



## The legacy of the regional research centers for minority oral health

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As noted in the Introduction to this special edition of *The Dental Clinics of North America* on “Minority Oral Health,” the National Institute of Dental and Craniofacial Research’s (NIDCR) commitment to support oral health research relevant to the lives of *all* citizens of the United States began long before the start of the Regional Research Centers for Minority Oral Health (RRCMOH) initiative. With clear determination, the NIDCR—the driving force behind oral health education, public service, and oral biology research in the United States—identified the necessity to address directly the issue of oral health disparities in a country that strives to ensure equality and inclusion. The NIDCR’s determination and dedication to this national initiative has remained so strong that we, the participants of the RRCMOH, could barely begin to reflect on our own accomplishments and legacy before the NIDCR, in an almost seamless fashion, initiated a new and expanded program dedicated to the *reduction* of oral health disparities in the United States. In part, our legacy, as reflected in this journal issue, is a compilation of protocols, facts, and figures that have served to identify an unmet need that must be addressed to improve the oral health and well-being of our nation’s diverse population. Clearly such information would not have been forthcoming without the RRCMOH, the support of the Research Centers in Minority Institutions Program (RCMI), and the foresight of the NIDCR. The RRCMOH may have had an even greater impact than its apparent influence on the future of minority oral health research, however; particularly with respect to the lives of those individuals intimately involved in the RRCMOH and the institutions they have represented so well.

The directors and co-directors of the RRCMOH, who authored this article, focused closely on the three goals of the RRCMOH initiative: (1) to improve the oral health of US racial and ethnic minorities through research, (2) to broaden the diversity of the scientific workforce, and (3) to develop and strengthen the oral health research infrastructure of minority and minority-serving dental schools. The enormity of this task was, and still is, daunting. How could we possibly succeed, how would we even recognize success, and what would be the consequences of failure? Part of our legacy is what was learned from the process that was undertaken to answer these questions.

The directors and co-directors of the regional research centers met frequently in Washington, DC or Bethesda, Maryland from 1993 to 2000. These meetings were arranged by Dr. Matthew Kinnard (currently the direc-

tor of the NIDCR Extramural Associates Program) from 1993 to 1995 and by Dr. Norman Braveman (assistant to the NIDCR director) and Ms. Lorraine Jackson (the diversity program specialist of the NIDCR) from 1995 to 2000. Initially, these meetings were limited to the directors, but soon included other center participants. We shared our progress and difficulties; met with key government officials who dealt nationally with minority issues related to education, health, and research; and discussed issues of equality and opportunity, fairness and prejudice, and “black and white.” We were, for the most part, research scientists who were being sensitized to issues of which many of us were not really aware. We talked of riots in Watts, perceived inequalities between predominantly white schools and black schools, socioeconomic factors in health and education, and the importance of behavioral factors as leading causes of death from alcohol and drugs. We spoke of missed opportunities, broken “pipelines” in education, and the importance of a supportive home environment. We pondered why Asian Americans were overrepresented in medical and dental schools at that time, whereas Hispanic and African Americans were underrepresented. A great deal was being asked of us, as we were being drawn into a realm of broad thinking on these issues. Indeed, broad thinking was required to embrace and achieve the goals of this initiative in a sustained fashion. Fortunately, the thoughts and ideas generated during these meetings were carried back to each of the centers where, with additional input and institutional support, significant change took place within the minority dental schools, as envisioned.

Until the late 1980s, the efforts of Meharry Medical College’s (MMC) School of Dentistry were mainly focused on training dentists and providing clinical services for the community. Since that time, however, research has become an integral component of the mission of the dental school. In 1995, when the school was awarded one of four RRCMOH grants, achievement of the goals of this research mission was significantly enhanced. This RRCMOH program was based on a partnership between MMC and the University of Alabama at Birmingham (UAB) and included support for joint research projects and shared research and research support facilities. A faculty development component of the RRCMOH program was supported by the RCMI program, as was an additional program to recruit research faculty and upgrade the physical infrastructure in the School of Dentistry.

The presence of the RRCMOH program at MMC and UAB provided resources to increase the research capacity of MMC’s School of Dentistry and to increase the number of minority scientists who had an interest in oral health issues. The program included support for physical and human research resources at both institutions, particularly in the areas of tissue repair, dental caries, periodontal disease, and dental biomaterials. The RCMI program, both in its role of supporting developing faculty in the RRCMOH program and as a separate but complementary oral biology component to hire faculty and further develop physical infrastructure,

enhanced the potential of the program. The legacy of the program includes the presence of an increased number of trained research scientists and an expanded physical research infrastructure in the School of Dentistry at MMC. Additionally, there is increased participation by dental students, and faculty and students in other areas of the college, in studies of oral health problems—particularly in minority populations.

