Chapter

Oral Health in Communities and Neighborhoods (OHICAN) Pilot Project: The Burden of Poor Oral Health

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Abstract

Poor oral health afflicts many low-income and other vulnerable populations. Lack of access to oral health can lead to unnecessary tooth decay, periodontal disease, pain, and the advancement of oral cancer. The absence of preventive care often leads to unnecessary and expensive visits to hospital-based emergency departments to address the pain of dental disease but not the causal conditions. The consequences on inequitable access to dental care are significant for individuals, families and communities. The OHICAN pilot project looked to address the lack of equitable access to care by creating new points of access, training medical providers to perform oral exams and apply fluoride when indicated, thus increasing the oral health workforce, utilizing technology to bridge clinical practice, education, training and research, educating stakeholders to allow dental hygienists to provide preventive care under general supervision, and creating business models that will assist others who seek to create a dental home for those they serve. Social, political and economic forces all contribute to varying degrees in terms of equity in healthcare. The work of OHICAN was designed to create a blueprint for potential solutions to these issues in order to foster oral health equity. Changes to improve access to dental care can take place in a relatively short period of time when all who care and are impacted by this continued unmet oral health need work together.

Keywords: oral health, business plan, app, marginalized communities, dental, non-traditional provider, school-based clinic

1. Introduction

Poor oral health afflicts many low-income and vulnerable populations with wide disparities in untreated tooth decay, other oral diseases, and days of restricted activity for children [1]. Untreated tooth decay and tooth loss for adults is significantly higher in low-income groups and racial minority populations compared with their higher-income and non-Hispanic white counterparts [1]. The OHICAN pilot project seeks to address the vast inequities in access to oral health care for marginalized, low-resourced, and minority communities by creating a comprehensive oral health network designed to increase access to preventive and restorative dental care in Georgia.

The Centers for Disease Control and Prevention (CDC) reports that one in three children aged 2 through 5 in families with incomes below $10,000 experienced at least one decayed tooth that had not been treated [1]. In contrast, only 1 in 10 preschool children in families with incomes of $35,000 or higher had untreated caries [1]. The CDC indicates this disparity rate is true for teenagers and adults as well.

Oral health is important for many reasons. Untreated caries can lead to problems with eating, speaking, and attending to learning in children, and work attendance in adults [1]. Untreated caries and periodontal (gum) disease will lead to tooth loss. CDC survey data show low-income adults suffer more severe tooth loss than their wealthier counterparts [1, 2]. Adults in families earning less than $15,000 per year were more than 2-1/2 times as likely to have lost six or more teeth from decay or gum disease as adults in families earning $35,000 or more [1].

A 2014 Georgia Department of Public Health report outlines the following dental health disparities in Georgia [3]:

- "The prevalence of tooth decay among children with low socioeconomic status (SES) is 50% higher than the prevalence of tooth decay among children with high SES."

- "The proportion of non-Hispanic Black and Hispanic high school students who visit an emergency room (ER) or urgent care center for oral or dental problems (10.3% each) is twice the proportion of non-Hispanic white high school students who visit an ER for the same problems (4.9%)."

- "Adults earning $50,000 or more per year are significantly more likely to visit a dentist than adults with income less than $15,000 a year (85% vs. 39%)."

These disparities contribute to poor dental health outcomes in the state of Georgia. The Georgia Department of Public Health has identified the following five dental outcomes in Georgia that need to improve [3]:

1. The presence of dental caries in young children age 2-5 years and children in 3rd grade

2. Untreated dental decay

3. Sealant on molars

4. Early detection of oral and pharyngeal cancers

5. Oropharyngeal cancer mortality

Frequently cited barriers to improving the oral health disparities and achieving Georgia's target outcomes include a shortage of dentists in areas of the state, unwillingness of dentists to participate in Medicaid due to low reimbursement rates and perceived high no-show rates, limited adult Medicaid dental benefits, cost of care, and unresolved patient education issues. These barriers contribute to a lack of access to oral health care in low income communities throughout the state.

Beyond the public health consequences of poor oral health are outcomes that affect the financial, educational, and workforce aspects of families and communities. This can lead to a self-reinforcing cycle that prevents families from improving their socioeconomic status and overall quality of life.

