

Editorials represent the opinions of the authors and not necessarily those of the American Dental Association.



GUEST EDITORIAL

Improving health in the United States

Oral health is key to overall health

Natalia I. Chalmers, DDS, PhD,
Diplomate American Board of Pediatric
Dentistry; Joseph S. Wislar, MS;
Sean G. Boynes, DMD, MS; Mark
Doherty, DMD, MPH; Brian B. Nový,
DDS

The vital relationship between health and the economy has been recognized and studied, and countries with a healthier workforce see strong economic performance and gain.^{1,2} What often goes unnoticed, however, is the significant role dentists can play in improving the overall health of the population.

Let's set the stage. National health expenditures are projected to grow at an average annual rate of 5.6% from 2016 through 2025 and reach 19.9% of gross domestic product by 2025.³ The top 20 medical conditions account for 57.6% of the spending, with more resources spent on diabetes than any other condition (\$101.4 billion per year).⁴

Dental health service expenditures grow 5.1% annually and are expected to reach \$185 billion in 2025.³ We see significant spending related to oral health in costly settings, such as hospital emergency departments^{5,6} and operating rooms, in which 50% to 75% of total charges are hospital related.⁷

The oral health-systemic connection has been well documented for many conditions, with strong evidence in 2017 connecting oral health and rheumatoid arthritis.^{8,9} Yet, the lack of detailed national- and state-level data

States in which adults are more likely to visit the dentist also tend to have the lowest proportion reporting fair or poor health.

means understanding the role of oral health in state-level health economics remains a challenge. In addition, access-to-care challenges will persist until an understanding emerges that enables systematic approaches to oral health. Ultimately, we need more evidence to better inform decisions and develop programs and policies.

To that end, we sought to move the needle forward. We examined the oral-overall health relationship using data on dental service utilization from the National Oral Health Surveillance System,^{10,11} self-rated overall health data from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System surveys such as the questionnaires from the Health-Related Quality of Life,¹² and dental benefits from the Medicaid and the State Children's Health Insurance Program Payment and Access Commission.¹³