The increased opportunities and interest in research catalyzed by the presence of the RRCMOH program has resulted in increased participation by students in on-campus and off-campus research activities. Students now regularly participate in a joint summer training program at the University of Connecticut and in programs at the National Institutes of Health (NIH), University of Rochester, and other research-intensive institutions. Some students are now participating in residency programs that include a research component. These students may well provide the most important legacy of the RRCMOH programs, by increasing the number of minority scientists who are studying oral health and oral health-related problems.

Through combined support of the RRCMOH and RCMI programs, and contributions by MMC, approximately 3000 square feet of space in the School of Dentistry was renovated and equipped to support research. This space includes a centralized research support facility with major pieces of shared equipment connected to well-equipped microbiology and cell and molecular biology core facilities. Additional space in the same area has been renovated and equipped for the research of individual investigators. The RRCMOH and RCMI programs also provided support to enhance the potential for clinical research in oral biology. Lastly, as a result of the progress made with the support of the RRCMOH and RCMI programs, MMC and its Board of Trustees has included in its \$125 million capital campaign the creation of an endowed Chair in Stomatology. The scholar/clinician selected for this position will lead collaborative, interdisciplinary efforts with the School of Medicine on projects that study the effects of periodontitis on cardiovascular disease, diabetes, and preterm low-birthweight babies.

Similarly, through support provided by the RRCMOH, the research infrastructure of the Charles R. Drew Medical University has improved significantly. In addition, collaboration between Drew Medical University and the University of California at Los Angeles (UCLA) has resulted in more than \$4.5 million of funding for RO1 grants for minority faculty researchers or topics related to health issues specific to minority populations. The RRCMOH has led to further understanding of minority-related oral health disease and to the development of minority faculty members into highly productive independent researchers at both the Charles R. Drew Medical University/Martin Luther King, Jr. Medical Center and UCLA. This program has also served to support the advancement of minority postdoctoral students to faculty positions at Charles R. Drew Medical University and UCLA.

Most prominent among the research legacy left by the center members at the Charles R. Drew Medical University are two investigator-initiated research projects that not only address the central theme of the NIDCR's interest in dental, oral, and craniofacial health and disease but also appear to be related in important ways to the missions of other institutes at NIH. In one instance, one of the center members applied for and received funding for research derived from studies on the repair of facial injury that had been supported by the center. Prior to this, he had never submitted a research application, let alone obtained one. Similarly, another center member, collaborating with behavioral scientists, developed an intervention trial aimed at reducing alcoholism and drug abuse as a way of reducing violence and resulting facial injury. An application was submitted by this individual and his team for peer review. It is important to note, however, that (1) the center member had never submitted a grant application to NIH previously; and (2) as with the previously mentioned study, the research proposed in this clinical trial cuts across the missions of at least two other institutes at NIH. Not only does the legacy of the UCLA/Drew center touch the future of the NIDCR-supported research, but it also will have an impact on other fields and on the careers of two individuals who otherwise may not have engaged in investigator-initiated research.

Since the inception of the RRCMOH at New York University College of Dentistry (NYUCD), the research infrastructure at NYUCD has developed significantly, particularly with respect to facilities, personnel, and expertise to conduct oral health assessment and promotion throughout New York City's diverse ethnic and racial communities. In collaboration with investigators from The Forsyth Institute (Boston, MA), an appropriate system of support was developed to make it possible to collect epidemiological data on the oral health status and needs of almost 4000 adults from different ethnic groups. Oral health data on some of these subgroups had not been previously available. More importantly, with respect to future endeavors, NYUCD has established relationships in minority communities in Manhattan, Brooklyn, and Queens. Other areas of research include risk assessment for the destructive periodontal diseases in minority populations, cloning of the submandibular salivary adhesion-promoting protein, microbiology and chemistry of saliva and dental plaque related to caries experience of minority populations, and characteristics of salivary immunity in minority populations. The center also played an important role in the first oral cancer screening (an initiative of NYUCD) held in New York and New Jersey. Many American minority students (dental students from NYUCD and the University of Puerto Rico, graduate students, dental hygiene students, and high school students) and faculty have received research training in NYUCD and Forsyth Institute laboratories, as well as opportunities to participate in international dental research meetings. Based on work carried out within this center, new research collaborations have been established at NYUCD with Sloan-Kettering Memorial Hospital, University of Puerto

Rico Dental School, New York State Department of Health, and the Albert Einstein College of Medicine. These research collaborations have resulted in funded grants and grant applications, with the center participants as either the Principal Investigator (PI) or Co-PI.

