CDA JOURNAL, VOL 45, N°8

Case Study: School-Based Oral Health Screening in San Francisco as an Essential Public Health Service

Jodi D. Stookey, PhD; Margaret Fisher, RDH; Lisa H. Chung, DDS, MPH; Stuart A. Gansky, DrPH, MI; Mary Jue, RN, MS; Susan A. Fisher-Owens, MD, MPH; Deborah Elam, MS, CAE; Christine E. Miller, RDH, MHS, MA; Claire Sit, RDH; Prasanthi Patel, MPH; and Irene V. Hilton, DDS, MPH

ABSTRACT This review explores school-based oral health screening as an essential public health service in San Francisco between 2001 and 2017. Available data suggest that the screening was associated with all 10 essential public health services, including empowering the community, mobilizing partnerships and changing policy and practice to improve children's oral health.

AUTHORS

Jodi D. Stookey, PhD, is a senior epidemiologist at the San Francisco Department of Public Health: Maternal, Child and Adolescent Health Section and chair of the CavityFree SF evaluation team.

Margaret Fisher, RDH, is an oral health consultant with the San Francisco Department of Public Health: Child Health and Disability Prevention Program and co-lead of the CavityFree SF collaborative.

Lisa H. Chung, DDS, MPH, is an associate professor at the University of California, San Francisco, School of Dentistry and co-lead of the CavityFree SF collaborative.

Stuart A. Gansky, DrPh, MS, is a professor at the University of California, San Francisco, School of Dentistry and director of the NIH-funded UCSF Center to Address Disparities in Children's Oral Health (CAN-DO). He is also a member of the CavityFree SF steering committee.

Mary Jue, RN, MS, is the program administrator for nursing services and school district nurse at the San Francisco Unified School District and a member of the CavityFree SF access team.

Susan A. Fisher-Owens, MD, MPH, is an associate professor of pediatrics at the University of California, San Francisco, School of Medicine and of preventive and restorative dental sciences at the UCSF School of Dentistry. She chairs the CavityFree SF integration team and is a member of the steering committee.

Deborah Elam, MS, CAE, is the executive director of the San Francisco Dental Society and a member of the CavityFree SF steering committee.

Christine E. Miller, RDH, MHS, MA, is an associate professor and director of community health programs at the University of the Pacific, Arthur A. Dugoni School of Dentistry and a member of the CavityFree SF steering committee.

Claire Sit, RDH, is a registered dental hygienist at the San Francisco Department of Public Health: Dental Services that is responsible for school-based screening, fluoride varnish and sealant programs.

Prasanthi Patel, MPH, is the oral health coordinator at the San Francisco Department of Public Health: Maternal, Child and Adolescent Health Section that is responsible for coordinating CavityFree SF.

Irene V. Hilton, DDS, MPH, is a staff dentist at the San Francisco Department of Public Health and a clinical instructor at the University of California, San Francisco, School of Dentistry and School of Medicine.

Conflict of Interest Disclosures: *None reported by all authors.*

The Centers for Disease Control and Prevention (CDC) and the National Academy of Medicine (formerly the Institute of Medicine) gauge optimal public health system performance in terms of "10 essential public health services."[1,2] Assessment is fundamental to 1) *monitor* health status, 2) *diagnose* community health problems and identify modifiable risk factors. Assessment can 3) *inform, educate and empower* the community about health issues, 4) *mobilize community partnerships* to solve health problems and provide evidence for 5) *policy development* and programs to promote community health. New policies and programs, in turn, can initiate new policy 6) *enforcement* mechanisms to 7) *link people to care* and 8) trainings to *assure a competent workforce*. Assessment can, furthermore, enable 9) *evaluation* and 10) *research* to inform program outreach

and quality improvement. Public health impacts are expected to flow from regular, iterative programmatic assessment.

In 2000, *Oral Health in America: A Report of the Surgeon General* identified children's dental disease as an epidemic public health problem.[3] Responding to this report, the incoming president of the San Francisco Dental Society (SFDS) approached the director of dental services at the San Francisco Department of Public Health (SFDPH) to explore ways for the two organizations to collaborate to improve children's oral health. At that time, no systematic assessment of the oral health status of San Francisco's children was occurring regularly. The San Francisco Children's Dental Health Committee, a group of dedicated professionals with two decades of experience working together, prioritized development of school-based oral health surveillance.[4] SFDPH and SFDS decided to create an annual kindergarten dental screening program for San Francisco's public schools to identify children with immediate dental needs and enable public health assessment.

Methodology and staffing of the annual kindergarten dental screening program (hereafter denoted "screening") has been described elsewhere.[5] In brief, the screening started as a public-private collaboration between SFDPH, SFDS, the National Dental Society of the Bay Area and local public schools. In 2001, the screening's first year, 44 volunteer dentists screened more than 3,300 children in San Francisco's 73 public schools. Since then, the screening has consistently served an average of 4,000 kindergartners, more than 95 percent of enrolled children, annually.

This case study reviewed information from publicly available sources to explore systematic oral health screening as an essential public health service in San Francisco between 2001 and 2017.

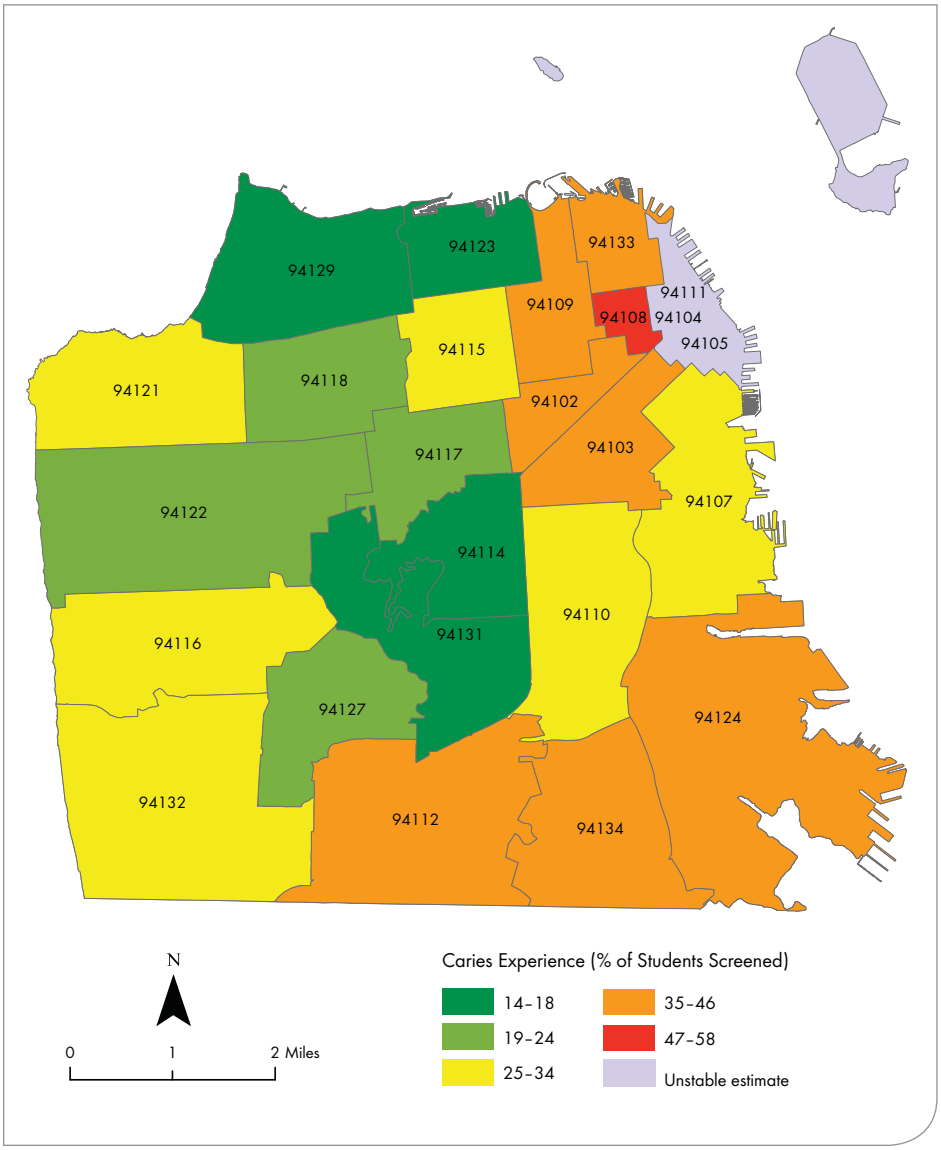


FIGURE 1. Percentage of kindergartners in public schools in San Francisco with caries experience in their primary teeth by child's ZIP code of residence, 2012–2013. Caries experience is defined as either untreated or treated (restored or filled) tooth decay.

