



Tribal/Native Oral Health Research at NIDCR

Tribal Advisory Committee (TAC) Meeting

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National Institute of Dental
and Craniofacial Research

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

NIDCR 2030



- Oral Health + Overall Health
- Precision Health
- Autotherapies
- Oral Biodevices
- Workforce Diversity

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

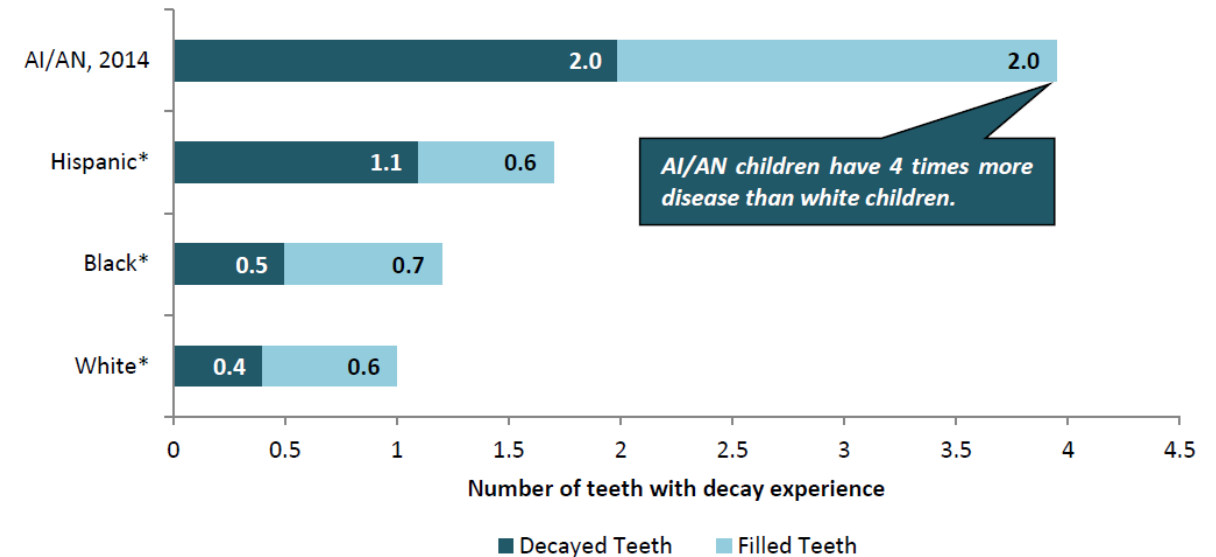
87%

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

Figure 1. Mean Number of Decayed and Filled Primary Teeth (dft) Among Children 2-5 Years of Age

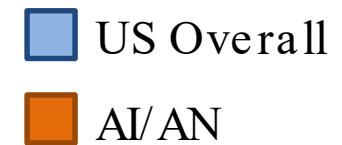


* Data Source: National Health and Nutrition Examination Survey (NHANES), 1999-2002

