



American Association
for Dental Research

January 25, 2019

Captain Bruce Dye, DDS, MPH
Judith Albino, PhD
SGR Team
NIH/NIDCR, 31 Center Drive
Room 5B55
Bethesda, MD 20892

Re: 2020 Surgeon General's Report on Oral Health

via: NIDCR-SGROH@nidcr.nih.gov

Dear Capt. Dye and Dr. Albino:

The American Association for Dental Research (AADR) is a nonprofit organization with over 3,300 individual and 107 institutional members in the United States. Its mission is: (1) to advance research and increase knowledge for the improvement of oral health; (2) to support and represent the oral health research community; and (3) to facilitate the communication and application of research findings.

AADR is extremely pleased to know that the 2020 Surgeon General's report will be addressing oral health in America. This timely update to the 2000 *Oral Health in America: A Report of the Surgeon General* should provide a vision for how scientific advancements since 2000 can be leveraged to improve the oral health of the U.S. population. For example, advances in genome-wide association studies have shed light on genetic contributions to caries, periodontal disease and orofacial clefts.^{1, 2, 3, 4} Greater understanding of the oral microbiome has led to the development of agents that may be able to selectively target cariogenic *S. mutans* bacteria for the prevention of dental caries.^{5, 6} The advent of immunotherapy has given new hope to cancer patients as 2016 and 2017 saw the

¹ Ballantine JL, Carlson JC, Ferreira Zandoná AG, Agler C, Zeldin LP, Rozier RG, Roberts MW, Basta PV, Luo J, Antonio-Obese ME et al. 2018. Exploring the genomic basis of early childhood caries: A pilot study. *International Journal of Paediatric Dentistry*. 28(2):217-225.

² Munz M, Richter GM, Loos BG, Jepsen S, Divaris K, Offenbacher S, Teumer A, Holtfreter B, Kocher T, Bruckmann C et al. 2019. Meta-analysis of genome-wide association studies of aggressive and chronic periodontitis identifies two novel risk loci. *European Journal of Human Genetics*. 27(1):102-113.

³ Gowans LJJ, Adeyemo WL, Eshete M, Mossey PA, Busch T, Aregbesola B, Donkor P, Arthur FKN, Bello SA, Martinez A et al. 2016. Association studies and direct DNA sequencing implicate genetic susceptibility loci in the etiology of nonsyndromic orofacial clefts in sub-saharan african populations. *Journal of Dental Research*. 95(11):1245-1256.

⁴ Moreno Uribe LM, Fomina T, Munger RG, Romitti PA, Jenkins MM, Gjessing HK, Gjerdevik M, Christensen K, Wilcox AJ, Murray JC et al. 2017. A population-based study of effects of genetic loci on orofacial clefts. *Journal of Dental Research*. 96(11):1322-1329.

⁵ Eckert R, He J, Yarbrough DK, Qi F, Anderson MH, Shi W. 2006. Targeted killing of streptococcus mutans by a pheromone-guided "smart" antimicrobial peptide. *Antimicrobial Agents and Chemotherapy*. 50(11):3651.

⁶ Garcia SS, Blackledge MS, Michalek S, Su L, Ptacek T, Eipers P, Morrow C, Lefkowitz EJ, Melander C, Wu H. 2017. Targeting of streptococcus mutans biofilms by a novel small molecule prevents dental caries and preserves the oral microbiome. *Journal of Dental Research*. 96(7):807-814.

approval of the immune checkpoint inhibitors nivolumab and pembrolizumab, respectively, for the treatment of chemotherapy-resistant head and neck cancers, and new indications for immunotherapy in head and neck cancer may be on the horizon.⁷ These are just a few of the advances of the last 20 years that could significantly alter the way that we prevent, diagnose and treat dental, oral and craniofacial conditions. It is also imperative that the report team identify research gaps to direct research and enable scientific advances for the next 20 years. AADR strongly encourages the report team to base all conclusions and recommendations on the best evidence available.

The report should highlight advances that have been made in reducing or eliminating oral health disparities, which exist between different racial, ethnic and socioeconomic groups.⁸ Scientific advances should be equitably distributed throughout the population, but newer therapies are likely to be less accessible to those with less income and those in underserved areas and could actually exacerbate disparities. The report should describe successful efforts to reduce oral health disparities that could potentially be scaled up, and it should enumerate oral health conditions for which progress in reducing disparities has been stagnant or even reversed, especially if a cause can be identified.

AA DR hopes this report will emphasize that oral health is part of total health and the role of interprofessionalism in maintaining oral health. It would be useful to provide guidelines and specific examples of the role non-dentist health professionals can play in maintaining the health of the oral cavity, particularly through expanded clinical roles^{9, 10} as well as the role the dental professional can play, as part of the primary health care team, in referring and managing other health conditions and risk factors. The report team should also review current research on reciprocal relationships that may exist between oral health and systemic health, especially in regards to diabetes, low birth weight and cardiovascular disease, questions that continue to be debated in the oral health community.^{11, 12}

Since the 2000 report, the Minamata Convention on Mercury, which aims to reduce the mercury emitted to land, water and air and its deleterious effects on human health, has become a legally binding treaty, of which the United States is a signatory. As part of this treaty, parties agreed to phase down the use of dental amalgam in tooth

⁷ Moskowitz JM, Ferris RL. 2018. Tumor immunology and immunotherapy for head and neck squamous cell carcinoma. *Journal of Dental Research*. 97(6):622-626.

