

APPENDIX

Consensus Statement on Future Directions for the Behavioral and Social Sciences in Oral Health

Daniel W. McNeil*, Cameron L. Randall*, Sarah Baker, Belinda Borrelli, Jacqueline M. Burgette, Barry Gibson, Lisa J. Heaton, George Kitsaras, Colman McGrath, and J. Timothy Newton

Summary of Consensus Statement Development Process

Considering the important role of behavioral and social factors for optimal oral health, the co-first authors (DWM, CLR) organized the Behavioral and Social Oral Health Sciences Summit, guided by a steering committee comprised of the other authors. The Summit was a three-day international meeting of experts and stakeholders representing 57 countries, all career stages, and a wide range of behavioral and social science disciplines and dental specialties. It was held in October and November of 2020. The aims of the Summit were to: describe the state of the field; identify the most significant research gaps and opportunities; and, build consensus about priority areas and future directions for advancing the application of rigorous behavioral and social research to improve oral health globally.

This Consensus Statement is a formal product of the Summit; it was developed with broad participation from the behavioral and social oral health research community and iterative refinement based on expert feedback. First, drawing on Summit content, the authors collaboratively produced a working draft of the Consensus Statement. Next, Summit participants and all members of the International Association for Dental Research (IADR) were invited to provide feedback on the working draft during an open comment period. Using targeted invitations and a snowball recruitment strategy, other stakeholders and relevant groups (e.g., research groups, advocacy groups, professional organizations, non-governmental organizations, funding agencies, industry) were invited to provide feedback during the same period. Comments were submitted on behalf of such groups as well as individuals. Those submitting comments considered the working draft section-by-section and as a whole. Next, drawing on all feedback submitted, the authors edited the working draft in three rounds to produce the final version of the Consensus Statement. Prior to being submitted for publication here, the Consensus Statement was then posted online and the following people/groups were directly invited to sign on as an endorser: all Summit attendees; all members of the IADR Behavioral, Epidemiologic and Health Services Research Group; other relevant stakeholders; any entity that submitted feedback during the open comment period; and anyone who received a forwarded invitation circulated within their professional organization. The more than 400 groups and individuals who endorsed the Consensus Statement are acknowledged below.

Table. Summary of Emphasis Areas and Overarching Considerations to be Prioritized in Future Research

| Areas of Emphasis and Overarching Considerations | Specific Actions Necessary to Advance Research and its Impact | Illustrative Approaches to Future Research |
|---|---|--|
| Behavioral and social theories and mechanisms related to oral health | <ul style="list-style-type: none"> • Develop testable “middle range” theories (i.e., between study-specific working hypotheses and all-encompassing conceptualizations) to understand how behavioral and social factors shape oral health • Specify detailed, multi-level causal pathways that bridge proximal and distal determinants of oral health | <ul style="list-style-type: none"> • From evidence in a series of studies, develop a theoretical formulation that focuses on mechanisms that may be involved in the onset and continuation of oral health behaviors or diseases, and then test the tenants of that theory in new research • Simultaneously assess determinants of oral health behaviors in a diversity of racial/ethnic/cultural population groups, including possible conditioning experiences, family and social group influences, and biological factors, among others • Focus specifically on racism, classism, and other forms of power-based oppression as factors systemically affecting oral health and healthcare, as well as the make-up and well-being of the research and clinical workforces in oral health • Using both cross-sectional and longitudinal approaches, focus theory-based research on known robust and clinically meaningful effects, rather than on those with modest explanatory power |
| Use of multiple and novel methodologies in social and behavioral research and practice related to oral health | <ul style="list-style-type: none"> • Develop theoretically based core of clinically relevant outcomes and health service delivery measures • Create and validate contemporary gold standard measures with strong psychometric properties • Use a range of contemporary qualitative, quantitative, and mixed-methods data approaches | <ul style="list-style-type: none"> • Develop an array of mixed (quantitative and qualitative), psychometrically sound, and practical measures of oral health behaviors and outcomes that are nuanced and go beyond self-report and global categorizations, and ensure racial/cultural diversity in development and in normative samples • Use multiple and novel methodologies in research that focus on oral healthcare systems and the training and behavior of those working in those systems |

| | | |
|--|---|--|
| | <ul style="list-style-type: none"> • Adopt methods for testing theories related to cognitive, affective, and motivational bases of behavior • Utilize causal analysis, complex systems science, and community-engaged research, accounting for individual, environmental, and structural factors (including policies) that influence health | <ul style="list-style-type: none"> • Promote skills training in and high-quality research application of advanced statistical methods and techniques for complex designs, including causal analysis, simulation modeling, social network analysis, and agent-based modeling |
| <p>Development and testing of behavioral and social interventions to promote oral health</p> | <ul style="list-style-type: none"> • Focus on both individual and population levels in intervention research • Focus on scalable interventions that can be customized and tailored to individuals and systems • Adopt technological approaches that maximize intervention customization and diffusion through large systems, expanding reach to underserved populations and those who are affected by health inequities • Involve multiple groups of stakeholders at every stage of intervention development and testing • Design interventions using theoretical frameworks • Measure testable mechanisms of change • Focus on individuals and systems that are not yet resourced or motivated for change • Focus on at-risk, disadvantaged, and marginalized communities • Apply and test theories and intervention elements shown to be effective in other healthcare disciplines | <ul style="list-style-type: none"> • Evaluate the combined effects of simultaneous delivery of individual- and higher-level interventions, including those aimed at prevention • Measure acceptability, amount of use, overall engagement, effectiveness, and/or maintenance of behavior change over time in intervention studies, in particular across diverse racial/cultural and age groups and especially in those involving novel interventions such as technology-based ones • Assess the treatment fidelity of intervention approaches using validated checklists to increase the internal and external validity as well as to aid in dissemination • Study how specific characteristics of interventions and dose are associated with patient satisfaction, engagement, and downstream clinical oral health outcomes • Assess approaches to promote or maintain oral health behaviors, delivered chairside by oral health professionals and in other healthcare settings by other professionals |