Tribal Groups Burdened by Poor Oral Health in Adults

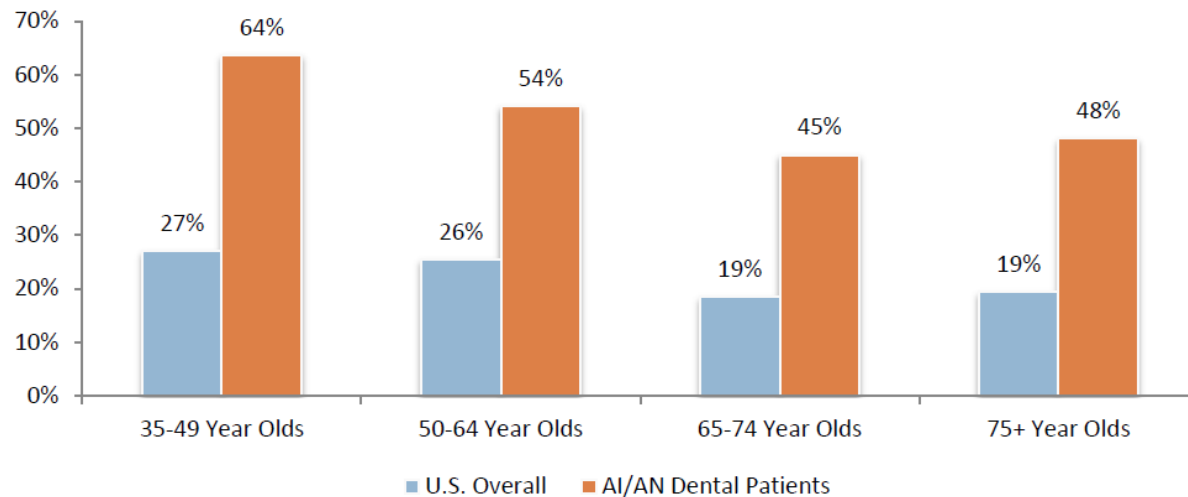
– Disparities

- AI/AN adults experience significantly higher rates of:
 - untreated dental caries
 - severe periodontal disease
 - missing teeth
 - painful aching in mouth



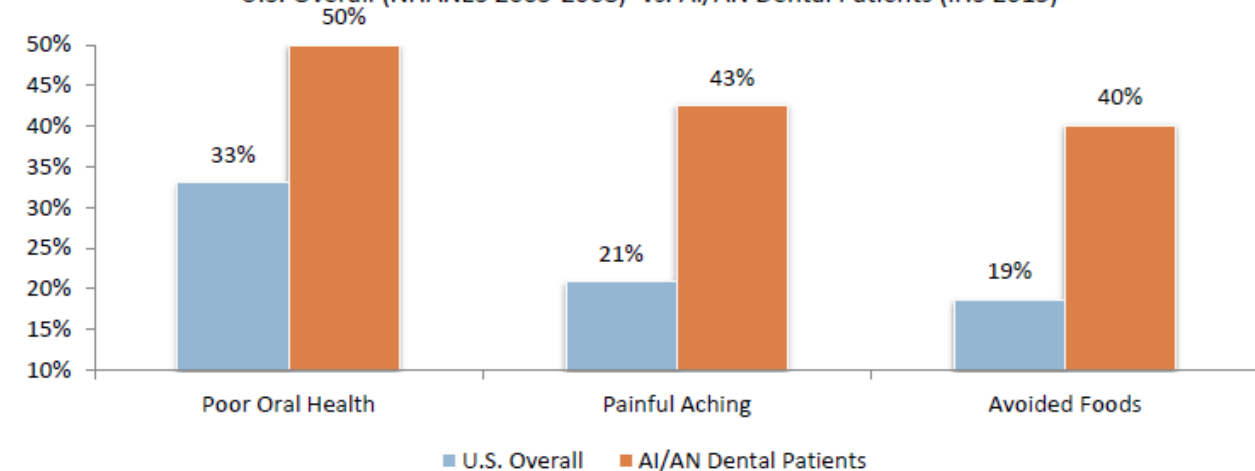
Untreated dental caries

Figure 1: Percent of Adults with Untreated Dental Caries by Age Group
U.S. Overall (NHANES 2011-2012)¹ vs. AI/AN Dental Patients (IHS 2015)



Poor oral health, painful aching, avoided foods

Figure 5: Percent of Adults 35+ Years that Reported Having Poor Oral Health, Painful Aching in the Mouth, or Avoided Foods Because of Mouth Problems During Last Year
U.S. Overall (NHANES 2005-2008)⁵ vs. AI/AN Dental Patients (IHS 2015)



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)*



Dr. Jeff Van Drew



Dr. Brian Babin



Dr. Drew Ferguson



Dr. Paul Gosar



Dr. Mike Simpson

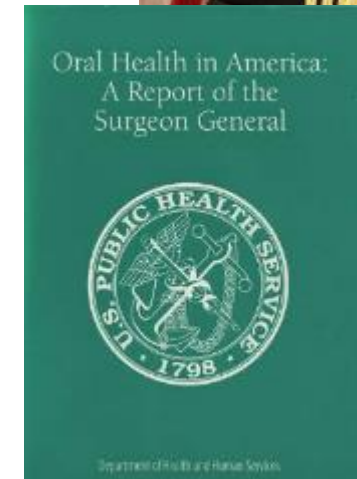
Senator Udall Visit to NIH



- Sen. Udall (NM) visited NIH on July 30th, 2018
- Interested in microbiome research and communication of research to the public