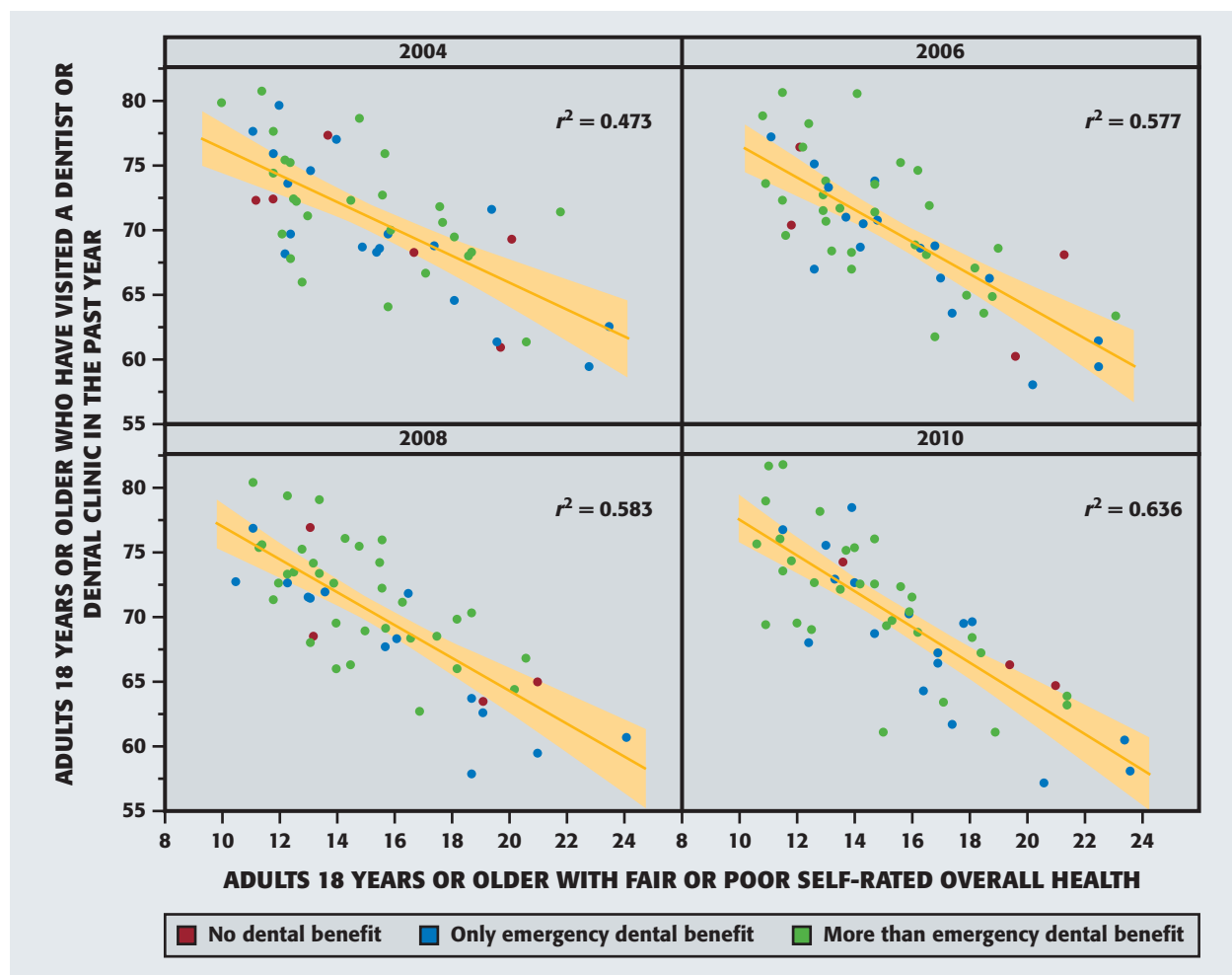


Figure. The figure illustrates state-level association between the proportion of adults who visited a dentist in the past year and the proportion reporting fair or poor overall health, color coded based on state Medicaid adult dental benefits and the years in which these 3 variables overlap (2004, 2006, 2008, and 2010). The results suggested that there is a strong correlation between a visit to the dentist and overall self-rated health, and this relationship is growing stronger over time. States with the highest level of benefits are concentrated in the upper left corners. Sources: Authors' analysis of the data from National Oral Health Surveillance System,¹¹ Health-Related Quality of Life: Percentage with fair or poor self-rated health,¹² and Medicaid and the State Children's Health Insurance Program Payment and Access Commission.¹³

Our analysis shows the state-level association between the proportion of adults who visited a dentist in the past year and the proportion of adults reporting fair or poor overall health in the same state (Figure). Medicaid adult dental benefits are stratified into 3 categories: no dental benefit, only emergency dental benefit, and more than emergency dental benefit. These 3 variables overlap in 2004, 2006, 2008, and 2010. The results indicated a strong correlation between dental visits and overall self-rated health, and this

relationship is getting stronger over time. In other words, states in which adults are more likely to visit the dentist also tend to have the lowest proportion reporting fair or poor health.

Why self-reported health? Research indicates self-rated health provides insight into a person's general health and serves as a guide to future outcomes, and it correlates with self-rated oral health.^{14,15} Research also suggests dental care utilization associated with self-care resulting in good overall health,

whereas regular patterns of dental care utilization are opportune for health enhancement and promotion.¹⁶ Given the dire need to address skyrocketing costs and limited access to care, our analysis suggests ongoing opportunities for dental care teams to effectively participate in the improvement of health and health care. This pursuit should include 3 aims: improve the experience of care, improve the health of populations, and reduce per capita costs of health care.¹⁷ Medical-dental integration is a key

mechanism to aid the incorporation of these 3 aims.

Integration cannot happen simply because it is a good idea for patients and clinicians. It needs to be predicated on an assessment of cost-effectiveness, and a structured approach needs to be developed to ensure long-term success. There are few retrospective US-based studies that have explored the cost-effectiveness of service coordination and have shown medical-dental integration has a positive effect. For insured patients, dental treatment was associated with lower medical costs.¹⁸⁻²⁰ A series of prospective studies of healthy insured workers and older adults in Japan demonstrated similar cost effectiveness.²¹⁻²⁵ Taken together, these studies suggest that treating oral disease can lead to reduced expenditures for patients and states.

Diabetes is 1 of the top 20 most expensive medical conditions, and more resources are spent on diabetes than any other condition.⁴ An analysis of a national health insurance claims database showed that newly diagnosed patients with diabetes who also received periodontal intervention had lower average total health (\$1,799), medical (\$1,577), and diabetes-related (\$408) costs over time.¹⁹

The evidence is there. Dentists can play a significant role in the systemic health of their patients beyond stabilization and prevention of oral disease. Many medical conditions can be first observed intra-orally, which provides an avenue for early diagnosis and treatment. Moreover, the use of screening processes to identify systemic disease indicators during the dental care encounter has grown over the last decade.²⁶ One report showed that most (55% to 90%) patient-respondents were willing to have dentists conduct medical screenings and many (50% to 67%) would pay up to \$20 for the service.²⁷ The authors also noted that 48% to 77% of respondents reported their

perceptions of their dentist's competence and compassion would improve if medical screening occurred during dental care.

Dental venues can serve as an effective care pathway access point for patients not active with primary medical care or in less than ideal health, and physicians have reported favorability and value with dental chairside medical screening and subsequent referral.²⁸⁻³⁰ However, the interprofessional referral process is challenging and cumbersome.

