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Conducting a low-cost oral health needs assessment in Chester County, Pennsylvania, USA.

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Abstract

Objective Conducting an Oral Health Needs Assessment (OHNA) could require significant resources. Low-cost OHNA implementation methods to fund a dental clinic in a Federally Qualified Health Center (FQHC) are presented.

Methods

A consensus agreement on goals and responsibilities was followed by collection of primary and secondary data. Primary data were collected from dental providers and consumers in survey questionnaires. Secondary data included socio-economic indicators, gaps in services, consumers' opinion on dental care, caries prevalence, oral cancer incidence, and water fluoridation.

Results

Communities with marginal dental provider capacity, high poverty and low educational attainment rates were key drivers documenting the need for a new dental site. OHNA data provided in a grant application secured funding for a new dental site. An annual average of 1,115 unduplicated dental patients were treated in the first year.

Conclusions

A low-cost OHNA could be implemented with community involvement and validated methods. An OHNA is a critical component in securing grants to support dental services. Practical Implications Organizations could implement an OHNA with limited resources. OHNAs could also assist key stakeholders and dental providers in the decision-making process for objectively selecting areas in greater need for dental services.

Key words: Oral health needs assessment, grant writing, federally qualified health center

Introduction

The health needs of individuals are not likely to be the same or as demanding as those of communities. Recognizing these differences is crucial for effectively planning and implementing services.[1] A community health needs assessment (CHNA) categorizes significant health needs and problems through systematic wide-ranging data collection and analysis to design a plan for improving health.[2] CHNA involves participation of stakeholders, providers, and consumers. Research indicate that it is beneficial for all health care providers to be aware of the needs of their local populations.[3] A CHNA is different from health surveys as well as program planning and evaluation studies. Health surveys monitor the health of a nation, state or community and could include interviews and physical examinations.[4] Evaluation studies determine overall effectiveness in meeting program goals and objectives, ensures programs are implemented as expected, and measures the effect of the program on the target population's health.[5] In a CHNA the community and planners are involved in activities to identify resources that are required to

analytically select the best method to resolve unmet community health needs.[6] CHNAs are implemented to address different public health questions and may have specific goals or purposes. Recently grant guidelines, state mandates, and the U.S. Internal Revenue Service requirements for tax exempt health care facilities including hospitals are among the main reasons for conducting a CHNA. The framework of a CHNA typically includes: 1. an organizing and planning stage, 2. engaging the community, 3. developing a goal or vision, 4. conducting the CHNA, 5. prioritizing health issues, 6. developing a community health improvement plan, 7. implementing and monitoring a community health improvement plan, and 8. evaluating processes and outcomes.[7]

In 1995 the Association of State and Territorial Dental Directors (ASTDD) developed an oral health needs assessment tool. Revised in 2003 this tool considers the extent and nature of existing problems in a community, the type of services that are available, unmet needs of populations, and limitations of the current health care infrastructure in the implementation of needed system changes and services. Similar to a CHNA framework the ASTDD needs assessment includes: STEP 1: Identification of partners and creation of an advisory committee, STEP 2: Conducting a self-Assessment, STEP 3: Planning the needs assessment, STEP 4: Collecting data, STEP 5: Organizing and analyzing data, STEP 6: Prioritizing issues and reporting of findings, and STEP 7: evaluating the needs assessment.[8] The primary aim of the Chester County Oral Health Needs Assessment (CCOHNA) was to identify the area of greater need for a new access point to dental services in a Federally Qualified Health Center (FQHC) serving low-income and under or uninsured populations. A secondary aim was to provide evidence in a competitive grant application to fund the new dental site.