1. Studies have found that toothaches are the number one reason for school absence. Toothaches are given as a reason for school absence seven times more than asthma [4, 5]. Missed school days limit a student's access to education and education outcomes are essential to moving out of low-income status.

2. Parents miss work when their child cannot attend school due to toothaches, which limits their ability to earn income on those days [6]. Missed productivity of workers also affects the companies and businesses that employ them.

3. The Health Disparities Report 2008 indicates that Fulton County, Georgia had 35,292 preventable visits to the Emergency Room (ER).[1] Nine thousand of these visits every year are for non-traumatic dental conditions. ER visits are the most expensive form of oral healthcare. Regretfully, ERs are not set up to provide the dental care needed to address the emergency, and patients leave with prescriptions for pain medications and antibiotics, the appropriateness of which is in question. A reduction in these preventable healthcare costs would greatly improve the financial stability of Grady Hospital and other ERs that see a large percentage of uninsured patients.

Poor oral health can lead to unnecessary tooth decay, periodontal disease, pain, and even the quiet and deadly advancement of oral cancer [7]. It also leads to unnecessary and expensive visits to hospital-based ERs to address the pain of dental disease but not the causal conditions. Finding ways to improve oral health in low-income communities is essential to good health and helps individuals move from poverty to middle class status. Improving oral health requires a collaborative effort of a diverse array of health care workers to ensure equitable outcomes that lead to overall health.

2. Wicked problem impact project (WPIP) description

Poor oral health in low income communities is a wicked problem that inflicts significant burdens on children and adults alike. The communities in which we work continue to have wide disparities in untreated tooth decay and restricted activity days for children. The lack of trained providers who can address these problems from both a definitive treatment approach and a preventive perspective is at the heart of the issue. The need for increased oral health literacy among people of all generations throughout the state adds to the disparity. To help close existing gaps in care, knowledge of oral health and disease needs to be incorporated into the fabric of the healthcare system (ie, healthcare professionals who are not in the dental health field) across the lifespan.

OHICAN is a pilot project in which we seek to increase access to oral health services and improve community knowledge on the importance of preventive oral health care in three low income and minority neighborhoods in Atlanta. Our intent is to work locally to demonstrate what can be done and deploy the successes and products nationally and internationally. The OHICAN program is composed of the following initiatives:

[1] More information on the 2008 Georgia Health Disparities Report can be found here: https://dph.georgia.gov/sites/dph.georgia.gov/files/related_files/site_page/Georgia%20Health%20Equity%20Initiative.pdf.

- increasing community knowledge of preventive oral care
- expanding existing oral health care capacity in local communities (includes training and education initiatives and incorporating oral health into care protocols for medical care providers)
- creating new points of access
- advocating on behalf of evidence-based methods to expand care and lower costs
- rolling out/disseminating results of the OHICAN project and transitioning it to an initiative for deployment nationally and internationally

Several key messages recur throughout this work and in this chapter:

- Individuals cannot be healthy without good oral health.
- Technology can be used to bridge clinical practice, education and training, research, and health policy.
- Integrating medical and dental efforts will increase access to preventive care.
- Changes to improve access to dental care can take place in a relatively short period of time when all who care about and are impacted by this continued unmet oral health need work together.

3. Methods

3.1 Context and background

The Oral Health in Communities and Neighborhoods (OHICAN) project is part of the Urban Health Initiative (UHI) at Emory University in Atlanta, Georgia. The geographic area for project development and implementation was three zip codes in Atlanta, Georgia—30311, 30314, and 30318. Leadership for the OHICAN project was provided by an interdisciplinary team from the Robert Wood Johnson Clinical Scholars program and supported by numerous community and academic partners. Our immediate goal was to increase access to oral health services in three target low income and minority neighborhoods in the Atlanta area. Our longer term goal was to develop a blueprint of solutions including documented approaches/ways of work, tools, and resources that could be expanded into a program for addressing poor oral health in communities and neighborhoods outside the project area.