| | | |
|--|--|--|
| <p>Dissemination and implementation (D&I) research for oral health</p> | <ul style="list-style-type: none"> • Meaningfully involve stakeholders in all aspects of D&I, in research and practice • Attend to contextual factors (at global and local levels) • Adopt contemporary D&I research study designs, using precisely specified methods • Focus on interdisciplinary research that embraces multidirectional interactions among researchers, community members, practitioners, and public policy makers • Leverage behavioral and social “big data” to reduce oral health inequities • Inform public health and policy approaches that support upstream action and a commitment to equity | <ul style="list-style-type: none"> • Use D&I research and practice to improve dental care delivery, oral health programs, and healthcare systems—and oral health—through social, cultural, and political systems-level changes, and by increasing adoption and sustained use of evidence-based behavioral and dental interventions • Advance the already robust and growing field of D&I science by employing study designs in oral health research that refine D&I theories, methods, and practice • Disseminate, implement, and scale up methods to prevent and respond to racism and other discrimination (e.g., class-, culture-, and religious-based) that adversely affect oral health and the oral health workforce, including as related to education/training, clinical and research settings, healthcare delivery, and public policy |
| <p>Overarching considerations for the application of behavioral and social sciences in oral health</p> | <ul style="list-style-type: none"> • Integrate behavioral and social sciences in the education, training, and mentoring of oral health clinicians and researchers • Adopt or enhance multi- and transdisciplinary collaborative and integrative efforts, prioritizing full inclusion, especially of behavioral and social sciences not historically represented in oral health research • Focus on inclusive research that involves population groups that have been marginalized and under-served in oral healthcare and research • Include in research positive aspects of oral health (shifting from a predominant focus on disease and disorder) | <ul style="list-style-type: none"> • Directly translate the strong existing descriptive behavioral and social oral health research findings into theory-based and mechanism-focused prevention and intervention research, across diverse racial/cultural/age groups, to yield meaningful change • Organize and maintain a multi-disciplinary, multi-career-stage, multi-national group (with intentional inclusion of those from low- and middle-income countries), led by behavioral and social scientists, that provides inspiration, ideas, and guidance for oral health research involving the behavioral and social sciences • Partner with industry in conducting behavioral and social research, as improvements in oral health will require engagement with and changes to the oral healthcare industry and commercial products • Cultivate the behavioral and social sciences as independent entities, and simultaneously transcend |

| | | |
|--|--|--|
| | | <p>disciplinary silos through the full engagement of behavioral and social scientists and researchers from various dental disciplines, in basic and clinical oral health research</p> <ul style="list-style-type: none">• Study social and other forces, including commercial practices and the influence of policy and products |
|--|--|--|

Note. Illustrations of possible research approaches provided in this table are intended as examples; they do not represent the full scope of necessary future research and their inclusion here is not necessarily based on priority relative potential examples not included.

Endorsement

Groups Endorsing the Consensus Statement

Alliance for Oral Health Across Borders, New York, USA
American Association for Dental, Oral, and Craniofacial Research (AADOCR), Alexandria, Virginia, USA
American Dental Education Association (ADEA) - Behavioral Sciences Section, Washington, DC, USA
Anxiety, Psychophysiology, and Pain Research Laboratory, West Virginia University, Morgantown, West Virginia, USA
Association of State and Territorial Dental Directors, Reno, NV, USA
Behavioral, Epidemiologic and Health Services Research (BEHSR) Scientific Group, International Association for Dental Research, Alexandria, VA, USA
Behaviour Change in Dentistry Network (BeCinD), King's College London and University of Manchester, London and Manchester, England, United Kingdom of Great Britain and Northern Ireland
British Society for Disability and Oral Health, United Kingdom of Great Britain and Northern Ireland
British Society of Periodontology and Implant Dentistry, Liverpool, United Kingdom of Great Britain and Northern Ireland
Center for Craniofacial and Dental Genetics (CCDG), University of Pittsburgh, Pittsburgh, Pennsylvania, USA
Center for Evidence-Based Stomatology, School & Hospital of Stomatology, Wuhan University, Wuhan, Hubei, China
Center for Integrative Global Oral Health, University of Pennsylvania School of Dental Medicine, Philadelphia, Pennsylvania, USA
Center for Molecular and Clinical Epidemiology of Infectious Diseases, University of Michigan, Ann Arbor, Michigan, USA
Center for Oral Health Research in Appalachia (COHRA), University of Pittsburgh, Pittsburgh, Pennsylvania, USA, and West Virginia University, Morgantown, West Virginia, USA
Center to Address Disparities in Children's Oral Health (CAN DO), University of California San Francisco, San Francisco, California, USA
Colgate Palmolive Company, Piscataway, New Jersey, USA
Deanship of Scientific Research, Al-Quds University, Jerusalem, Palestine
DeCare Dental, Vision & Wellness Ireland and Europe, National University of Ireland Galway, Dublin, Leinster, Ireland
Dental Health Services Victoria, Melbourne, Victoria, Australia
Dental Hygienists Association of Australia (DHAA), Melbourne, Victoria, Australia
Department of Dental Medicine Division of Pediatric Dentistry, Jamaica Hospital Medical Center, Jamaica, New York, USA
Department of Preventive and Community Dentistry - School of Dentistry, Universidad de Buenos Aires, Buenos Aires, CABA, Argentina
Family and Community Intervention Lab, University of Arkansas, Fayetteville, Arkansas, USA
German Society of Oral Epidemiology and Healthcare Research, German Society of Dentistry and Oral Medicine, Giessen, Hesse, Germany
Grupo de Investigación en Salud Pública, Educación y Profesionalismo Médico, Universidad de los Andes, Bogotá D.C., Colombia
Humble Smile Foundation, Sundbyberg, Stockholm, Sweden
Indigenous Oral Health Unit, University of Adelaide, Adelaide, South Australia, Australia
Institut der Deutschen Zahnärzte, Witten/Herdecke University, Cologne, North Rhine-Westphalia, Germany
International Association for Dental Research (IADR), Alexandria, Virginia, USA
Irish Dental Hygienist Association (IDHA), Dublin, Ireland

