chicago was to search for all other existing oral health curricula. These curricula would be reviewed to determine matching and discordant elements. The results would be discussed with experts in CHWs, dentistry, and community oral health to generate conclusions regarding essential elements for oral health CHWs working with children. These elements would then be incorporated into a final curriculum. This process did not involve human subjects, and the CO-OP Chicago study is monitored by the University of Illinois at Chicago Institutional Review Board.

The Search Process

We used a snowball technique to identify curricula that existed before July 13, 2016, that addressed oral health (any type), were in English or Spanish, and targeted United States populations (all ages). We did not ask for CHW-specific curricula. Curricula were excluded if sufficient information about their contents could not be obtained or if curricula focused on dental clinicians. We began with what we—the CO-OP investigators—already had. This included the CHECK curriculum in addition to three others. We then extended our search inquiry to outside oral health and CHW colleagues to identify additional oral health curricula. Our co-investigators facilitated introductions with oral health advocacy teams in other states which identified two more curricula. CO-OP is funded by the National Institute of Dental and Craniofacial Research (NIDCR) as part of a multidisciplinary collaborative research consortium to reduce oral health disparities in children. Reaching out to our NIDCR consortium identified 10 additional curricula. Two investigators from two independent academic institutions contacted the PI for information on CO-OP and both of these investigators shared their curricula. On Google and PubMed, we searched “CHWs Oral Health”, “Community Health Workers Oral Health”, and “Community Oral Health” but

no additional curricula were found other than what our collegial outreach efforts had already produced. In total we spoke to and/or emailed 28 individuals to obtain curricula. Authors/contact persons of three curricula identified did not respond to requests. Two programs identified via referrals stated they did not have any curricula to share.

The Analysis Process

Basic information on each curriculum was collected, including the curriculum name, developer, delivery format, number of hours, target audience, any specific mention of CHWs, and curriculum completeness. A curriculum was coded as “complete” if we were able to obtain content sufficient to facilitate a training. This usually was in the form of textbook, manual, guidelines, PowerPoint slides or a combination of these. Curricula were coded as “partial” if we could only obtain an outline of a curriculum or only bullet points of topics covered. This information is shown in Table 1.

A list of oral health domains and associated definitions was compiled by a team of oral health experts, CHW experts, and pediatricians. (See supplemental digital content.) Two separate analysts mapped each curricula to these oral health domains. Agreement overall between coders was 85.5%. Once the initial coding was complete, the investigators and coders reviewed areas of discrepancy and resolved them using group consensus which determined the final coding determination. During the process of coding, two new domains (health disparities and special needs) emerged and were added.

The data were then reviewed and discussed by the CO-OP Steering Committee, one of the contributors of a curriculum from an outside institution, and the CO-OP Community Advisory Board which is comprised of local clinicians (dental and general pediatrics), a CHW, policy, and advocacy experts. The purpose during these discussions was to use group discussion and decision-making to determine which final domains should remain, which could be eliminated, and if the domains chosen were adequate or required modification. These decisions then informed the final oral health curriculum contents.

RESULTS

In total, 18 unique curricula were identified that met inclusion criteria, with complete information obtained on 13 (72%). See Table 1. Fourteen of the curricula (78%) were CHW specific. The curricula were developed by academic research institutions, professional societies, government agencies, and service/advocacy organizations. The target service audience for all were families in communities, although the training target population ranged from CHWs to non-dental healthcare providers such as pediatricians. Most were lecture-based. When hours of training were stated, the exact hours showed tremendous variance, ranging in the curricula manuals from 1.5 hours to 20 hours. (This range does not include an outlier; one program from the American Dental Association stated their training was over 1800 hours.) We did not identify any obvious differences between curricula with complete data and partial data. Pathological factors, caries formation, toothbrushing basics, flossing, nutrition, sugar sweetened beverages, oral health recommendations, baby bottle tooth decay, fluoride treatments, and fluoride were covered to some extent in at least 75% of curricula.

More than half of the curricula did not mention types of teeth, oral health during pregnancy, anti-fluoride, cultural humility, and special needs populations.