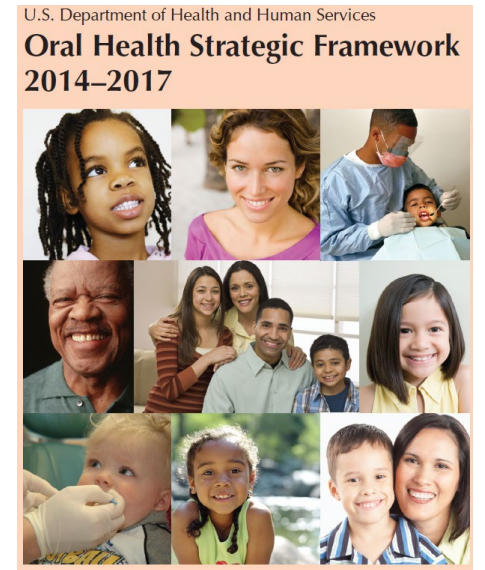
2020 Surgeon General's Report on Oral Health in America

- **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



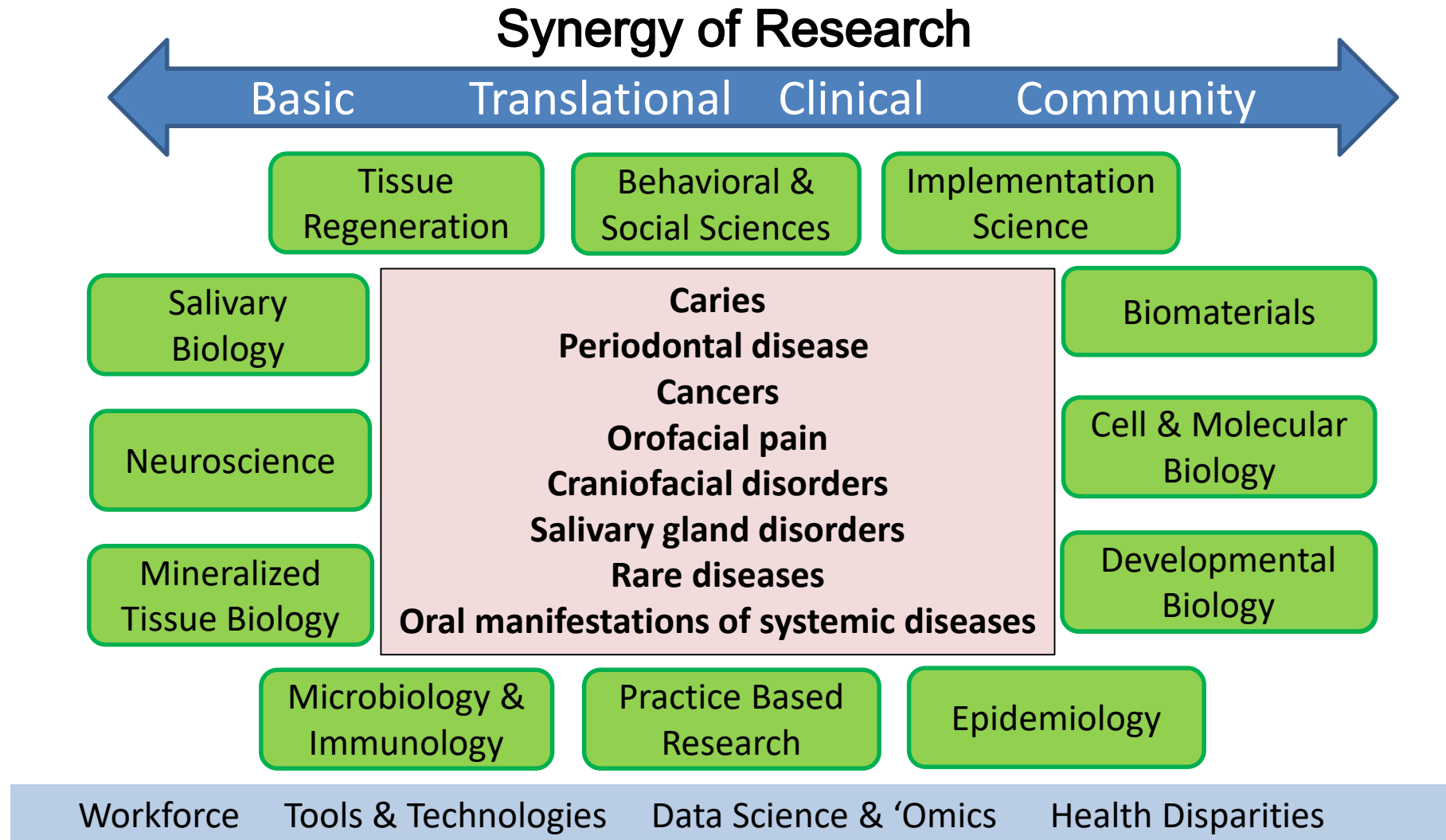
Working Across Federal Agencies to Address Health Disparities