METHODS

Descriptive studies characterize persons attributes such as age, gender, education, place or residence, work and time when events occurred with an outcome.[9] The CCOHNA describes the current health systems infrastructure and socio-demographic characteristics of individuals in living in areas with limited access to oral health services. The first step of the CCOHNA was the creation of an advisory committee (AC) that provided leadership, agreed on goals, expectations, deliverables, roles and responsibilities, and allocated resources for the needs assessment. The AC consisted of the FQHC's executive director, directors of safety-net dental clinics, consumers, and a volunteer dental public health dentist / epidemiologist who designed, conducted, and managed the CCHNA project. FQHC managers and support staff assisted in the collection of survey questionnaires data and information and polled private practice dentists in enrolled in the state Medicaid dental program about their capacity to accept new patients.

Primary and secondary data and information were collected. Primary data consisted of survey questionnaires / interviews targeting consumers / families, dental providers, and key stakeholders. Secondary data were collected from federal, state, and local sources. Secondary data included: the Pennsylvania 2010 statewide Maternal and Child Health Needs Assessment (Title V Block Grant Program), the Health Resources and Services Administration data warehouse, the InsureKidsNow -a website operated by the Centers for Medicare & Medicaid Services that provides information about dentists' participation in the Medicaid and States Children Health Insurance Program (SCHIP), the U.S. Census, American Fact Finder, Chester County Health Department and federal agencies fluoridation data and maps, the Pennsylvania Department of Health Medicaid Office, and the U.S. National Center for Health Statistics.

Primary Data

Data provided from the state Medicaid agency included names, dental practice addresses, type of dental specialties, and telephone numbers from 174 dentists in the county. From this list a proportionally stratified random sample (n=50) of dentists were selected and polled by FQHC staff. Dentists were asked about their participation in the state Medicaid program and if they were currently accepting new patients.

A Likert 5-point scale survey questionnaire was provided to consumers and FQHC's patients to inquire about their opinions regarding: regular dental checkups,

age of children first dental visit, tobacco, smoking and drinking alcohol role in oral cancer, reasons to visit the dentist, preferences about spending money on dental care, time from work and distance to dental offices as barriers to dental care, and the role of periodontal health in overall health and diabetes management.

Secondary Data

Secondary data consisted of socio-economic and demographic characteristics of the county population and health insurance coverage. These data were summarized at the state, county, zip code and census tract levels. Data were also presented for zip codes served by the FQHC. The state Medical Assistance Office (PA Medicaid) provided a list of dentists enrolled and active in the Medicaid program. The PA Medicaid office also identified dentists that were accepting new dental patients. From this list a stratified random sample was created to estimate the number and location of dentists currently accepting patients covered by the PA Medicaid program in the county. Using ESRI Geographical Information System (Redland, WA) software maps were created to depict location and concentration of persons below 50% Federal Poverty Level (FPL), with less than a high school education, persons without health insurance, number of dentists enrolled in Medicaid, areas with optimally fluoridated drinking water systems, oropharyngeal cancer incidence and mortality. Data on oral health disparities in Pennsylvania children were collected from the National Survey of Children's Health, National Center of Health Statistics at the Centers for Disease Control. Highlights on oral health needs of mothers and children were collected from the Pennsylvania 2010 Maternal and Child, Title V Block Grant, 5-year state-wide health needs assessment.

The relationship between diabetes and periodontal disease has been documented in many studies. Local data on diabetes prevalence from the 2012 Behavioral Risk Factor Surveillance System (BRFSS), for Montgomery, Bucks, and Chester Counties were collected. Data on Chester county population at-risk for diabetes, periodontal disease, and suboptimal glycemic control were presented. County oral cavity and pharynx age-adjusted cancer incidence mortality rates were provided.[13]

The prevalence of dental caries in children ages 2 to 19 years was extrapolated for the FQHC area using 2010 U.S. Census data and 2011-2012 National Health and Nutrition Examination Survey (NHANES data. Caries experience is defined as having at least one tooth with tooth decay that may or may not have been treated. Untreated caries refers to having dental caries that have not been treated.