We then compared CHW curricula (N=14) with non-CHW curricula (N=4) to determine factors specific to CHWs (Figure 1 and supplemental digital content). Basic tooth anatomy was covered in 57% of CHW curricula and tooth development in 64%, but types of teeth was only discussed in 21%. Pathologic factors and caries formation were mentioned in 71% and 85% of CHW curricula respectively; they were covered in 100% of non-CHW curricula. While discussed in 71% of CHW curricula, 100% of non-CHW curricula covered baby bottle tooth decay. Toothpaste and flossing were mentioned in only 64% and 71% respectively of CHW curricula but in 100% of non-CHW curricula. Nutrition in general was mentioned in all curriculum. However, poor nutrition and sugar-sweetened beverages were only specifically discussed in 50% and 71% of CHW curricula. Oral health recommendations during pregnancy was discussed in only about half of curricula. Description of the anti-fluoride movement was infrequent in CHW curricula (21%) and covered in none of the non-CHW curricula. Cultural humility was mentioned in 57% of CHW curriculum but in none of the non-CHW curricula. Health disparities were discussed in 86% of CHW curricula compared to 25% of non-CHW curricula.

Table 2 shows the final selected domains for an oral health CHW curricula that resulted from review of the existing curricula and subsequent discussion process by investigators and the community advisory board. We felt basic tooth anatomy should be a primary domain but types of teeth could be eliminated as a topic for CHWs. Pathologic factors, caries formation, and cavities basics are essential domains and are related enough to be combined into one single domain. We also felt that common dental diseases should be added into this domain. Early childhood caries was important enough as a CHW topic to be separated out into its own category, and we merged baby bottle tooth decay and tooth development/teething into this category because of their close relationships. Caries assessment in children was thought to be an important skill for CHWs and to warrant its own domain. Toothbrushing basics, toothpaste, and types of toothbrushes were clearly important and could be combined into one domain of toothbrushing. We included flossing in this domain as well, because even though it wasn't covered frequently by other CHW trainings, we felt caregivers and adults needed to understand basic flossing. Nutrition definitely was an important topic that could be combined with poor nutrition and sugar-sweetened beverages. Oral health recommendations regarding access for children were important but it was decided that recommendations for pregnancy could be an optional domain to be included in populations only of child-bearing age or if time allows. We felt all four of the fluoride domains—water source, fluoride treatment, fluoride, and anti-fluoride—could be combined into one category of fluoride. While coverage of anti-fluoride was limited in the curricula reviewed, we felt that recent resurgences of this movement warranted addition of it in all curricula. Because of the populations CHWs typically work with, cultural humility and health disparities were important domains to include. Special needs populations was decided to be an optional domain.

DISCUSSION

This analysis applied oral health and CHW content expertise to existing oral health curricula to determine the core domains that our oral health CHW training curricula targeting young children and their families should include. Our final curriculum domains are described in Table 2. Several important differences between CHW-specific and non-CHW curricula were noted in this process. CHW programs typically target populations that are underserved and therefore almost always address health disparities. Also the CHW trainings focused more on behaviors and less on clinical/scientific aspects of oral health. CHWs are not health care professionals and are not intended to have clinical expertise in the areas they work. Therefore their training does not (and should not) focus heavily on clinical aspects (such as tooth anatomy); it should instead emphasize behaviors (i.e. toothbrushing, going to the dentist) and provide social support and navigation support to achieve these goals.^{34–35} There is a tendency, especially among clinicians, to want to train CHWs in all aspects of a disease but our experiences in this field suggest that too much emphasis on clinical facts can overwhelm them. Instead, CHW interventions should target specific behaviors, with their training primarily aligned to these tasks.^{34–35}

The proposed training is intended to describe only the oral health specific training needed by CHWs. CHWs require other skills before they are ready to go into the field. Most basic CHW training courses provide a general overview of health which includes a range of diseases, building relationships, self-advocacy, teamwork and conflict resolution, crisis and emergency management, and home visitation.^{34–35} Many programs train CHWs in motivational interviewing or similar behavior change support skills. We recommend CHWs be trained in these additional areas. Testing of their understanding of disease-specific content, and their ability to deliver this content, is the next step. This can be done with standardized role plays. Then CHWs benefit from shadowing experiences and a period of observation in the field before their initial training is complete. It is also important to recognize the importance of ongoing training as many issues come up in the field that will require additional education and support for the CHWs.^{34–35}