3.2 Approach

Impetus for the OHICAN project came from a 2013 community needs assessment (CNA) done by Dr. Moore and the Emory Rollins School of Public Health faculty, staff and students in a marginalized community of West Atlanta composed of zip codes 30311, 30314 and 30318. According to the West Atlanta Oral Health Community Needs Assessment, lack of equitable access to care was among the top reasons for poor oral health in underserved and other vulnerable populations.

3.2.1 Values guiding our work.

Our values included (1) health equity, (2) cultural sensitivity and relevancy, (3) products we developed would be empowering, easy to use, informative, and self-gratifying, (4) our work would bridge education and training, clinical practice, research, and health policy, and be provided at no cost to users, (5) reflect a desire to serve multiple elements of the healthcare system such as providers and students, patients and families, stakeholders, and partners.

3.2.2 Starting point

Our initial step was to perform a needs assessment in our three target zip codes. We engaged students from the Emory University Rollins School of Public Health to work with our team. Together, we prepared the needs assessment using their expertise combined with information gleaned from interviewing patients, providers, and members of the community we planned to serve. The CNA was based on the OHIP-14 guidelines. The assessments were through in-person interviews using a digital platform. There were also focus groups led by experienced public health professionals that contributed to the knowledge obtained.

In addition to confirming results of the 2013 CNA, our assessments pointed out the need to involve and engage local community members and partner with other individuals and organizations with interests in oral health and whose work aligned with our goals. We formed a community advisory board (CAB) composed of people representing the diversity of the community from faith-based, private and public including non-profit organizations. Additionally, individuals with an interest in oral health that resided in the community were included in this CAB. The age span was from 16 to 74 with primarily female representation.

We expanded our team to include partners from non-profits, public health organizations, business, professional associations, and universities. Our working group included the leadership team of Charles Moore MD, David Reznik DDS, and Hope Bussenius DNP; the Community Advisory Board (CAB); and the partner organizations shown below.

- Georgia Center for Nonprofits
- Emory Rollins School of Public Health
- Emory Business School
- Georgia State School of Public Health
- Emory Urban Health Initiative
- Emory School of Nursing
- NYU – Langone Advanced Education in General Dentistry Residency Program
- Georgia Department of Public Health
- Georgia Dental Hygiene Association
- Georgia Dental Association

3.2.3 Establishing ways of work

Once we had information from community needs assessments, we partnered with the Georgia Center for Nonprofits to develop a strategic plan. We determined who we serve, impacts on those we serve, indicators of success, strategies and key actions, funding strategies, community engagement strategies, key actions, and our next steps.

The strategic plan served as the basis for a monitoring and evaluation plan, which we jointly developed with students from the Emory Rollins School of Public Health. The plan included our program goal, objectives, specific sub-activities, process and output indicators, baseline data, target data, source of data collection and means of verification, frequency of data collection, and responsible team members. In year two of the project, we modified the monitoring and evaluation plan with assistance of the Robert Wood Johnson Foundation Clinical Scholars Evaluation team.

We adopted essentially two modes of work. The first mode was personal contact. Examples of activities included building relationships, delivering hands-on trainings in oral health screening and preventive care, working with the CAB and our partner organizations, collaborating with professional organizations and universities, advocating for and supporting evidence-based methods to expand care and lower its cost, engaging medical care providers in our efforts, serving on boards relevant to our goals, providing lectures and presentations to appropriate audiences, and writing articles and publishing them in peer-reviewed journals.

To expand the reach of our personal contact work, we incorporated technology solutions to broaden the scope of our innovative changes and make them transformative and sustainable. We explored various transformative healthcare models that included technology-based solutions and focused on creating innovative change at the system level, but found none that embraced the values we espoused. Therefore, we decided to incorporate the values stated above in our development of technology-based interventions. We called our approach the 2 Transformative Technology Evaluation and Assessment Model or 2TEAM.

