BigMouth:
A multi-institutional dental data repository

Muhammad F Walji, PhD

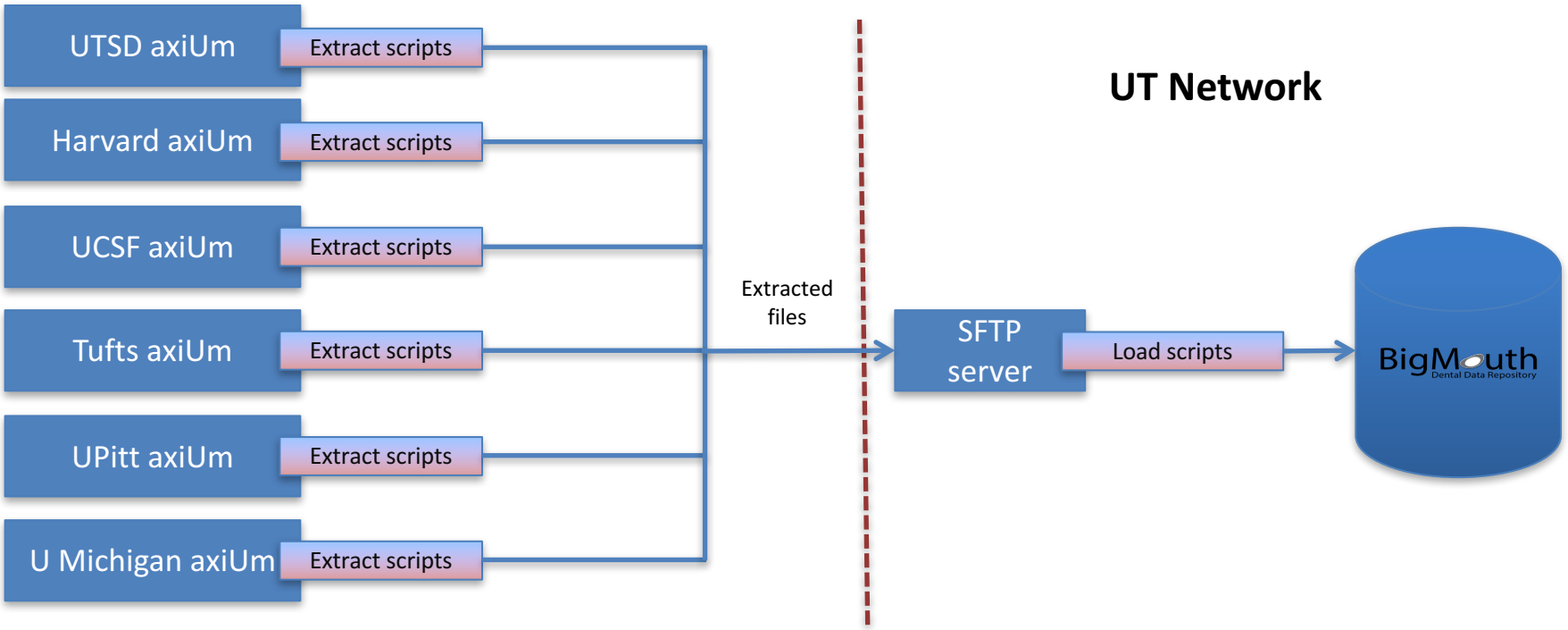
UTHealth™ | School of Dentistry
The University of Texas
Health Science Center at Houston

Outline

- Demonstration of BigMouth
- Data Governance (how to contribute and access)
- Data Standardization in Dentistry
- Examples of Research Projects using BigMouth
- Dental Quality Measurement

BigMouth

- BigMouth contains data from six dental schools
- BigMouth allows non-technical users to query the axiUm data
- Data available - Demographics ,Diagnosis, Procedures, Forms, Odontogram, Perio, Medication, Insurance, Practice



Electronic Health Records (EHRs)

- Increased adoption in dentistry
- Large amount and variety of data
- Majority of US Dental Schools use same platform
- Unstructured data
- Data collected for Treatment, Payment, Operations
- Limited standardization

  No diagnostic terminology until recently

Data in axiUm

- Patient Information – Demographics, vitals, height, weight, zip code etc.
- Dental information– Treatments, Diagnoses, Dental History etc.
- Medical information – Medical History
- Medication – Current medication, Prescription etc.
- Tooth level information – Odontogram, DMFS/ DMFT
- Periodontal Chart
- Educational – Students and Residents, Grades
- Financial – Billing, Insurance

Benefits of using EHR data for research

- Lower cost and quicker than traditional clinical research[1]
- Patients rather than research subjects[1]
- Data readily available
  - Potential of using these resource to generate abstracts/proposals
  - Opportunity to develop scholarly portfolio

1 Mei Song, Kaihong Liu, Rebecca Abromitis, Titus L. Schleyer, Reusing electronic patient data for dental clinical research: A review of current status, Journal of Dentistry, Volume 41, Issue 12, December 2013, Pages 1148-1163

Challenges of using EHR data for research

- Clinical notes(free text) are not readily queryable[1]
- Data quality issues[1]
  - Incomplete, Missing (e.g. Ethnicity)
  - Inaccurate (e.g. self reported data)
  - Inconsistent (Coding issues)
- Ethical Issues (e.g. Patient Privacy)
- Data may be idiosyncratic and may not be generalizable[1]

1 Mei Song, Kaihong Liu, Rebecca Abromitis, Titus L. Schleyer, Reusing electronic patient data for dental clinical research: A review of current status, Journal of Dentistry, Volume 41, Issue 12, December 2013, Pages 1148-1163

BigMouth Dental Data Repository

UTHealth
The University of Texas Health Science Center at Houston

Access BigMouth | FAQ | Publications | Contact

HARVARD SCHOOL OF DENTAL MEDICINE

Tufts | School of Dental Medicine

University of California San Francisco
UCSF School of Dentistry

University of Pittsburgh School of Dental Medicine

UTHealth | School of Dentistry
The University of Texas Health Science Center at Houston

SCHOOL OF DENTISTRY UNIVERSITY OF MICHIGAN (Coming Soon)

Welcome to the BigMouth Dental Data Repository

BigMouth is an oral health database developed from partially de-identified electronic health record data contributed by dental schools who are part of the Consortium for Oral Health Research and Informatics (COHRI). Access to the database is provided by i2b2, an open source data warehousing tool.

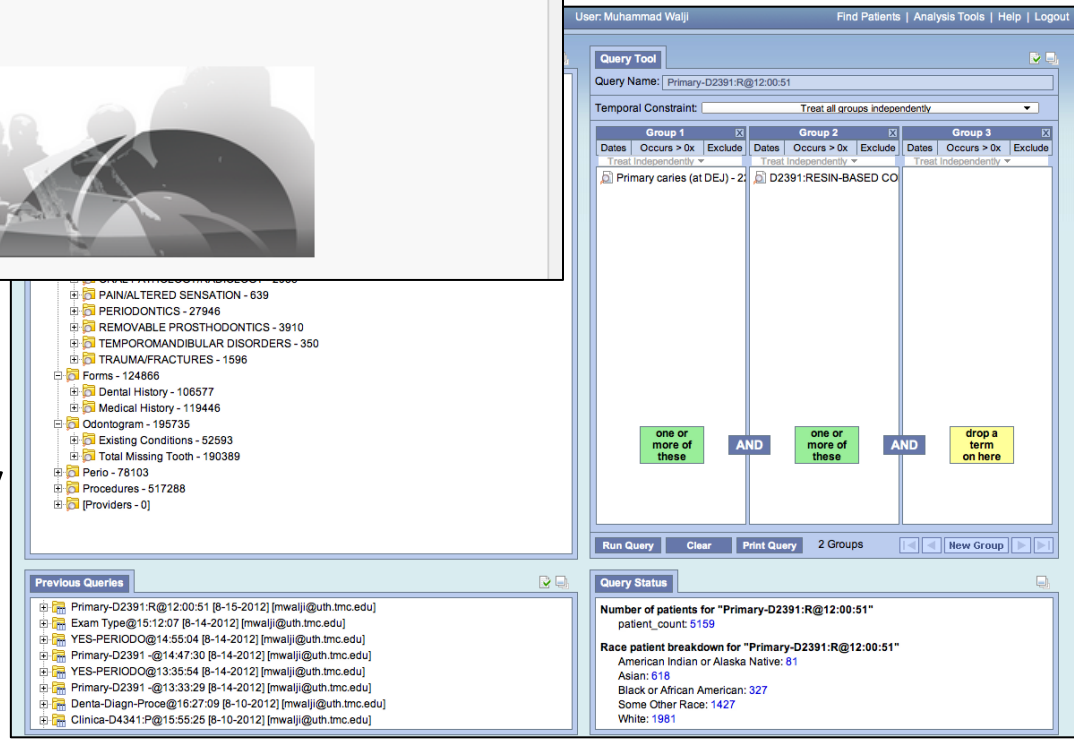
BigMouth contains data from five dental schools and is hosted at UTHealth | The School of Biomedical Informatics, Houston. The current participants are:

- Harvard | School of Dental Medicine
- Tufts University | School of Dental Medicine
- The University of California, San Francisco | School of Dentistry
- The University of Pittsburgh | School of Dental Medicine
- UTHealth | School of Dentistry
- **Coming soon:** The University of Michigan | School of Dentistry