The specific aim was to describe ways that the screening — i.e., assessment — was associated with other essential public health services with potential to improve children's oral health. The analysis provides preliminary data to operationalize the screening in terms of 10 essential public health services for future oral health intervention planning and evaluation. Results will inform measures to index the extent and quality of linkage of the screening with other essential services.

Methods

This review provides an exploratory, retrospective case study of the screening offered to San Francisco public elementary schools from 2001 to 2017. The program's 17-year continuous and countywide reach was unique among California's 58 counties during this period.

Information about the screening was gathered from publicly available documents, including peer-reviewed journal articles, community health

needs assessments, program planning documents, San Francisco Health Commission documents and media articles. Resources were identified using Google and PubMed searches and through personal communication with local oral health stakeholders affiliated with the San Francisco Health Improvement Partnership (SFHIP) or CavityFree SF. Google and PubMed search terms included "San Francisco" with "oral health screening," "children's tooth decay," "children's caries," "caries experience," "Children's Oral Health Strategic Plan" or "SFHIP oral health." Throughout this review, caries experience is defined as the prevalence of either untreated or treated (restored or filled) tooth decay.

The review included materials that mentioned the screening, used screening data or implied any impact, positive or negative, direct or indirect, of the screening in 2001–2017. Screening impact was not restricted to immediate access to dental care or treatment of untreated caries. Each mention of the screening or use of screening data was abstracted from the sources and tabulated in qualitative terms, grouped by essential public health service[1] and year. The review summarized changes in monitoring, investigation, community partnerships, policy development, law enforcement, care delivery, workforce training, evaluation and/or research related to the screening. This descriptive case study did not seek to test for causal effects of the screening, estimate unbiased magnitudes of association or control for confounding variables. Local oral health resources and contextual factors, which might confound or modify relationships between the screening and children's caries experience, were described to facilitate results interpretation and guide future program planning and evaluation.

Results

The **TABLE** found on cda.org/aug17 summarizes essential public health services in San Francisco that were related to the screening in 2001–2017.

Public Health Service No. 1: Monitor

Since implementation in 2001, the screening enabled systematic monitoring of kindergartners' caries experience and severity status. Screening data were used for community health needs assessment in San Francisco.[6–9] In 2016, protocol to screen for caries experience was extended to children under age 5 at preschools and pediatric clinics.[10] In 2017, Sonoma County requested technical assistance to replicate San Francisco's public-private collaborative model of school-based oral health monitoring.[11]

Untreated caries was 60 percent higher in schools where at least 50 percent of students qualified for free/ reduced price meals.

Public Health Service No. 2: Diagnose and Investigate

Analysis of 2001–2005 screening data showed kindergartner caries experience was unevenly distributed across San Francisco by race/ethnicity, income and residential neighborhood.[5] Low-income, Asian, Hispanic and black children had significantly greater odds of experiencing caries compared to white, higher-income children.[5] Untreated caries was 60 percent higher in schools where at least 50 percent of students qualified for free/ reduced price meals.[5] In 2004–2005, the prevalence of untreated caries was 51 percent among children in the Chinatown neighborhood and 38 percent among children living in the southeast section of San Francisco versus 29 percent citywide.[5]

Although 2001–2005 trends suggested oral health improvements for all racial/ethnic groups, lack of change in year-to-year caries severity suggested that the caries burden was becoming concentrated in fewer children, widening caries experience disparities.[5] By 2008, the prevalence of untreated decay decreased to 5 percent in higher-income schools but was 40 percent (eight times higher) in lower-income schools.[12] Differences among neighborhoods persisted over time (**FIGURE 1**).

The screening results stimulated investigation into caries risk factors for low-income, minority, San Francisco children aged 0–5. Investigations included analyses to describe dental care utilization, focus groups to identify barriers to accessing dental care and pilot studies to determine the feasibility of offering preventive dental services in alternative settings.

Dental care utilization before age 5 appeared to be protective against caries experience for San Francisco kindergartners.[8] Dental care access by San Francisco children aged 0–3 was linearly and inversely associated with the prevalence of the caries experience in local kindergartners one year later.[8] Utilization of dental care increased significantly for Chinese and Hispanic children in 2003–2012.[13] Nonutilization of dental care among kindergartners was associated with speaking a language other than English, Spanish or Chinese.[14]

In 2007, focus groups with caregivers of young children identified possible barriers to accessing dental care for children aged 1–5.[15] Belief that primary

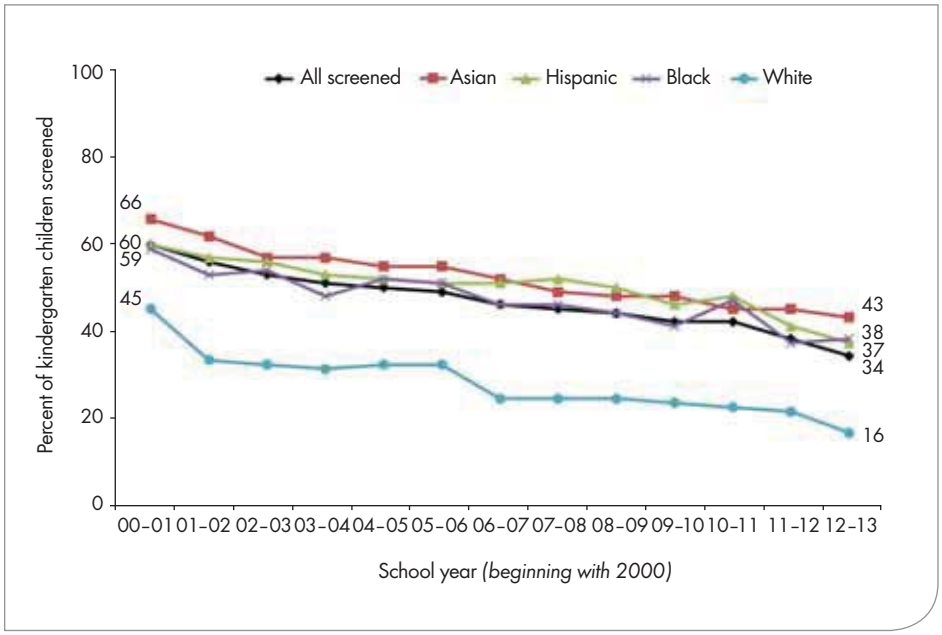


FIGURE 2. Percentage of kindergartners in public schools in San Francisco with caries experience in their primary teeth by race/ethnicity, 2001–2012. Caries experience is defined as either untreated or treated (restored or filled) tooth decay.

teeth "just fall out anyway" was widely shared among focus group participants. Routine preventive dental visits were considered unnecessary. Focus group participants trusted their child's pediatrician to check teeth at well-child visits and refer to the dentist for any dental problems. A participant commented, "There's a lot of dentists that don't take 1-year-olds. A lot. Most don't take them …" and that some dentists suggested unnecessary treatment. Focus group participants stated that they counted on pediatricians, relatives and social networks to choose a dentist. In 2016, focus groups confirmed that parents prefer physicians and schools to provide oral health screening, information and referral.[16]

Child care-center program reports and clinic billing records also suggested gaps in access to dental care for low-income San Francisco children younger than age 5. "Pending" and wait-listed dental appointments were documented as the reason that children who were referred for treatment after screening did not receive treatment.[17] Clinic wait times for children's dental appointments were two to three months.[18] In 2004–2005, neighborhoods with high rates of caries experience had a severe shortage of dental providers who would accept fee-for-service Denti-Cal; there was only one dentist for 33,170 southeast San Francisco residents.[5] Fewer than 20 percent of Denti-Cal-enrolled children aged 0–3 saw a dentist from 2004 to 2008.[8] In 2011, only 50 dental offices/clinics citywide accepted Denti-Cal.[12]

Diagnosing and investigating the problem showed that "the comparatively small dental safety net cannot meet the demand for care for children, which will only increase with the Affordable Care Act's requirement for pediatric dental coverage and the reinstatement of some adult Medi-Cal dental benefits in 2014."[12]

Consistent with parents' expectation that pediatricians address children's oral health at check-ups,[15–16] pilot studies suggested the potential for primary care clinics in San Francisco to offer oral health preventive services to children aged 0–5 who were not receiving regular dental care. Offering fluoride varnish applications to very young children at federally qualified health center (FQHC) primary care visits was found to be feasible and financially viable.[19] A 2011 telephone survey of primary care clinics determined that very few pediatric clinics offered fluoride varnish to their patients aged 0–5.[12]

Public Health Service No. 3: Inform, Educate and Empower

Since its implementation in 2001, the screening has informed, educated and empowered parents and caregivers. Children and families are provided their child's screening results, oral health education and dental clinic referral lists following a standardized protocol.[20] Each school is provided information about the school-specific rates of caries experience and severity. Screening staff, including San Francisco Dental Society members, are updated about screening results to maintain continued engagement and interest in volunteering.