We employed both modes of work (personal contact and technology) in addressing the five OHICAN initiatives:

- increasing community knowledge of preventive oral care
- expanding existing oral health care capacity in local communities (includes training and education initiatives and incorporating oral health into care protocols for medical care providers)
- creating new points of access
- advocating on behalf of evidence-based methods to expand care and lower costs
- rolling out/disseminating results, outcomes, and accomplishments of the OHICAN project and transitioning it to an initiative for deployment nationally and internationally

3.2.4 Increasing community knowledge of preventive oral health care

Personal contact work in this area included (1) educating our CAB of the importance of oral healthcare; (2) developing and conducting a dental provider

needs assessment; (3) engaging our CAB in discussions regarding best ways to increase community knowledge and seeking their input and feedback on plans, activities, and educational brochures; (4) work with local medical providers to increase their willingness and capability to incorporate basic dental preventive education into their patient encounters, and learn the appropriateness of knowing when more extensive dental care was needed; (5) developing a brochure called OHICAN in which we introduced ourselves and the OHICAN program, listed service locations, services available, contact information, defined who was eligible to access the services, and provided facts and information about oral healthcare. We had 750 copies of the OHICAN brochure printed and distributed to schools and community organizations in the target area. At these events, we measured the baseline level of knowledge of the respondents then had a brief educational intervention followed by a post survey. These educational interventions to raise community awareness were done in-person. Additional information was provided to the participants through a brochure that also directed the reader to the OHICAN website discussed below.

We developed two technology-based solutions that contribute to increasing community knowledge of preventive oral care. One was a culturally sensitive website (https://ohican.org/) to improve communication and provide information on free resources and local opportunities for dental care. The brochure discussed above is on the website.

The second technology-based solution is a smartphone app (OH-I-CAN) available for download on the website. The phone app has two questionnaires, the OHIP (Oral Health Impact Profile) and the ECOHIS (Early Childhood Oral Health Impact Scale). The OHIP measures people's perceptions of the impact of oral health disorders on their well-being and includes questions regarding dysfunction, discomfort, disability, and handicap resulting from oral health conditions. The ECOHIS measures the quality of oral health-related quality-of-life of preschool children and their families. Both questionnaires are culturally sensitive, easy to use, and self-gratifying because they provide immediate results to improve the health of the individual(s) entering data.

3.2.5 Expanding existing oral health care capacity in local communities

Addressing the need for increased literacy about the importance of oral health is only part of a comprehensive solution. Once people are aware, they need places to go to obtain dental care. Lack of adequate capacity to care for populations in low income and minority areas is a major issue [7, 8]. Personal contact work we did to expand dental health care capacity included (1) identifying, engaging, and training non-traditional dental care providers to perform oral exams and apply fluoride when indicated; (2) training providers to be aware of the requisite steps to address oral health issues and enhance preventive oral health measures in communities (approximately 1000 non-dental healthcare professionals were educated and trained in this area); (3) educating hygienists of recent changes in licensing laws that allow their profession to provide preventive care under general supervision; (4) educating stakeholders (primarily dentists) of the implications of the changes in dental hygienists' practice laws (approximately 325 dentists were educated in this area); (5) supporting implementation efforts for the expanded role for hygienists; and (6) integrating medical and dental efforts to increase access to preventive care.

We used technology to extend the reach of our in-person intervention efforts, primarily through the development of the OHICAN website. The website has educational tools for providers, training modules, provider protocols, videos, a toolkit and other resources, and connects to a metadata repository that gathers

information from the quality of life questionnaires on the smartphone app. Using the repository database, providers can examine the oral health-related quality of life of individual patients at discrete points or review an individual patient's status over time. As the repository builds and appropriate safeguards are put in place, providers can compare results with others on national and international levels. The repository will enable providers and researchers to uncover information including hidden patterns, unknown correlations, and customer/patient preferences that can help providers make better-informed clinical decisions. The app, repository, and database will also allow for population-based studies revealing need(s) based on zip code, age, illness, and other parameters.

3.2.6 Creating new points of access

Another way to increase community capacity for providing dental care is to create new points of access. To this end, we (1) partnered with dental residency programs to expand the number of residents at existing sites and establish new ones; (2) worked to establish and support new dental clinics in marginalized neighborhoods; (3) supported the establishment of oral health programs at school-based health centers; and (4) supported efforts to attract dental practices and practitioners to areas with high unmet needs.