Safety-net dental clinics provide direct care to individuals with limited resources including those without dental insurance (publicly funded or private). These organizations have specific eligibility requirements that vary according to their mission. A list of dental safety-net clinics was compiled from publicly available websites. To better understand the availability of safety-net dental services and procedures to access these clinics, telephone and or e-mail communication were made to these organizations.

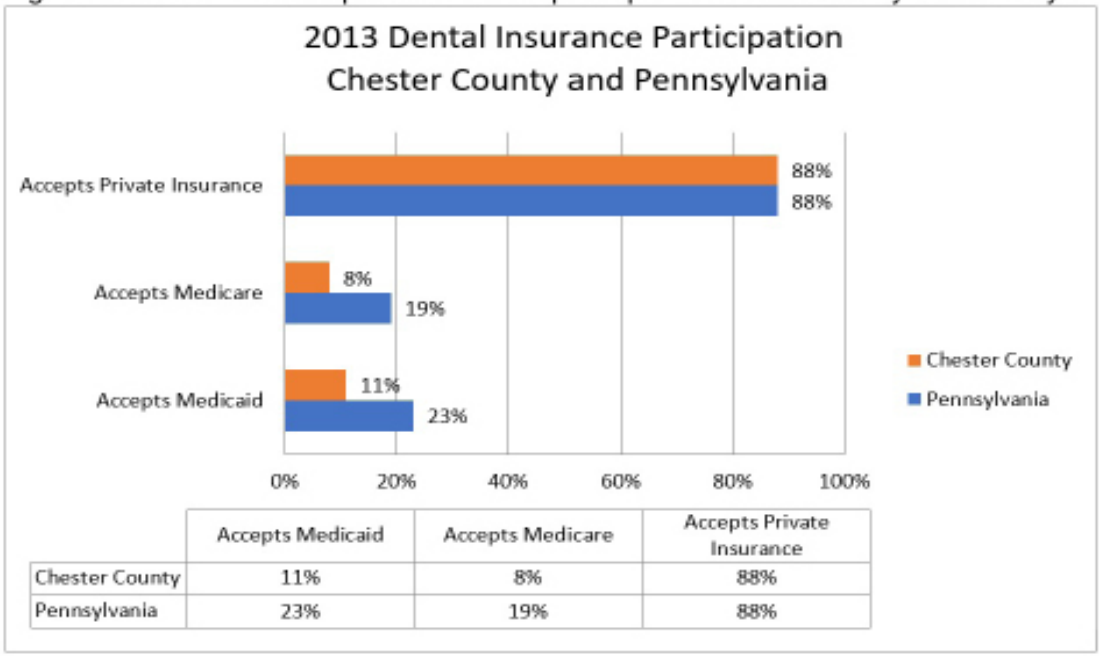
RESULTS

In 2014 an estimated 512,784 persons resided in the county. White alone accounted for 87.1% of the county population. Hispanic or Latino population was 7.0%, Black or African American alone 6.4%, and Asian alone 4.5%. When compared to the state (PA), a larger percentage of Chester County population were foreign born persons 9.0% vs. PA 6.0%, and 11.8% vs PA 10.3% of persons 5 year of age and older spoke a different language other than English at home. Most persons (407,952) were at or above the 200% of Federal Poverty Level (FPL) and 33,895 individuals were below 100% of the FPL. U.S. Census Bureau data (2009-2013) indicate that a greater percentage of persons below the poverty level were comprised of female householders with no husband present and married-couple families were less likely to be below the poverty level. The percentage of female householders with no husband present below the poverty level increased when related children under 18 years of age were present. The trend of a higher percentage of families below poverty in females' householder persisted across racial and ethnic groups. More individuals living below 50% of the FPL resided in Southern Chester County (SCC). In 2013 there were an estimated 40,345 uninsured persons (8.1%) among Chester County civilian

non-institutionalized population. The majority of uninsured were persons 18 to 64 years of age and more males were uninsured. More uninsured persons and persons with less than a high school education resided in zip codes close to the FQHC.