- 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

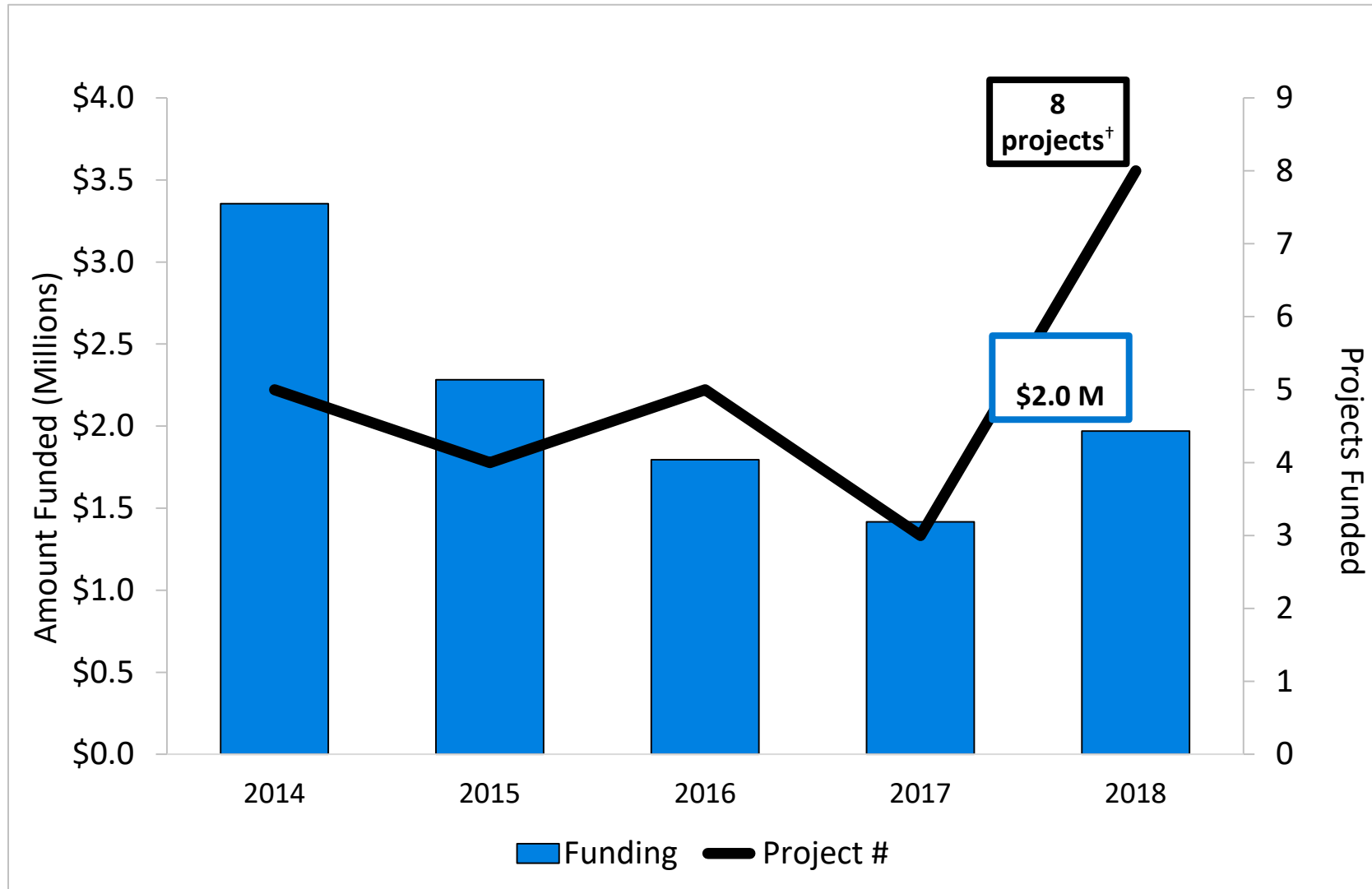


Dr. Tim Ricks

NIDCR Portfolio



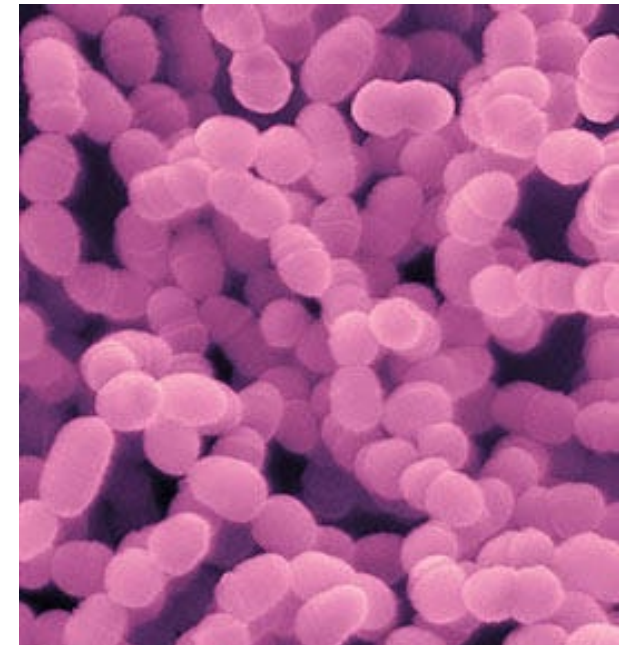
NIDCR American Indian/ Alaska Native Research Funding FY 2014 -2018



† 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



Streptococcus mutans
Credit: Microbewiki

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



Credit: Oral Health Kellogg Foundation

PDHAs and DHATs “bridge the gap between the dentists and the community.”