Establishing oral health practices can be quite expensive. To aid practitioners and stakeholders in determining financial requirements for establishing new points of access in underserved areas of Georgia, we engaged the Office of Business Practice Improvement, Emory University's Internal Consulting Group, to develop an oral health business plan. The model includes specific service and staffing costs, unreimbursed costs (time for client education, team meetings, referral coordination, training of staff), and supply and technology costs. Any new program or practice must be fiscally sound, therefore our model allows the consideration of costs, identification of payment opportunities, and development of cost containment strategies. The business model allows for an individual or practice to accurately apply the conditions of their unique environment and elicit the costs of running a program within that environment. The financial model also includes cost projections based on volumes and projected revenue, and can provide pro-forma financial statements to give an idea of how the actual statement would look if the underlying assumptions hold true. The interactive business plan is available on the OHICAN website.

3.2.7 Advocating on behalf of evidence-based methods to expand care and lower costs

Throughout our team's project, we personally engaged in advocacy efforts at the individual, regional, state, and national levels to build support for our program. One example was our work in supporting the Dental Hygiene General Supervision for Preventive Care Bill. It was passed into law on January 1, 2018 with the goal of increasing access to preventive oral health care for children and adults in under-resourced areas. In collaboration with the Georgia Dental hygiene Association, Georgia Dental Association, and Eunice Chay, DMD, MPH from the Grady Health System Advance Education in General Dentistry Residency (AEGD) program, we created an implementation toolkit to assist providers in both public and private sectors implement the law. Dr. Reznik from the OHICAN team continues to serve as chair of the general supervision implementation subcommittee, and all three of the OHICAN team leaders are board members of the Georgia Oral Health Coalition.

On the OHICAN website, we included a tab specifically for advocacy in which we post relevant articles, white papers, and other items of interest to advocates. Additionally, the Toolkit for Incorporating General Supervision in Dental Private Practice and Safety Net Settings in Georgia, a product of our collaboration with Dr. Chay, is available on the website.

3.2.8 Rolling out/disseminating results of the OHICAN pilot project and transitioning it to an initiative for deployment nationally and internationally

We employed both in-person and technological methods in rolling out and disseminating the results of the OHICAN project. We designed and implemented a social media roll out (Facebook, Twitter, Instagram) to share information about OHICAN and its purpose and uses, results, and tools. A critical part of dissemination included educating medical providers (physicians, nurse practitioners, physician assistants, nurses) and oral health professionals about the website and its learning opportunities, specifically additional training and education modules, toolkits, videos, and further information on the OH-I-CAN app available on the website. Attendees were instructed through presentations, seminars, and skills workshops. Included in educational sessions was an introduction to the OHICAN website, www.OHICAN.org, and the downloadable app and its purposes and uses. Additional dissemination efforts were accomplished through publication of aspects of this work in peer reviewed journals and via radio and other media appearances, and we plan additional publications for the immediate future. We also incorporated concepts of the OHICAN project in an inter-professional course titled Social Determinants of Health and Health Equity, developed in collaboration with Emory University.

4. Outcomes/accomplishments/results

Oral health is an essential component of good health. Not only is the oral system the primary way we take nutrients into our bodies through the food we consume, the health of that system is critically associated with other health outcomes. Appropriate oral health care and taking preventative measures to protect against diseases of the oral cavity, craniofacial diseases, and cancer are critical elements of good health. However, poor oral health and lack of access to care among low-income, minority, and other vulnerable populations is a significant contributor to health disparities for this population. The OHICAN project developed and implemented multiple approaches using both personal contact and technology to address the lack of equitable access to care. Results, accomplishments, and outcomes of the project are summarized below.