When compared to the state, a lower percentage of Chester County dentists accepted Medicaid (11% county vs. 23% state) and Medicare (8% county vs.19% state) (Figure 1).

Figure 1. 2013 Private and public insurance participation Chester County and Pennsylvania

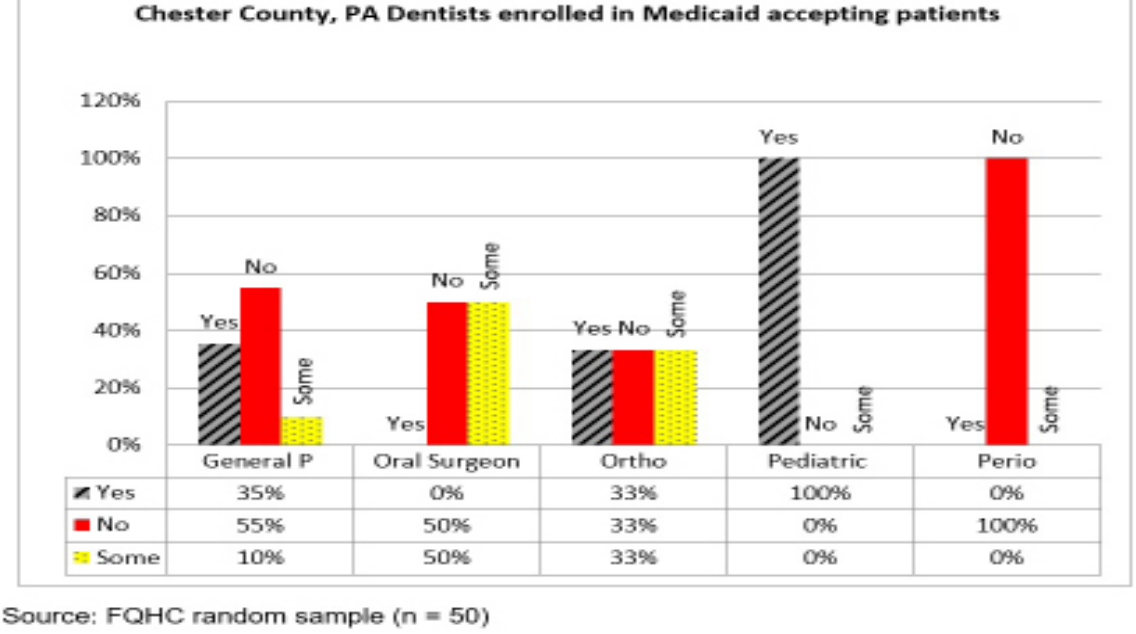


	Accepts Medicaid	Accepts Medicare	Accepts Private Insurance
Chester County	11%	8%	88%
Pennsylvania	23%	19%	88%

Source: Personal communication with PA Medicaid PAMEDICAID@pa.gov

Chester County dentists were less likely to accept new Medicaid patients (15% county vs. 28% state). As of June 2015, SCC had 11 dentists enrolled in the PA Medicaid program. Results from the FQHC survey of county dentists indicated that 47% of all dentists enrolled in the PA Medicaid were currently accepting patients. Regarding participation and acceptance of patients by specialty type, 100% of pediatric dentists, 35% of general practice dentists, and 33% of orthodontists enrolled in the PA Medicaid program were currently accepting patients. Fifty percent of oral surgeons reported that they were accepting some Medicaid patients (Figure 2).