Irish Society of Disability and Oral Health, Dublin, Ireland
Malaysian Association of Dental Public Health Specialists, Kuala Lumpur, Federal Territory of Kuala Lumpur, Malaysia
New Mexico Oral Health Coalition (NMOHC), Albuquerque, Santa Fe, Las Cruces, and Farmington, New Mexico, USA
Oral Health Centre of Expertise, Stavanger, Rogaland, Norway
Oral Health Equity Core, Institute for Inclusion, Inquiry, and Innovation (iCubed), Virginia Commonwealth University, Richmond, Virginia, USA
Peninsula Dental School, University of Plymouth, Plymouth, Devon, United Kingdom of Great Britain and Northern Ireland
Poche Centre for Indigenous Health, The University of Sydney, Camperdown, New South Wales, Australia
School of Clinical Dentistry, University of Sheffield, Sheffield, South Yorkshire, United Kingdom of Great Britain and Northern Ireland
School of Dental Sciences, Newcastle University, Newcastle upon Tyne, Tyne and Wear, United Kingdom of Great Britain and Northern Ireland
Seniors Dental Care Australia, Ipswich, Queensland, Australia
The British Association for the Study of Community Dentistry (BASCD), United Kingdom of Great Britain and Northern Ireland
Toothfriendly Foundation, Basel, Basel, Switzerland
West Virginia Dental Hygienists' Association, Charleston, West Virginia, USA
West Virginia University School of Dentistry Research Committee, West Virginia University, Morgantown, West Virginia, USA
WHO Collaborating Center Quality Improvement & Evidence-based Dentistry, New York University, New York, New York, USA

Individuals Endorsing the Consensus Statement

Norintan Ab-Murat, University of Malaya, Kuala Lumpur, Malaysia
Hazem Abbas, Tohoku University, Sendai, Miyagi, Japan
Hams H. Abdelrahman, Alexandria University, Alexandria, Egypt
Naif Abogazalah, King Khalid University College of Dentistry, Abha, Asir, Saudi Arabia
Lucas G. Abreu, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil
Pauline Adair, Queen's University, Belfast, Co Antrim, United Kingdom of Great Britain and Northern Ireland
Razia Z. Adam, University of the Western Cape, Cape Town, Western Cape, South Africa
Himanshi Aggarwal, Saraswati Dental College, Lucknow, India
Nilufar Ahmed, University of Bristol, Bristol, United Kingdom of Great Britain and Northern Ireland
Aderonke Akinkugbe, Virginia Commonwealth University, Richmond, Virginia, USA
Walid A. Al-Soneidar, McGill University, Montreal, Québec, Canada
Bakheet M. Alaa, Our Lady of Fatima University, Metro Manila, Valenzuela, Philippines
Judith Albino, University of Colorado Anschutz Medical University, Denver, Colorado, USA
Linda A. Alexander, West Virginia University, Morgantown, WV, USA
Arlene Cecilia A. Alfaro, University of the Philippines Manila, Manila, Philippines
Finbarr Allen, National University of Singapore, Singapore, United Kingdom of Great Britain and Northern Ireland
Paul Allison, McGill University, Montreal, Quebec, Canada
Dua'a Almegbil, University of Sheffield, Sheffield, South Yorkshire, United Kingdom of Great Britain and Northern Ireland
Andre Mariz Almeida, Instituto Universitário Egas Moniz, Lisboa, Portugal
Saad H. A. S. Alqahtani, Ministry of Health, Qasr, Jahra, Kuwait
Lina AlQobaly, Taibah University, Madinah, Madinah, Saudi Arabia
Abdulrahman Alsaad, Riyadh Elm University, Riyadh, Riyadh, Saudi Arabia

Dalil Alshammari, University of Manchester, Manchester, Greater Manchester, United Kingdom of Great Britain and Northern Ireland

Aws Fakhri Alzwghaibi, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Euridsse Sulemane Amade, National Institute of Health, Maputo, Maputo Cidade, Mozambique

Vesna Ambarkova, Cyril & Methodius University Skopje, Skopje, The former Yugoslav Republic of Macedonia

Jeongwi An, West Virginia University, Morgantown, WV, USA

Oelisoa M. Andriankaja, University of Puerto Rico, San Juan, Puerto Rico, USA

Ainol Haniza Kherul Anuwar, University of Malaya, Kuala Lumpur, Malaysia

Thiago Machado Ardenghi, Federal University of Santa Maria, Santa Maria, Rio Grande do Sul, Brazil

Arheiam Arheiam, University of Benghazi, Benghazi, Libyan Arab Jamahiriya

Mbende Eliane Aurelie, University of Yaounde I, Yaounde, Center, Cameroon

Muneer Gohar Babar, International Medical University, Kuala Lumpur, Malaysia

Sarah R. Baker, University of Sheffield, Sheffield, South Yorkshire, United Kingdom of Great Britain and Northern Ireland

Ramaa Balkaran, The University of the West Indies, St. Augustine, Trinidad and Tobago

Anzany Tania Dwi Putri Baringbing, Indonesian National Narcotics Board Drug Rehabilitation Center, Bogor, Jawa Barat, Indonesia

Emma Barnes, Cardiff University, Cardiff, United Kingdom of Great Britain and Northern Ireland

Sule Batu, Istanbul University, Istanbul, Turkey

Abbie O'Ferrell Beacham, University of Louisville, Louisville, KY, USA

Darragh Beecher, University College Cork, Cork, Ireland

Alexander Bendayan, Boston University Henry M. Goldman School of Dental Medicine, Boston, Massachusetts, USA

Amrit Bhatti, University of Leeds, Leeds, West Yorkshire, United Kingdom of Great Britain and Northern Ireland

Maria Gabriela H. Biazovic, University of São Paulo, São Paulo, Brazil

Paul Block, William James College, Barrington, Rhode Island, USA

Rafael Aiello Bomfim, Federal University of Mato Grosso do Sul, Campo Grande, Mato Grosso do Sul, Brazil