This analysis has several limitations. We doubt we captured all curricula, despite our best efforts. We also were not able to get complete information for some curricula. While it is possible that is because the owners did not want to share them, our experience suggests the more likely reason is that community trainings are sometimes not formally prepared in ways that can be shared with others. That is one of the reasons we conducted this analysis, so that we could show others the resources that exist and the ways to organize them effectively. We realize that the definitions used for some of the oral health domains could be improved. Our purpose for defining as we did was mainly to ensure the analysis team coded data consistently. We recommend that for application of our curriculum by others, standard definitions for each domain be applied. Finally, we restricted our efforts to only the oral health aspects of the CHW training. While the full training needs of CHWs are important to define, tremendous variation exists within this workforce³⁴ making descriptions of general CHW training beyond the scope of this manuscript.

The final pediatric oral health CHW curriculum domains have been converted into a manual for implementation testing with a cohort of CHWs to determine feasibility, acceptability, and ability of the curriculum to adequately prepare CHWs to work with families on caries prevention. Adequacy of the training will be assessed by facilitator feedback, CHW exit surveys, and standardized role plays to assess CHW skills. Then the ability of oral health CHWs to improve family behaviors and child outcomes will be tested in a randomized controlled trial.

IMPLICATIONS FOR POLICY AND PRACTICE

Healthy People 2020 established oral health as one of the nation's top twelve leading health indicator topics.³⁶ This was followed by an Institute of Medicine report emphasizing oral health promotion and disease prevention.³⁷ Prevention of caries is achieved through policy changes that improve access and address social determinants of health and through individual behavior change.³⁸ CHWs may play a key role in this process. CHWs offer tailored approaches to support individual behavior change.^{20–23, 34–35} They address social determinants of health on the individual level, and sometimes on the community level as well.^{20–23, 34–35} Despite well documented disparities in the field of oral health, oral health CHWs are rare to date.^{39–43} The oral health training curriculum described in this manuscript is a first step toward generating evidence for oral health CHWs and determining their effectiveness. Using existing evidence and expert insight, CO-OP Chicago produced an oral health CHW training curriculum outline that emphasizes behaviors, social support, and navigation assistance to promote preventive oral health behaviors in families of young children. The process of creating this curriculum and its basic elements can be applied to other disease areas as well. Clearly defined trainings that are made publically available, such as this one, support efforts to standardize the CHW field in preparation for CHW certification and reimbursement in the future.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

We would like to thank Anabelen Diaz and Tamara Green for their assistance preparing these data. We also want to recognize the CO-OP Chicago Steering Committee and Community Advisory Board who reviewed and contributed to the interpretation of these data. The Steering Committee members include the authors and the following: David Avenetti, DDS, MSD, MPH, Michael Berbaum, PhD, Anabelen Diaz, BA, Marcio da Fonseca, DDS, MS, Helen Lee, MD, MPH, Mark Minier, MD, Jennie Pinkwater, MNM, Oksana Pugach, MS, PhD, Usha Raj, MD, Sheela Raja, PhD, and Benjamin Van Voorhees, MD, MPH. The Community Advisory Board members include: Anne Clancy, MBA, MOT, MPH, Julie Janssen, Linda Kaste, PhD, DDS, MS, JoAnn Peso, MEd, RD, Indru Punwani, DDS, MSD, Pamela Roper, MD, MPH, Amy Sagen, Lora Vitek, MBA, and Alejandra Valencia, DDS, MPH, MS. Finally we would like to thank all the individuals and projects who shared their curricula with us.

FUNDING

This research is supported by a grant from the National Institutes of Health, National Institute of Dental and Craniofacial Research (UH2DE025483).