https://bigmouth.uth.edu/

axiUm

InCommon FEDERATION

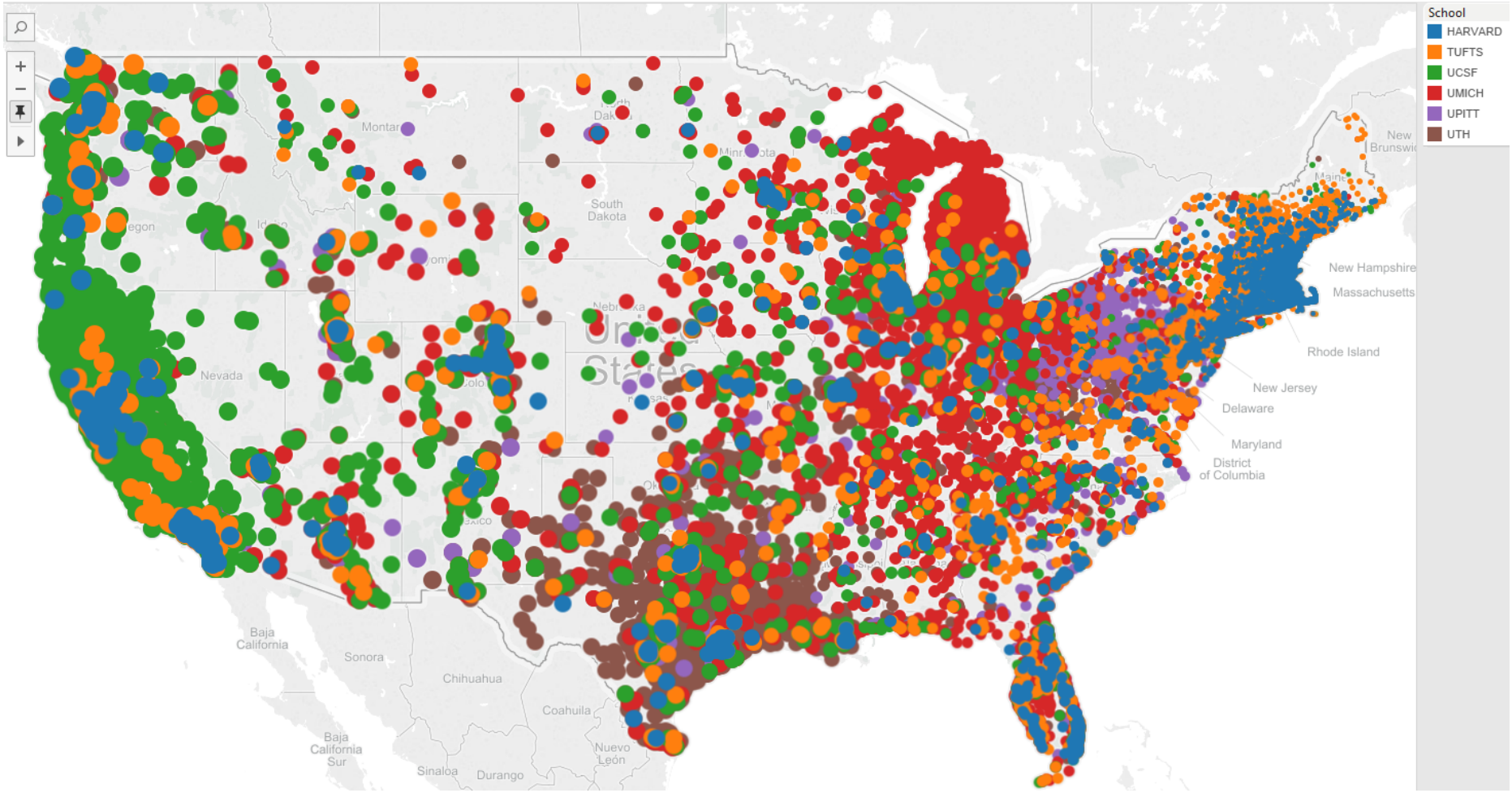


Data in BigMouth

# of patients

	# of patients
Demographics	2,178,816
Diagnosis	301,970
Procedures	1,223,806
Forms	462,001
Odontogram	1,903,625
Periodontal Chart	227,369
Prescribed Medication	141,613
Insurance	444,727

Geographical distribution of Patients in BigMouth



Linking Medical and Dental Records Using an eMPI

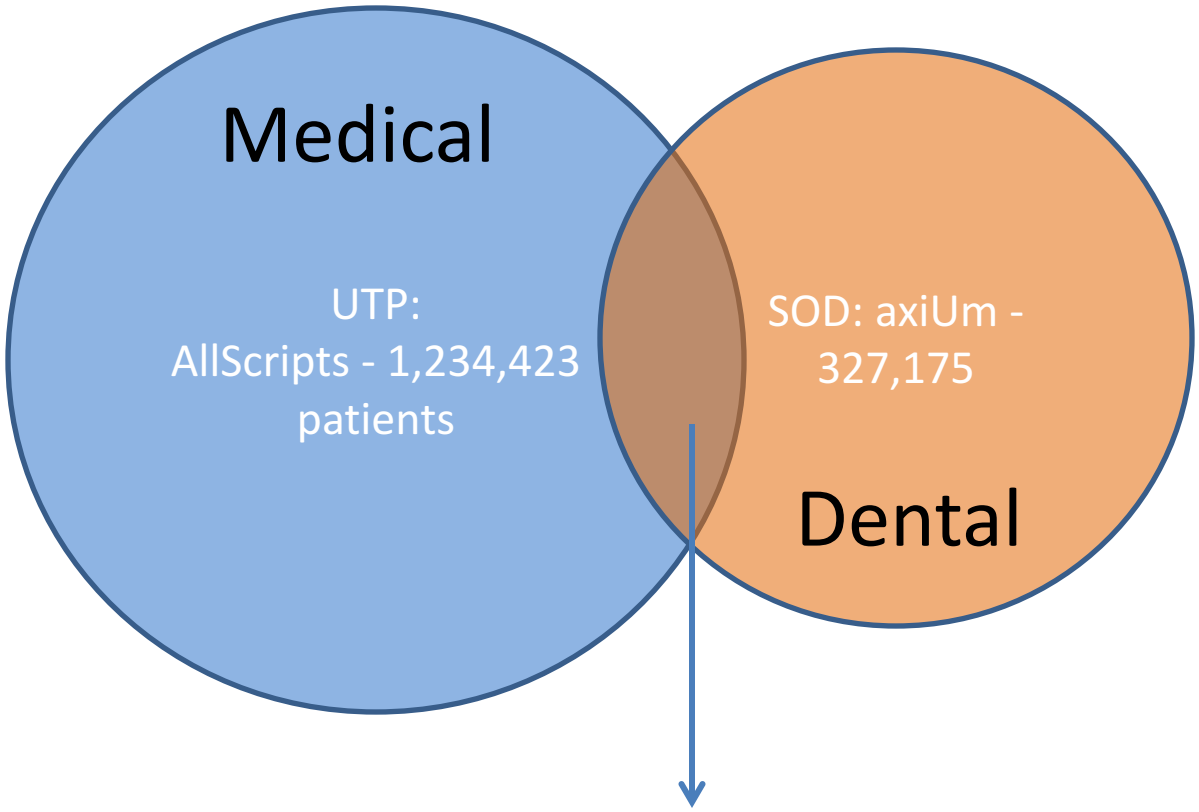
The Enterprise-wide Master Patient Index:

- A database of all patients across an organization, each assigned a unique ID.
- Matches patients across systems using “essential data” :
  - Name, Gender, Date of Birth, Race and Ethnicity, Social Security Number, Current address and Contact information
- Necessary for the maintenance of accurate demographic and clinical data

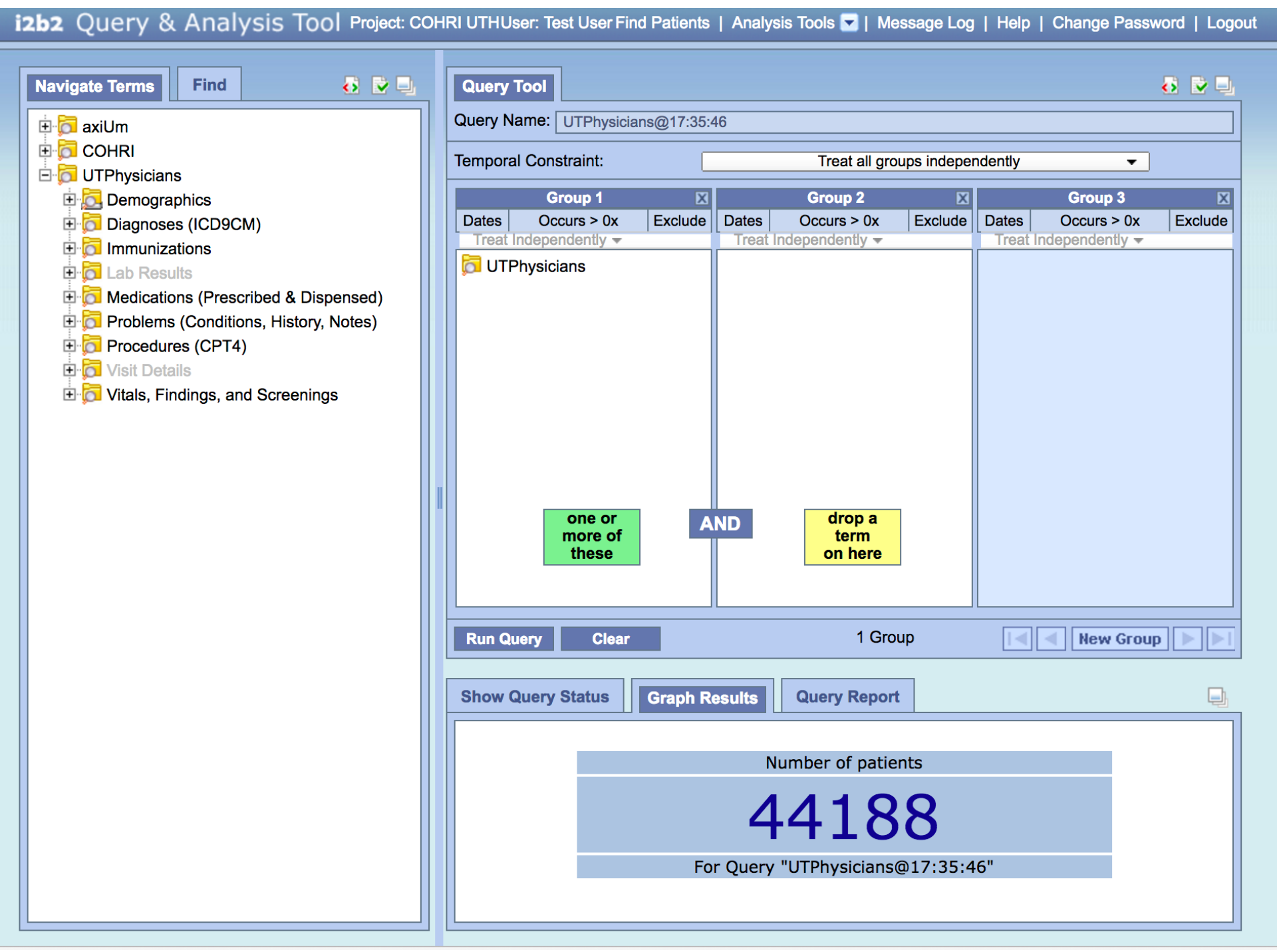
Joffe, E., Byrne, M. J., Reeder, P., Herskovic, J. R., Johnson, C. W., McCoy, A. B., ... & Bernstam, E. V. (2014). A benchmark comparison of deterministic and probabilistic methods for defining manual review datasets in duplicate records reconciliation. *Journal of the American Medical Informatics Association*, *21*(1), 97-104.