The screening data were used to inform, educate and empower the community. In 2011, aggregate screening results were presented to the SFHIP Children's Oral Health Working Group,[21–23] a derivative of the San Francisco Children's Dental Health Committee.[4] The trends in caries including the widening of oral health disparities, from a 14 percent absolute difference between whites and blacks in 2000 to a gap of 22 percent in 2012 (**FIGURE 2**), enabled SFHIP to secure seed funding,[21] planning grants from the Metta Fund, the United Way and the California Department of Public Health[24,25] and a $400,000 implementation grant from the Hellman Foundation[26] awarded in 2013 to provide funds for 2014–2017.

In 2013–2014, the screening results were presented to more than 50 local

policymakers, community health leaders, child care center and school administrators and grassroots community members at two citywide meetings to gather input and announce the San Francisco Children's Oral Health (COH) Strategic Plan.[22,24] City funds were allocated to hire a coordinator for the implementation.[23]

In 2015, screening results were presented at community briefings in three neighborhoods to inform, educate and empower the community about neighborhood-specific caries experience and disparities. Local media reported the screening results and community briefings.[27–29] In 2015–2017, screening data were shared at quarterly steering committee meetings, biannual Health Commission updates and annual citywide briefings.[22,30,31] San Francisco policymakers, including San Francisco supervisors, First 5 San Francisco commissioners and representatives from the San Francisco Community Clinic Consortium, San Francisco Pediatric Advisory Committee and San Francisco Health Plan were informed about the screening data and COH Strategic Plan.[23] First 5 San Francisco is a department of the city and county of San Francisco that is dedicated to advancing the well-being of children and families.

In 2016, the briefings empowered community members and local politicians to advocate for $250,000 in grant funding to develop children's oral health community-based task forces.[30]

Public Health Service No. 4: Mobilize Community Partnerships

Beginning in 2001, the screening mobilized partnerships between SFDPH, SFDS, the National Dental Society of the Bay Area and local public schools. In 2005, SFDPH partnered with University of California San Francisco (UCSF) public health dental researchers to analyze and report the screening data.[5] In 2013, a diverse array of community, civic, private and public organizations, including dental and medical safety net providers, child advocates and early education stakeholders, collaborated to develop the COH Strategic Plan.[21,22] In 2014, launch of the COH Strategic Plan galvanized a dedicated citywide SFHIP Children's Oral Health Collaborative, currently known as CavityFree SF, whose objective was to implement the COH Strategic Plan.[12]

The work teams engaged in the four target areas of the COH Strategic Plan: promotion, integration, access and evaluation.

The CavityFree SF collaborative was structured with a "backbone" core team for ongoing administrative and leadership support, an implementation coordinating committee (ICC) and four implementation work teams.[21,22] The core team was co-led by two agencies, SFDPH and the UCSF School of Dentistry, and included a planning consultant and an administrative staff person. Multiple sectors and agencies (UCSF, SFDPH, SFHIP, University of the Pacific, Arthur A. Dugoni School of Dentistry, SFDS, SFUSD, San Francisco Health Plan) participated in the ICC.[21,22] The work teams engaged in the four target areas of the COH Strategic Plan:[12] promotion, integration, access and evaluation. The strategic goals and activities of the four work teams are described below:

Evaluation

The evaluation team's goal was to "develop and establish an ongoing oral health population-based surveillance system to address the oral health of San Francisco children."[30] The team collaborated to outline a surveillance plan with standardized protocol for measurement, assess staff capacity for oral health data collection, analysis and reporting, create oral health epidemiologist positions, request data from Denti-Cal and child care agencies and improve surveillance software and hardware.[23,30,32]

Promotion

The promotion team's goal was to "increase awareness and practice of optimal children's oral health behaviors among diverse communities."[30] The team developed connections with local media and neighborhood community-based organizations that serve low-income, minority families and children under age 5. The San Francisco mayor and supervisors budgeted $250,000 to mobilize community-based oral health task forces.[32] In 2015, the Chinatown Children's Oral Health Task Force was created as a result of the Chinatown community briefing.[30,33] They met twice to develop goals specific for the Chinatown population[33] and partnered with Chinatown neighborhood schools to provide oral health education materials and resources. Formation of the Chinatown Oral Health Task Force was sponsored by the Chinatown YMCA, the Asian Pacific Islander Health Parity Coalition, Asian Perinatal Advocates Family Support Services, NICOS Chinese Health Coalition (North East Medical Services, Chinese Community Health Care Association, Chinese Hospital, On-Lok Lifeways and Self-Help for the Elderly).[34] In 2017, SFDPH released a request for proposal for a grant sponsored by the mayor's office to support neighborhood-specific children's oral health task forces.[35]

Access

The access team's goal was to "increase access to oral health care services for San Francisco children and pregnant women."[30] This team collaborated with the National Network for Oral Health Access to unite common efforts to increase access to dental care outside the "four walls"[33] at "nontraditional sites," such as schools and FQHC clinics. They worked with child care centers to expand the public school-based oral health program to serve preschool-age children.[30,33]

Integration

The integration team's goal was to "integrate oral health with overall health."[30] The integration team worked to standardize documentation of fluoride varnish application in electronic health records across a large network of primary care providers serving low-income children, including the San Francisco Health Network, Kaiser Permanente and North East Medical Services. The team developed open-source resources to support primary care clinics to begin to implement fluoride varnish application during well-child pediatric visits, such as training, materials and technical assistance.[30] Team members worked with San Francisco's largest Medi-Cal managed care plan to support and incentivize medical providers to incorporate fluoride varnish for children aged 0–5 into their medical practices.[30]

Public Health Service No. 5: Develop Policies

In 2005, the California Dental Association sponsored AB 1433 (Emmerson/Laird). This landmark legislation required that children have a dental checkup by May 31 of their first year in public school, at kindergarten or first grade. While AB 1433 was being considered by the California legislature, the screening was cited as a model in support of the legislation,[36] which was eventually passed and signed into law.[37] The screening was cited in support of a resolution in Los Angeles to enforce AB 1433.[38]

In 2015, also at the statewide level, SFDS presented the screening data to California State Assemblymember David Chiu to advocate for oral health issues including increased funding for Denti-Cal.[39] The California Department of Education (CDE) approved a waiver to allow dental clinics to be paid for dental services delivered in schools, paving the way for local community dental clinics to begin providing sealants and other preventive dental services in San Francisco schools in 2016.[33]

Collectively, these policies raise awareness about children's oral health among local leaders, policymakers and the community.