Figure 2. Chester County Dentists enrolled in Medicaid accepting patients June 2015



	General P	Oral Surgeon	Ortho	Pediatric	Perio
Yes	35%	0%	33%	100%	0%
No	55%	50%	33%	0%	100%
Some	10%	50%	33%	0%	0%

Source: FQHC random sample (n = 50)

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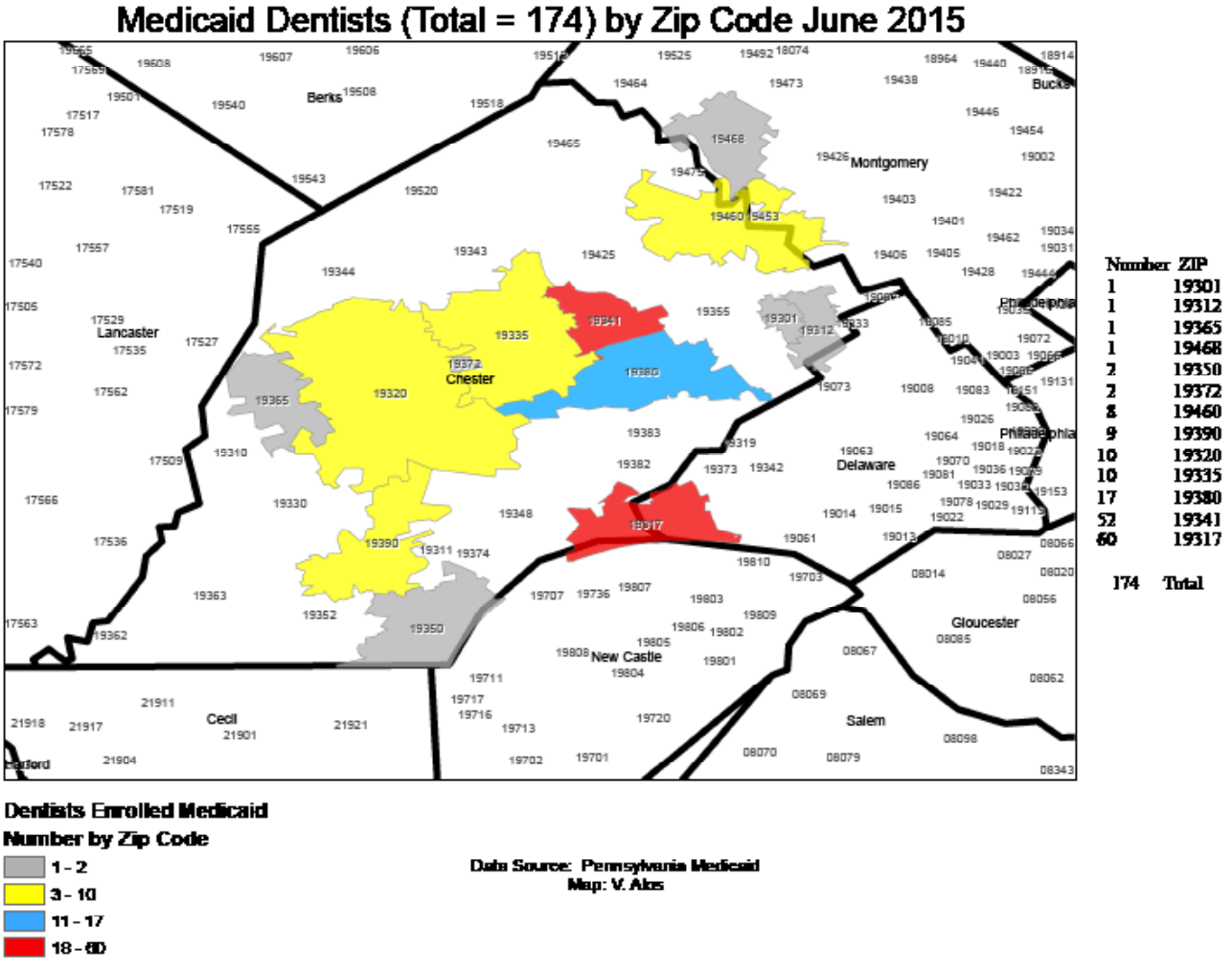
In the southern part of the county, there were no enrolled dentists in the following zip codes: 19362, 19363, 19352, 19310, 19330, 19311, 19374, and 19348 (Figure 3).