4.1 Starting point and ways of work

- Performed 3 dental Community Needs Assessments (CAN) with Rollins School of Public Health (completed in urban setting; pending in rural settings)
- Performed dental provider needs assessment
- Developed Strategic Plan and Monitoring/Evaluation Plan

4.2 Increasing community knowledge of preventive oral health care

- OHICAN website with educational materials
- Distributed 750 copies of informational brochure; brochure available on website
- Educated 12 CAB members on the importance of preventive oral health care
- Delivered 52 presentations to more than 1700 individuals in the target communities
- Baseline and follow-up assessments of community knowledge of preventive oral health care, demonstrated a greater than 95% increase in knowledge and best practice for oral health care

4.3 Expanding oral health care capacity in local communities

- Completed OHICAN education and training of 300 BSN, ABSN, MSN and AMSN students
- Provided oral health education to inter-professional group of 65 medical providers and support staff
- Gave 2 lectures to more than 250 dental hygienists to inform them of a new law (Dental Hygiene General Supervision for Preventive Care Bill) allowing them to perform oral care preventive services under general supervision and to discuss best practices

4.4 Creating new points of access

- Established a clinic to provide oral health services (Neighborhood Union) in a vulnerable neighborhood
- Provided access to dental screening and other services at Hollis Academy, a Science, Technology, Engineering, and Mathematics (STEM) school in the Atlanta Public School System serving pre-kindergarten through eighth grade students
- Created oral health programs at two additional school-based health centers
- Worked with NYU-Langone AEGD residency program in Georgia, Grady Health System, Ben Massell Dental Clinic, HEALing Community Center and Good Samaritan Atlanta, to increase the number of dental residents to be trained from 4 to 6 providers
- Extended the reach of the residency program to Albany, Georgia by securing a residency site with two residents beginning in the summer of 2020
- Developed the Oral Health Business Plan Interactive Resource in conjunction with the Emory University School of Business

4.5 Advocating on behalf of evidence-based methods to expand care and lower costs

- Supported and advocated for the Dental Hygiene General Supervision for Preventive Care Bill that passed and became law on January 1, 2018
- Created an implementation toolkit to assist dentists and dental hygienists in implementing the new law in both the public and private sectors (toolkit available on website)
- Continued work with Georgia Dental Hygiene Association, Georgia Dental Association and Dr. Chay from the Grady Health System Advance Education in General Dentistry Residency (AEGD) program
- The three members of the OHICAN leadership team are board members of the Georgia Oral Health Coalition
- Dr. Reznik (leadership team) serves as chair of the general supervision implementation sub-committee
- Included a tab on website to post updated information regarding advocacy efforts and posted two articles of interest

4.6 Rolling out/disseminating results of the OHICAN project and transitioning it to an initiative for deployment nationally and internationally

- Designed and completed social media rollout
- Educated physicians, nurse practitioners, physician assistants, and nurses on available learning opportunities of OHICAN initiative
- OHICAN app and website launched in local and global areas, back to school programs in Georgia, a Federally Qualified Health Center (FQHC) dental practice, and is included in the Georgia Department of Public Health State Oral Health Plan
- Through connections of a member of the OHICAN leadership team, launched the website and smartphone app in mobile clinics in Haiti

4.7 Website and app

- Completed OHICAN Smartphone application and connected metadata repository
- Established OHICAN website, www.ohican.org
- Developed OHICAN app with registry for patient needs assessment via the Oral Health Impact Profile 14 (OHIP 14) and the ECOHIS for assessing oral health-related quality-of-life for children
- Launch of OHICAN smartphone application locally and globally
- More than 25,000 users of OHICAN initiative

4.8 Tangible products

- Publications
- Presentations
- Educational software (see www.OHICAN.org)
- Trainings on oral health screening and preventive care such as application of fluoride varnish or fluoride rinses (see www.OHICAN.org)
- Extramural funding
- OHICAN Smartphone App (see www.OHICAN.org)
- OHICAN Website (see www.OHICAN.org)
- OHICAN healthcare provider protocol (see www.OHICAN.org)
- OHICAN Toolkit (see www.OHICAN.org)
- Oral Health Business Plan Interactive Resource (see www.OHICAN.org)

5. Discussion

The OHICAN pilot project was designed to address the burden of poor oral health in marginalized communities. A myriad of factors contribute to poor oral health and include access to and cost of care. Lack of dental insurance and/or transportation to a dental facility both impact an individual's ability to obtain oral healthcare. Factors such as proximity to fresh fruits and vegetables and grocery stores impact the ability to make healthy choices. Social, political and economic forces all contribute to varying degrees to the lack of equity in healthcare. The work of OHICAN was designed to create a blueprint for some potential solutions to these issues. Most training programs for healthcare professionals have neither an exposure to identifying oral health issues, nor do they have educational opportunities for learners to develop the ability to identify and definitively treat oral health issues. Development of training videos in conjunction with specific algorithms for providers should provide healthcare workers, and in particular non-dental healthcare workers, with tools to assist in the treatment of their patients with oral health issues. Likewise, providing in-person trainings in nursing schools, physician assistant schools, and other medical healthcare training programs should help equip future providers to be more adept in addressing dental-related problems in their patients.