A 2016 American Dental Association Health Policy Institute brief demonstrates physician dissatisfaction with the referral process due to absence of electronic referrals, inconsistent communication, and a lack of dentists willing to accept Medicare or Medicaid.³¹ Because of their location and dental-medical record integration, federally qualified health centers may be a good place to start; they are well-positioned to integrate care efficiently and effectively.³²

For other types of practice settings, we must consider a structured approach using improvement networks (for example, the Southern New England Practice Transformation Network). One such approach may be for dental providers to identify 1 health issue (for example, diabetes or heart disease), and focus the efforts on integrating care for people who have that condition. Using patient engagement processes that lead to patient activation and self-efficacy can positively impact overall well-being, and patients who are more active tend to report better outcomes and engage in ongoing care.³³⁻³⁵ Each practice will be different, but meeting the specific needs of the clinic population will provide the best opportunity.

Oral diseases share risk factors with other noncommunicable diseases such as cardiovascular disease, diabetes, respiratory disease, and cancer.³⁶ Population-based frameworks such as "Oral Health in All Policies" are beginning to recognize

the importance of integrating oral health strategies with those for noncommunicable diseases.³⁶

No matter how it plays out, we know that improving health in the United States will require a coordinated multisystem solution, and oral health is a key to improving the overall health of the nation. ■

<http://dx.doi.org/10.1016/j.adaj.2017.04.031>

Copyright © 2017 American Dental Association. All rights reserved.

Dr. Chalmers is the director, Analytics and Publication, DentaQuest Institute, 2400 Computer Dr., Westborough, MA 01581, e-mail Natalia.Chalmers@DentaQuestInstitute.org. Address correspondence to Dr. Chalmers.

Mr. Wislar is a biostatistician, Analytics and Publication, DentaQuest Institute, Westborough, MA.

Dr. Boynes is the director, Interprofessional Practice, DentaQuest Institute, Westborough, MA.

Dr. Doherty is the executive director, Safety Net Solutions, DentaQuest Institute, Westborough, MA.

Dr. Nový is the president, DentaQuest Oral Health Center, and the director, Practice Improvement, DentaQuest Institute, Westborough, MA.

Disclosure. None of the authors reported any disclosures.

1. Bloom DE, Canning D. Policy forum: public health—the health and wealth of nations. *Science*. 2000;287(5456):1207, 1209.

2. Bloom DE, Canning D, Sevilla J. The effect of health on economic growth: a production function approach. *World Development*. 2004; 32(1):1-13.

3. Keehan SP, Stone DA, Poisal JA, et al. National health expenditure projections, 2016-25: price increases, aging push sector to 20 percent of economy. *Health Aff (Millwood)*. 2017;36(3):553-563.

4. Dieleman JL, Baral R, Birger M, et al. US spending on personal health care and public health, 1996-2013. *JAMA*. 2016;316(24):2627-2646.

5. Chalmers N, Grover J, Compton R. After Medicaid expansion in Kentucky, use of hospital emergency departments for dental conditions increased. *Health Aff (Millwood)*. 2016; 35(12):2268-2276.

6. Wall T, Vujicic M. Emergency department use for dental conditions continues to increase. Health Policy Institute Research Brief. American Dental Association. April 2015. Available at: http://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIBrief_0415_2.ashx. Accessed May 1, 2017.

7. Lalwani K, Kitchin J, Lax P. Office-based dental rehabilitation in children with special healthcare needs using a pediatric sedation service model. *J Oral Maxillofac Surg*. 2007; 65(3):427-433.