Diann Bomkamp, St. Louis, Missouri, USA

Belinda Borrelli, Boston University Henry M. Goldman School of Dental Medicine, Boston, Massachusetts, USA

João Botelho, Egas Moniz - Cooperativa de Ensino Superior, CRL, Lisbon, Portugal

Elizabeth A. Boutsis, Lavrio Health Center, Lavrio, Attica, Greece

Kevin L. Boyd, Lurie Children's Hospital, Chicago, Illinois, USA

Tegwyn H. Brickhouse, Virginia Commonwealth University, Richmond, Virginia, USA

Jonathan M. Broadbent, University of Otago, Dunedin, Otago, New Zealand

Tom Broomhead, The University of Sheffield, Sheffield, South Yorkshire, United Kingdom of Great Britain and Northern Ireland

Patricia S. Brown, University of Washington, Seattle, Washington, USA

Jamey T. Brumbaugh, West Virginia University, Morgantown, West Virginia, USA

Erin Ealba Bumann, University of Missouri - Kansas City, Kansas City, Missouri, USA

Daniela Bustos, Particular, Santiago, Región Metropolitana, Chile

Kevin Matthew Byrd, ADA Science and Research Institute, Gaithersburg, Maryland, USA

Susana J. Calderon, Illinois State University, Normal, Illinois, USA

Guglielmo Campus, University of Bern, Bern, Switzerland

Helen Cartner, Northumbria University, Newcastle upon Tyne, Tyne and Wear, United Kingdom of Great Britain and Northern Ireland

Paola Carvajal, University of Chile, Santiago, Santiago, Chile

Roger Keller Celeste, Federal University of Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil

Andrés Celis, University of Chile, Santiago, Santiago, Chile
Maximiliano S. Cenci, Universidade Federal de Pelotas, Pelotas, Rio Grande do Sul, Brazil
Sanaa Chala, Mohammed V University in Rabat, Rabat, Morocco
Claire Chang, Boston University, Boston, Massachusetts, USA
Akhilanand Chaurasia, King George's Medical University, Lucknow, Uttar-Pradesh, India
Radhika Chhibber, McGill University, Montreal, Quebec, Canada
Gail Childs, University of Florida College of Dentistry, Gainesville, FL, USA
Gary T. Chiodo, University of Washington School of Dentistry, Seattle, Washington, USA
Remus Chunda, Dental Therapist, Dumfries and Galloway, Scotland, United Kingdom of Great Britain and Northern Ireland
Sun Oh Chung, University of Washington, Seattle, Washington, USA
Jeanne Chung, Colgate Palmolive, Piscataway, New Jersey, USA
Joseph Flaherty Churchill, Lower Elwha Klallam Tribe, Sequim, Washington, USA
Lois K. Cohen, National Institute of Dental and Craniofacial Research, National Institutes of Health, Bethesda, Maryland, USA
Robert J. Collins Jr., University of Pennsylvania, Philadelphia, Pennsylvania, USA
Carolina Yanez Contreras, Universidad San Sebastian, Valdivia, Chile
Marco Cornejo, University of Chile, Santiago, Santiago, Chile
James Coughlan, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, London, Greater London, United Kingdom of Great Britain and Northern Ireland
Stephanie Cruz, University of Washington, Seattle, Washington, USA
Julia Csikar, The University of Leeds, Leeds, West Yorkshire, United Kingdom of Great Britain and Northern Ireland
Cristina B. Culacciati, Universidad de Buenos Aires, Ciudad Autónoma de Buenos Aires, Buenos Aires, Argentina
Joana Cunha-Cruz, University of Alabama, Birmingham, Alabama, USA
Charlotte C. Currie, Newcastle University, Newcastle Upon Tyne, Tyne and Wear, United Kingdom of Great Britain and Northern Ireland
Karen Danke, Universidad de Chile, Santiago, Santiago, Chile
Elaine L. Davis, University at Buffalo, Buffalo, New York, USA
Aimee Dawson, Université Laval, Québec, Québec, Canada
David R. Dean, University of Washington, Seattle, Washington, USA
Jennifer Deane, Newcastle University, Newcastle Upon Tyne, United Kingdom of Great Britain and Northern Ireland
Chris Deery, University of Sheffield, Sheffield, South Yorkshire, United Kingdom of Great Britain and Northern Ireland
Renate Deinzer, Justus Liebig University, Giessen, Hesse, Germany
Flavio Fernando Demarco, Federal University of Pelotas, Pelotas, Rio Grande do Sul, Brazil
Heidi Desmarais, Eastern Washington University, Spokane, Washington, USA
Iwan Dewanto, Indonesian Dental Association and School of Dentistry University Muhammadiyah Yogyakarta, Sleman, DI Yogyakarta, Indonesia
Cássia Dezan-Garbelini, State University of Londrina, Londrina, Paraná, Brazil
Kunaal Dhingra, Centre for Dental Education and Research, All India Institute of Medical Sciences, New Delhi, India
Andreea Cristiana Didilescu, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania
Kimon Divaris, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA
Loc Do, The University of Queensland, Brisbane, Queensland, Australia
David Dunning, University of Nebraska Medical Center, Lincoln, Nebraska, USA
Angela Durey, University of Western Australia, Perth, Western Australia, Australia
Samuel F. Dworkin, University of Washington, Seattle, Washington, USA
Burton L. Edelstein, Columbia University, New York, New York, USA
Uyi Idah Ekowmenhenhen, Lagos University Teaching Hospital, Idiara, Lagos State, Nigeria