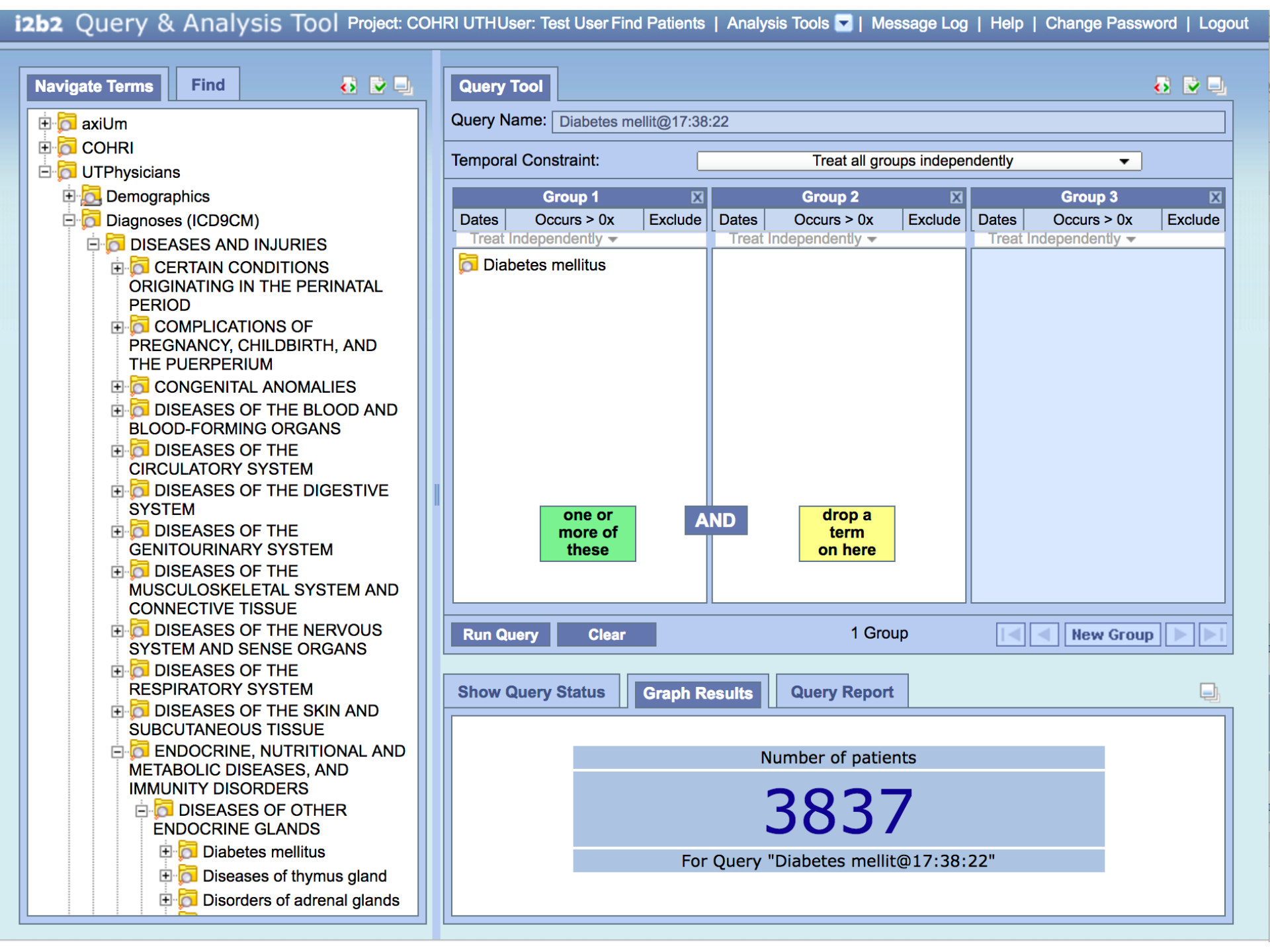
McCoy, A. B., Wright, A., Kahn, M. G., Shapiro, J. S., Bernstam, E. V., & Sittig, D. F. (2013). Matching identifiers in electronic health records: implications for duplicate records and patient safety. *BMJ quality & safety*,*22*(3), 219-224.

Data Availability



As of 01/17/2017


i2b2 Query & Analysis Tool
Project: COHRI UTHUser: Test User
Find Patients | Analysis Tools | Message Log | Help | Change Password | Logout
Navigate Terms
Find
axiUm
COHRI
UTPhysicians
Demographics
Diagnoses (ICD9CM)
Immunizations
Lab Results
Medications (Prescribed & Dispensed)
Problems (Conditions, History, Notes)
Procedures (CPT4)
Visit Details
Vitals, Findings, and Screenings
Query Tool
Query Name: UTPhysicians@17:35:46
Temporal Constraint: Treat all groups independently
Group 1
Group 2
Group 3
Dates
Occurs > 0x
Exclude
Treat Independently
UTPhysicians
one or more of these
AND
drop a term on here
Run Query
Clear
1 Group
New Group
Show Query Status
Graph Results
Query Report
Number of patients
44188
For Query "UTPhysicians@17:35:46"


i2b2 Query & Analysis Tool
Project: COHRI UTHUser: Test User Find Patients | Analysis Tools | Message Log | Help | Change Password | Logout
Navigate Terms
Find
axiUm
COHRI
UTPhysicians
Demographics
Diagnoses (ICD9CM)
DISEASES AND INJURIES
CERTAIN CONDITIONS ORIGINATING IN THE PERINATAL PERIOD
COMPLICATIONS OF PREGNANCY, CHILDBIRTH, AND THE PUERPERIUM
CONGENITAL ANOMALIES
DISEASES OF THE BLOOD AND BLOOD-FORMING ORGANS
DISEASES OF THE CIRCULATORY SYSTEM
DISEASES OF THE DIGESTIVE SYSTEM
DISEASES OF THE GENITOURINARY SYSTEM
DISEASES OF THE MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE
DISEASES OF THE NERVOUS SYSTEM AND SENSE ORGANS
DISEASES OF THE RESPIRATORY SYSTEM
DISEASES OF THE SKIN AND SUBCUTANEOUS TISSUE
ENDOCRINE, NUTRITIONAL AND METABOLIC DISEASES, AND IMMUNITY DISORDERS
DISEASES OF OTHER ENDOCRINE GLANDS
Diabetes mellitus
Diseases of thymus gland
Disorders of adrenal glands
Query Tool
Query Name: Diabetes mellit@17:38:22
Temporal Constraint: Treat all groups independently
Group 1
Group 2
Group 3
Dates
Occurs > 0x
Exclude
Treat Independently
Diabetes mellitus
one or more of these
AND
drop a term on here
Run Query
Clear
1 Group
New Group
Show Query Status
Graph Results
Query Report
Number of patients
3837
For Query "Diabetes mellit@17:38:22"

Data Governance

1. Adhere to privacy and security requirements
2. Access provided to those institutions that contribute
3. Each source site retains control/ownership of contributed data
4. Project review committee approval required for use of data for specific research projects
5. Continuously assess and improve the quality of data

Data Governance 2.0

1. Adhere to privacy and security requirements
2. Access provided to researchers from non-profit institutions
3. Each source site retains control/ownership of contributed data
4. Project review committee approval required for use of data for specific research projects
5. Continuously assess and improve the quality of data

How to Access BigMouth

- Contributing Institution
  - Signup at https://bigmouth.uth.edu/
- Level 1 Access
  - Explore the data using the BigMouth Workbench
- Level 2 Access
  - Submit proposal to Research Review Committee
    - IRB Approval
  - Receive dataset to conduct analysis
    - Fill out the research data request template

How to become a Contributing Institution

- COHRI member institutions eligible
- Complete a data use agreement
- IRB approval

COHRI
Consortium for Oral Health Research and Informatics

www.cohri.org

VISION

To be leading experts in informatics for oral health research, education, and patient care

MISSION

COHRI will:

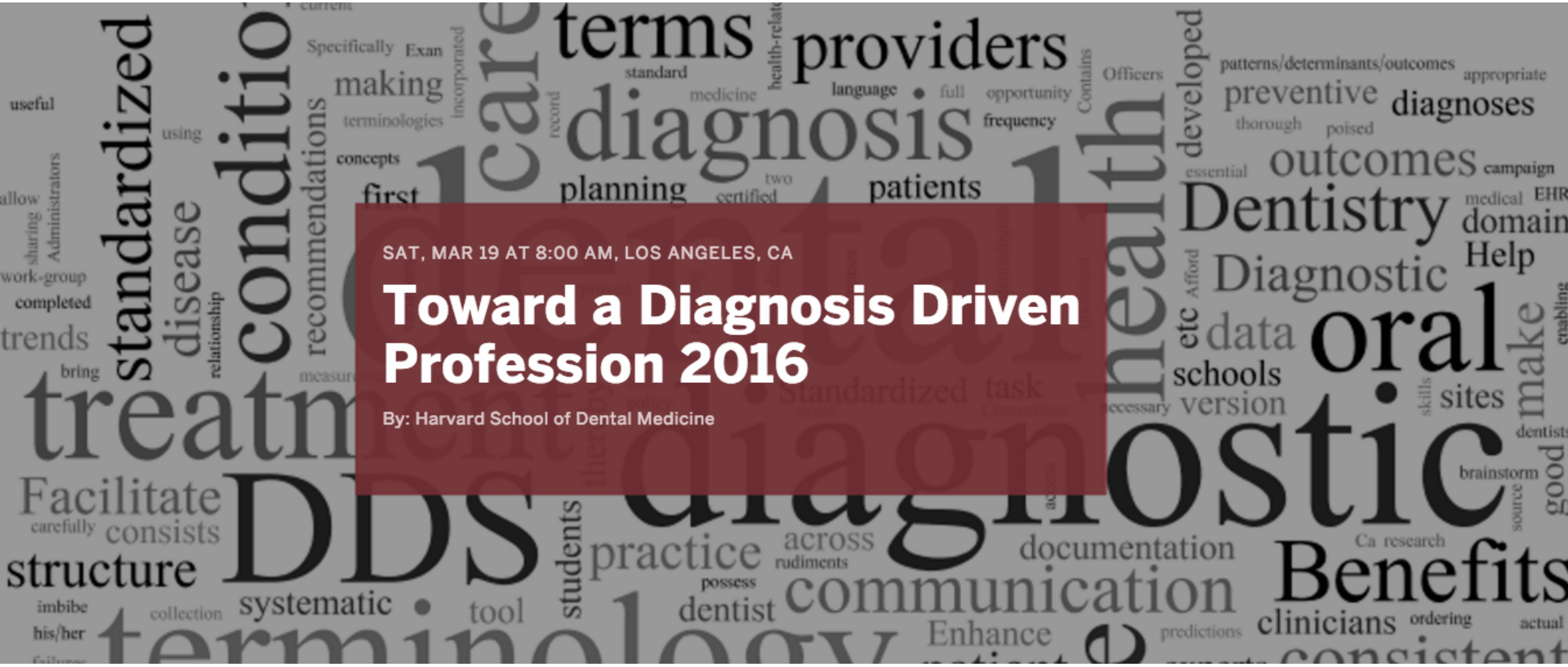
- Create, standardize, integrate and share data using electronic health records
- Improve informatics utilization in dental education, health care, and research
- Work collaboratively to develop research projects to promote evidence based dentistry

Current Member Institutions (n = 40)

Academic Centre for Dentistry (ACTA)
Baylor University
Columbia University
Creighton University
Harvard
Indiana University
LECOM Bradenton
Loma Linda
Medical University of South Carolina
Meharry Medical College
Midwestern University Downers Grove
New York University
Nova Southeastern University
Oregon Health & Science University
Southern Illinois University
Temple University
Tufts University
University of California, San Francisco
University of Colorado
University of Florida
University of Illinois
University of Kentucky
University of Louisville
University of Michigan
University of Minnesota
University of New England
University of Nevada Las Vegas
University of Oklahoma
University of Pacific
University of Puerto Rico
University of Pittsburgh
University of Sharjah, UAE
University of Southern California
University of Tennessee
University of Texas, Houston
University of Texas, San Antonio
University of Washington
Virginia Commonwealth University
West Virginia University
Willamette Dental Group

COHRI Resources

1. Adult medical and dental histories
2. Pediatric medical and dental histories
3. Problem list
4. Dental Diagnostic System (DDS)
5. Caries risk assessment (long + short)
6. BigMouth Dental Data Repository