Results from the FQHC consumer survey questionnaire indicate that 64 participants were females and 35 males. The group average age was 39 year of age, and age range was 13 to 82. Half of the participants were less than 35 years of age, 75% of them were under 50, and only 10% of them were above 61 years of age. About 50% of all participants reported visiting the dentist in less than 12 months, 75% had a visit in less than 36 months, and 10% had a dental visit in more than 84 months. Using Stata v12.1 (College Station, TX) we found no significant associations between having dental insurance and last visit to the dentist ($p = 0.131$) or last visit to the dentist and gender ($p = 0.968$). More females reported having dental insurance and the association between gender and dental insurance coverage was significant ($p = 0.03$). Consumers' average scores were higher for the following questions: "No pain, no need to see the dentist", "Spending money for dental care is not a priority", and " I don't have time to visit the dentist". The lowest consumer average score was given to: "Regular dental care is important", "Smoking can cause cancer", and "Dental care is important to general health".

The Centers for Disease Control and Prevention (CDC) Water Fluoridation Reporting System (WFRS) reported Pennsylvania with 54.6% of the state population receiving fluoridated drinking water in 2012. The Healthy People 2010 national objective target was 75%. CDC WFRS data for Chester County showed 23% of the county population and 52% of public water systems (PWS) were receiving fluoridated water.[18] Most of the areas without fluoridated drinking water systems are in the central and eastern areas of the county. SCC had only three fluoridated water systems. Areas close to the FQHC included Kennett Square with a partially fluoridated water system, and Avondale, West Grove, and Oxford, all located in southern Chester County with had no fluoridated drinking water systems.

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Pennsylvania data from a telephone survey conducted by the National Center of Health Statistics indicated that in 2011-2012 Hispanic or Latino children had more oral health problems and their overall condition of their teeth was fair or poor, when compared to all other children ages 1-17. For the same period, more Black or African American and children from Other Non-White or Hispanic races/ethnicity had no preventive dental care services and did not receive any dental services within the last 12 months.[16] Findings from the Pennsylvania 2010 Maternal and Child Health Title V Block Grant needs assessment identified lack of insurance and out of pocket costs as consumers' barriers to dental care. Additionally, pregnant women in Pennsylvania avoided dental care due to costs and women perceived dental care as something that is "nice to have" but it is not seen as essential to their overall health. Other barriers to dental care included the lack of awareness about the importance of preventive dental care and general health.[17]

In a review of studies published since 1960 Taylor reports that persons with diabetes have increased prevalence, extent, or severity of periodontal disease, and that poor glycemic control also contributes to periodontal disease.[10] Periodontal disease is also considered as a complication of diabetes.[11] Local data from the 2012 Behavioral Risk Factor Surveillance System (BRFSS) for Montgomery, Bucks, and Chester County, indicate that 8.1% of adults were told by a doctor that they have diabetes.[12] African American, Hispanic/Latino, American Indian, Asian American or Pacific Islander ancestry is considered as one of the risk factors for diabetes.[19] Chester County has a significant representation of at-risk racial and ethnic groups at risk for diabetes, and also potentially at risk for periodontal disease, especially those with suboptimal glycemic control.

Extrapolated data for the FQHC area from 2010 U.S. Census data and 2011-2012 NHANES indicated that an estimated 8,040 (30.6 percent) of children ages 2 to 19 years are in need for treatment for dental caries (Table 1).

Table 1. Estimated Prevalence of Dental Caries in Children in the FQHC Service Area.

National Prevalence Caries Experience[1]		Age Range	Population FQHC Service Area[2]	Persons with Caries FQHC Estimate	Persons with Caries Total FQHC Estimate
Untreated Caries	14.3%	2-8 Years	24,471	3,499	8,040
	15.3%	12-19 Years	29,682	4,541	
Caries Experience	36.7%	2-8 Years	24,471	8,981	26,256
	58.2%	12-19 Years	29,682	17,275	

Similar calculations were made to estimate prevalence for tooth retention in adults, periodontitis, oral cancer due to Human papillomavirus (HPV) infection in the local FQHC area. FQHC communities' demographic and workforce dental capacity data was provided by zip code. Potentially 14,485 individuals below the 200% of FPL and an estimated 24,772 uninsured patients could be served by the new dental site (Table 2).

