

**MOVING PAST
DISRUPTION
TO IMPROVE
ORAL HEALTHCARE**

Learning from data in dentistry

Muhammad F Walji PhD



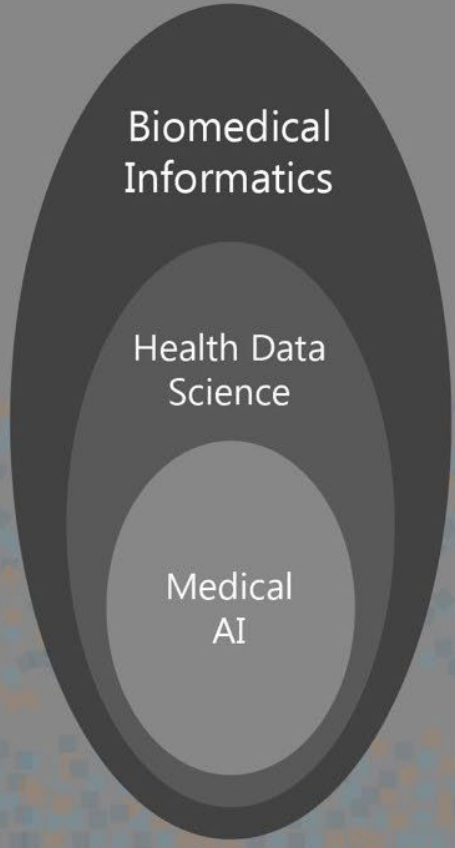
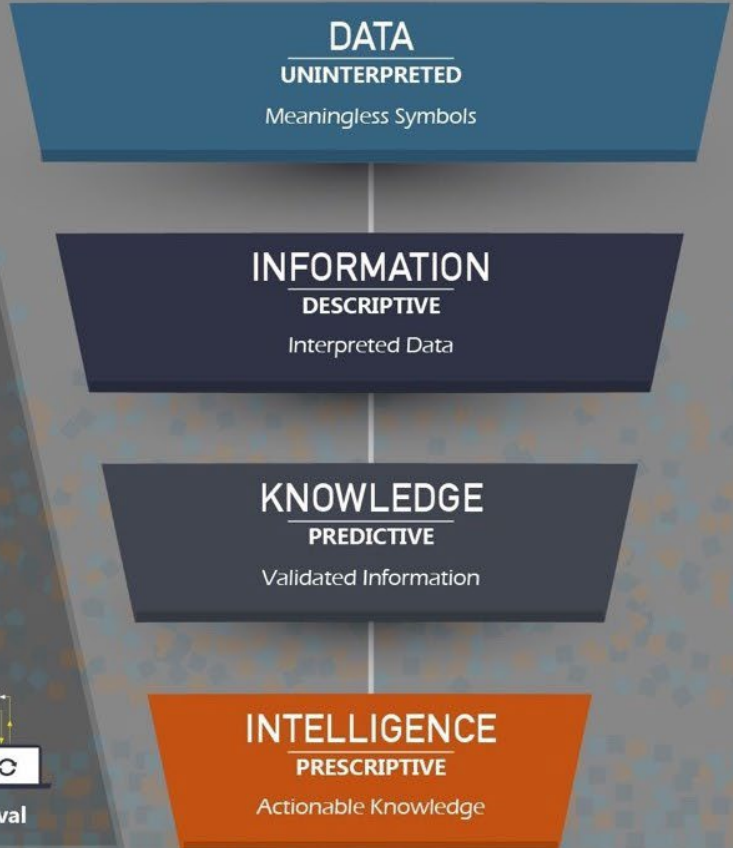
UTHealth Houston
School of Dentistry
Texas Center for
Oral Healthcare
Quality and Safety

Disclosures

- Muhammad F Walji has no relationships to disclose.