8. Abbasi J. To prevent rheumatoid arthritis, look past the joints to the gums. *JAMA*. 2017; 312(12):1201-1202.
9. König MF, Abusleme L, Reinholdt J, et al. *Aggregatibacter actinomycetemcomitans*-induced hypercitrullination links periodontal infection to autoimmunity in rheumatoid arthritis. *Sci Transl Med*. 2016;8(369): 369RA176.
10. Malvitz DM, Barker LK, Phipps KR. Development and status of the National Oral Health Surveillance System. *Prev Chronic Dis*. 2009;6(2):A66.
11. Centers for Disease Control and Prevention. Oral health data. Available at: <https://www.cdc.gov/oralhealthdata/>. Accessed May 1, 2017.
12. Centers for Disease Control and Prevention. Behavioral risk factor data: health-related quality of life (HRQOL). Available at: <https://chronicdata.cdc.gov/Health-Related-Quality-of-Life/Behavioral-Risk-Factor-Data-Health-Related-Quality/xuxn-8kju>. Accessed May 1, 2017.
13. Medicaid and CHIP Payment and Access Commission. Medicaid Coverage of Dental Benefits for Adults. Available at: <https://www.macpac.gov/wp-content/uploads/2015/06/Medicaid-Coverage-of-Dental-Benefits-for-Adults.pdf>. Accessed May 1, 2017.
14. Bailis DS, Segall A, Chipperfield JG. Two views of self-rated general health status. *Soc Sci Med*. 2003;56(2):203-217.
15. Benyamini Y, Leventhal H, Leventhal EA. Self-rated oral health as an independent predictor of self-rated general health, self-esteem and life satisfaction. *Soc Sci Med*. 2004;59(5): 1109-1116.
16. Wall TP, Vujicic M, Nasseh K. Recent trends in the utilization of dental care in the United States. *J Dent Educ*. 2012;76(8):1020-1027.
17. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. *Health Aff (Millwood)*. 2008;27(3):759-769.
18. Jeffcoat MK, Jeffcoat RL, Gladowski PA, Bramson JB, Blum JJ. Impact of periodontal therapy on general health: evidence from insurance data for five systemic conditions. *Am J Prev Med*. 2014;47(2):166-174.
19. Nasseh K, Vujicic M, Glick M. The relationship between periodontal interventions and healthcare costs and utilization: evidence from an integrated dental, medical, and pharmacy commercial claims database. *Health Econ*. 2017; 26(4):519-527.
20. Albert DA, Sadowsky D, Papapanou P, Conicella ML, Ward A. An examination of periodontal treatment and per member per month (PMPM) medical costs in an insured population. *BMC Health Serv Res*. 2006;6:103.
21. Iwasaki M, Sato M, Yoshihara A, Miyazaki H. Effects of periodontal diseases on diabetes-related medical expenditure. *Curr Oral Health Rep*. 2016;3(1):7-13.
22. Sato M, Iwasaki M, Yoshihara A, Miyazaki H. Association between periodontitis and medical expenditure in older adults: a 33-month follow-up study. *Geriatr Int*. 2016;16(7): 856-864.
23. Iwasaki M, Sato M, Yoshihara A, Ansai T, Miyazaki H. Association between tooth loss and medical costs related to stroke in healthy older adults aged over 75 years in Japan. *Geriatr Gerontol Int*. 2017;17(2):202-210.
24. Ide R, Hoshuyama T, Takahashi K. The effect of periodontal disease on medical and dental costs in a middle-aged Japanese population: a longitudinal worksite study. *J Periodontol*. 2007;78(11):2120-2126.
25. Ide R, Hoshuyama T, Wilson D, Takahashi K, Higashi T. Relationships between diabetes and medical and dental care costs: findings from a worksite cohort study in Japan. *Ind Health*. 2010;48(6):857-863.
26. Greenberg BL, Glick M, Frantsve-Hawley J, Kantor ML. Dentists' attitudes toward chairside screening for medical conditions. *JADA*. 2010;141(1):52-62.
27. Greenberg BL, Kantor ML, Jiang SS, Glick M. Patients' attitudes toward screening for medical conditions in a dental setting. *J Public Health Dent*. 2012;72(1):28-35.
28. Kalladka M, Greenberg BL, Padmashree SM, et al. Screening for coronary heart disease and diabetes risk in a dental setting. *Int J Public Health*. 2014;59(3):485-492.
29. Greenberg BL, Thomas PA, Glick M, Kantor ML. Physicians' attitudes toward medical screening in a dental setting. *J Public Health Dent*. 2015;75(3):225-233.
30. Young SL, Karp NV, Karp WB. Dentists' and physicians' attitudes on the role of the dental health care team in a cardiovascular risk factor reduction program. *J Publ Health Dent*. 1990;50(1):38-41.
31. Miloror MB, Vujicic M. Physicians dissatisfied with current referral process to dentists. Health Policy Institute Research Brief. American Dental Association. March 2016. Available at: http://www.ada.org/~media/ADA/Science%20and%20Research/HPI/Files/HPIBrief_0316_5.pdf. Accessed May 1, 2017.
32. Crall JJ, Pourat N, Inkelas M, Lampron C, Scoville R. Improving the oral health care capacity of federally qualified health centers. *Health Aff (Millwood)*. 2016;35(12):2216-2223.
33. Hibbard JH, Greene J. What the evidence shows about patient activation: better health outcomes and care experiences; fewer data on costs. *Health Aff (Millwood)*. 2013;32(2):207-214.
34. Hibbard JH, Greene J, Overton V. Patients with lower activation associated with higher costs; delivery systems should know their patients' 'scores'. *Health Aff (Millwood)*. 2013;32(2): 216-222.
35. Syrjälä AM, Knecht MC, Knuuttila ML. Dental self-efficacy as a determinant to oral health behaviour, oral hygiene and HbA1c level among diabetic patients. *J Clin Periodontol*. 1999;26(9):616-621.
36. Sheiham A, Williams DM, Weyant RJ, et al. Billions with oral disease: a global health crisis—a call to action. *JADA*. 2015;146(12): 861-864.