At the local level, screening data were used to set citywide agendas for funding, program planning, quality improvement and evaluation. In 2013, the data provided the evidence base for the COH Strategic Plan goal: "To reduce disparities and improve the oral health of children in San Francisco by increasing access to quality care and services, integrating oral health into overall health and promoting oral health among high-need communities and neighborhoods."[12] The screening data were translated into specific objectives for policy and intervention: "reduce the percentage of kindergartners with dental caries experience from 37 percent in 2012 to 27 percent in 2017, reduce the percentage of kindergartners with untreated dental decay from 16 percent in 2012 to 8 percent in 2017 and reduce the gap between Chinese, black and Hispanic/Latino kindergartners and white kindergartners with respect to the risk of caries experience from a 20/21 percentage point difference in 2012 to a 15 percentage point difference in 2017."[12]

In 2014, the San Francisco Health Commission officially recognized children's caries experience as a local public health problem and endorsed the COH Strategic Plan.[40] In 2016, kindergartners' caries experience was selected as a DPH San Francisco Health Network True North Metric[10] and a key measure of success for the mayor's Our Children Our Families efforts.[41] In 2016, the San Francisco Health Plan, the Medi-Cal Managed Care Plan which serves a majority of children eligible for Medi-Cal in San Francisco, recognized caries experience among local low-income kindergartners as a health issue, and strategized to encourage health providers to offer fluoride varnish application as a Medi-Cal benefit to eligible children aged 0–5.[42] The San Francisco Health Plan included in its performance improvement plan a financial incentive rewarding primary care clinics that administer fluoride varnish at well-child visits.[22] In 2016, SFHIP selected children's caries experience as a focus area for community health improvement planning efforts.[43] Collectively, these policies raise awareness about children's oral health among local leaders, policymakers and the community.[44]

Public Health Service No. 6: Enforce Laws

Pediatric providers affiliated with the Child Health and Disability Prevention (CHDP) program are mandated to refer their pediatric patients to a dentist at age 1, annually thereafter and any time a dental problem is suspected during the well-child exam.[45] The SFDPH CHDP public health nurses used screening data slides showing racial/ethnic and income oral health disparities during audits to educate and inform medical directors and clinic managers to persuade those providers, who had not been following this state regulation, to monitor and ensure their medical staff made a dental referral.[46]

The school-based screening facilitated compliance with AB 1433. In the 2006–07 school year, the first full year of AB 1433 implementation, San Francisco was the county with the highest rate of returned school assessment forms in California (88 percent). The statewide average was 35 percent for that initial year, as per personal communication from Irene Hilton, DDS.

Public Health Service No. 7: Link To/Provide Care

Over the past 17 years, the screening directly linked individuals and families to dental care. Per standardized protocol, all children identified as needing treatment during screening were given a letter to notify the parents of the result and a list of resources for dental follow-up[5,20] COH Strategic Plan implementation resulted in new dental screening and treatment services being offered to children in grades other than kindergarten. Between August and November 2015, 55 children at eight Head Start preschool centers received full dental exams with X-rays and fluoride varnish application at their preschool sites. The Head Start centers adopted the motto "two is too late" for the first dental visit and committed to continuing the on-site dental chair and dental screening partnership in 2016. Four Head Start sites that serve children aged 3 and 4 and two early Head Start sites that serve children aged 0–2 were in the process of acquiring on-site dental "clinic" services.[9] A CDE waiver was approved to allow nonprofit community clinics to provide dental services on-site at San Francisco public schools and preschools,[22] dramatically expanding dental screening capacity for schools and access to dental treatment for children.

The Head Start centers adopted the motto "two is too late" for the first dental visit and committed to continuing the on-site dental chair and dental screening partnership in 2016.

With respect to access to preventive dental care, screening and fluoride varnish application services were expanded to include all preschoolers enrolled in district preschools.[10] Access to preventive dental care was increased for approximately 1,045 Head Start preschoolers and 1,500 school district preschoolers.[31] The school sealant program was expanded to include an additional 400 fifth- and sixth-graders.[22]

COH Strategic Plan implementation resulted in efforts to offer fluoride varnish application to children aged 0–5 in medical clinics. Before implementation, the only medical providers routinely administering fluoride varnish were the SFDPH pediatric clinic at the county hospital and some pediatric practices at San Francisco Kaiser Permanente.[22] To date, COH Strategic Plan implementation has resulted in 17 additional medical clinics in three large medical systems providing fluoride varnish applications at pediatric well-child visits for children under age 5.[31] The implementation team worked on an electronic medical record notification to medical providers if a child has not received fluoride varnish in the last six months.[33] At the largest family medicine clinic in San Francisco to integrate fluoride varnish application, the rate of fluoride varnish application more than tripled from a baseline of 5 percent to 18 percent in January 2016.[47] In 2015–2016, pediatric clinics in San Francisco offered fluoride varnish to almost 20,000 children aged 0–5 with Medi-Cal insurance.[31] Approximately 33,000 children aged 0–10 have Medi-Cal insurance in San Francisco.[31]

Following AB 1433, in 2006, the screening also indirectly provided care by systematically providing oral health education to families of all first-time public school students. School districts were required to notify parents about the importance of primary teeth and oral health to overall health and learning and how to access health insurance programs.[48]

Public Health Service No. 8: Assure Competent Workforce

The capacity of the existing public health workforce to reduce kindergartners' caries experience burden was increased through student training. Each year since 2001, the screening has provided opportunities for volunteer dentists to gain hands-on experience working with kindergarten-age children in the school setting and collaborate with public health professionals. SFDPH provided didactic training to both UCSF pediatrics and family medicine residents for 15 and 11 years, respectively. The lecture materials included screening results to inform residents about local caries experience and provide rationale for

fluoride varnish application during well-child examinations. UCSF public health dental students used screening data and/or focused on risk factors for kindergarten caries experience to fulfill summer internship or residency requirements.[13,14]

COH Strategic Plan implementation increased workforce capacity by training existing staff. SFDPH and volunteer San Francisco Dental Hygiene Society hygienists trained pediatricians in 17 primary care clinics regarding oral health assessment and fluoride varnish application.[22,31] A Chinese hospital pediatrician trained private physicians to provide fluoride varnish in Chinatown.[49] Training materials included information about local disparities in kindergarten caries experience along with instruction regarding fluoride varnish application and technical assistance about billing strategies.[50]

The number of staff positions dedicated to reducing kindergartners' caries experience increased because of the efforts of the CavityFree SF collaborative. The promotion team chair led ICC steering committee members and the Chinatown Task Force Community Health Coalition (NICOS) to meet with San Francisco County supervisors' staff to advocate for financial support to advance the work of the CavityFree SF collaborative. The advocacy resulted in a permanent position at SFDPH to coordinate citywide children's oral health activities in 2015[30] and an allocation of $250,000 city funding in 2016 to support up to three neighborhood community task force groups to work to improve children's oral health.[22] In 2014, SFDPH hired a dental hygienist to expand the early education schools fluoride varnish program. The Hellman Foundation awarded funding in 2015 to create a temporary oral health epidemiologist position at UCSF in 2016.[26]

Public Health Service No. 9: Evaluate

Our literature review did not identify any formal published program evaluations that used screening data. "Bending the curve" of kindergarten caries experience is expected to require a lag time of up to five years, the time for infants currently receiving fluoride varnish at well-child visits to age and enroll in kindergarten. Evaluations of interventions implemented for the COH Health Strategic Plan are expected after 2020.

The annual systematic screening data did, however, enable agencies to plan to evaluate intervention efforts with measurable outcomes[41,43,51] and engage in quality improvement.[10] Ongoing oral health surveillance activities will track kindergartners' caries experience along with COH Strategic Plan implementation process measures.[12] The screening data provide an essential baseline reference for gauging impact.

Ongoing oral health surveillance activities will track kindergartners' caries experience along with COH Strategic Plan implementation process measures.

SFDPH was recently awarded local dental pilot project (LDPP) funding from the California Department of Health Care Services Dental Transformation Initiative (DTI).[31] The DTI is a mechanism within the Medi-Cal 2020 waiver to improve dental health for Medi-Cal children by focusing on high-value care, improved access and utilization of performance measures to drive delivery system reform.[52] The goals of DTI LDPP funding are to "increase dental prevention, caries risk assessment and disease management and continuity of care among Medi-Cal children through innovative pilot projects implemented by alternative programs, potentially using strategies focused on urban or rural areas, care models, delivery systems, workforce, integration of oral health into primary care, local case management initiatives and/or education."[53] SFDPH will use the $6.4 million award for five pilot projects that align with COH Strategic Plan goals, serve children aged 0–5 and aim to reduce caries experience as measured by the screening. The screening provided key metrics required for LDPP planning, quality improvement and evaluation.