Ian Richard Epondulan, The University of Sydney, Sydney, New South Wales, Australia
Susana Margarita Lorenzo Erro, Universidad de la República, Montevideo, Uruguay
Negin Eslamiamirabadi, McGill University, Montreal, Quebec, Canada
Iris L. Espinoza, University of Chile, Santiago, Santiago, Chile
Dominik A. Ettlin, University of Zurich, Zurich, Zurich, Switzerland
Nathalia Fernandes Fagundes, University of Alberta, Edmonton, Alberta, Canada
Jocelyne S. Feine, McGill University, Montreal, Quebec, Canada
Carlos Alberto Feldens, Lutheran University of Brazil, Porto Alegre, Rio Grande do Sul, Brazil
Raquel C. Ferreira, Federal University of Minas Gerais, Belo Horizonte, Minas Gerais, Brazil
Tracy L Finlayson, San Diego State University, San Diego, California, USA
Eleanor Fleming, Meharry Medical College, Nashville, Tennessee, USA
Michael Foley, University of Queensland, Brisbane, Queensland, Australia
Natalia Fortich-Mesa, Corporacion Universitaria Rafael Nunez, Cartagena, Bolivar, Colombia
Chelsea Fosse, American Dental Association, Chicago, Illinois, USA
Sarah E. Francis, West Virginia University, Morgantown, WV, USA
Balgis Gaffar, Imam Abdulrahman bin Faisal university, Dammam, Eastern province, Saudi Arabia
Julie Gallagher, University College London, London, United Kingdom of Great Britain and Northern Ireland
Jesus Carlos Galvan, Albuquerque, New Mexico, USA
Stuart A. Gansky, University of California San Francisco, San Francisco, California, USA
Xiaoli Gao, National University of Singapore, Singapore, Singapore
Sandra Garbely-Kerkovich, Choptank Community Health, Bishopville, Maryland, USA
Dina Tamar Garcia, Virginia Commonwealth University, Richmond, Virginia, USA
Alejandra García-Quintana, Universidad Central de Venezuela, Caracas, Miranda, Bolivarian Republic of Venezuela
Frank L. Gardner, School of Health Sciences of Touro College, New York, New York, USA
Arwa Z. Gazzaz, University of British Columbia, Vancouver, British Columbia, Canada
Andrew R. Geddis-Regan, Newcastle University, Newcastle upon Tyne, Tyne and Wear, United Kingdom of Great Britain and Northern Ireland
William V. Giannobile, Harvard School of Dental Medicine, Boston, Massachusetts, USA
Barry John Gibson, University of Sheffield, Sheffield, South Yorkshire, United Kingdom of Great Britain and Northern Ireland
Jilly Gibson-Miller, University of Sheffield, Sheffield, Yorkshire, United Kingdom of Great Britain and Northern Ireland
Efrat Gilon, Tel-Aviv University, Tel-Aviv, Israel
Jeannie Ginnis, University of North Carolina Adams School of Dentistry, Chapel Hill, North Carolina, USA
Noha A. E. Gomaa, Western University, London, Ontario, Canada
Juliana Gomez, Colgate-Palmolive, Manchester, Greater Manchester, United Kingdom of Great Britain and Northern Ireland
Michaela Goodwin, University of Manchester, Manchester, United Kingdom of Great Britain and Northern Ireland
Kara A. Gray-Burrows, University of Leeds, Leeds, West Yorkshire, United Kingdom of Great Britain and Northern Ireland
Sonia Groisman, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil
Carol C. Guarnizo-Herreno, Universidad Nacional de Colombia, Bogota, Distrito Capital, Colombia
Shilpa Gunjal, Mahsa University, Jenjarom, Selangor, Malaysia
Anisha Gupta, University of Bristol, Bristol, England, United Kingdom of Great Britain and Northern Ireland
Dandara Gabriela Haag, University of Adelaide, Adelaide, South Australia, Australia
Faisal F. Hakeem, Taibah University, Madinah, Madinah, Saudi Arabia
Martin Hall, Dental Health Services Victoria, Melbourne, Victoria, Australia

Takashi Hanioka, Fukuoka Dental College, Fukuoka City, Fukuoka, Japan
Máiréad Antoinette Harding, University College Cork, Cork, Ireland
Dana Harris, American Dental Hygiene Association, West Richland, Washington, USA
Rebecca Harris, University of Liverpool, Liverpool, Merseyside, United Kingdom of Great Britain and Northern Ireland
Paul Hatton, The University of Sheffield, Sheffield, South Yorkshire, United Kingdom of Great Britain and Northern Ireland
Lisa J. Heaton, University of Washington, Seattle, Washington, USA
Brenda Heaton, Boston University, Boston, Massachusetts, USA
Anna Maria Heikkinen, University of Helsinki, Helsinki, Uusimaa, Finland, Suomi
Masahiro Heima, Kagoshima University, Kagoshima, Kagoshima, Japan
Richard Heimberg, Temple University, Philadelphia, Pennsylvania, USA
Michelle Henshaw, Boston University, Boston, Massachusetts, USA
Brenda Yuliana Herrera-Serna, Universidad Autónoma de Manizales, Manizales, Caldas, Colombia
Richard E. Heyman, New York University, New York, New York, USA
Noor Syahidah Hisamuddin, University of Malaya, Kuala Lumpur, Federal Territory of Kuala Lumpur, Malaysia
Alexander C. L. Holden, The University of Sydney, Sydney, New South Wales, Australia
Richard Holliday, Newcastle University, Newcastle upon Tyne, Tyne and Wear, United Kingdom of Great Britain and Northern Ireland
Richard D. Holmes, Newcastle University, Newcastle upon Tyne, Tyne and Wear, United Kingdom of Great Britain and Northern Ireland
Matt Hopcraft, University of Melbourne, Melbourne, Victoria, Australia
Uma M. Irfan, Case Western Reserve University, Cleveland, Ohio, USA
Lisa M. Jamieson, University of Adelaide, Adelaide, South Australia, Australia
Barbara Janssens, Ghent University, Ghent, Flanders, Belgium
Newell W. Johnson, Griffith University, Brisbane, Queensland, Australia
Judith Ann Jones, University of Detroit Mercy, Detroit, Michigan, USA
Birgitta Jönsson, University of Gothenburg, Gothenburg, Västra Götalandsregionen, Sweden
Mohammed Junaid, University of Western Australia, Nedlands, Western Australia, Australia
Zvonimir Kaic, Croatian Academy of Medical Sciences, Zagreb, Croatia
Mel L. Kantor, University of Wisconsin-Eau Claire, Eau Claire, Wisconsin, USA
Elizabeth C. Kao, West Virginia University, Morgantown, West Virginia, USA
Flavia P. Kapos, University of Washington, Seattle, Washington, USA
Elham Kateeb, Al-Quds University, Jerusalem, Palestine
Vartika Kathuria, New Delhi, Delhi, India
Lydia Georgieva Katrova, Faculty of Dental Medicine of the Medical University of Sofia, Bulgaria, Sofia, Bulgaria
Ali Kazemian, Mashhad University of Medical sciences, Mashhad, Khorasan-e Razavi, Iran
Cristin Kearns, University of California, San Francisco, San Francisco, California, USA
Aengus Kelly, University of Plymouth, Plymouth, Devon, United Kingdom of Great Britain and Northern Ireland
Salsbeel Khan, The University of Lahore, Lahore, Punjab, Pakistan
Marc T. Kiviniemi, University of Kentucky, Lexington, Kentucky, USA
Celeste Kong, Boston University, Boston, Massachusetts, USA
Carrie Krekoski, University of British Columbia, Vancouver, British Columbia, Canada
Carol Kunzel, Columbia University, New York, New York, USA
Satu Lahti, University of Turku, Turku, Finland
Jaime Lawson, Virginia Commonwealth University, Richmond, Virginia, USA
Linda LeResche, University of Washington, Seattle, Washington, USA
Lenny Lesa, University of Malaya, Kuala Lumpur, Kuala Lumpur, Malaysia
Alissa Levine, McGill University, Montreal, Quebec, Canada
Nareudee Limpuangthip, Chulalongkorn University, Bangkok, Pathumwan, Thailand