Table 2. Estimated population and dental capacity data by FQHC zip code areas*

FQHC Service Area Zip Codes	Total Estimated Population	Number below 200% FPL	Number Uninsured	Number Licensed Dentists	Number Medicaid Dentists	Population to dentist ratio	Population to Medicaid dentist ratio
17763	422	44	57	0	0	Na	Na
19310	2,919	390	408	0	0	Na	Na
19311	9,094	784	1715	4	0	2274	Na
19320	52,798	4673	5453	13	10	4061	5280
19330	5,495	430	670	0	0	Na	Na
19348	21,798	853	2424	25	0	872	Na
19350	11,406	246	704	3	2	3802	5703
19352	10,466	218	798	1	0	10466	Na
19362	6,270	674	1094	1	0	6270	Na
19363	17,104	2080	2741	7	0	2443	Na
19365	6,929	615	956	3	1	2310	6929
19380	50,098	1400	3070	7	17	7157	2947
19382	53,404	1357	3055	20	0	2670	Na
19390	13,606	721	1627	5	9	2721	1512
Total	261809	14485	24772	89	39	2942	6713

Poverty Source: U.S. Census Bureau, 2008-2012 American Community Survey 5-Year Estimates, B05010
Insurance Source: U.S. Census Bureau, 2009-2013 5-Year American Community Survey, B27001: Health Insurance Coverage Status by Sex by Age - Universe: Civilian noninstitutionalized population
Licensure Verification: http://www.licensepa.state.pa.us/

* Federally Qualified Health Center (FQHC) zip code areas highlighted in yellow

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In 2016 these data from the CCOHNA were used to write a successful federal grant and obtain a $350,000 award for the implementation of the new FQHC dental site. During the first two years of operation, the new dental site generated 927 and 1,303 unduplicated dental visits in 2017 and 2018 respectively. For the same period, nearby FQHC dental sites experienced a decline in the number of unduplicated patients.

Regarding access barriers to dental safety-net clinics in Chester County, lack of public transportation, distance and driving time were the top issues reported by consumers. In the Southern Chester County area mostly rural, these issues were exacerbated language barriers.

DISCUSSION

The following information justifies the need for establishing a new dental site in the FQHC service area. The new site will be in the southern part of the county, where there are no dentists enrolled in the PA Medicaid program (Zip Codes: 19362, 19363, 19352, 19310, 19330, 19311, 19374, 19348). Existing safety-net dental clinics are located at a considerable distance from the proposed location in southern Chester County. A significant number of individuals living below 50% of the Federal Poverty Level reside in the FQHC service area and proposed dental site. The new dental site area has a significant number of persons without health insurance. The dental site area has racial and ethnic groups experiencing oral health disparities, either partially or non-fluoridated water systems, a higher percentage of persons under 50% of the federal poverty level, persons without health insurance, individuals with less than a high school education, and at high risk for diabetes and periodontal diseases.

CONCLUSIONS

A local oral health needs assessment could successfully be implemented with limited resources. FQHC's existing organizational capacity could be leveraged by volunteers. FQHC leadership and staff time investment could result in significant benefits including successful grant awards to start new dental sites and address access barriers experienced by low-income populations. Critical components of an oral health needs assessment include the participation of key stakeholders and standardized / validated needs assessment methods.