Public Health Service No. 10: Research

Aggregate results from the 2001–2005 screening were reported in a peer-reviewed journal.[5] Focus group results regarding risk factors for caries experience in low-income young children in San Francisco were published in a peer-reviewed journal article.[15] Graduate students used screening data for research and/or studied risk factors associated with kindergarten caries experience.[13,14,54,55]

Essential Public Health Service by Year

Beginning in 2001, the screening was associated with four essential public health services: monitor, inform/educate/empower, partner with communities and provide care. Over time, the screening became related with all 10 essential public health services (**TABLE**, cda.org/aug17). Linkage of the screening with other public health services coincided with research partnership and communication of data to organized groups, communities and funders. The process of hiring new staff took about one year. For example, about one year elapsed between the allocation of city funds for the COH coordinator

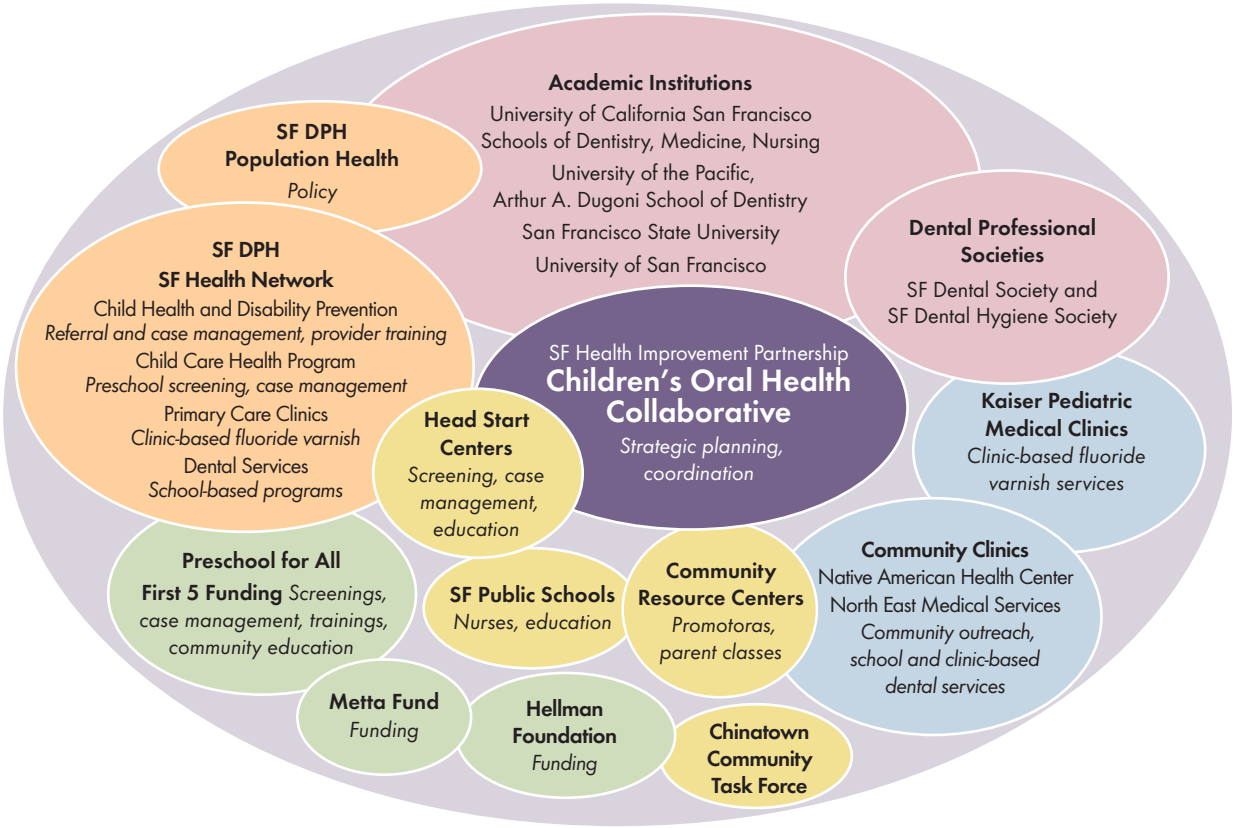


FIGURE 3. University, health network, community clinic, child care, public school, funding and public health resources in San Francisco in 2001–2017. University resources are grouped in pink. San Francisco Department of Public Health (SF DPH) resources are grouped in orange. Community clinics are grouped in blue. Educational resources are grouped in yellow. Funding resources are grouped in green. This figure is for illustrative purposes only and may not represent all resources.

and the hiring of the COH coordinator at SF DPH (**TABLE**, cda.org/aug17). Hellman Foundation funding was obtained to hire an oral health epidemiologist in 2015. The new epidemiologist is expected to start at UCSF this year.

Background Context

The associations observed in this review may be contingent on contextual factors in the background, such as organized community groups, the presence of academic institutions, researchers with expertise in the topic and availability of funding. Collaborative leadership, backbone resources, trusting relationships and willingness of many people to volunteer time outside the scope of their compensated jobs supported the COH Strategic Plan and collective impact work.[22] **FIGURE 3** illustrates the variety of agencies involved in the COH Strategic Plan in 2001–2017.

Effects of oral health screening may also depend on federal, statewide or local policy. Head Start's national mandate requiring oral health screening for every child within 90 days of enrollment facilitated fluoride varnish application interventions in child care centers. Statewide CDE policy was a barrier to delivery of dental care on-site at public schools. Statewide Denti-Cal policy changed over time, limiting benefits for adults in 2009 and restoring benefits for adults in 2014. Denti-Cal benefits for adults may affect the availability of dental appointments for Denti-Cal eligible children.[13] Local health plan reimbursement policy may incentivize pediatric fluoride varnish application.

Discussion

Results of the present review suggest that over the past 17 years school-based oral health screening in San Francisco was related to each of the 10 CDC's essential public health services.[1] Resources identified for this review indicated multiple uses of screening data beyond immediate detection of children needing referral for dental care, consistent with school-based oral health screening playing an important role in planning and providing health services.[56]

Indication that the screening did not occur in isolation, independent of other essential public health services, implies potential for confounded, interactive or synergistic effects of the 10 essential public health services on kindergartners' caries experience. To account for the type

and extent of linkage(s) between the screening and other essential services, the screening might be operationalized as a multi-component exposure and/or analyses might test whether screening effects are confounded or modified by level or change in other essential services. The results warrant a wide scope to describe and interpret trends in local kindergartners' caries experience.

This review identified concrete examples of changes in essential public health services associated with the screening, which may serve as preliminary data to inform planning for future CavityFree SF interventions and evaluation. Future interventions might aim to link the screening (or screening data) with public health services where there has been relatively less activity, such as law enforcement, workforce training and research. Future evaluations might systematically track the number of community briefings or newspaper articles to index activities to "inform, educate, empower." Documents reviewed for the present analysis report a time lag of many months to create positions, hire new staff and train providers to apply fluoride varnish. This time lag suggests that CavityFree SF evaluation plans should include years of follow-up to describe effects of screening linked with changes in essential services.

Although the context of the present analysis is specific to San Francisco in 2000–2017, results motivate questions about the public health services context in other studies of screening effectiveness. For example, what essential public health services were working in the background of randomized controlled trials that previously tested for effects of school-based oral health screening, such as Milsom et al.?[57] And to what extent does the public health services context contribute to debate over the effectiveness of school-based dental screening? These questions are pertinent, given that the effectiveness of school-based oral health screening is considered to be one of the most debated aspects of health care systems, public health practice and health policy discussions.[58]

Milsom et al.[57] report no significant effect of oral health screening in schools in the United Kingdom on attendance at a dental visit or treatment of caries, oral sepsis, gross plaque or calculus over a four-month follow-up period. With respect to background context for this trial, the authors note that wait times for a dental appointment were short, there were no financial barriers to dental care and the target population generally preferred minimal intrusion from government agencies regarding care-seeking decision-making. The authors do not report, however, the linkage (or nonlinkage) of the screening with other essential public health services. They do not call for further research to investigate why families did not take their children for indicated treatment. Readers are not alerted to the possibility of outcomes not evaluated by the trial, such as short-term effects of school-based screening on community-level outcomes (e.g., changes in policy, funding and materials to incentivize dental visits) and/or longer-term effects of the screening on caries experience, mediated via changes in essential public health services. Despite the fact that Milsom et al.[57] did not rule out longer-term benefits of the screening for subsequent cohorts of children, school-based oral health screening was discontinued in the U.K., even for surveillance, as a result of this trial. The U.K. National Screening Committee recently upheld the decision to discontinue the screening, based on no new evidence that screening children aged 6–9 for dental disease by the school dental service in England is effective.[59]

> To what extent does the public health services context contribute to debate over the effectiveness of school-based dental screening?

Although screening is recognized by health authorities as the first of 10 essential public health services,[1,2] research[57,58] and protocol for school-based oral health screening[20,60] have not treated it that way. Protocols specify how and when individual children will be screened and referred for treatment, but not how and when aggregate screening results will be systematically reported to the community or linked with other essential services.