Chia-Shu Lin, National Yang Ming Chiao Tung University, Taipei, Taiwan
James A. Lipton, University of Pennsylvania, Philadelphia, Pennsylvania, USA
Stefan Listl, Radboud University, Nijmegen, Gelderland, Netherlands
Kathy M. Lituri, Boston University, Boston, Massachusetts, USA
Naty Lopez, University of Minnesota, Minneapolis, Minnesota, USA
Vanessa Machado, Egas Moniz - Cooperativa de Ensino Superior, CRL, Lisbon, Portugal
Ana Cristina Mafla, Universidad Cooperativa de Colombia, Pasto, Nariño, Colombia
Waad Elfatih Omer Mahadi, Khartoum University, Khartoum, Sudan
Mohamed Ali Mami, Tripoli university, Tripoli, Libyan Arab Jamahiriya, Libya
Lloyd Mancl, University of Washington, Seattle, Washington, USA
David J. Manton, University of Groningen, Groningen, Groningen, Netherlands
Mary L. Marazita, University of Pittsburgh, Pittsburgh, Pennsylvania, USA
Kanchan Marcus, The University of Sydney, Sydney, New South Wales, Australia
Zoe Marshman, University of Sheffield, Sheffield, South Yorkshire, United Kingdom of Great Britain and Northern Ireland
Vijay Prakash Mathur, All India Institute of Medical Sciences, New Delhi, Delhi, India
Gerardo Maupome, Indiana University, Indianapolis, Indiana, USA
Aurelie Eliane Mbende, University of Yaounde I, Yaounde, Center, Cameroon
Eleanor L. McGlinchey, Fairleigh Dickinson University, Teaneck, New Jersey, USA
Colman McGrath, University of Hong Kong, Hong Kong, Hong Kong SAR, China
Valrie J. McKenzie, University of Technology, Jamaica, Kingston, Jamaica
Christy McKinney, University of Washington, Seattle, Washington, USA
Cheryl B. McNeil, West Virginia University, Morgantown, West Virginia, USA
Daniel W. McNeil, West Virginia University, Morgantown, West Virginia, USA
Jocelyn A. Medina-Paneto, University of Puerto Rico, San Juan, Puerto Rico, USA
Dalia E. Meisha, King Abdulaziz University, Jeddah, Makkah region, Saudi Arabia
Elisabeth Lind Melbye, Oral Health Center of Expertise - Rogaland, Norway, Stavanger, Rogaland, Norway
Ana Lúcia Mello, Universidade Federal de Santa Catarina, Florianópolis, Santa Catarina, Brazil
Michael Antonio F. Mendoza, University of the Philippines Manila, Manila, Metro Manila, Philippines
Elizabeth Mertz, University of California, San Francisco, San Francisco, California, USA
Peter Milgrom, University of Washington, Seattle, Washington, USA
Manasi Murthy Mittinty, University of Sydney, Sydney, New South Wales, Australia
Tuti Mohd-Dom, The National University of Malaysia, Kuala Lumpur, Federal Territory of Kuala Lumpur, Malaysia
Shahida Mohd-Said, Universiti Kebangsaan Malaysia, Kuala Lumpur, Kuala Lumpur, Malaysia
Alexander Montasem, University of Central Lancashire, Preston, Lancashire, United Kingdom of Great Britain and Northern Ireland
Maria Morgan, Cardiff University, Cardiff, Wales, United Kingdom of Great Britain and Northern Ireland
Vanessa Muirhead, Queen Mary University of London, London, United Kingdom of Great Britain and Northern Ireland
Craig Murdoch, University of Sheffield, Sheffield, South Yorkshire, United Kingdom of Great Britain and Northern Ireland
Heikki Murtomaa, Helsinki University, Helsinki, Uusimaa, Finland
Oscar Musalem-Dominguez, Universitat de Valencia, Valencia, Valencia, Spain
Lene Myhren, Oral Health Centre of Expertise Rogaland, Stavanger, Rogaland, Norway
Shillpa Naavaal, Virginia Commonwealth University, Richmond, Virginia, USA
Koratagere Nagesh, Krupa Dental Clinic, Bengaluru, Karnataka, India
Gustavo G. Nascimento, Aarhus University, Aarhus, Jutland, Denmark
Jessica A. Naylor, University of Bristol, Bristol, United Kingdom of Great Britain and Northern Ireland
Cecelia Nelson, West Virginia University, Morgantown, West Virginia, USA