SAT, MAR 19 AT 8:00 AM, LOS ANGELES, CA

Toward a Diagnosis Driven Profession 2016

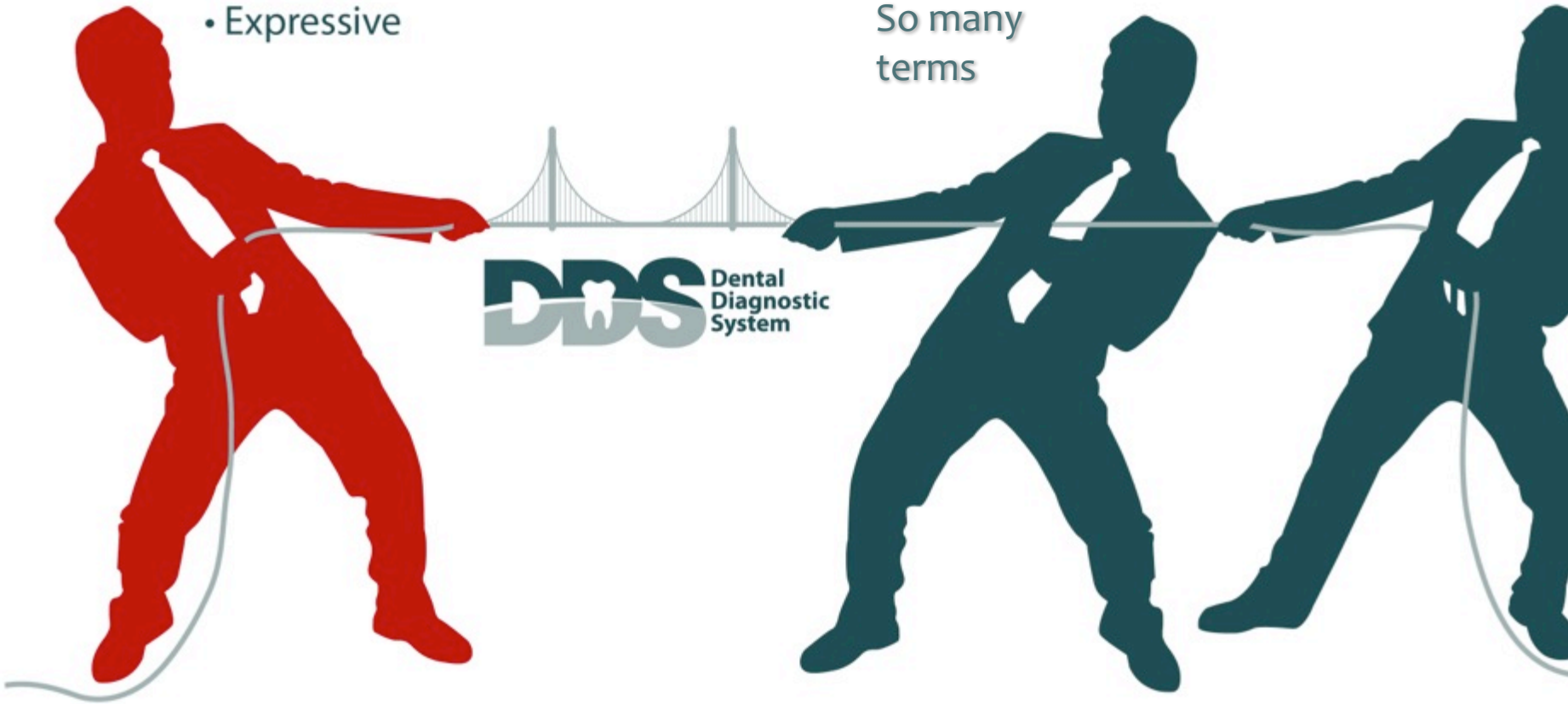
By: Harvard School of Dental Medicine

Interface Terminology

- Clinical Usability
- Flexibility
- Common phrases
- Expressive

- Potential for nonsense terms
- Formally defined concepts
- Rigidly defined inter-relationships

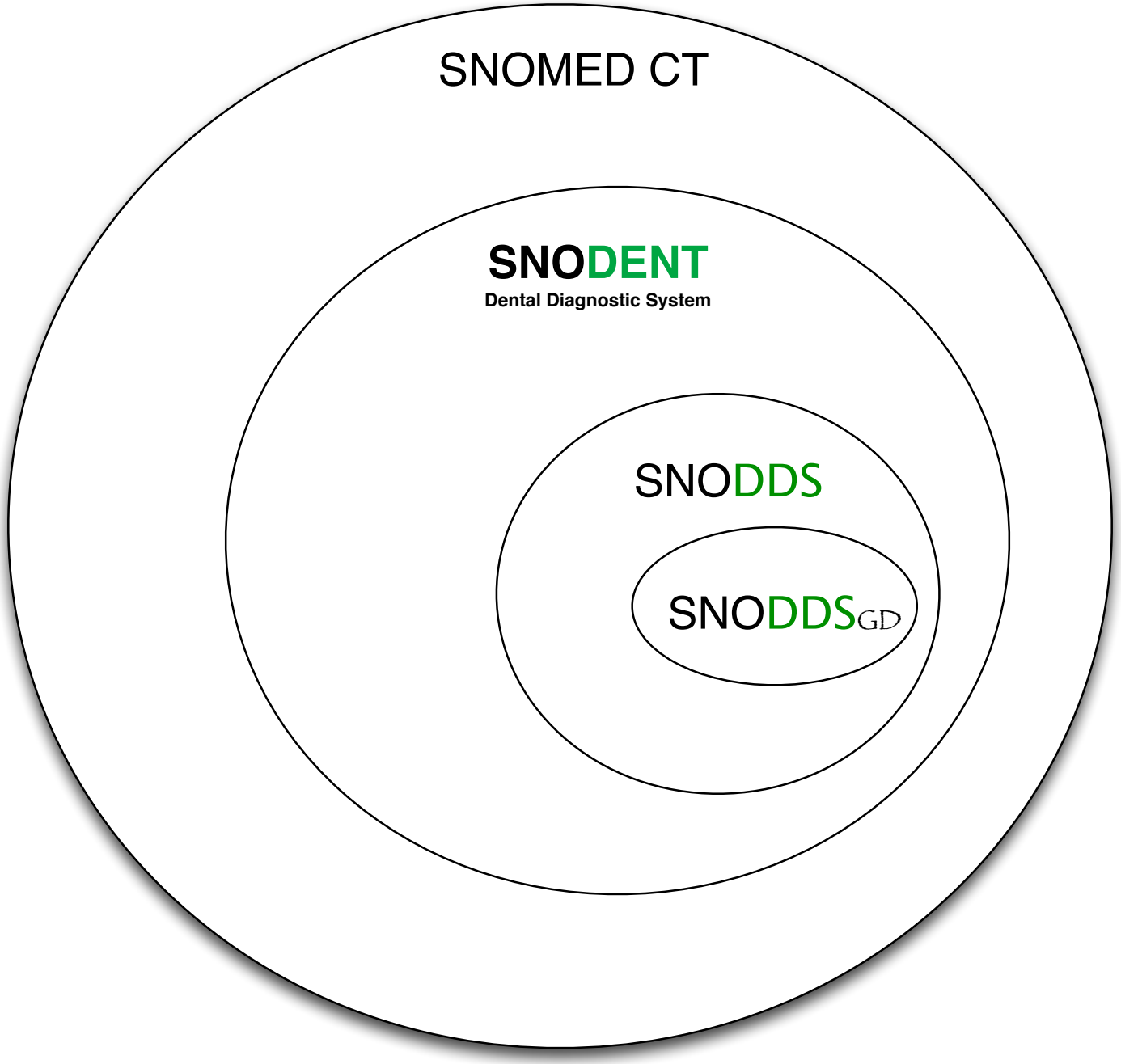
So many terms



USER

FORMAL TERMINOLOGIES

ANSI Approved Standard



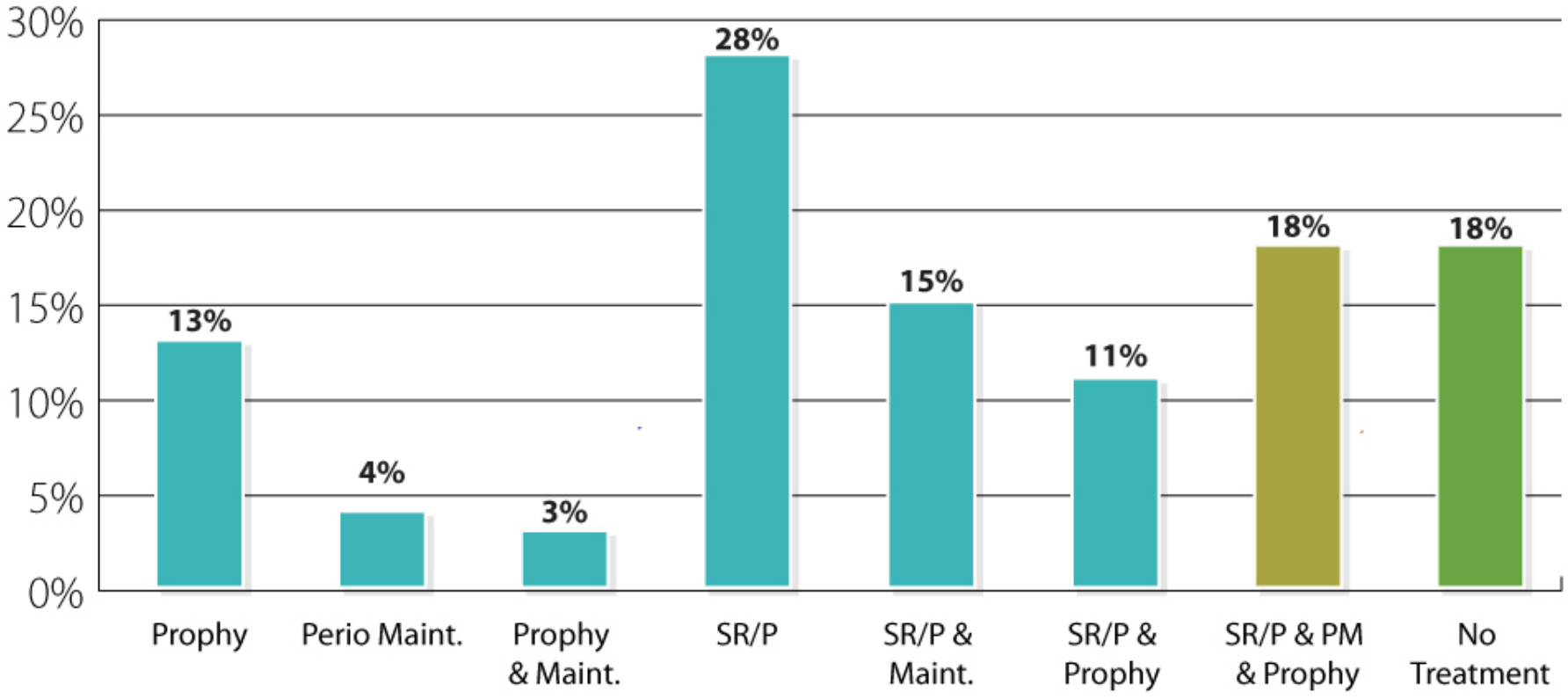
Examples of Research Projects

The Value of Using a Dental Diagnostic Terminology in an Electronic Health Record – Kalenderian et al.