In 2001, linkages between the screening and other essential public health services in San Francisco were not deliberately coordinated or preplanned. The present review of historical records suggests that the screening ended up related to other essential services in multiple ways. Awareness of the connections between services puts CavityFree SF in position not only to understand the screening's impact but also to intentionally strengthen links between essential services going forward. It remains to be determined if intentional linkage of the screening with other essential public health services can magnify the screening's impact.

Limitations

The present review assembled a patchwork of various data types from different sources to retrospectively scope school-based oral health screening as an essential public health

service in San Francisco over a period of 17 years. Evaluation data were not systematically, prospectively collected about the screening process and public health outcomes. This review was limited to publicly available documents and may not capture effects of the screening that were internal to programs or not reported in writing or online. The sources and data content included in this review were not restricted to peer-reviewed journal articles or validated measures. While some references included in this review witness causal impacts of the screening,[22,33] the present descriptive, qualitative synthesis does not support causal inference about effects of the screening. Use of the term "association" in this review does not mean that statistical tests of association were conducted and never implies causality. The review provides raw preliminary data about ways that the screening might affect particular public health services, for example, how the screening might contribute to policy change. This review did not describe complex interrelationships between the public health services.

School-based oral health screening was implemented in San Francisco in 2001 to track and reduce children's caries experience. Beyond referral of individual children for dental treatment, the screening was associated with changes in all other essential public health services in 2001–2017. The results highlight community-level, public health uses of school-based oral health screening. The findings provide foundation for ways to intentionally use the screening as the first of 10 essential public health services to improve local services and understand their public health impacts.

Funding

Support for the kindergarten screening program was provided by the San Francisco Department of Public Health, San Francisco Unified School District, AmeriCorps, the National Dental Society of the Bay Area (local chapter of the National Dental Association) and the San Francisco Dental Society. Colgate provided toothbrushes. This review was unfunded. ■

ACKNOWLEDGMENTS

The authors acknowledge Liza Karamardian, DDS, San Francisco Dental Society president-elect 2000, president 2001, and Samantha Stephen, former SFDPH director of dental services, for envisioning and launching the kindergarten school screening program; Steven Ambrose, DDS, current SFDPH director of dental services for continually shepherding the program; and hundreds of dentists, school nurses and health workers who volunteered to make the screening program possible.

The strategic planning process was supported by the San Francisco Health Improvement Partnership, Metta Fund, United Way, California Department of Public Health and Hellman Foundation. The authors gratefully appreciate the contributions of everyone who has participated in CavityFree SF. The authors recognize the role of the San Francisco Children's Dental Health Committee, including Janet Fricke, Dennis Shinbori, DDS, and Nick Paredes, DDS, whose regular meetings in the 1980s prepared the way for current collaborations.

The views expressed herein do not necessarily reflect the official policies of the city and county of San Francisco, nor does mention of the University of California San Francisco, the San Francisco Unified School District, the University of the Pacific, Arthur A. Dugoni School of Dentistry, San Francisco Dental Society or the San Francisco Department of Public Health imply their endorsement.