Senturia K et al. (2018) *Community Dent Oral Epidemiol.*

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

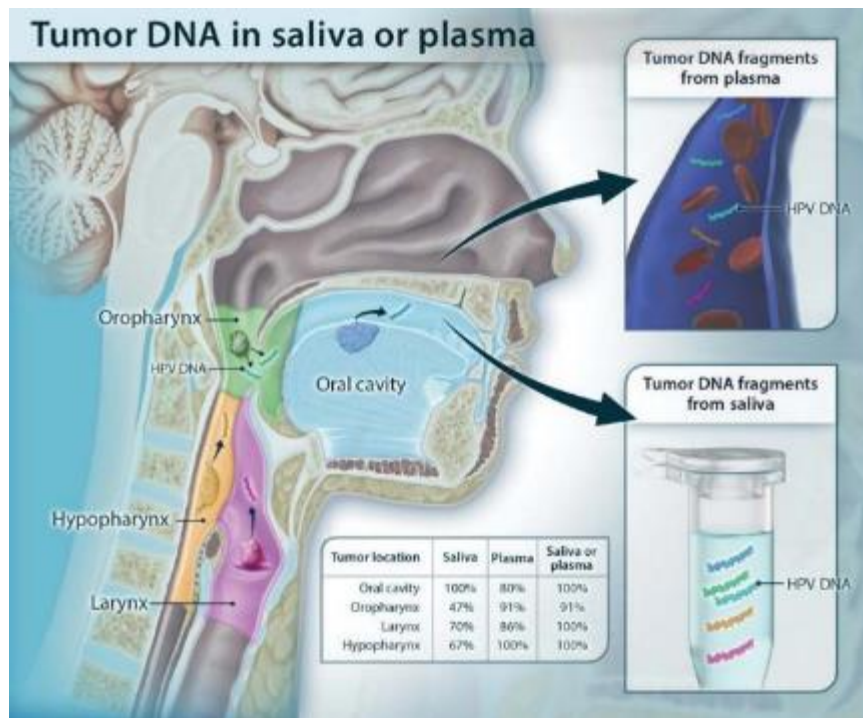
- Partnering with the Hopi Tribe in Arizona and the Crow Tribe in Montana
- Conducting a formative assessment on oral health
- Adapting a best -practices culturally -tailored oral health intervention
 - Study facilitated by community health workers
 - Oral health intervention components:
 - Dietary and 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