- Goal : Find patients diagnosed with moderate chronic periodontitis who received treatment according to current American Academy of Periodontology (AAP) guidelines.
- Data used: Diagnosis and Procedures

Kalenderian E, Tokede B, Ramoni R, Khan M, Kimmes N, White J, Vaderhobli R, Yansane A, Feilzer A, Walji MF. Dental clinical research: an illustration of the value of standardized diagnostic terms. Journal of Public Health Dentistry. 2015. Oct 30. doi: 10.1111/jphd.12124.

Tx for Generalized Chronic Moderate Periodontitis



Efficacy and accuracy of pre-doctoral periodontal education in the US: An evaluation of the generalist and specialist teaching models on periodontal education – Ali Sajadi, DDS

- Goal: To understand the accuracy of diagnosis by analyzing clinical charting parameters and diagnostic codes by final year students
- Data used: Diagnosis

Partial-mouth periodontal examination protocol for estimation of prevalence, severity and extent of periodontitis – Tran et al.

- Goal: This project aims to identify a partial-mouth periodontal; examination protocol which closely approximates a full-mouth periodontal examination protocol in estimating prevalence, severity and extent of periodontitis in population
- Data used: Perio, Forms

Association between obesity and periodontitis :Cross-sectional study on patients visiting universities' dental clinics - Tran et al.

- Goal: *Evaluate perio initial exam of obese patients.*
- Data used: axiUm (Perio, medical and dental history and Missing teeth) and AllScripts (Diagnosis, medical history etc.)

Statin Use is Inversely Correlated with Symptomatic Endodontic Diagnoses – Kanwal et al.

- Goal : The purpose of this retrospective study was to verify if correlations exist between endodontic diagnoses and statin use.
- Data used: Forms, Procedure

Assessment of Diagnosed Temporomandibular Disorders and Orofacial Pain Conditions by Pre-doctoral Dental Students – Adibi et al.

- Goal : The purpose of this study was to assess the degree to which 1) patients report signs and symptoms of TMD/OFP, 2) if pre-doctoral dental student diagnose TMD/OFP, and 3) if patients receive any treatment for TMD/OFP.
- Data: Forms, Procedures, Diagnosis, Provider

Adibi SS, Kookal KK, Fishbeck NM, Thompson CR, Walji MF. Assessment of Diagnosed Temporomandibular Disorders and Orofacial Pain Conditions by Predoctoral Dental Students: A Pilot Study. J Dent Educ 2016 80:1450-1456.

Implementing Dental Quality Measures in Practice

- R01, 5-Year NIH/NIDCR Grant
- UT Houston, HSDM, UCSF, WDG
- March 01 2015 – February 28 2020

1. Assess dental quality measure implementation feasibility and validity across 4 core sites.
2. Implement valid dental quality measures across all 11 sites and assess inter-site variation.
3. Develop useful and usable Dental Quality Measure dashboard views and functionality to support the interpretation of dental quality measures

What is Quality?

"The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."

IOM

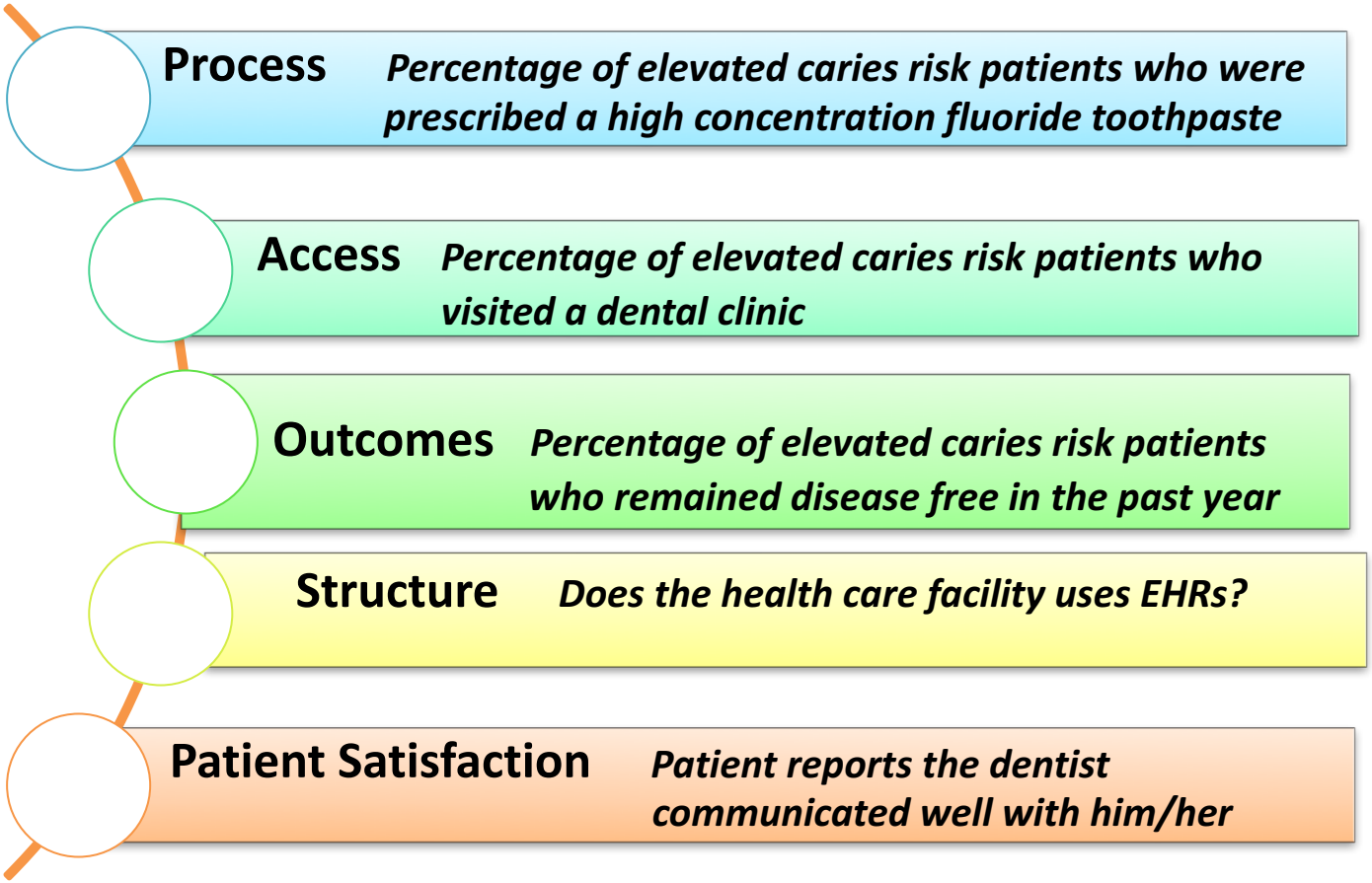
https://www.nationalacademies.org/hmd/Global/News%20Announcements/Crossing-the-Quality-Chasm-The-IOM-Health-Care-Quality-Initiative.aspx

What are Clinical Quality Measures?

- Clinical quality measures, are tools that help measure and track the quality of health care services provided
- CQM Measure:
  - health outcomes
  - clinical processes
  - patient safety
  - efficient use of health care resources
  - care coordination
  - patient engagements
  - population and public health
  - adherence to clinical guidelines

Measure domains

Clinical quality measures:



https://www.qualitymeasures.ahrq.gov/about/domain-definitions.aspx

Ten Dental Quality Measures

1. **Diabetes and Annual Oral Evaluation**
2. Sealants
3. Tobacco Screening and Cessation Counseling Intervention
4. Caries Risk
5. Caries Treatment
6. Caries Outcomes
7. Periodontal Risk
8. Periodontal Treatment
9. Periodontal Outcomes
10. Pregnancy and Oral Evaluation

What percentage of diabetics receive an annual oral examination?

NUM: Number of diabetics who received the following dental examination procedures: D0150, D0120 & D0180 in the measurement period

---

DEN: Dental patients, who reported having diabetes, of record in the dental clinic in the reporting year

=

Claims data → EHR

Approach for Evaluating DQM

1. Development of EHR query
2. Calculate sample sizes needed to review
3. 2 Reviewers independently reviewed 50 charts
4. Inter-rater reliability
5. Single review of remaining charts
6. Calculation of sensitivity, specificity, NPV, PPV and Kappa
7. Identification of why patients did not receive oral evaluation
8. Develop and evaluate improved measure

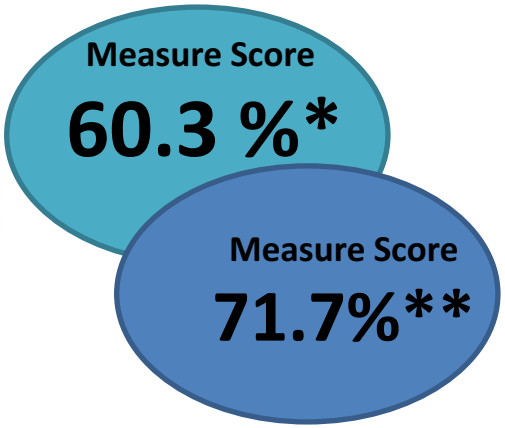
Initial EHR-Measure results:

NUM: How many received the following procedures: D0150, D0120 & D0180 in the measurement period

---

DEN: Dental patients of record , who reported having diabetes, in the dental clinic in the reporting year

=



* Manual Review
** Automated query

	Initial EHR measure		
Overall Score	**Manual Review** (n= 1,242)	**Measure rate: 60.3%** (95% CI; 58-63%)	P<0.001[1]
	Automated Query (n=12,960)	**Measure rate: 71.7%** (95% CI; 71-72%)	
Sensitivity	93% (95% CI; 90.7-94.5) of the time that manual review revealed Oral Evaluation, the query identified Oral Evaluation		
Specificity	100% (95% CI; 100-100) of the time that the manual review did not reveal Oral Evaluation, the query did not identify Oral Evaluation		
Positive Predictive Value	100% (95% CI; 100-100) of the time that the query identified Oral Evaluation, the manual review revealed Oral Evaluation		
Negative Predictive Value	100% (95% CI; 100-100) of the time that the query did not identify oral evaluation, the manual review did not reveal oral evaluation		

Why did Diabetics Not Receive an Oral Evaluation?