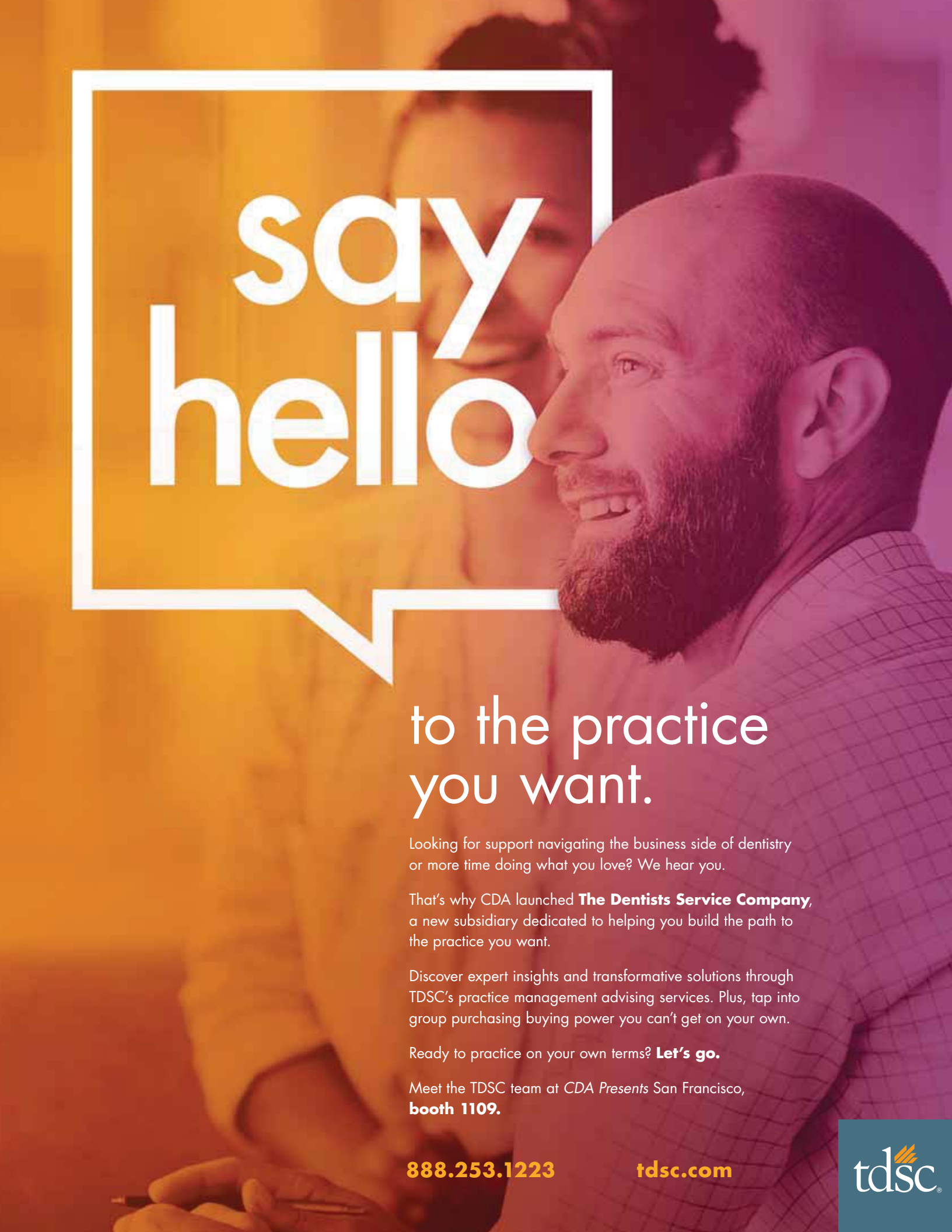
REFERENCES

1. National Public Health Performance Standards Program (NPHPSP): 10 Essential Public Health Services. Atlanta: Office for State, Tribal, Local and Territorial Support, Centers for Disease Control and Prevention; 2014. CDC publication. www.cdc.gov/nphpsp/documents/essential-phs.pdf. Accessed April 27, 2017.
2. The future of public health. Washington D.C.: Committee for the Study of the Future of Public Health, Division of Health Care Services, Institute of Medicine; 1988. The National Academies Press. www.nap.edu/read/1091/chapter/1. Accessed April 27, 2017.
3. *Oral Health in America*: A Report of the Surgeon General. Rockville, Md.: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000. DHHS publication. www.nidcr.nih.gov/DataStatistics/SurgeonGeneral/Documents/hck1ocv.@www.surgeon.fullrpt.pdf. Accessed April 27, 2017.
4. Fisher M, Patel P, Miller C. History of Interdisciplinary Collaboration to Promote Children's Oral Health in SF. SFDPH MCAH Child Health and Disability Prevention Program memorandum. April 2017; San Francisco.
5. Chung LH, Shain SG, Stephen SM, Weintraub JA. Oral health status of San Francisco Public School Kindergartners 2000–2005. *J Public Health Dent* 2006; 66(4): 235–241.
6. 2014 Needs Assessment of Maternal Child and Adolescent Health. San Francisco: San Francisco Department of Public Health, Maternal, Child and Adolescent Health Section; 2014. www.sfdph.org/dph/comupg/oprograms/MCH/MCAHNeeds.asp. Accessed April 27, 2017.
7. San Francisco Community Health Needs Assessment 2016. San Francisco: San Francisco Health Improvement Partnership; 2016. www.sfhip.org/content/sites/sanfrancisco/2016_SF_CHNA.pdf. Accessed April 27, 2017.
8. San Francisco Community Health Needs Assessment 2016 Appendices. San Francisco: San Francisco Health Improvement Partnership; 2016. www.sfdph.org/dph/files/hc/HCAgen/HCAgen2016/May%2017/2016CHNAAppendices.pdf. Accessed April 27, 2017.
9. Mission Neighborhood Centers Inc. 2015 Community Needs Assessment Update. San Francisco: Mission Head Start\Early Head Start; 2015. mncsf.org/home/wp-content/uploads/2016/01/2015_Community-Needs-Assessment.pdf. Accessed April 27, 2017.
10. Ambrose S. SFHN Dental Services Update. Presented at: Community and Public Health Subcommittee Meeting, SFDPH Health Commission; Nov. 15, 2016; San Francisco. https://www.sfdph.org/dph/files/hc/HCCommPublHlth/Agendas/2016/November%2015/Health%20Commission_SFHN%20Dental%20Services%20update_20161115-2-1.pdf. Accessed April 27, 2017.
11. Sonoma County and Santa Rosa city schools partner on kindergarten dental-health assessment pilot. Santa Rosa, Calif.: Sonoma County Department of Health Services; Feb. 15, 2017. sonomacounty.ca.gov/Health/Press-Releases/Kindergarten-Dental-Health-Assessment-Pilot. Accessed April 27, 2017.
12. San Francisco Children's Oral Health Strategic Plan 2014–2017. San Francisco: San Francisco Health Improvement Partnership; 2014. assets.thehcn.net/content/sites/sanfrancisco/Final_document_Nov_2014_20141126111021.pdf. Accessed April 27, 2017.
13. Mughni A, Pollick HF, Isman R, Lazar A. Ethnic Disparities in Medicaid Dental Utilization in San Francisco (2003–2012). Presented at: UCSF School of Dentistry Research and Clinical Excellence Day; Oct. 10, 2013; San Francisco. Presentation. dentistry.ucsf.edu/sites/dentistry.ucsf.edu/files/content/PDF/rced2013program.pdf; cando.ucsf.edu/node/101. Accessed April 27, 2017.
14. Sabo R. Dental care utilization: Subpopulations of San Francisco kindergartners at risk. Presented at: UCSF School of Dentistry Research and Clinical Excellence Day; Oct. 16, 2014; San Francisco. dentistry.ucsf.edu/sites/default/files/content/PDF/rced_2014_program.pdf. Accessed April 27, 2017.
15. Hilton IV, Barker SS, Weintraub JA. Cultural factors and children's oral health care: A qualitative study of carers of young children. *Comm Dent Oral Epidemiol* 2007;35: 429–438.

16. Klivans L. Fighting Children's Cavities in Chinatown: It takes a coalition. KQED News, State of Health 2017; March 29. https://ww2.kqed.org/stateofhealth/2017/03/29/fighting-childrens-cavities-in-chinatown-it-takes-a-coalition. Accessed April 27, 2017.
17. Head Start Program Information Report. Washington, D.C.: U.S. Department of Health and Human Services, Administration for Children and Families, Office of Head Start; 2013.
18. Udesky L. State Lags in Dental Health Care for Children. *The New York Times* 2010; May 22. www.nytimes.com/2010/05/23/us/23sfdental.html. Accessed April 27, 2017.
19. Mendoza R. Letters to the Editor: Implementing Oral Health Screening in Children. *Am Fam Physician*. 2007; 76(9):1280.
20. Dental Screening Guidelines, Children's Dental Disease Prevention Program (CDDPP) Program. Sacramento, Calif.: California Department of Health Services, Chronic Disease Control Branch, Office of Oral Health, In collaboration with The University of California San Francisco School of Dentistry; Updated 8/2006.
21. Fisher-Owens S, Brown CL, Chung L, Fisher M, Gansky S, Santiago A, Grumbach K. Gathering the Fish and Casting a Net: San Francisco's Children's Oral Health Strategic Plan. Presented at AAP National Conference; Oct. 24, 2015; Washington, D.C. aap.confex.com/aap/2015/webprogram/Paper30959.html. Accessed April 27, 2017.
22. Grumbach K, Vargas RA, Fleisher P, Aragón TJ, Chung L, Chawla C, Yant A, Garcia E, Santiago A, Lang PL, Jones P, Liu W, Schmidt LA. Achieving health equity through community engagement in translating evidence to policy: The San Francisco Health Improvement Partnership, 2010–2016. *Prev Chronic Dis* 2017;14:160469. doi: dx.doi.org/10.5888/pcd14.160469. Accessed April 27, 2017.
23. Anonymous. SF HIP Children's Oral Health Strategic Plan 2014-2017. Presented at: SFDPH Steering Committee Meeting; June 18, 2015; San Francisco. www.sfhip.org/content/sites/sanfrancisco/SFHIP_Childrens_Oral_Health_Presentation_to_SC_6-18-15.pdf. Accessed April 27, 2017.
24. Focus on dental health, Children's oral health. San Francisco: San Francisco Department of Public Health, San Francisco Health Network, *The Bridge*; 2014; 1(1). www.sfhealthnetwork.org/wp-content/uploads/SFHN-NEWSLETTER-11-12-14.pdf. Accessed April 27, 2017.
25. University of California, San Francisco, SF HIP Children's Oral Health Strategic Plan. San Francisco: Metta Fund, Search our grants; 2013. www.mettafund.org/grantmaking/grants-awarded/?keyword=oral+health andtax-term= andyear-min=From andyear-max=To. Accessed April 27, 2017.
26. Hellman Collaborative Change Initiative: Current awardees. San Francisco: Hellman Foundation; 2014, 2015. www.hellmanfoundation.org/awardees.html. Accessed April 27, 2017.
27. Kwong J. Tooth decay still high among Chinatown kindergartners. *San Francisco Examiner* 2015; May 14. www.sfexaminer.com/tooth-decay-still-high-among-chinatown-kindergartners. Accessed April 27, 2017.
28. Colliver V. Health leaders try to cut kids' cavities, improve access to care. *San Francisco Chronicle* 2015; June 15. www.sfgate.com/health/article/Health-leaders-try-to-cut-kids-cavities-6328824.php. Accessed April 27, 2017.
29. Wenus L. SF's Income Disparity Displayed in a Smile of Bad Teeth. Mission Local 2015; June 15. missionlocal.org/2015/06/inside-the-citywide-battle-for-kids-oral-health. Accessed April 27, 2017.
30. SFDPH Children's Oral Health Strategic Plan 2014-2017 Update, SFHIP report to the health commission. Presented at: SFDPH Health Commission Community and Public Health Committee Meeting; Sept. 15, 2015; San Francisco._www.sfdph.org/dph/files/hc/HCCommPublHlth/Agendas/2015/Sept%2015/2015.09.10%20SFHIP%20Children's%20Oral%20Health%20Presentation%20to%20Health%20Commission%20Update%20%20for%209-15.pdf. Accessed April 27, 2017.
31. CavityFree SF, SFHIP Children's Oral Health Collaborative Update 2016. Presented at: Health Commission Meeting; March 21, 2017; San Francisco. www.sfdph.org/dph/files/hc/HCCommPublHlth/Agendas/2017/March%2021/MCAH%203-21-17%20pres%20to%20Hlth%20Comm%20DRAFT%20%203.16.17.pptx.pdf. Accessed April 27, 2017.
32. MEMORANDUM FY 2016–17 and 2017–18 Proposed Budget – June Update. San Francisco: City and County of San Francisco; 2016. www.sfdph.org/dph/files/hc/HCAgen/HCAgen2016/June%207/FY%2016-18%20HC%20Budget%20Summary%206-9-16.pdf. Accessed April 27, 2017.
33. SFHIP Steering Committee Monthly Report: September-October 2015. San Francisco: San Francisco Health Improvement Partnership; Nov. 16, 2015. www.sfhip.org/content/sites/sanfrancisco/SFHIP_Monthly_Update_Report_October_2015.pdf. Accessed April 27, 2017.
34. Maier S. UCSF Partners with San Francisco Community to Address Oral Health Epidemic. UCSF News Center 2015; May 12. www.ucsf.edu/news/2015/05/127266/ucsf-partners-san-francisco-community-address-oral-health-epidemic. Accessed April 27, 2017.
35. Request for Proposals (RFP) 26-2017. Children's Oral Health Community-Based Taskforces for the San Francisco Department of Public Health. San Francisco: San Francisco Department of Public Health. Office of Contract Management and Compliance; 2017. www.sfdph.org/dph/comupg/aboutdph/insideDept/Contracts/RFP262017.asp. Accessed April 27, 2017.
36. SF Department of Public Health – SFUSD Annual Kindergarten Dental Screening. San Francisco: San Francisco Department of Public Health, Maternal, Child and Adolescent Health; Nov. 11, 2016O www.sfdph.org/dph/files/dentalSvcsdocs/SFUSD-Annual-Kindergarten-Dental-Screening-Numbers.pdf. Accessed April 27, 2017.
37. Emmerson Pupil health: Oral health assessment. Sacramento, Calif.: Secretary of State, Chapter 413, Bill Number AB 1433; Feb. 22, 2005. www.leginfo.ca.gov/pub/05-06/bill/asm/ab_1401-1450/ab_1433_bill_20060922_chaptered.html. Accessed April 27, 2017.
38. Anonymous. New life for Kindergarten Oral Health Requirement. Sacramento, Calif.: California Dental Association; March 3, 2017. www.cda.org/news-events/new-life-for-kindergarten-oral-health-requirement. Accessed April 27, 2017.
39. San Francisco Health Improvement Partnership, Children's Oral Health Collaborative. SF Children's Oral Health. Presented at: San Francisco Dental Society Meeting for Assembly member David Chiu; Nov. 21, 2015; San Francisco.
40. In support of improving the oral health of all children in the City and County of San Francisco County. San Francisco: Health Commission, City and County of San Francisco, Resolution No. 15-4; 2015 .sfdph.org/dph/files/hc/HCRes/Resolutions/2015/oralhealth.pdf. Accessed April 27, 2017.
41. Summary of the San Francisco Children's Oral Health (COH) Collaborative. San Francisco: Our Children, Our Families (OCOF) Council, San Francisco Mayor's Office; Updated May 14, 2015. static1.squarespace.com/static/55b29790e4b0b85c405b2af2/t/55c13414e4b0afb1f3f0d5c2/1438725140720/Children%27s+Oral+Health+Collaborative+-+OCOF+Summary+May+2015.pdf. Accessed April 27, 2017.
42. San Francisco Health Plan. Pediatric news: AAP adds fluoride varnish to anticipatory guidance schedule. Provider Update 2015; Oct. 1. www.sfhp.org/files/providers/provider_updates/October%202015%20Provider%20Update.pdf. Accessed April 27, 2017.
43. San Francisco Health Improvement Partnership Unveils Results of Community Needs Assessment. San Francisco: San Francisco Health Improvement Partnership; Oct. 27, 2016. ctsi.ucsf.edu/news/san-francisco-health-improvement-partnership-unveils-results-community-needs-assessment. Accessed April 27, 2017.
44. Advancing the Oral Health of Children in San Francisco through Collaboration. San Francisco. San Francisco Health Improvement Partnership. Accessed April 27, 2017.
45. § 6843. Referral to Dentist. California Code of Regulations Title 17. Public Health California Code of Regulations. Division 1, State Department of Health Services, Chapter 4, Preventive Medical Service, Subchapter 13. *Child Health and Disability Prevention Program. Article 4. Required Services (Refs & Annos). 17 CA ADC* § 6843.
46. Mooney C, Fisher M. Fluoride varnish. Preventing dental decay in the medical office. Presented at: SF Child Health and Disability Prevention Program Trainings; March 2016; San Francisco.
47. Fisher-Owens S, Spiegel M, Gonzalez C, Hilton I, Wolf A, Fisher M, Chung L, Mooney C. Medical Providers Can Prevent the Most Common Chronic Childhood Disease – Tooth Decay. San Francisco: San Francisco Department of Public Health, Maternal Child and Adolescent Health, Handout for CHDP providers; 2015. www.sfdph.org/dph/files/MCHdocs/CHDP/Article-IntegratingFlourideVarnishIntotheWellChildVisit.pdf. Accessed April 27, 2017.
48. Promoting oral health for California's students: New roles, new opportunities for schools. California School Boards Association, Governance and Policy Services Policy Briefs; November 2008. www.csba.org/GovernanceAndPolicyResources/DistrictPolicyServices/~/media/CSBA/Files/GovernanceResources/PolicyNews_Briefs/StudentHealth/OralHealth/2008_11_PolicyBrief_PromotingOralHealth.ashx. Accessed April 27, 2017.
49. Fisher M, Chung L, Patel P. SFHIP CavityFree SF Children's Oral Health Collaborative. Presented at: San Francisco Department of Public Health Steering Committee Meeting; Nov. 17, 2016; San Francisco. www.sfhip.org/content/sites/sanfrancisco/SFHIP_Oral_Health_Update.pdf. Accessed April 27, 2017.
50. Ng LW. Preventing early childhood cavities, in the mouths of babes. Presented at Pediatrics, Gellert