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Figure 1.
CHW Curricula (N=14) Compared to Non-CHW Curricula (N=4) on Selected Oral Health Domains

Table 1

Oral health training curriculums

Name and Developer	Basic Description	Curriculum Delivery	Hours	Target Population for Training	Target Service Audience	CHW Specific	Complete-ness*
Action for Dental Health: CDHC Curriculum Outline American Dental Association	This is a project initiated by the American Dental Association to deploy a new type of community health worker that has a focus on patient education, disease prevention and patient navigation.	Lecture	Hours: 1,800+	Dental Health Coordinators / CHWs	Underserved communities	Yes	Partial
Boca Sana Cuerpo Sano / Healthy Mouth Healthy Body San Diego Prevention Research Center	This is a community-based participatory research project to engage the community to reduce oral health disparities among Mexican migrant families in North San Diego County.	Lecture	Hours: 10	CHWs	Migrant families	Yes	Partial
Columbia University CMMI CHW Training Columbia University	This is a Centers for Medicare and Medicaid-funded Health Care Innovation Award that aims to stop the progression of tooth decay in affected children and to reduce their risk of future decay.	Lecture	Hours: 10 lessons 20 hours	CHWs	Parents Families	Yes	Complete
Community Health Aide Program Certification Board (CHAPCB) AK Standards for DHA	The Community Health Aide Program Certification Board sets standards for the community health aide program and certifies individuals as	Alaska State Guidelines	Not applicable	Community Health Aides in Alaska	Clinic Community	Yes	Complete

Name and Developer	Basic Description	Curriculum Delivery	Hours	Target Population for Training	Target Service Audience	CHW Specific	Complete-ness*
	community health aides and dental health aides and behavioral health aides and practitioners in Alaska.						
Contra Caries Mixed Methods Study University of California, San Francisco	Contra Caries Oral Health Education Program is a theory-based, promotor-led education program for low-income, Spanish-speaking parents of children aged 1–5 years.	Lecture	Lessons: 4 Hours: 8	CHWs	Parents	Yes	Partial
Coordination of Health Care for Complex Kids (CHECK) University of Illinois at Chicago	CHECK is a Centers for Medicare and Medicaid-funded Health Care Innovation Award that aims to provide comprehensive community-based care to children and young adults with chronic illness.	Lecture	Hours: * 2.5 hours	CHWs	Children Adolescents	Yes	Complete
A Healthy Mouth for a Lifetime: Beyond the Basics Dental Health Initiative of San Diego/Share the Care	This program trains community members to be a dental health resource for individuals, including parents and older adults. The program expands on the “A Healthy Mouth for a Lifetime: Oral Health for Everyone” publication.	Lecture, Manual, Self-Study	Not available	Health educators/dental health ambassadors	Community Schools Families	Yes	Complete

Name and Developer	Basic Description	Curriculum Delivery	Hours	Target Population for Training	Target Service Audience	CHW Specific	Complete-ness*
Healthy Smiles for a Lifetime: English and Spanish National Center for Farmworker Health	This curriculum provides detailed lessons and activities for training Lay Health Workers on dental health issues so they can return to their communities and share the information they learned.	Lecture, Manual	Lessons: 7 Hours: 8	Lay health workers / CHWs	Migrant families and communities	Yes	Complete
Minnesota Community Health Worker Curriculum Outline Minnesota Community Health Worker Alliance	This is a course that focuses on a broad range of topics needed to understand and promote oral health.	Lecture	Not available	CHWs	Communities Families	Yes	Partial
Oral Health Competencies for Community Health Worker Training in MD Maryland Dental Action Coalition	This is an outline developed by the Maryland Dental Action Coalition to address oral health.	Lecture	Not available	CHWs	Communities Families	Yes	Partial
Public Housing Residents as Dental Health Advocates / Training for Dental Health Advocates Boston University	This training was created by the Boston University Henry M. Goldman School of Dental Medicine for public housing residents as part of a project aimed at improving oral health.	Lecture	Lessons: 6	Dental Health Advocates	Public housing residents	Yes	Complete
SAPNA Oral Health Project Albert Einstein University	South Asian Parents and Navigators' Action for oral health (SAPNA) is a program to support moms and families to learn about caring for teeth in 12–18 month olds.	Lecture	4 days	CHWs	Southeast Asian community	Yes	Complete