Travis Nelson, University of Washington, Seattle, Washington, USA
Suchitra Nelson, Case Western Reserve University, Cleveland, Ohio, USA
Sudan Prasad Neupane, Specialist Oral Health Center for Western Norway Department:
Rogaland, Stavanger, Rogaland, Norway
Patricia Neville, University of Bristol, Bristol, Avon, United Kingdom of Great Britain and
Northern Ireland
Tan Minh Nguyen, Deakin University, Melbourne, Victoria, Australia
Muhammad Omar Niaz, Pakistan Medical Commission, Islamabad, Federal Capital, Pakistan
Richard Niederman, New York University, New York, New York, USA
Herry Novrinda, Universitas Indonesia, Jakarta Pusat, DKI Jakarta, Indonesia
Nazik Nurelhuda, University of Khartoum, Khartoum, Khartoum State, Sudan
Sivakumar Nuvvula, Narayana Dental College and Hospital, Nellore, Andhra Pradesh, India
Kevin Nyadwe, University of Nairobi, Nairobi, Kenya
Lucy O'malley, University of Manchester, Manchester, England, United Kingdom of Great
Britain and Northern Ireland
Richard Ohrbach, University at Buffalo, Buffalo, New York, USA
Christopher Okunseri, Marquette University, Milwaukee, Wisconsin, USA
Branca Heloisa de Oliveira, Rio de Janeiro State University, Rio de Janeiro, Brazil
Maisa Omara, Medical University of Vienna, Vienna, Austria
Olubunmi Oni, University College Hospital, Ibadan, Oyo, Nigeria
Frank Oppenheim, Boston University Medical Center, Boston, Massachusetts, USA
Gloria Pacheco, Luna Community College, Las Vegas, New Mexico, USA
Fotinos Panagakos, West Virginia University, Morgantown, West Virginia, USA
Sharat Chandra Pani, Schulich School of Medicine and Dentistry, London, Ontario, Canada
Carrigan Parish, Columbia University, New York, New York, USA
Candida Parisi, University of Bologna, Bologna, Italy
Brian Partido, Seattle Central College, Seattle, Washington, USA
Chris Penlington, Newcastle University, Newcastle upon Tyne, Tyne and Wear, United
Kingdom of Great Britain and Northern Ireland
Sílvia H. C. Sales Peres, University of São Paulo, Bauru, São Paulo, Brazil
Arnaldo Perez, University of Alberta, Edmonton, Alberta, Canada
Valerie Perrine, West Virginia University, Morgantown, WV, USA
Helder Pinheiro, Federal University of Pará, Belém, Pará, Brazil
Erica Torres de Almeida Piovesan, University of Brasilia, Brasilia, Federal District, Brazil
A. Stephen Polins, Henry M. Goldman School of Dental Medicine, Boston, Massachusetts,
USA
Deborah E. Polk, University of Pittsburgh, Pittsburgh, Pennsylvania, USA
C. Alec Pollard, Saint University School of Medicine, St. Louis, Missouri, USA
Tracy E. Popowics, University of Washington, Seattle, Washington, USA
Teodor T Postolache, University of Maryland School of Medicine, Baltimore, Maryland, USA
Lauren B. Quetsch, University of Arkansas, Fayetteville, Arkansas, USA
Sheela Raja, University of Illinois at Chicago, Chicago, Illinois, USA
Aiameeza Rajali, Universiti Teknologi MARA, Sg Buloh, Selangor, Malaysia
Isabel Rambob, University of Maryland School of Dentistry, Baltimore, Maryland, USA
Roxana Patricia López Ramos, Universidad Peruana Cayetano Heredia, San Martin de
Porres, Lima, Peru
Cameron L. Randall, University of Washington, Seattle, Washington, USA
Haslina Rani, Universiti Kebangsaan Malaysia, Kuala Lumpur, Kuala Lumpur, Malaysia
Sarah E. Raskin, Virginia Commonwealth University, Richmond, Virginia, USA
Said Harith Al Rawahi, Oman Dental College, Muscat, Oman, King's College London, London,
United Kingdom of Great Britain and Northern Ireland
Kadambari Rawal, Boston University Henry M Goldman School of Dental Medicine, Boston,
Massachusetts, USA
Ignacio N. Retamal, Universidad de los Andes, Santiago, Región Metropolitana, Chile