Health Services, Chinese Community Health Services; October 2016; San Francisco. fcmsmd.org/wp-content/uploads/2016/10/2016-Conference-Dr-L-Ng.pdf. Accessed April 27, 2017.
51. UCSF Clinical and Translational Science Institute. San Francisco Adopts New Model for Improving Health, UCSF Joins Community Partners in Leading Transition to Collective Impact Model. UCSF News Center 2013; August 2. www.ucsf.edu/news/2013/08/107876/city-adopts-new-model-improving-health. Accessed April 27, 2017.
52. Dental Transformation Initiative (DTI). Sacramento, Calif.: California Department of Health Care Services (DHCS); 2017. www.dhcs.ca.gov/provgovpart/Pages/DTI.aspx. Accessed April 27, 2017.
53. Local Dental Pilot Project Application. Sacramento, Calif: California Department of Health Care Services (DHCS); 2017. www.dhcs.ca.gov/services/Documents/RevisedFinalLDPPApplication6.14.16.pdf. Accessed April 27, 2017.
54. Darius E. Oral Health Disparities Among Children in San Francisco Chinatown; A Community-Based Approach. Presented at Human Rights Center Fellowship Conference; November 4, 2016; University of California, Berkeley. www.law.berkeley.edu/research/human-rights-center/events/human-rights-center-fellowship-conference-2016. Accessed April 27, 2017.
55. Nguyen H, Chung L, Hilton I, Stookey J. Evaluation of San Francisco school based sealant program. Presented at: AADR Annual Meeting; March 17, 2016; Los Angeles. *aadr2016.zerista.com/poster/member/56587*. Accessed April 27, 2017.
56. World Health Organization. Oral health promotion: an essential element of a health-promoting school. WHO information series on school health. Document eleven. Geneva: WHO; 2003.
57. Milsom K, Blinkhorn A, Worthington H, Threlfall A, Buchanan K, Kearney-Mitchell P, Tickle M. The effectiveness of school dental screening: A cluster-randomized control trial. *J Dent Res* 2006; 85(10):924–8.
58. Arora A, Khattri S, Ismail NM, Sumanth KN, Prashanti E. School dental screening programmes for oral health (protocol). *Cochrane Database of Syst Rev* 2017; 3: CD012595.
59. Spiby J. Screening for dental caries in children aged 6 to 9 years. External review against programme appraisal criteria for the UK National Screening Committee (UK NSC) Version: Two. January 2013.
60. Kwan SYL, Petersen PE, Pine CM, Borutta A. Health-promoting schools: an opportunity for oral health promotion. Bulletin of the World Health Organization 2005; 83:677–685.

THE CORRESPONDING AUTHOR, Jodi D. Stookey, PhD, can be reached at jodi.stookey@sfdph.org.



to the practice you want.

Looking for support navigating the business side of dentistry or more time doing what you love? We hear you.

That's why CDA launched **The Dentists Service Company**, a new subsidiary dedicated to helping you build the path to the practice you want.

Discover expert insights and transformative solutions through TDSC's practice management advising services. Plus, tap into group purchasing buying power you can't get on your own.

Ready to practice on your own terms? **Let's go.**

Meet the TDSC team at *CDA Presents* San Francisco, **booth 1109.**

888.253.1223 **tdsc.com**

tdsc®