Perhaps the most significant accomplishments of the NYUCD-Forsyth Center collaboration are reflected in the individual success stories of its minority trainees and students. We cannot do justice to these stories here, but they include significant advances by a young hygiene school faculty member to graduate from dental school with honors and pursue research, the advancement of a recipient of the center's Supplement for Minority Investigator to a position of an assistant professor and director of the Office of Public Health (NYUCD) and as a co-PI on a recently funded NIH grant, the determination of a center co-investigator who entered a PhD program in molecular epidemiology at Columbia in September 2002, the development of a data entry assistant who completed his DDS training and an MS degree in Oral Biology and who was subsequently awarded a 3-year Clinical Research Fellowship from the NIDCR, the dedication of a young dental hygiene faculty member who is completing an MS degree in public health and plans on pursuing a PhD degree in international public health, and a determined junior assistant in the NYUCD biostatistics core who is now pursuing a PhD in clinical psychology. What is most relevant to this report, however, is the fact that in the identification of these personal achievements, these individuals have attributed their participation in the RRCMOH as a key factor in both setting and achieving their goals.

The Northeastern Minority Oral Health Research Center (NMOHRC) constituted a partnership between a minority-serving dental school, the University of Medicine and Dentistry at New Jersey (UMDNJ), and a research-intensive dental school, the University of Connecticut (UConn). The UMDNJ/UConn center conducted four major studies. A 3-year follow-up study on the oral manifestations of pediatric AIDS stands as the definitive, as well as the largest and longest, study on this vulnerable set of patients. It has provided an extensive archived database that continues to be used by investigators for retrospective studies. Another study focused on the epidemiologic and genetic risk factors for oral cancer, and likewise has left an archival database consisting of behavioral risk factors (eg, extensive histories on smoking, drinking, and nutritional behaviors) and linked tissue specimens that will continue to be useful as database as newer genetic site (DNA) probes are developed over the years ahead. The third major study of the center was on risk factors for early childhood caries (ECC) in the offspring of medically indigent mothers. This study greatly contributed to the detailed understanding of the etiology of ECC, and was a major contributing factor to the international NIH-sponsored meeting on ECC as well as the 2001 NIDCR's Consensus Development Conference on the diagnosis and management of dental caries throughout the lifespan.

The final major study within the center, entitled “The Tuskegee Legacy Project (TLP): Factors Affecting the Recruitment of Minorities into Biomedical Studies,” culminated in a recently completed study based on the administration of the TLP questionnaire to over 1100 participants in four US cities. This will represent the latest and most complete investigation into this subject of widespread national interest. Its legacy as a research project (beyond the scientific findings themselves) includes (a) having played a major and central—and completely unanticipated—role in the development of President Clinton’s apology for the infamous United States Public Health Service (USPHS)–Tuskegee syphilis study to the African American community, and the subsequent establishment of the National Center for Bioethics in Research and Health Care at Tuskegee University; and (b) having established a line of investigation that directly led to one of the major studies within NYUCD’s Oral Cancer Research on Adolescent and Adult Health Promotion Center funded as one of the NIDCR’s Centers for Research to Reduce Oral Health Disparities, which is the current iteration and direct descendant of the RRCMOH.

In conclusion, the oral health findings and the initiation of investigators’ line of scientific inquiry that occurred under the RRCMOH will likely have a direct and positive effect on knowledge related to minority oral health issues, and a parallel and equally positive effect on indirectly improving the access to oral health care for minorities in the United States. This will be accomplished by providing dentists and allied dental health professionals with better knowledge, skills, and treatments for minority patients. Increased publicity (via lay press and scientific journals) of these findings should lead to enhanced numbers of minorities seeking oral health care. Finally, the RRCMOH have had notable success in initiating and supporting the early development of minority investigators who would likely have pursued other professional activities in the absence of the RRCMOH. The lifetime scientific accomplishments and contributions of this cadre of “RRCMOH-sponsored” minority investigators and their respective roles as models for other developing scientists will be, undoubtedly, one of the major legacies of the RRCMOH. The RRCMOH helped to redefine the research and education missions of the participating institutions, and placed new emphasis on early diagnosis, prevention, and conservative interventions in minority-related oral diseases, with an eye toward innovative, cost-effective solutions to long-neglected and underfunded areas of dental and craniofacial research, education, and health-promotion programs.