- Group 1: Reasons that justified the patient being excluded from the denominator

Group	Category – Reasons for Exclusion
1	Patients were discontinued
2	Edentulous
3	Patient reported for limited/emergency/urgent./specialist care only
4	Less than a year of visit
5	Miscoded

- The selection of eligible patients in the initial measure did not follow an exclusion criteria

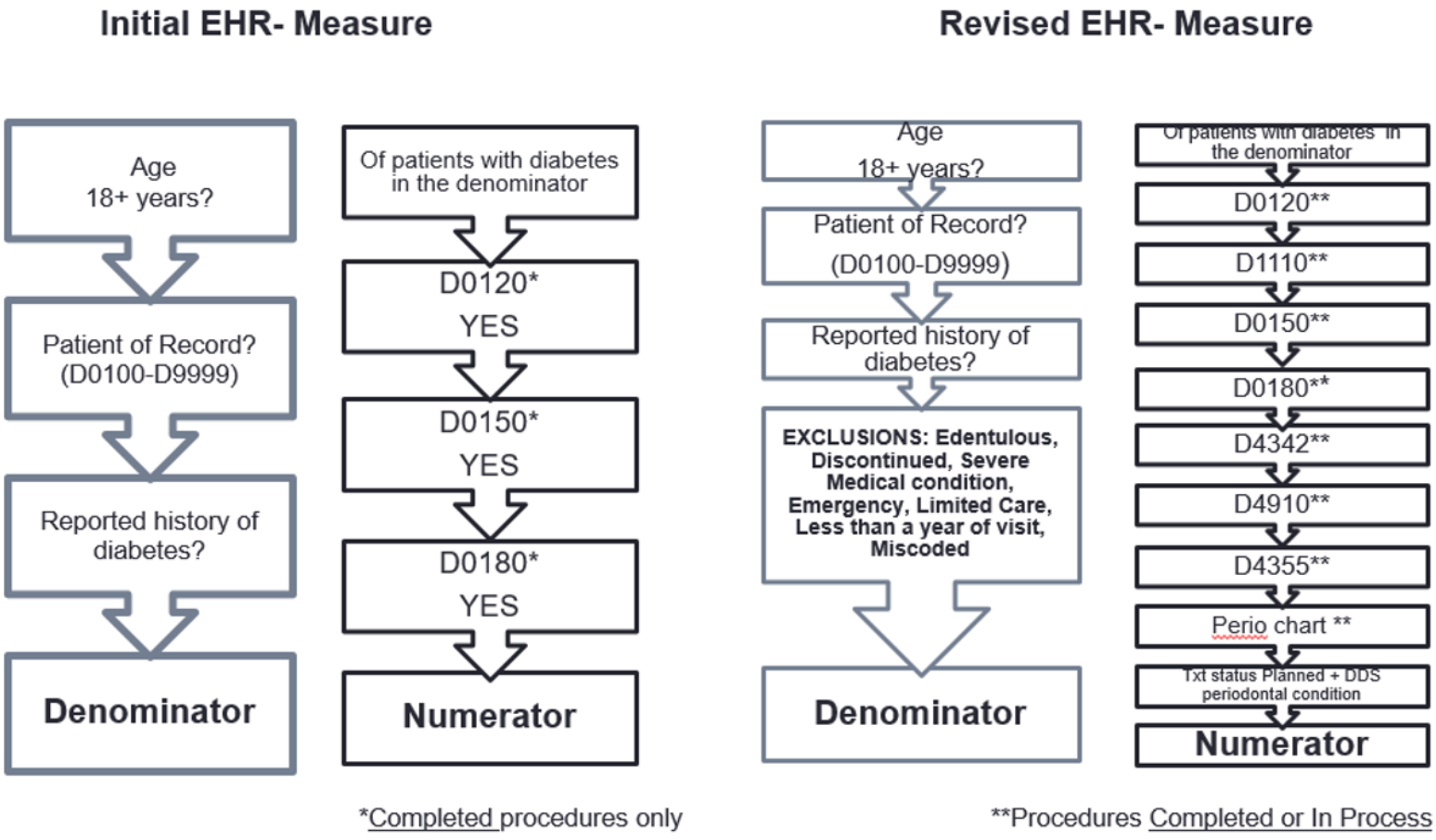
Why did Diabetics Not Receive an Oral Evaluation?

- Group 2: Reasons that justified the patient being included in the numerator

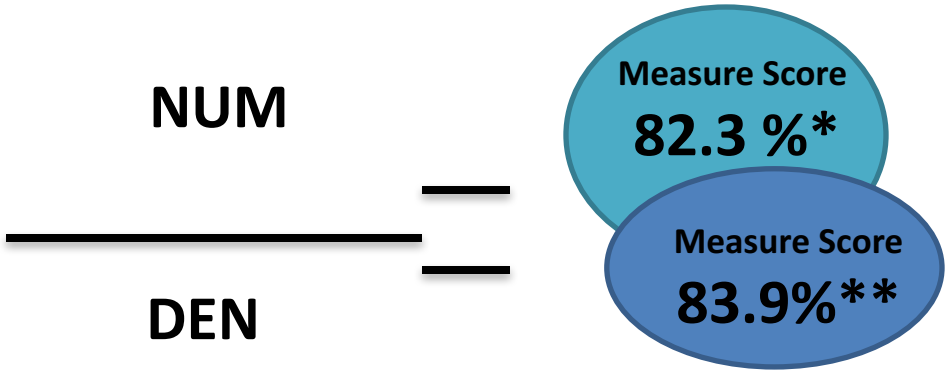
Category – Reasons for Inclusion
Other acceptable Periodontal care: Adult Prophylaxis (D1110) Periodontal maintenance (D4910) Full mouth debridement (D4355) Scaling and root planing of one to three teeth (D4342) Scaling and root planing of four or more teeth (D4910) Periodontal Chart *Completed* or *In Progress* Dental Procedures under *Planned* and in conjunction with the DDS terminology

- To include only comprehensive periodontal evaluation OR comprehensive oral evaluation OR periodic oral evaluation may underestimate the care patients received

Figure 1. Numerator and Denominator workflow for Initial and Revised EHR-Measures:



Revised EHR-quality Measure scores:



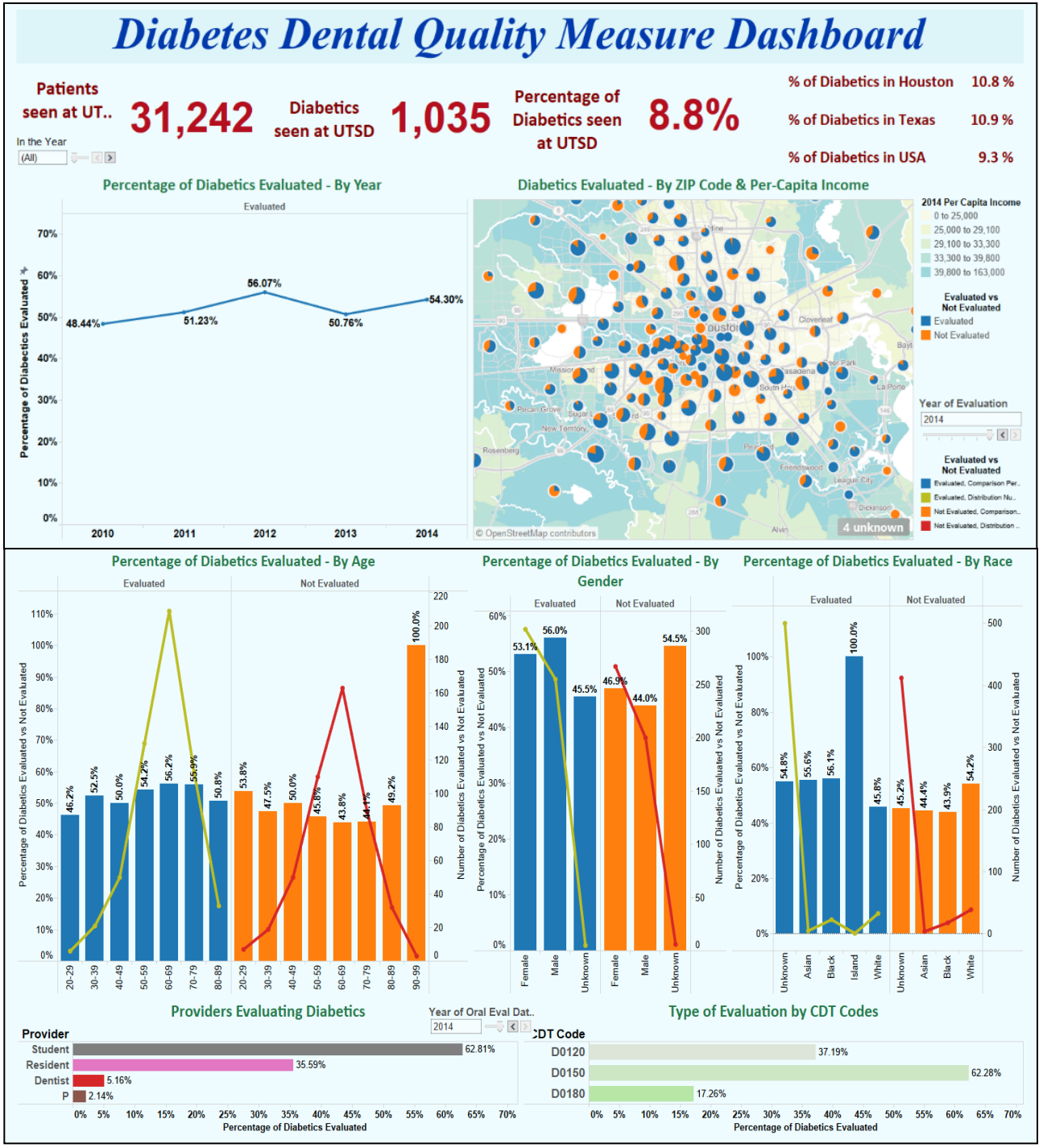
* Manual review
** Automated query

Measure rates for the Initial and Revised EHR-Measures across four sites for both automated query and manual reviews.

	Initial EHR measure			Revised EHR measure		
Overall Score	Manual Review (n= 1,242)	**Measure rate: 60.3%** (95% CI; 58-63%)	P<0.001[1]	Manual Review (n= 710)	**Measure rate: 82.3%** (95% CI; 79-85%)	**P =0.260**[1]
	Automated Query (n=12,960)	**Measure rate: 71.7%** (95% CI; 71-72%)		Automated Query (n= 13,221)	**Measure rate: 83.9%** (95% CI; 83-85%)	
Sensitivity	93% (95% CI; 90.7-94.5)			99% (95% CI; 98.7-100)		**P <0.001**
Specificity	100 (95% CI; 100-100)			90% (95% CI; 85.0-95.2)		**P <0.001**
Positive Predictive Value	100 (95% CI; 100-100)			98% (95% CI; 96.5-99.0)		**P <0.001**
Negative Predictive Value	100 (95% CI; 100-100)			98% (95% CI; 94.8-100)		**P <0.001**

[1] – Relationship between manual and automated queries calculated with two sample test of proportions

[2]- Relationship between of the validation analysis between the adapted and revised measures calculated with two sample test of proportions


Diabetes Dental Quality Measure Dashboard
Patients seen at UT..
31,242
Diabetics seen at UTSD
1,035
Percentage of Diabetics seen at UTSD
8.8%
In the Year
(All)
% of Diabetics in Houston 10.8 %
% of Diabetics in Texas 10.9 %
% of Diabetics in USA 9.3 %
Percentage of Diabetics Evaluated - By Year
Evaluated
Percentage of Diabetics Evaluated
48.44%
51.23%
56.07%
50.76%
54.30%
2010
2011
2012
2013
2014
Diabetics Evaluated - By ZIP Code & Per-Capita Income
2014 Per Capita Income
0 to 25,000
25,000 to 29,100
29,100 to 33,300
33,300 to 39,800
39,800 to 163,000
Evaluated vs Not Evaluated
Evaluated
Not Evaluated
Year of Evaluation
2014
4 unknown
© OpenStreetMap contributors
Percentage of Diabetics Evaluated - By Age
Evaluated
Not Evaluated
Percentage of Diabetics Evaluated vs Not Evaluated
Number of Diabetics Evaluated vs Not Evaluated
46.2%
52.5%
50.0%
54.2%
56.2%
55.9%
50.8%
53.8%
47.5%
50.0%
45.8%
43.8%
44.1%
49.2%
100.0%
20-29
30-39
40-49
50-59
60-69
70-79
80-89
90-99
Percentage of Diabetics Evaluated - By Gender
53.1%
56.0%
45.5%
46.9%
44.0%
54.5%
Female
Male
Unknown
Percentage of Diabetics Evaluated - By Race
54.8%
55.6%
56.1%
100.0%
45.8%
45.2%
44.4%
43.9%
54.2%
Unknown
Asian
Black
Island
White
Providers Evaluating Diabetics
Year of Oral Eval Dat..
2014
Provider
Student 62.81%
Resident 35.59%
Dentist 5.16%
P 2.14%
Percentage of Diabetics Evaluated
Type of Evaluation by CDT Codes
CDT Code
D0120 37.19%
D0150 62.28%
D0180 17.26%
Percentage of Diabetics Evaluated

