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The Surgeon General's Report on Oral Health and its offspring, A National Oral Health Plan, serve as both a challenge and a catalyst for the research and academic communities. The report, while providing ample testimony on the considerable progress made over the past 20 years in prevention and treatment, dramatically demonstrated that the burdens of oral diseases and disorders are not borne equally across population groups: It is the have-nots who have the largest share of the difficulties. This health disparity affecting vulnerable populations in the United States has its counterparts in countries throughout the world.

In the United States, the National Institute of Dental and Craniofacial Research (NIDCR) has taken a leadership role in developing programs to track and confront a growing disparity that is heightened by increased immigration and population heterogeneity. In a form of anticipatory guidance, the NIDCR in 1992 funded four Regional Research Centers for Minority Oral Health. Currently, a group of Centers for Research to Reduce Oral Health Disparities are being activated, selected in response to a competitive request for applications. The conceptual underpinning of such centers is the encouragement of interdisciplinary research across components of academic health centers and adjunctive institutions, as well as involvement of community groups and state and local health agencies.

In January, 2001, the NIDCR formally introduced "A Plan to Eliminate Craniofacial, Oral and Dental Health Disparities" as part of the overall "Strategic Plan" for the Institute. The plan involves three general initiatives: (1) research to eliminate health disparities in the critical areas of oral infections, oral and pharyngeal cancers, and craniofacial injuries; (2) the enhancement of research capacity through supported training and career development, with emphasis on increasing the diversity of the research work force; and (3) increasing information dissemination and health promotion through a variety of collaborative programs with government, professional, and community groups.

Particularly pertinent to the research community are both the general and more specific research areas and activities that NIDCR considers as important in attaining the overall research goals. Overarching research needs identified include: (1)

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identification of biomarkers of disease, (2) molecular genetic research in population subgroups, (3) epidemiological studies in population subgroups, (4) clinical trials designed for prevention and management of oral infections, and (5) patient-oriented research in vulnerable populations on health care utilization patterns and barriers to care and on enhancing adoption of research findings into clinical practice.

Specific research areas considered to be of particular pertinence in caries and periodontal diseases include: (1) microbial genomics of specific pathogens, (2) familial bacterial transmission, (3) development of vaccines, (4) individual risk assessment, and (5) novel agents to disrupt microbial biofilms. Increased emphasis was placed on the need to expand research efforts on other oral infections such as *Candida*, Herpes, and those associated with human papillomavirus. Biomimetics and tissue engineering continue to be a priority area.

Although not specifically highlighted in the NIDCR plan, workshops and conferences supported by NIDCR have focused on related research opportunities. These include increased attention to etiology and prevention of early childhood caries in vulnerable groups, new diagnostic technologies to detect early-stage caries, and clinical trials on agents to arrest and remineralize pre-cavital lesions. Given the increased number of studies that indicate an epidemiologic association between oral infections and systemic diseases, there are pressing needs for prospective, interventional, and mechanistic studies.

The efforts to reduce disparities in oral/pharyngeal cancers emphasize studies on: (1) genetic/environmental relationships, (2) identification of biomarkers in blood and oral fluids, (3) interventions to reduce oral complications of chemotherapy and radiation, and (4) identification and amelioration of factors associated with survival time.

The plan to reduce disparities in craniofacial injuries calls for development of a national program to increase use of protective head and face gear in sports and vehicle operation. Behavioral and socio-cultural research is needed to identify causes and develop preventive approaches to reduce conflict and violence. Head and face injuries account for 20 million emergency room visits a year and 6 million office visits—clearly a serious research concern.

If a well-trained and diverse research cadre is to exist, training and career development programs need to be enhanced. The science component of institutional training should include genomics, proteomics, informatics, and

molecular epidemiology. In addition, the training should include courses and exposures that enhance students' cultural awareness and recognition of health disparities. The training has to prepare for participation in interdisciplinary research that can join the reductionism of the basic sciences with the vision of behavioral and social sciences. Not only initial training but also ongoing career development are essential through in-service and short-term updating opportunities.

Academic institutions world-wide recognize a common mission to provide the instructional and experiential basis for clinical practice in the 21st century. They must also inculcate in students and faculty the sense of social responsibility that comes with the privilege of practicing a health profession. It is part of the social compact and particularly germane to the care of vulnerable populations that experience health disparities because of socio-economic status, age, physical or emotional disability, or behavioral life style.

Toward the enhancement of providing such a broad educational experience, dental schools should seek collaborations

across academic health centers and with health professionals in medicine, public health, and allied health education. Increased efforts should be made to increase faculty and student diversity and to provide interaction with the communities served through extramural community-based care, as well as in school clinics: Multicultural awareness should be encouraged.

Schools must accelerate incorporation of new science into the curriculum, highlighting "genetic literacy" and promoting evidence-based oral health care in teaching and research. There will be increasing pressure to provide innovative continuing education programs utilizing the opportunities available through computer technology.

The overarching challenge to academia is how to balance the rapidly expanding biological and technological/esthetic demands with the increasing need for community-oriented social responsibility. A curriculum is an education designed by a committee, and there must be champions who voice the needs of the vulnerable. These needs are world-wide, and the National Oral Health Plan can be a valuable resource.