Christine A. Riedy, Harvard School of Dental Medicine, Boston, MA, USA
D. Brad Rindal, Health Partners Institute, Minneapolis, Minnesota, USA
John Rogers, University of Melbourne, Melbourne, Victoria, Australia
Arisson R. da Rosa, UNISINOS, São Leopoldo, Rio Grande do Sul, Brazil
Rose Anne Q. Rosanes, University of the Philippines Manila, Manila, NCR, Philippines
Karolyn D. Ruggles, West Virginia University, Morgantown, West Virginia, USA
Budi Aslinie Md Sabri, Universiti Teknologi MARA, Sungai Buloh, Selangor, Malaysia
Magdalena San-Martin, Universidad Católica del Uruguay, Montevideo, Montevideo, Uruguay
Sylvia L Santos, SLS Clinical Research Consulting, LLC, Montville, New Jersey, USA
Cornelia Melinda Adi Santoso, University of Debrecen, Debrecen, Hajdú-Bihar, Hungary
Yoshiyuki Sasaki, Tokyo Medical and Dental University, Bunkyo-ku, Tokyo, Japan
Carly Scala, West Virginia University, Morgantown, West Virginia, USA
Brette Scala, West Virginia University, Charleston, West Virginia, USA
Sasha Scambler, King's College London, London, United Kingdom of Great Britain and Northern Ireland
Gottfried Schmalz, University Hospital Regensburg, Regensburg, Bavaria, Germany
Helena Silveira Schuch, Federal University of Pelotas, Pelotas, Rio Grande do Sul, Brazil
Suzanne E. Scott, King's College London, London, United Kingdom of Great Britain and Northern Ireland
Gerhard K. Seeberger, Academy of Dentistry International, San Antonio, Texas, USA
Laura D. Seligman, University of Texas Rio Grande Valley, Edinburg, Texas, USA
Amit Sethi, Boston University, Boston, Massachusetts, USA
John R. Shaffer, University of Pittsburgh, Pittsburgh, Pennsylvania, USA
Sonia Sharma, University at Buffalo, Buffalo, New York, USA
Swati Lavani Sharma, University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA
Alcinda K Trickett Shockey, West Virginia University School of Dentistry, Morgantown, West Virginia, USA
Nazli G. Shujaat, University of Health Sciences, Lahore, Punjab, Pakistan
Fawaz Shamim Siddiqui, Penang International Dental College, Butterworth, Penang, Malaysia
Sharanbir K. Sidhu, Queen Mary University of London, London, United Kingdom of Great Britain and Northern Ireland
Miguel Simancas-Pallares, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA
Melanie Simmer-Beck, University of Missouri-Kansas City, Kansas City, Missouri, USA
Kirt E. Simmons, University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA
Ankur Singh, University of Melbourne, Melbourne, Victoria, Australia
Astha Singhal, Boston University, Boston, Massachusetts, USA
Jeanne Craig Sinkford, Howard University College of Dentistry, Washington D.C., USA
Linda Slack-Smith, University of Western Australia, Perth, Western Australia, Australia
Michael C. Smith, University of Melbourne, Melbourne, Victoria, Austria
Ahmad Sofi-Mahmudi, Cochrane Iran, Seqiz, Kurdistan, Iran, Kurdistan
Woosung Sohn, University of Sydney, Sydney, New South Wales, Australia
Oyinkansola Sofola, University of Lagos, Nigeria
Kalo C. Sokoto, West Virginia University, Morgantown, West Virginia, USA
Ana L. Sorazabal, Universidad de Buenos Aires, Buenos Aires City, Buenos Aires, Argentina
Nicholas Sotak, University of Washington, Seattle, Washington, USA
Avron Spiro, Boston University Goldman School of Dental Medicine, Boston, Massachusetts, USA
Aldo Squassi, Universidad De Buenos Aires, Buenos Aires, CABA, Argentina
Sukeshana Srivastav, All India Institute of Medical Sciences, New Delhi, Delhi, India
Jane E. M. Steffensen, Tufts University School of Dental Medicine, Boston, Massachusetts, USA
David M. S. Stewart, PDC Pediatric Dentistry, South Jordan, Utah, USA

Bernal Stewart, Colgate Palmolive, Somerset, New Jersey, USA
Ronald P. Strauss, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA
Joel L. Strom, Forsyth Dental Institute, Boston, Massachusetts, USA
Anna Liisa Suominen, University of Eastern Finland, Kuopio, Northern Savo, Finland
Santosh Kumar Tadakamadla, Griffith University, Gold Coast, Queensland, Australia
Tayla Tallman, West Virginia University, Morgantown, West Virginia, USA
Guillermo Tamayo-Cabeza, Universidad de Cartagena, Cartagena, Bolívar, Colombia
Sharon Tan, National University of Singapore, Singapore, Singapore
Maha El Tantawi, Alexandria University, Alexandria, Egypt
Mary Tavares, The Forsyth Institute Cambridge, Boston University, Boston, Massachusetts, USA
Greig Daniel Taylor, Newcastle University, Newcastle Upon Tyne, Tyne and Wear, United Kingdom of Great Britain and Northern Ireland
Stuart Taylor, University of Washington, Seattle, Washington, USA
Marisol Tellez, Maurice H. Kornberg School of Dentistry, Temple University, Philadelphia, Pennsylvania, USA
Wendy Thompson, University of Manchester, Manchester, Greater Manchester, United Kingdom of Great Britain and Northern Ireland
W. Murray Thomson, University of Otago, Dunedin, Otago, New Zealand
Tamanna Tiwari, University of Colorado, Aurora, Colorado, USA
Mimmi Tolvanen, University of Oulu, Oulu, Valitse alue, osavaltio tai provinssi (käytössä US-osoitteissa), Finland
Scott L. Tomar, University of Illinois Chicago, Chicago, Illinois, USA
Georgios Tsakos, University College London, Greater London, United Kingdom of Great Britain and Northern Ireland
Bathsheba Turton, University of Puthisastra, Phnom Penh, Cambodia
Yap Adrian Ujin, Ng Teng Fong General Hospital, Singapore, Singapore
Lidia A. R. Valadas, University of Buenos Aires, Buenos Aires, Buenos Aires, Argentina
Erinn J. Victory, West Virginia University, Morgantown, West Virginia, USA
Jorma Virtanen, University of Bergen, Bergen, Hordaland, Norway
Catherine G Waldron, Dublin Dental University Hospital, Dublin, Dublin, Ireland
Christopher Waters, West Virginia University, Morgantown, West Virginia, USA
Richard G. Watt, UCL, London, Greater London, United Kingdom of Great Britain and Northern Ireland
Andrea Waylen, University of Bristol, Bristol, Bristol, United Kingdom of Great Britain and Northern Ireland
Carolyn J. Wehler, Boston University, Boston, Massachusetts, USA
Jane A. Weintraub, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA
Meghan Wendland, University of Missouri, Kansas City, Missouri, USA
Christina Worle, Peninsula Dental Social Enterprise, Plymouth, Devon, United Kingdom of Great Britain and Northern Ireland
Casey D. Wright, West Virginia University, Morgantown, West Virginia, USA
Amjad H. Wyne, Institution of Dentistry CMH Lahore Medical College, Lahore, Punjab, Pakistan
Nurul Asyikin Yahya, Universiti Kebangsaan Malaysia, Kuala Lumpur, Kuala Lumpur, Malaysia
Siyang Yuan, University of Dundee, Dundee, Scotland, United Kingdom of Great Britain and Northern Ireland
Norashikin Yusof, Universiti Teknologi MARA, Shah alam, Selangor, Malaysia
Zamros Y. M. Yusof, Universiti Malaya, Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur, Malaysia
Marieke van der Zande, University of Liverpool, Liverpool, Merseyside, United Kingdom of Great Britain and Northern Ireland
Kawtar Zouaidi, The University of Texas Health Science Center, Houston, Texas, USA