Oral Cancer

Number of HPV-associated oral cancers has now surpassed HPV cervical cancers

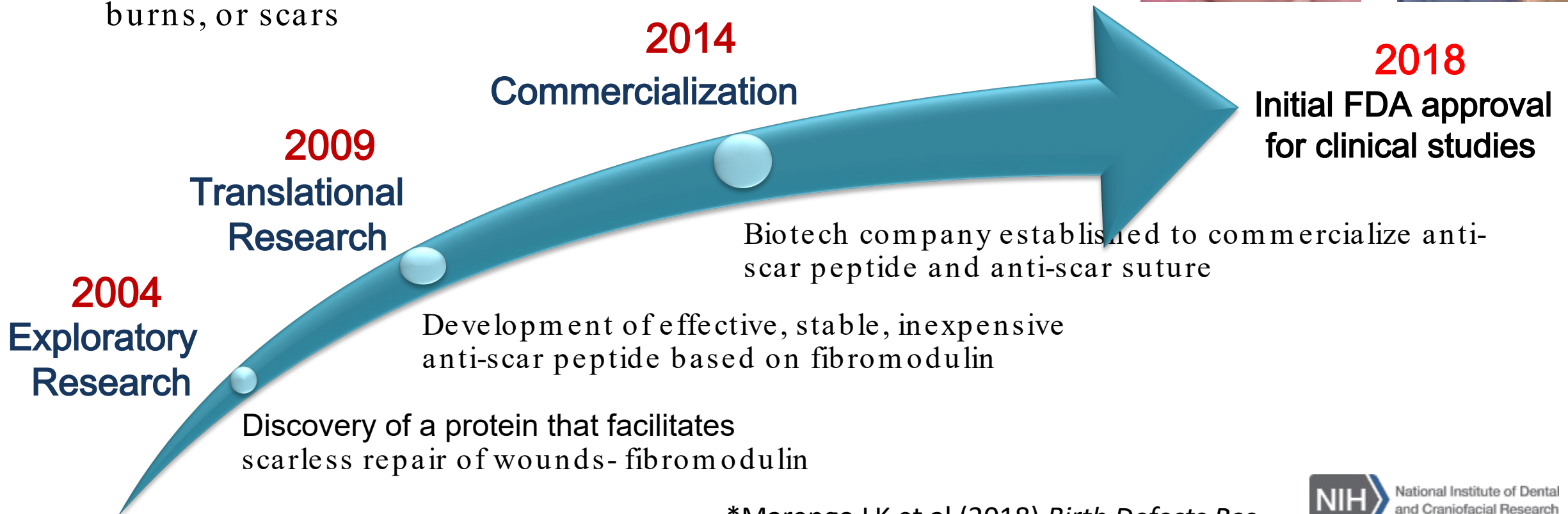
- NCI Cancer moonshot- immune-engineering for head and neck cancers
- Salivary Diagnostics for early detection