Name and Developer	Basic Description	Curriculum Delivery	Hours	Target Population for Training	Target Service Audience	CHW Specific	Complete-ness*
What to do for Healthy Teeth, Texts and Teacher Training Manuals Institute for Healthcare Advancement	This training manual was created to assist lay people to find effective ways to distribute the <i>What to do for Healthy Teeth</i> book.	Lecture, Manual, Self-Study	Lessons: 6 Hours: 1-1.5 total	Community volunteers, health educators, and health care professionals	Parents Families	Yes	Complete
Where There is No Dentist Hesperian Health	This is a book that is intended to guide community health workers and individuals how to implement basic oral health treatments when no dentist is available.	Self-Study	Varies because self-study	CHWs, individuals	Community Schools Clinics Parents Families	Yes	Complete
AAP's Protecting All Children's Teeth (PACT): A Pediatric Oral Health Training Program American Academy of Pediatrics	This presentation provides an in-depth discussion on prevention methods to assist in oral health counseling and anticipatory guidance.	Lecture	Not available	Healthcare providers	Parents Families	No	Complete
Dental Health Ambassador Training Manual USCD Pre-Dental Society	The Dental Health Ambassadors program is the educational outreach component of the UCSD Pre-Dental Society. Society members are trained and certified as Dental Health Ambassadors with the help of the Share-the-Care Dental Initiative of San Diego County. The goal is to raise awareness for oral health.	Lecture	Not available	Students	Community Schools Families Clinics	No	Complete

Name and Developer	Basic Description	Curriculum Delivery	Hours	Target Population for Training	Target Service Audience	CHW Specific	Complete-ness*
Health & Safety in Childcare Setting: Promoting Children's Oral Health California Childcare Health Program (UCSF)	This curriculum provides up-to-date information and strategies to promote oral health that are specific to infants and young children. It also provides effective and practical lesson plans for child care providers, parents and children. It is intended for those working in the field of early child care and education.	Lecture	Lessons: 6 Hours: 2-4	Health Professionals and Child Care Providers	Community Schools Families	No	Complete
Smiles for Life: A National Oral Health Curriculum American Academy of Family Medicine	This is a pediatric oral health course for physicians.	Self-Study	Hours: 1.5	Family medicine physicians	Parents Families	No	Complete

* Oral health is part of larger CHW training program. These are just the hours for the oral health-specific curriculum.

Table 2

Final Selected Oral Health Domains for CHW Curricula

Required Domains
<ul style="list-style-type: none"> • Basic tooth anatomy <i>Describe the main layers of teeth.</i> • Pathological factors <i>Define caries. Describe things that cause caries. Describe how caries are formed. Describe periodontal disease and gingivitis.</i> • Early childhood caries <i>Define early childhood caries and baby bottle tooth decay. Describe teething basics and links to caries.</i> • Caries assessment in children <i>Describe how to identify caries or pre-carious lesions in children.</i> • Tooth brushing basics <i>Describe when to start tooth brushing, how often, how long, and with what equipment. Discuss types of toothbrushes. Describe flossing basics.</i> • Fluoride basics <i>Explain what fluoride is, sources of fluoride, fluoride treatments, and the anti-fluoride movement.</i> • Nutrition <i>Discuss kinds of foods and beverages support a healthy mouth and those that cause tooth decay, with emphasis on sugar-sweetened beverages.</i> • Oral health recommendations for children <i>Describe recommendations for dental visits and home oral health behaviors.</i> • Cultural humility <i>Discuss approaches to understanding variations in cultural practices and how to promote oral health recommendations in diverse populations.</i> • Health disparities <i>Discusses inequalities that occur in the provision of healthcare and access to healthcare across different racial, ethnic and socioeconomic groups.</i>
Optional Domains
<ul style="list-style-type: none"> • Oral health during pregnancy <i>Describe recommendations for oral health during pregnancy.</i> • Special needs <i>Discuss approaches to and resources for populations with medical complexities.</i>