Transforming Big and SMALL Data in Oral Health

- It is not about the Data
- Oral Health Priority Conditions
- Medical Waste in Oral Health
- Big data for understanding trends & improving clinical outcomes
- “Small” data for quality improvement
- Training the next generation
- Enhanced user experience with Big data
BIG DATA for Clinical Outcomes

DATA for Public Policy

BIG DATA for Reducing Medical Waste

Operating Room

Emergency Department

DATA for Quality

Quality Measures

Quality Improvement

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Addressing Oral Health in Health Policy

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Below is a description of some unique opportunities for Delivery System Science Fellows at DentaQuest Institute.

First Oral Health Delivery System Site

The DentaQuest Institute is a not-for-profit organization focused on improving the efficiency and quality of the care provided by the dental care delivery system. The DentaQuest Institute’s Safety Net Solutions
DentaQuest Institute Mission and Approach

**Mission:** Improve the Oral Health of All
Promote optimal oral health through efficient and effective care and prevention.

**DentaQuest Institute Approach**

- **Knowledge**
  - **Basic Research**
    - Developing new knowledge on the etiology and epidemiology of disease
  - **Applied Research**
    - Testing new prevention and treatment methods in clinical practice
  - **Think Tank**
    - Compiling, processing and disseminating information to inform practice and policy

- **Routine Practice**
  - **Quality Improvement**
    - Overcoming clinical and process barriers to make care more efficient and effective
  - **Technical Assistance**
    - Supporting practitioners in making practice changes to improve care

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**Opportunity for Improvement in Dentistry**

**Guest Editorial**

**Improving Quality in Dentistry: An Imperative for the Profession**

**What we know**

**DESIRED**

- Natalia I. Chalmers, DDS, PhD
  - DentaQuest Institute, Westborough, Mass.
- Richard Scoville, PhD
- Adam Richman
  - DentaQuest Institute, Westborough, Mass.
- James J. Crall, DDS, ScD
  - UCLA School of Dentistry, Los Angeles, Calif.
- Krishna Aravamudhan, BDS, MS
  - American Dental Association, Chicago, Ill.
- Man Wai Ng, DDS, MPH
  - Boston Children’s Hospital and Harvard School of Dental Medicine, Boston, Mass.
Opportunity for Improvement in Dentistry

**What we know DESIRED**
- Focused prevention
- Assess and manage risk
- Support behavior change
- Repair defects

**THE GAP**
- Applying evidence
- Changing processes
- Training workforce
- Educating parents
- Using information technology
- Aligning payment

**What we do ACTUAL**
- Prevention essentially the same for everyone
- Little focus on self-management
- 6-month recall visits
- Restore teeth

DentaQuest Institute Impact Map
Patient Centered Population Focused

Oral Health and Systemic Health

2013 Health Care Spending in the United States

US spending on personal health care*  

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1 Diabetes mellitus</td>
<td>87.350</td>
<td>6.10%</td>
</tr>
<tr>
<td>2 Ischemic heart disease</td>
<td>64.350</td>
<td>5.30%</td>
</tr>
<tr>
<td>3 Low back and neck pain</td>
<td>7.150</td>
<td>3.66%</td>
</tr>
<tr>
<td>4 High blood pressure</td>
<td>26.850</td>
<td>5.16%</td>
</tr>
<tr>
<td>5 Falls</td>
<td>15.950</td>
<td>3.00%</td>
</tr>
<tr>
<td>6 Depression</td>
<td>10.350</td>
<td>3.40%</td>
</tr>
<tr>
<td>7 Oral disorders</td>
<td>9.050</td>
<td>2.95%</td>
</tr>
<tr>
<td>8 Vision and hearing loss</td>
<td>5.450</td>
<td>2.60%</td>
</tr>
<tr>
<td>9 Skin diseases</td>
<td>0.150</td>
<td>3.04%</td>
</tr>
<tr>
<td>10 Pregnancy and postpartum care</td>
<td>0.150</td>
<td>2.19%</td>
</tr>
</tbody>
</table>

*Figures reflect amount of spending that could be broken down by condition.

Note: Spending on oral disorders includes oral surgery and cavities, including fillings, crowns, teeth removal. Oral disorders; skin diseases include conditions such as cellulitis, cysts, acne, and eczema.

1996 Dental Spending in the United States

2013 Dental Spending in the United States


2013 Access to Dental Service (0-20 years)
CRITICAL TRENDS AFFECTING THE FUTURE OF DENTISTRY

Dental Services Expenditures
Aggregate and per Capita Amounts, Percent Distribution and Annual Percent Change by Source of Funds: Calendar Years 2009-2025
We Are Here

Dental Services Expenditures = Amount in Billions

Dental Services Expenditures = Percent Distribution

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Smooth (Private Health Insurance)
Smooth (Medicare)
Smooth (Medicaid)
Priority Conditions

Committee was charged with prioritizing the top 20 high-impact Medicare conditions.

The list of the top 20 high-impact Medicare conditions was provided to NQF by HHS, as those conditions that account for 95 percent of Medicare costs based on an analysis of claims in CMS’ Chronic Conditions Warehouse.
### Longevity of Restorative Treatments in Pediatric Patients: Evidence Based Dentistry in the Era of the EHR
Longevity of Restorative Treatments in Pediatric Patients: Evidence Based Dentistry in the Era of the EHR

Natalia I. Chalmers DDS, PhD
Director, Analytics and Publication, DentaQuest Institute

Timothy J. Iafolla DMD, MPH
Chief, Program Analysis and Reports Branch
Office of Science Policy and Analysis, NIDCR, NIH

Levels of Evidence

- **Strong**
  - Systematic Reviews
  - Randomized Controlled Trials
- **Moderate**
  - Cohort Studies
- **Low**
  - Case-Control Studies
  - Case series, Case Reports
  - Editorials, Expert Opinion
- **Weak**
  - Animal Research, Bench-top Research

Clinical expertise
Evidence
Patient preferences & needs