- 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



*Marengo LK et al (2018) *Birth Defects Res.*

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

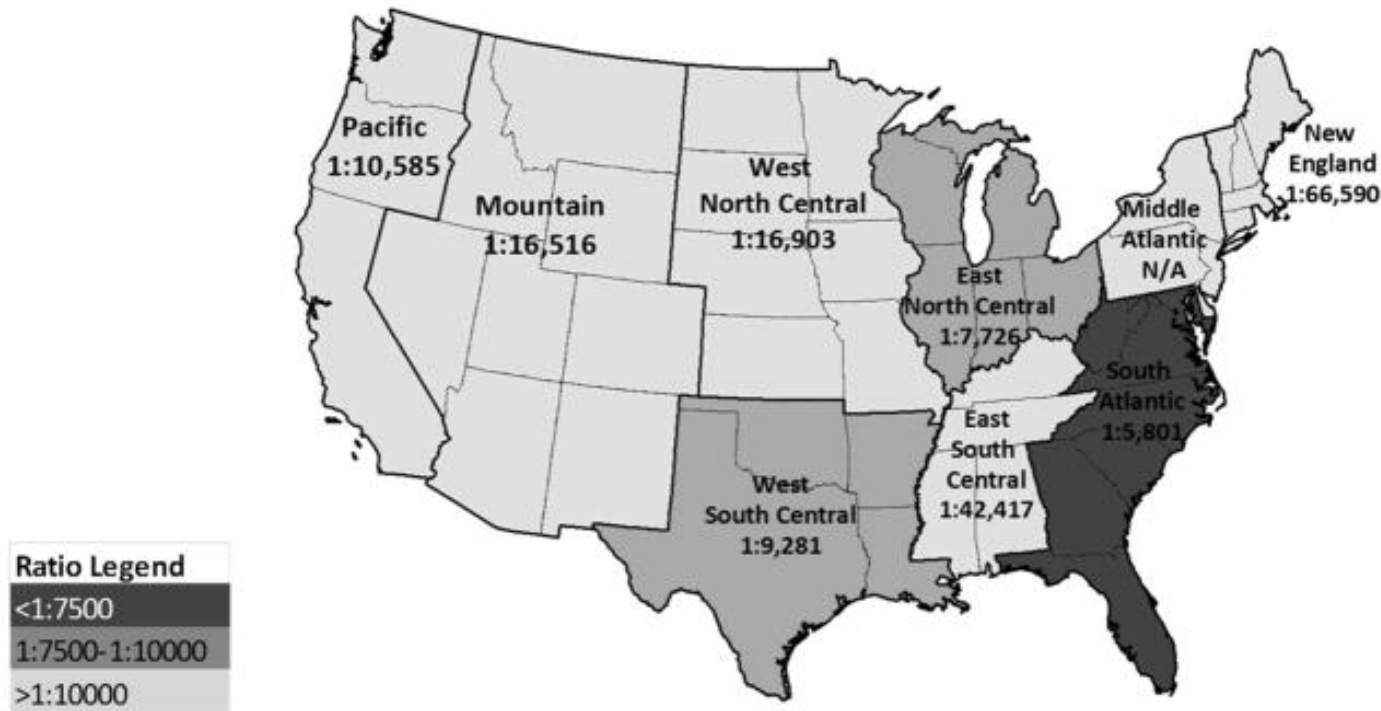
- Interdisciplinary Approaches to Promote Adolescents' Oral Health and Reduce Disparities