While addressing the educational exposure of non-traditional dental care providers, it is also important to increase the level of oral health literacy of the general public across the lifespan. In an ideal setting, oral health would be initiated at the stage of infancy. Training parents or caretakers on the expected oral health milestones and appropriate methods of care in a similar manner as is done with the stages of crawling to walking from infancy to toddler stage, to the teenage years, young adult, to senior years would be an excellent start. Oral health messages and healthy practices can also be reinforced through the creation of new access points that will allow more people to receive care.

A significant part of increasing oral health in marginalized communities includes advocacy efforts to change legislation that in turn creates opportunities for providers to perform at the top of their licenses. Additionally, advocacy efforts are needed to create funding sources for seniors to receive required care such as inclusion of dental benefits for Medicare recipients.

Data are required to provide evidence-based methods for expanding care and lowering costs. The authors are optimistic that data gleaned as a result of the OHICAN App and connected repository will assist in this process. Through the collection of quality of life data which can be compared on a global platform, similarities and differences in patients' experiences can be compared and contrasted across differing age groups, sex, geographic location, and other parameters. Examinations of this type should help provide the basis for evidenced-based work to effectively address the burden of poor oral health in low-resourced communities.

In addition to improving access to oral health services and increasing widespread community prevention efforts, services provided by insurance and public programs must be expanded. For instance in Georgia, adult Medicaid recipients have access only to emergency care and extractions. The disparity between the privately insured and uninsured populations is even larger for children and older adults. Unmet dental care needs continue to be highest among individuals without insurance.

The OHICAN team has worked to train non-traditional providers but there remains the issue that a limited supply of dental providers are willing to work with underserved populations. This shortage is even more pronounced in more rural parts of the state. Additionally, racial and ethnic minorities are under-represented in the dental profession. Minority dentists are more likely to practice in communities that have larger minority populations. Also, African-American and Hispanic-American dentists disproportionately serve African-Americans and Hispanic Americans, respectively, in their private practices and patients are more likely to seek health care from professionals of a similar culture or background. As the population continues to have significant increases in ethnic and racial minorities, there will be an ever increasing need for a more diverse dental workforce, which has been a focus of the American Dental Education Association.

Future efforts by the OHICAN team will include expanding the pool of dental providers and non-traditional dental providers in conjunction with increasing the number of access points and enhancing the oral health literacy of communities and neighborhoods.

6. Leader learning

Through this work, our OHICAN team employed several health equity skills which can be grouped into six categories: communications, cultural competency, program planning and development, analytic assessment, community practice, leadership, and systems thinking. Cultural competence is the ability to understand, communicate with and effectively interact with people across cultures. Program planning and development grow from the base of having appropriate communications in conjunction with cultural competency. This then allows for the repeated analysis of the work at hand with appropriate planning for the community of practice. The group of people who share these common concerns are able to come together in a more effective and efficient manner to fulfill both individual and group goals. Throughout the process, we have been able to identify opportunities to implement multiple leadership styles and identify ways to impact the issue from a systems perspective. By strategically combining health tools and effective communication processes, we have an opportunity to improve healthcare quality and safety.

As with all projects, there are always hurdles to overcome. We faced time limitations establishing effective partnerships. Working to educate key players involved in a legislative process to help increase equitable access to dental care was time intensive as well. Not only did we need to educate key legislators on the human toll of unmet dental need, we had to moderate between the two main constituents in the legislative process: the Georgia Dental Association and the Georgia Dental Hygiene Association. Even after the governor signed the legislation into law, implementation of a new legislative change is taking a significant amount of time to take hold and make a difference in access. We had a 2nd year dental resident put together an implementation toolkit for the new legislation. In over a year and a half since the legislation granting dental hygienists the ability to perform preventive dental care under general supervision was signed into law, only a handful of practices have taken advantage of this new program. Team OHICAN leaders are members of the Georgia Oral Health Coalition and are involved in the implementation of the program.