⁸ Disparities in oral health. 2016. Atlanta, GA: Division of Oral Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, U.S. Department of Health and Human Services; [accessed 22 January 2019]. https://www.cdc.gov/oralhealth/oral_health_disparities/index.htm.

⁹ Okunseri C, Szabo A, Jackson S, Pajewski NM, Garcia RI. 2009. Increased children's access to fluoride varnish treatment by involving medical care providers: Effect of a medicaid policy change. *Health Services Research*. 44(4):1144-1156.

¹⁰ Lee JS, Somerman MJ. 2018. The importance of oral health in comprehensive health care. *JAMA*. 320(4):339-340.

¹¹ Pihlstrom BL, Hodges JS, Michalowicz B, Wohlfahrt JC, Garcia RI. 2018. Promoting oral health care because of its possible effect on systemic disease is premature and may be misleading. *The Journal of the American Dental Association*. 149(6):401-403.

¹² Slavkin HC, Kleinman D, Alfano MC. 2018. Oral systemic health. *The Journal of the American Dental Association*. 149(9):749-750.

restorations.¹³ AADR's parent organization, the International Association for Dental Research, agreed to help coordinate research into novel dental materials to replace dental amalgam. An important contribution of the 2020 report would be to highlight any research on the safety of dental amalgam since the two seminal NIDCR-funded studies;^{14, 15} trends on use of dental amalgam and other restoratives in the U.S.; scientific advances in new dental materials, particularly regarding longevity;¹⁶ and remaining research gaps that need to be addressed in dental materials research.

The report should also address the impact of electronic (e-) cigarettes on oral health. Use of e-cigarettes by middle and high schoolers has increased dramatically in just the past year.¹⁷ Some research suggests that e-cigarette use may damage oral tissues^{18, 19} and lead youth who never would have used combustible cigarettes to do so.²⁰ However, due to the novelty of these products, more research is needed on their long-term health effects. A review of e-cigarettes by the National Academies of Science, Engineering and Math specifically noted a lack of research on the oral health effects of e-cigarettes. The 2020 Surgeon General's report on oral health should highlight any available research on the oral health effects of e-cigarettes, identify research gaps and provide guidance for how health providers should discuss these products with their patients.

AADR would also like to draw attention to special needs groups. The Friends of NIDCR is comprised of 32 patient advocacy organization members that represent everything from autoimmune to craniofacial disorders. These organizations are a major voice in the oral health community. The 2020 Surgeon General's report on oral health has the opportunity to focus the research community's efforts on these patients' needs, identify the most effective evidence-based interventions and research gaps that need to be addressed.

Finally, AADR is ready to assist with this effort in any way that it can. Previously, AADR promoted the January 10 Surgeon General's Report on Oral Health Public Comment Announcement webinar through the *Science Advocate*,

¹³ Minamata Convention on Mercury. 2017. Kumamoto: United Nations Environment Program.

<http://www.mercuryconvention.org/Portals/11/documents/Booklets/COP1%20version/Minamata-Convention-booklet-eng-full.pdf>.

¹⁴ Bellinger DC, Trachtenberg F, Barregard L, et al. 2006. Neuropsychological and renal effects of dental amalgam in children: A randomized clinical trial. *Journal of the American Medical Association*. 295(15):1775-1783.

¹⁵ DeRouen TA, Martin MD, Leroux BG, et al. 2006. Neurobehavioral effects of dental amalgam in children: A randomized clinical trial. *Journal of the American Medical Association*. 295(15):1784-1792.

¹⁶ Bernardo M, Luis H, Martin MD, Leroux BG, Rue T, Leitão J, DeRouen TA. 2007. Survival and reasons for failure of amalgam versus composite posterior restorations placed in a randomized clinical trial. *Journal of the American Dental Association*. 138(6):775-783.

¹⁷ Cullen KA, Ambrose BK, Gentzke AS, Apelberg BJ, Jamal A, King BA. 2018. Use of electronic cigarettes and any tobacco product among middle and high school students — United States, 2011–2018. *Morbidity and Mortality Weekly Report*. 67(45):1276-1277.

¹⁸ Rouabhia M, Park HJ, Semlali A, Zakrzewski A, Chmielewski W, Chakir J. 2016. E-cigarette vapor induces an apoptotic response in human gingival epithelial cells through the caspase-3 pathway. *Journal of Cellular Physiology*.

¹⁹ Sundar IK, Javed F, Romanos GE, Rahman I. 2016. E-cigarettes and flavorings induce inflammatory and pro-senescence responses in oral epithelial cells and periodontal fibroblasts. *Oncotarget*. 7(47).

²⁰ National Academies of Sciences, Engineering, and Medicine. 2018. *Public health consequences of e-cigarettes*. Washington, DC: The National Academies Press.

AADR's monthly e-newsletter to members, and on social media and encouraged members to provide comments. Many of the attendants of the Surgeon General's Listening Session on Oral Health were members of AADR, as are many members of the Surgeon General's report team. AADR will continue to promote engagement in future activities, provide comments from researchers on drafts of the report and assist with dissemination and promotion once the final report is released.

Thank you for the opportunity to provide comments during the crucial initial phases of the development of this report. Please do not hesitate to contact AADR at any time if you need any further assistance.

Sincerely,

Handwritten signature of Christopher H. Fox in blue ink.

Christopher H. Fox, DMD, DMSc
Chief Executive Officer

Handwritten signature of Maria Emanuel Ryan in black ink.

Maria Emanuel Ryan, DDS, PhD
President