Next Steps

- Scalability
- Standardization
- Sustainability
- Linking to Medical Data
- Linking to Genomic Data

BigMouth Team

UT-Houston

- Muhammad Walji PhD
- Krishna Kookal M.S
- Joseph Applegate
- Susan Guerrero

Tufts

- Britta Magnuson, DMD
- Matt Johnston

UCSF

- Elsbeth Kalenderian DDS, MPH PhD
- Joel White DDS MS
- Bing Espiritu

Univ of Pittsburg

- Patrick Hetherington

Harvard

- German Gallucci DMD, PhD
- Scott Jason

Univ of Michigan

- Willy Wangsa

DQM Team

UT-Houston

M Walji (PI)

A Neumann

K Kookal

S Kumar

S Bangar

C Van Strien

J Modha

UCSF

E Kalenderian (PI)
J White
Eni Obadan
A Yansane
R Vaderhobli
B Mertz

Harvard

B Tokede

J Etolue

Willamette Dental Group

K Simmons

J Evens

J Mullins

E Blaga

T Guy

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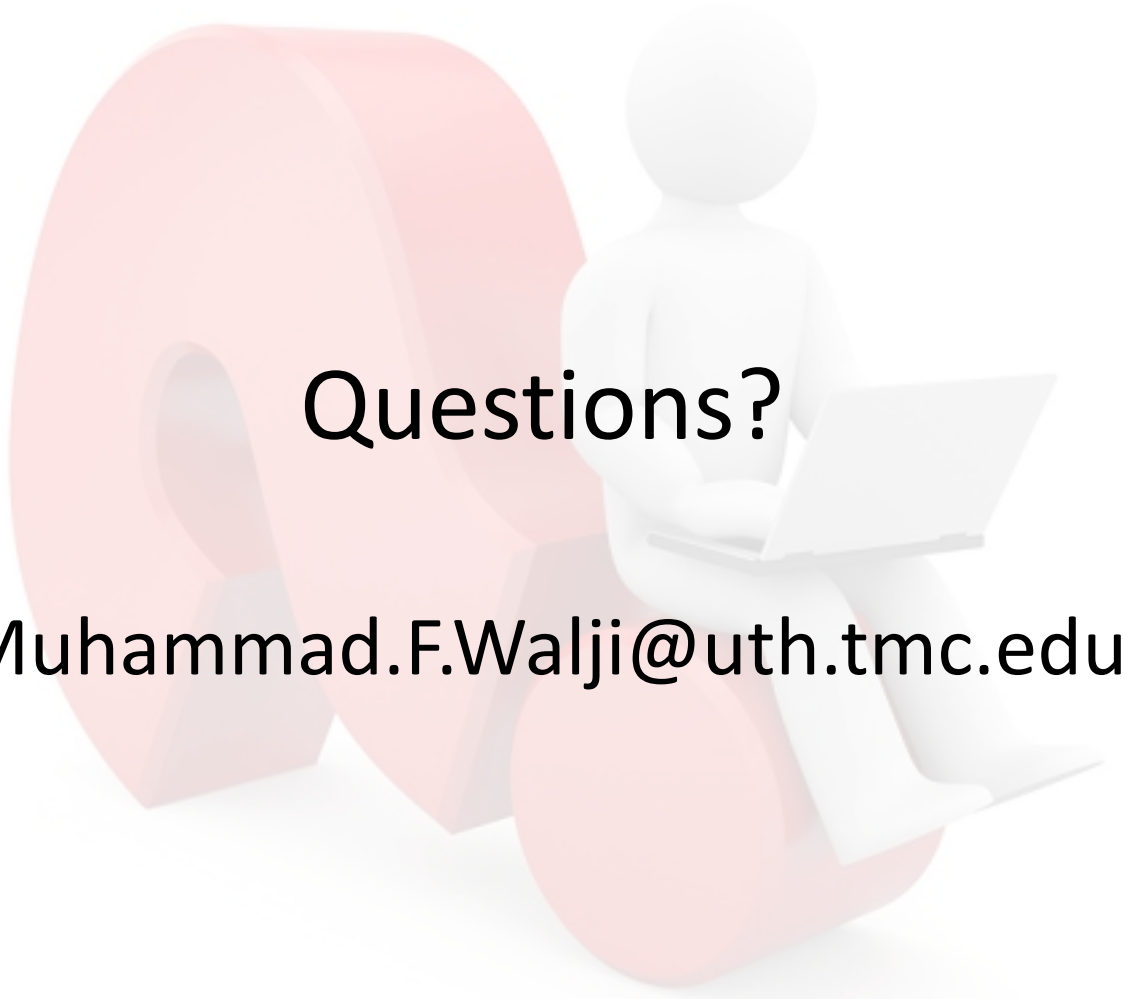
R01DE023061 (NIDCR): A Whole Systems Approach To Implementing Standardized Dental Diagnostic Terms

R01DE022628 (NIDCR): Developing a Patient Safety System for Dentistry

R01DE024166 (NIDCR): Implementing Dental Quality Measures in Practice

- Thank you to our research team members!

Muhammad.F.Walji@uth.tmc.edu



Questions?

Muhammad.F.Walji@uth.tmc.edu

https://bigmouth.uth.edu

BigMouth Dental Data Repository

UTHealth
The University of Texas Health Science Center at Houston

Access BigMouth **FAQ** **Publications** **Contact**

HARVARD SCHOOL OF DENTAL MEDICINE

Tufts | School of Dental Medicine

University of California San Francisco
UCSF
School of Dentistry

UNIVERSITY OF PITTSBURGH School of Dental Medicine

UTHealth | School of Dentistry
The University of Texas Health Science Center at Houston

SCHOOL OF DENTISTRY UNIVERSITY OF MICHIGAN

Welcome to the BigMouth Dental Data Repository

BigMouth is an oral health database developed from partially de-identified electronic health record data contributed by dental schools who are part of the Consortium for Oral Health Research and Informatics (COHRI). Access to the database is provided by i2b2, an open source data warehousing tool.

BigMouth contains data from six dental schools and is hosted at The University of Texas School of Biomedical Informatics at Houston. The current participants are:

- Harvard | School of Dental Medicine
- Tufts University | School of Dental Medicine
- The University of California, San Francisco | School of Dentistry
- The University of Pittsburgh | School of Dental Medicine
- UTHealth | School of Dentistry
- The University of Michigan | School of Dentistry

UTHealth Authentication

UT ID: mwalji

Password: ••••••••••••••

Login

change password | password help

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privacy & security | contact | UTHealth
date last modified: July1, 2010

Navigate Terms | Find

- Axium
- COHRI

Previous Queries | Find

- Prescribed Medi@17:35:22 [1-18-2017] [mwalji@uth
- Prescribed Medi@15:11:31 [12-19-2016] [mwalji@ut
- ABNORMA-Male@11:50:09 [12-16-2016] [mwalji@u
- ABNORMA-Male@11:49:41 [12-16-2016] [mwalji@u
- Vicodin@15:36:28 [12-9-2016] [mwalji@uth.tmc.edu
- Vicodin@15:32:49 [12-9-2016] [mwalji@uth.tmc.edu
- Vicodin@15:32:28 [12-9-2016] [mwalji@uth.tmc.edu
- Vicodin@15:32:11 [12-9-2016] [mwalji@uth.tmc.edu

Query Tool

Query Name:

Temporal Constraint: Treat all groups independently

Group 1			Group 2			Group 3		
Dates	Occurs > 0x	Exclude	Dates	Occurs > 0x	Exclude	Dates	Occurs > 0x	Exclude
Treat Independently			Treat Independently			Treat Independently		

drop a term on here

Run Query | Clear | 0 Groups | New Group

Show Query Status | Graph Results | Query Report

Navigate Terms | Find

- Axium
  - Harvard - 69108
  - Pittsburgh - 240127
  - Tufts - 279333
  - UCSF - 854302
  - University of Michigan - 408820
  - UTHealth - 327175
- COHRI

Previous Queries | Find

- Prescribed Medi@17:35:22 [1-18-2017] [mwalji@uth
- Prescribed Medi@15:11:31 [12-19-2016] [mwalji@ut
- ABNORMA-Male@11:50:09 [12-16-2016] [mwalji@u
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- Vicodin@15:32:11 [12-9-2016] [mwalji@uth.tmc.edu

Query Tool

Query Name:

Temporal Constraint: Treat all groups independently

Group 1			Group 2			Group 3		
Dates	Occurs > 0x	Exclude	Dates	Occurs > 0x	Exclude	Dates	Occurs > 0x	Exclude
Treat Independently			Treat Independently			Treat Independently		

drop a term on here

Run Query | Clear | 0 Groups | New Group

Show Query Status | Graph Results | Query Report

Navigate Terms | Find

- Axium
  - Harvard - 69108
  - Pittsburgh - 240127
  - Tufts - 279333
  - UCSF - 854302
  - University of Michigan - 408820
  - UTHealth - 327175
    - Demographics - 327175
    - Diagnosis - 56962
    - Forms - 96269
    - Insurance - 29807
    - Odontogram - 314227
    - Perio - 36312
    - Practice - 169428
    - Prescribed Medications - 25262
    - Procedures - 164383
    - Providers
- COHRI

Previous Queries | Find

- Prescribed Medi@17:35:22 [1-18-2017] [mwalji@uth
- Prescribed Medi@15:11:31 [12-19-2016] [mwalji@ut
- ABNORMA-Male@11:50:09 [12-16-2016] [mwalji@u
- ABNORMA-Male@11:49:41 [12-16-2016] [mwalji@u
- Vicodin@15:36:28 [12-9-2016] [mwalji@uth.tmc.edu
- Vicodin@15:32:49 [12-9-2016] [mwalji@uth.tmc.edu
- Vicodin@15:32:28 [12-9-2016] [mwalji@uth.tmc.edu
- Vicodin@15:32:11 [12-9-2016] [mwalji@uth.tmc.edu

Query Tool

Query Name:

Temporal Constraint: Treat all groups independently

Group 1			Group 2			Group 3		
Dates	Occurs > 0x	Exclude	Dates	Occurs > 0x	Exclude	Dates	Occurs > 0x	Exclude
Treat Independently			Treat Independently			Treat Independently		
drop a term on here								