One of the main barriers to expanding access to oral health care is the expense of starting a dental practice. Dental equipment and supplies are very expensive. Whether you build a two operatory or four operatory clinic, you will still need to purchase basic equipment such as a compressor, suction, autoclaves, X-ray units, developing equipment, an assortment of hand pieces, and an electronic dental record. Staffing is a substantial expense. Building a new program does not mean the patients will automatically show up for care. Time and effort are needed to market the program to those most in need. Salaries for dentists and dental hygienists are expensive. Even with exceptional outside assistance from Emory University's Goizueta School of Business, developing a working business model was time intensive.

Initiating a school-based program involves numerous steps including working with school leadership and families. Establishing relationships and gaining approval for a new service in a school requires a lot of time. As one of our consultant colleagues said, a lot of spaghetti dinners are involved to gain acceptance from families and school leadership.

Our initial plan assumed if you build a new oral health program in an area of high unmet need, patients will be lining up for the service. Regretfully, this was not the case. Oral health literacy for most Americans is lacking. Education and marketing must occur early and often in the process. While this is time intensive, the benefits outweigh the use of education and marketing resources to ensure equitable access to dental care.

Dental students are graduating with enormous educational debt. Corporate dental service organizations, many backed by hedge funds or other sources of investment, are actively recruiting new graduates and even residents before the end of their residency programs. The combination of economic pressure and promises of very high salaries from corporate dentistry makes it difficult to recruit dentists to serve in public health settings.

6.1 Recommendations

If tackling this oral health issue in your community, you should:

- Secure extramural funding
- Expand training opportunities for learners
- Ensure you have community buy-in

- Be prepared to increase the number of dentists in residency programs and Federally Qualified Health Centers (FQHC) or FQHC look-alike dental programs
- Secure site-specific data analyses
- Map out potential sites for expansion of new access points for care
- Explore social media rollout resources

We would not recommend you proceed without community input/needs assessment(s), or too broad of a pilot phase. Instead keep your initial activities confined to local efforts for quality improvement before initiating next steps. If your initiative is intended to open new points of access, we suggest avoiding opening too many sites at the same time. Ensure the systems you have created are functioning well and then develop a detailed plan before expanding.

6.2 Best practices

A project like this will consume much more time than you might anticipate with additional job responsibilities. Accomplishing your goals might take much longer than you expected, so ensure your local institution/employer supports the needed effort for your project. You should also expect your initial plan to change many times, so be open to new opportunities. Ensure all components of the effort and participants are on the same page throughout the project. Wicked problems take a lot of time and effort to address and take many twists and turns. Communication from the highest levels to those on the ground remains vital.

6.3 Our best pieces of advice

- Keep communicating throughout both high and low moments. Also, do not forget to laugh because it is an amazing opportunity to share and help those who cannot help themselves.
- Working toward a goal to address a wicked problem can be hard work. Know it is good work, and work worth doing!

7. Toolkit

A full description of the toolkit can be found at www.ohican.org. The toolkit provides educational and training materials as well as the capability for research endeavors through an online repository. The OH-I-CAN app, downloadable from the website, contains the Oral Health Impact Profile (OHIP-14), questions on blood pressure and head and neck cancer screening, and the ECOHIS applicable to children. The OHIP-14 is a measure of oral health related quality of life. This tool can be used to study specific populations (i.e. zip code, medical conditions including HIV, head and neck cancer, diabetes) in a very easy to use interface that connects to the online repository. The ECOHIS is designed to measure the quality of oral health-related quality-of-life for preschool children and their families. Below is a list of the technology solutions developed by the OHICAN project team.

- Website: OHICAN.org
- Smartphone App: OH-I-CAN for iOS and Android phones
- Online OHICAN Repository
- Twitter: @OHICAN1

A more comprehensive toolkit can be found at https://clinicalscholarsnli.org/community-impact

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