Tribal/Native Oral Health Research at NIDCR
Tribal Advisory Committee (TAC) Meeting

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NIH: Largest Funder of Biomedical Research

NIH’s mission is to seek fundamental knowledge about the nature and behavior of living systems and to apply that knowledge to enhance health, lengthen life, and reduce illness and disability.

Intramural Research
- 7,000 scientists
- 1,500 active trials at the Clinical Research Center
- 11% of NIH budget

Extramural Research
- 2,500 institutions
- 300,000 scientists & research personnel
- 70,000 applications and 40,000 awards annually
- 81% of NIH budget

FY2018 Appropriations: NIH - $37.1 B, NIDCR - $446.7 M
NIDCR Funding of Oral Health Research

NIDCR’s mission is to improve dental, oral, and craniofacial health.

Intramural Research
- 16% of NIDCR budget
- 350 staff, trainees, & volunteers
- Dental Research Clinic
  - Over 20 active trials
  - 3,600 outpatient dental clinic visits/year

Extramural Research
- ~80% of NIDCR budget
- 220 institutions & small businesses in 40 states
- 1,300 competing applications & 250 new awards annually
- US workforce
  - Thousands of oral health researchers
  - 204,000 dentists & numerous other healthcare providers
In 2030, we imagine a world where...

- Dental, oral and craniofacial health and disease are understood in the context of the whole body
- Research informs the strategies we use to promote health, prevent and treat disease, and overcome disparities in health
- All people have the opportunity to lead healthy lives
Tribal Groups Burdened by Poor Oral Health in Children – Disparities

4x more dental decay in AI/AN children (age 2-5) compared with white counterparts

87% of AI/AN elementary school children (age 6-9) have dental caries experience

5x more likely to have untreated dental caries in permanent teeth in AI/AN children (age 6-8) compared with US population overall

Data Source: Indian Health Service, 2015 and 2017
Tribal Groups Burdened by Poor Oral Health in Adults

- AI/AN adults experience significantly higher rates of:
  - untreated dental caries
  - severe periodontal disease
  - missing teeth
  - painful aching in mouth
  
Data Source: Indian Health Service, 2016
Dentists in Congress

Dentists in the House of Representatives

- Dr. Jeff Van Drew (D - New Jersey)
- Dr. Brian Babin (R - Texas)
- Dr. Drew Ferguson (R - Georgia)
- Dr. Paul Gosar (R - Arizona)
- Dr. Mike Simpson (R - Idaho)
Senator Udall Visit to NIH

- Sen. Udall (NM) visited NIH on July 30th, 2018
- Interested in microbiome research and communication of research to the public
Commissioned by Dr. Jerome Adams, SG of the US
  - 20th anniversary of the first report
  - Articulate a vision for the future
  - Call to take action

NIDCR Project Leads:
  - Capt. Bruce Dye
  - Dr. Judith Albino

Listening Session on Nov. 26-27, 2018

Webinar on Jan. 10, 2019
• Oral Health Coordinating Committee
  • Directs and coordinates a broad range of oral health policy, research, and programs across federal agencies, and between the public and private sectors
  • Developed the Oral Health Strategic Framework to coordinate efforts to improve the nation’s oral health

• Dr. Tim Ricks, from IHS, appointed Chief Dental Officer
NIDCR Portfolio

Synergy of Research

Basic          Translational    Clinical        Community

Tissue Regeneration  Behavioral & Social Sciences  Implementation Science

Salivary Biology

Neuroscience

Mineralized Tissue Biology

Microbiology & Immunology  Practice Based Research  Epidemiology

Caries
Periodontal disease
Cancers
Orofacial pain
Craniofacial disorders
Salivary gland disorders
Rare diseases
Oral manifestations of systemic diseases

Workforce  Tools & Technologies  Data Science & ‘Omics  Health Disparities
NIDCR American Indian/Alaska Native Research Funding FY 2014 - 2018

- Award count includes subprojects, Intramurals, IDDA, and co-funded projects.
Streptococcus mutans and Dental Caries among Native American Children

- Caries-causing bacteria -- *Streptococcus mutans*
- Examined how *S. mutans* is transmitted from mother to child in a Northern Plains tribal community
  - Identified 17 unique types of *S. mutans*
  - Found that *S. mutans* colonization occurred by 16 months in 58% of the children
  - Discovered that early colonization was associated with more severe caries
  - Revealed *S. mutans* is often, but not exclusively, acquired from mothers
- Found that tooth eruption occurs earlier in AI/AN children