Run Query | Clear | 0 Groups | New Group

Show Query Status | Graph Results | Query Report

Navigate Terms | Find

- OCCLUSION DISORDERS - 4708
- ORAL PATHOLOGY/RADIOLOGY - 2211
- ORTHODONTICS - 2369
- PAIN/ALTERED SENSATION - 3770
- PERIODONTICS - 16846
  - Abscesses of the Periodontium - 187
  - Aggressive Periodontitis - 202
  - Chronic Periodontitis - 9050
    - Generalized Moderate Chronic Periodontitis - 3474
    - Generalized Severe Chronic Periodontitis - 1751
    - Generalized Slight Chronic Periodontitis - 3084
    - Localized Moderate Chronic Periodontitis - 1526
    - Localized Severe Chronic Periodontitis - 2465
    - Localized Slight Chronic Periodontitis - 1006
    - Peri-implant mucositis - 8
    - Peri-implantitis - 72
    - Refractory Periodontitis - 6
  - Developed and Acquired Deformi -

Previous Queries | Find

- Prescribed Medi@17:35:22 [1-18-2017] [mwalji@uth
- Prescribed Medi@15:11:31 [12-19-2016] [mwalji@ut
- ABNORMA-Male@11:50:09 [12-16-2016] [mwalji@u
- ABNORMA-Male@11:49:41 [12-16-2016] [mwalji@u
- Vicodin@15:36:28 [12-9-2016] [mwalji@uth.tmc.edu
- Vicodin@15:32:49 [12-9-2016] [mwalji@uth.tmc.edu
- Vicodin@15:32:28 [12-9-2016] [mwalji@uth.tmc.edu
- Vicodin@15:32:11 [12-9-2016] [mwalji@uth.tmc.edu

Query Tool

Query Name:

Temporal Constraint: Treat all groups independently

Group 1	Group 2	Group 3
Dates | Occurs > 0x | Exclude	Dates | Occurs > 0x | Exclude	Dates | Occurs > 0x | Exclude
Treat Independently	Treat Independently	Treat Independently
Chronic Periodontitis - 9050		
one or more of these	AND drop a term on here	

Run Query | Clear | 1 Group | New Group

Show Query Status | Graph Results | Query Report

Navigate Terms | Find

- 44226
- 156 - Stomach or duodenal ulcer - 44301
- 157 - Crohn's disease - 44310
- 158 - Colitis - 44305
- 159 - Cirrhosis/Liver disease - 44310
- 161 - Gastroesophogeal reflux disease - 44218
- 163 - Other gastrointestinal diagnoses information (double-click) - 13968
- [166 - Do you presently suffer from any of the following? - 0]
- 167 - Heartburn - 44212
- 168 - Difficulty swallowing - 44231
- 169 - Vomiting - 44143
- 173 - Other gastrointestinal symptoms information (double-click) - 12427
- [177 - ENDOCRINE - 0]
- [178 - Have you been diagnosed with any of the following conditions? - 0]
- 179 - Diabetes - 44280
  - 179 - NO-Diabetes - 39509
  - 179 - UNANSWERED-Diabetes - 63
  - 179 - YES-Diabetes - 5287
  - 180 - Type I - 5220
  - 187 - Type II - 5220
  - 193 - Other form of diabetes - 5221
- 195 - Thyroid disorder - 44238
- 200 - Adrenal gland disorder - 44175
- 201 - Steroids taken within the

Query Tool

Query Name:

Temporal Constraint: Treat all groups independently

Group 1	Group 2	Group 3
Dates / Occurs > 0x / Exclude	Dates / Occurs > 0x / Exclude	Dates / Occurs > 0x / Exclude
Treat Independently	Treat Independently	Treat Independently
Chronic Periodontitis - 9050	179 - YES-Diabetes - 5287	
one or more of these	one or more of these	drop a term on here

AND AND

Run Query | Clear | 2 Groups | New Group

Show Query Status | Graph Results | Query Report

Navigate Terms | Find

- 44226
- 156 - Stomach or duodenal ulcer - 44301
- 157 - Crohn's disease - 44310
- 158 - Colitis - 44305
- 159 - Cirrhosis/Liver disease - 44310
- 161 - Gastroesophogeal reflux disease - 44218
- 163 - Other gastrointestinal diagnoses information (double-click) - 13968
- [166 - Do you presently suffer from any of the following? - 0]
- 167 - Heartburn - 44212
- 168 - Difficulty swallowing - 44231
- 169 - Vomiting - 44143
- 173 - Other gastrointestinal symptoms information (double-click) - 12427
- [177 - ENDOCRINE - 0]
- [178 - Have you been diagnosed with any of the following conditions? - 0]
- 179 - Diabetes - 44280
  - 179 - NO-Diabetes - 39509
  - 179 - UNANSWERED-Diabetes - 63
  - 179 - YES-Diabetes - 5287
  - 180 - Type I - 5220
  - 187 - Type II - 5220
  - 193 - Other form of diabetes - 5221
- 195 - Thyroid disorder - 44238
- 200 - Adrenal gland disorder - 44175
- 201 - Steroids taken within the

Query Tool

Query Name: Chronic-179 - Y@22:09:49

Temporal Constraint: Treat all groups independently

Group 1	Group 2	Group 3
Dates / Occurs > 0x / Exclude	Dates / Occurs > 0x / Exclude	Dates / Occurs > 0x / Exclude
Treat Independently	Treat Independently	Treat Independently
Chronic Periodontitis - 9050	179 - YES-Diabetes - 5287	
one or more of these	one or more of these	drop a term on here

AND AND

Run Query | Clear | 2 Groups | New Group

Show Query Status | Graph Results | Query Report

Number of patients

1313

For Query "Chronic-179 - Y@22:09:49"

- 44231
- 169 - Vomiting - 44143
- 173 - Other gastrointestinal symptoms information (double-click) - 12427
- [177 - ENDOCRINE - 0]
- [178 - Have you been diagnosed with any of the following conditions? - 0]
- 179 - Diabetes - 44280
  - 179 - NO-Diabetes - 39509
  - 179 - UNANSWERED-Diabetes - 63
  - 179 - YES-Diabetes - 5287
  - 180 - Type I - 5220
  - 187 - Type II - 5220
  - 193 - Other form of diabetes - 5221
- 195 - Thyroid disorder - 44238
- 200 - Adrenal gland disorder - 44175
- 201 - Steroids taken within the

one or more of these | AND | one or more of these | AND | drop a term on here

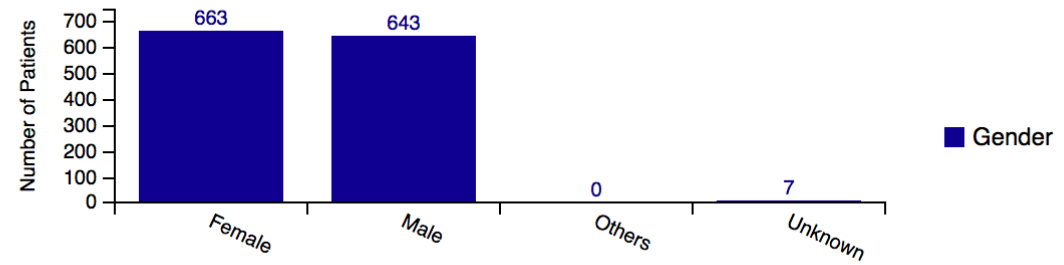
Run Query | Clear | 2 Groups | New Group

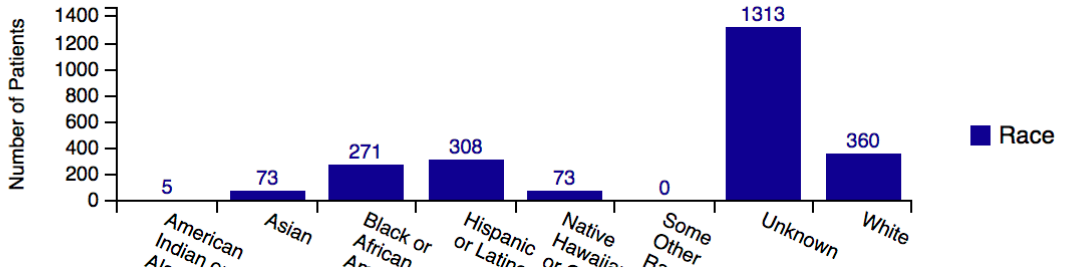
Show Query Status | Graph Results | Query Report

Number of patients

1313

For Query "Chronic-179 - Y@22:09:49"





Navigate Terms | Find

- Axium
- COHRI
  - Demographics - 2117660
  - Dental Procedures - 1016214
  - Diagnosis - 248406
  - Forms - 295516
  - Perio - 195934
  - Providers

Previous Queries | Find

- Chronic-179 - Y@22:09:49 [1-18-2017] [mwalji@uth
- Prescribed Medi@17:35:22 [1-18-2017] [mwalji@uth
- Prescribed Medi@15:11:31 [12-19-2016] [mwalji@ut
- ABNORMA-Male@11:50:09 [12-16-2016] [mwalji@u
- ABNORMA-Male@11:49:41 [12-16-2016] [mwalji@u
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- Vicodin@15:32:49 [12-9-2016] [mwalji@uth.tmc.edu
- Vicodin@15:32:28 [12-9-2016] [mwalji@uth.tmc.edu

Query Tool

Query Name:

Temporal Constraint: Treat all groups independently

Group 1			Group 2			Group 3		
Dates	Occurs > 0x	Exclude	Dates	Occurs > 0x	Exclude	Dates	Occurs > 0x	Exclude
Treat Independently			Treat Independently			Treat Independently		

drop a term on here

Run Query | Clear | 0 Groups | New Group

Show Query Status | Graph Results | Query Report

Navigate Terms | Find

- Dental History - 254948
- Medical History - 265547
  - Allergy - 184920
  - Alternative Medicine - 69475
  - Biphosphonates - 4383
  - Blood Disorders - 192223
  - Cancer - 149355
  - Cardiovascular Disorders - 220858
  - Drug/Alcohol/Tobacco Use - 255044
  - Eating Disorders - 49607
  - Endocrine disorders - 194176
    - Adrenal gland disorder - 43446
    - Diabetes - 172814
      - NO - 150916
      - UNANSWERED - 1133
      - YES - 23630
    - Family history of diabetes - 50076
    - Hyperthyroidism - 53278
    - Hypothyroidism - 53304
    - Thyroid problems - 76634
  - Eye/Ear/Nose/Throat disorders - 135408
  - General Health Status - 233831

Previous Queries | Find

- Chronic-YES@22:16:56 [1-18-2017] [mwalji@uth.tm
- Chronic-179 - Y@22:09:49 [1-18-2017] [mwalji@uth
- Prescribed Medi@17:35:22 [1-18-2017] [mwalji@uth
- Prescribed Medi@15:11:31 [12-19-2016] [mwalji@ut
- ABNORMA-Male@11:50:09 [12-16-2016] [mwalji@u
- ABNORMA-Male@11:49:41 [12-16-2016] [mwalji@u
- Vicodin@15:36:28 [12-9-2016] [mwalji@uth.tmc.edu
- Vicodin@15:32:49 [12-9-2016] [mwalji@uth.tmc.edu

Query Tool

Query Name: Chronic-YES@22:16:56

Temporal Constraint: Treat all groups independently

Group 1	Group 2	Group 3
Dates / Occurs > 0x / Exclude	Dates / Occurs > 0x / Exclude	Dates / Occurs > 0x / Exclude
Treat Independently	Treat Independently	Treat Independently
Chronic Periodontitis - 79092	YES - 23630	
one or more of these	one or more of these	drop a term on here

AND AND

Run Query | Clear | 2 Groups | New Group

Show Query Status | Graph Results | Query Report

Number of patients

2484

For Query "Chronic-YES@22:16:56"