References:

1. Wright J, Williams R, Wilkinson JR. Health needs assessment. Development and importance of health needs assessment. Br Med J. 1998.
2. Rosenbaum SJ. Principles to Consider for the Implementation of a Community Health Needs Assessment Process.; 2013. https://hsrc.himmelfarb.gwu.edu/sphhs_policy_facpubs/863/.
3. Shanks, John, Sadru Kheraj and SF. Better ways of assessing health needs in primary care. BMJ. 1995;(310):480-481. https://www.bmj.com/content/310/6978/480.
4. National Health and Nutrition Examination Survey (NHANES). Information for Health Professionals. https://www.cdc.gov/nchs/nhanes/hlthprofess.htm. Published 2016. Accessed May 9, 2019.
5. Centers for Disease Control and Prevention. Program Operations Guidelines for STD Prevention. Atlanta, GA; 2001. https://www.cdc.gov/std/program/progevaluation.pdf.
6. CDC. Community Health Assessments & Health Improvement Plans. Center for State, Tribal, Local, and Territorial Support. https://www.cdc.gov/publichealthgateway/cha/plan.html. Published 2018. Accessed May 9, 2019.
7. CDC. Drivers of Health Assessment & Improvement Planning. Public Health Professionals Gateway. https://www.cdc.gov/publichealthgateway/cha/drivers.html. Published 2015. Accessed May 9, 2019.
8. Kuthy, R. A., & Siegal MD. Assessing oral health needs: ASTDD seven-step model. In: Association of State and Territorial Dental Directors. Columbus, OH; 1995. https://www.astdd.org/docs/Seven-Step-Model-Introduction.pdf.
9. CDC. Descriptive and Analytical Studies. https://www.cdc.gov/globalhealth/healthprotection/fetp/training_modules/19/desc-and-analytic-studies_fg_final_09252013.pdf. Published 2013. Accessed November 9, 2019.
10. Taylor GW. Bidirectional interrelationships between diabetes and periodontal diseases: an epidemiologic perspective. Ann Periodontol. 2001. doi:10.1902/annals.2001.6.1.99
11. Loe H. Periodontal disease: The sixth complication of diabetes mellitus. In: Diabetes Care. ; 1993. doi:10.2337/diacare.16.1.329
12. CDC. SMART: BRFSS City and County Data and Documentation. Behavioral Risk Factor Surveillance System. https://www.cdc.gov/brfss/smart/smart_data.htm.
13. CDC. State Cancer Registry. National Program of Cancer Registries Cancer Surveillance System. http://statecancerprofiles.cancer.gov/index.html. Published 2014.

Cite this article: Conducting a low-cost oral health needs assessment in Chester County, Pennsylvania, USA.: Am J Den and Ora Car. 2020; Philadelphia: 3(1): 01-08.

14. Pennsylvania Department of Health. Pulse of Pennsylvania's Dentist and Dental Hygienist Workforce.; 2014. https://www.pilot.health.pa.gov/topics/Documents/Programs/Workforce Reports/2013 Pulse of PA Dentist and Dental Hygienist Workforce Report Final.pdf.
15. US Census. US Census http://quickfacts.census.gov/qfd/states/42000.html. Quickfacts. http://quickfacts.census.gov/qfd/states/42000.html. Published 2013.
16. NSCH. National Survey of Children's Health. NSCH 2011/12. www.childhealthdata.org.
17. REDA/Altarum. The Pennsylvania Department of Health's Maternal and Child Health Services 2010 Statewide Needs Assessment.; 2010. http://www.portal.state.pa.us/portal/server.pt/gateway/PTARGS_0_75878_919985_0_0_18/PADOHNeedsandCapacityAssessment.pdf.
18. CDC. CDC Water Fluoridation Reporting System. https://www.cdc.gov/fluoridation/data-tools/reporting-system.html.
19. NIH. National Diabetes Education Program. https://www.niddk.nih.gov/health-information/communication-programs/ndep.

Cite this article: Conducting a low-cost oral health needs assessment in Chester County, Pennsylvania, USA.: Am J Den and Ora Car. 2020; Philadelphia: 3(1): 01-08.