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



Mertz E et al. (2017) *JPHD*

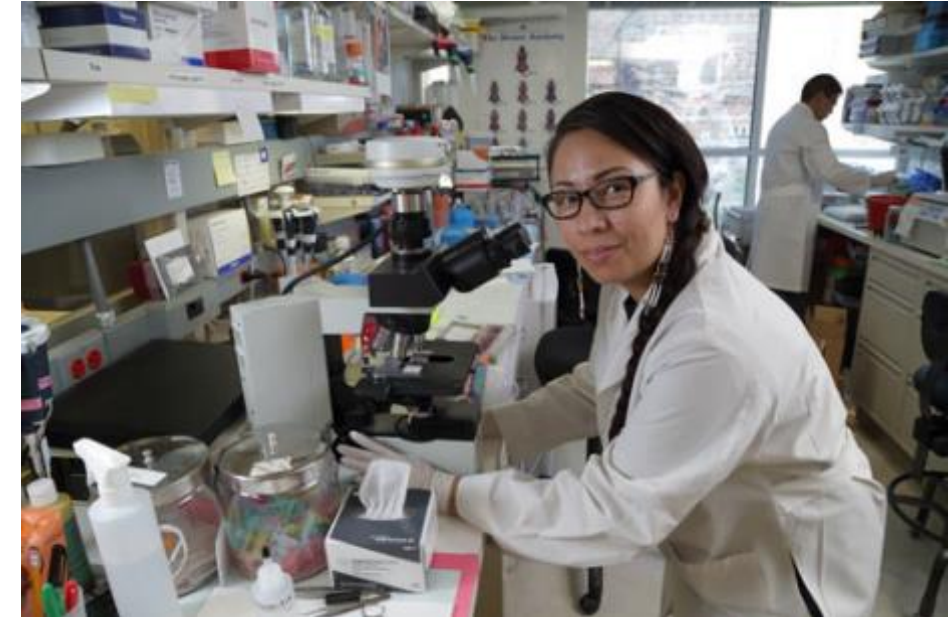
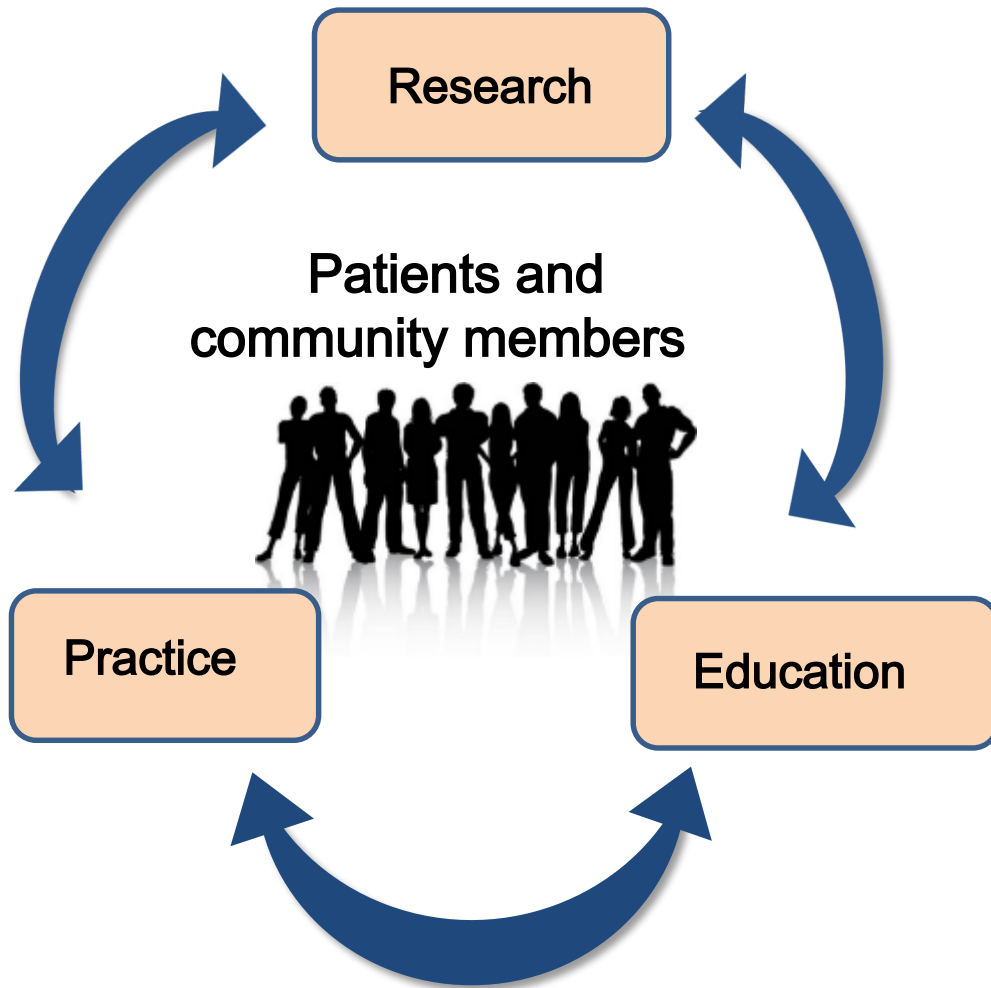


Photo: Loretta Grey Cloud
Former NIDCR Intramural Postbac trainee

Committed to training a diverse workforce

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

Engaging the Community



*Facilitating
communication
between practitioners,
communities, patients
and researchers*

Thank You

NIDCR 2018



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