*Children acquire S. mutans at an earlier age than previously thought*
Dental Care Delivery System Intervention

Goal to improve oral health while reducing costs

- Risk-based dental care delivery system
- Children living in remote Alaska villages
- Oral health prevention and treatment delivered by dental health aides
  - Primary Dental Health Aides (PDHAs)- oral health promoters, provide preventive oral care
  - Dental Health Aide Therapists (DHATs)- preventive care, oral diagnostic, restorative and surgical care
- Accepted by communities in Alaska and a few other states
- Address disparities in dental care and oral health for Native children

PDHAs and DHATs “bridge the gap between the dentists and the community.”
Storytelling to Improve Oral Health Knowledge

- Developed a traditional story – *Coyote and Little Man*
  - Chronicles Coyote and the “little man” in his mouth (ie, bacteria that can cause a cavity)

- Goal to improve oral health knowledge and behaviors in women and their infants

- Messaging largely effective, but other barriers limit overall impact (eg, poor access to care, limited access to healthy foods, lack of fluoridated water, etc.)

“But when it’s a story and you’re listening to it, you’re enjoying it more, you’re paying attention to it more and you’re even dissecting the story a little bit more because you know that there are lessons to be told.” [Pilot FG]  
Heaton B et al. (2018) *Prev Chronic Dis*
Reducing Consumption of Sugar Fruit Drinks in Alaska Native Children

Yup’ik children in Alaska’s Yukon – Kuskokwim Delta
• Consume avg. of 50 tsp added sugar each day
• 16x higher than recommended max
• Mostly from sugared fruit drinks
• Experience 16x US average tooth decay rates

Behavioral trial
• Community Health Worker -led health education
• Self-efficacy training for caregivers

Health education
• Address tooth decay etiology
• Discuss misinformation about sugared fruit drinks
• Promote sugar-free water enhancers
Great Beginnings for Healthy Native Smiles

Early childhood caries prevention program

• Partnering with the Hopi Tribe in Arizona and the Crow Tribe in Montana
• Conducting a formative assessment on oral health
• Adapting a best-practices culturally-tailored oral health intervention
  o Study facilitated by community health workers
  o Oral health intervention components:
    ▪ Dietary and oral health education during pregnancy and the postnatal period
    ▪ Oral health care of children including fluoride varnish
    ▪ Motivational interviewing with children’s mothers
    ▪ Patient care coordination/navigation of existing oral health services
The number of HPV-associated oral cancers has now surpassed HPV cervical cancers.

- NCI Cancer moonshot: immune-engineering for head and neck cancers
- Salivary Diagnostics for early detection
  - Effectively detect tumor DNA in saliva
  - Distinguish between HPV+ and HPV- cancer
  - Potential for early detection of recurrence

Innovative Treatment to Reduce Scarring

- ~70% higher prevalence of orofacial clefting in AI/AN newborns compared with non-Hispanic whites*
- Molecules to improve wound healing
  - Correction of birth defects such as cleft lip and palate
  - Reconstruction after injuries from military combat, accidents, burns, or scars

**2004**
Exploratory Research

**2009**
Translational Research

**2014**
Commercialization

- Development of effective, stable, inexpensive anti-scar peptide based on fibromodulin

**2018**
Initial FDA approval for clinical studies

Biotech company established to commercialize anti-scar peptide and anti-scar suture

Current Funding Opportunities

- Intervention Research to Improve Native American Health (R01)
- Research to Improve Native American Health (R21)
- Biological Factors Underlying Dental, Oral and Craniofacial Health Disparities (R01, R21)
- Native American Research Centers for Health, NARCH (S06)
- NIDCR Mentoring Networks for Underrepresented Postdoctoral and Early-Career Faculty Investigators (UE5)

Cleared Concept
- Interdisciplinary Approaches to Promote Adolescents' Oral Health and Reduce Disparities
American Indian and Alaska Native Oral Health Workforce

**AI/AN are under represented in dentistry**

Ratio of American Indian/Alaska Native Dentists per American Indian/Alaska Native Population by U.S. Census Division

Committed to training a diverse workforce

- Intramural Director’s Postdoctoral Fellowship to enhance diversity
- Extramural diversity supplements and mentoring network RFA

Mertz E et al. (2017) *JPHD*

Photo: Loretta Grey Cloud
Former NIDCR Intramural Postbac trainee
Engaging the Community

Facilitating communication between practitioners, communities, patients and researchers

- Research
- Patients and community members
- Practice
- Education
Thank You

NIDCR 2018

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