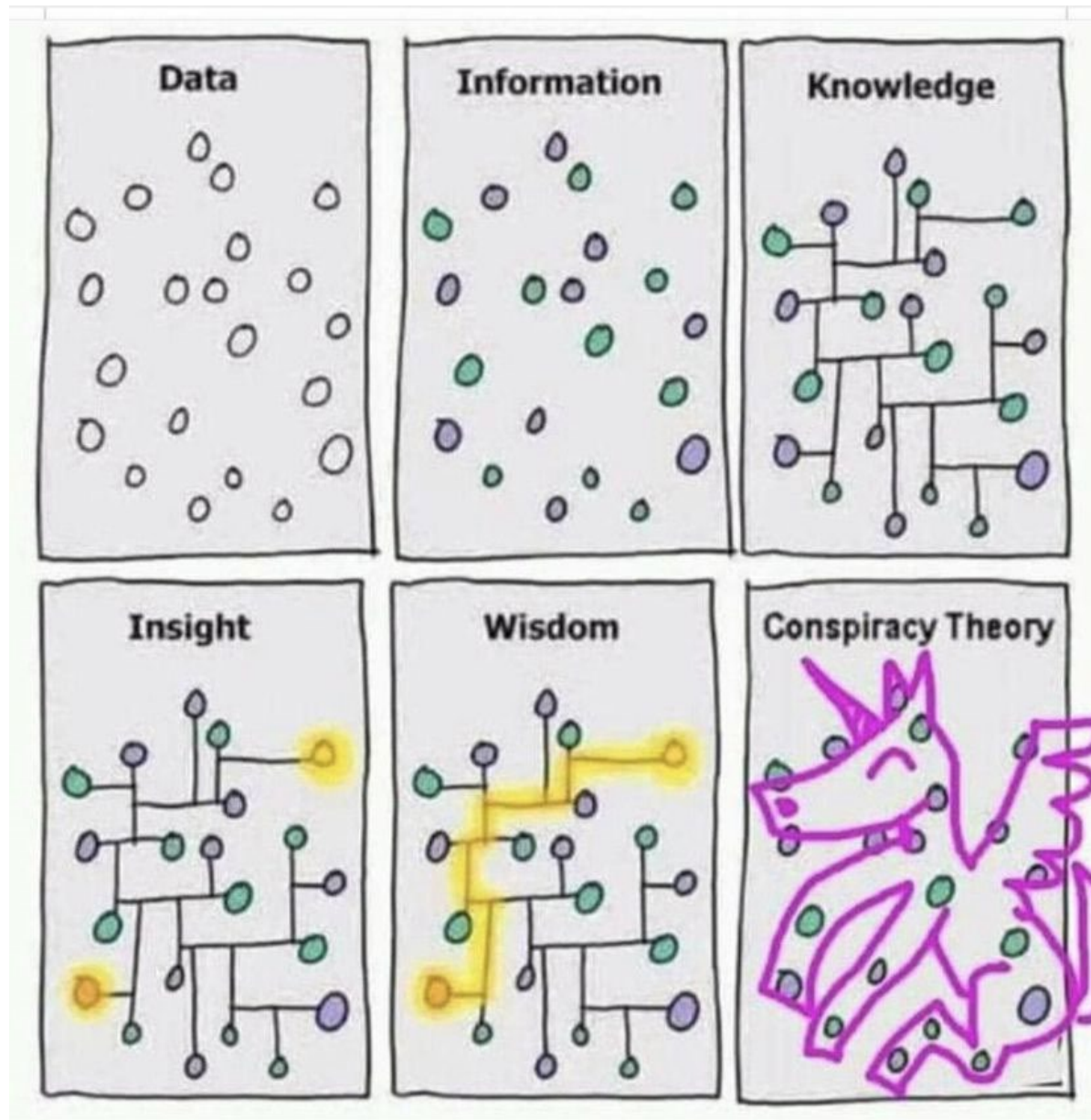
PROCESSES

ENTITIES



DOMAINS

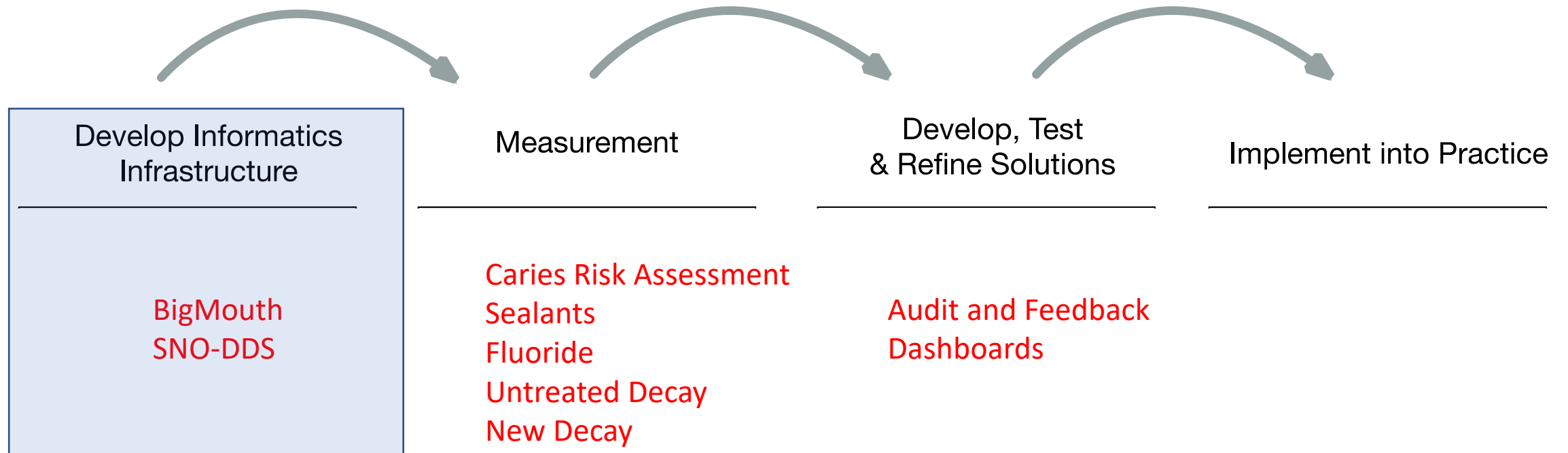




<https://www.gapingvoid.com/blog/2014/01/22/information-vs-knowledge/>

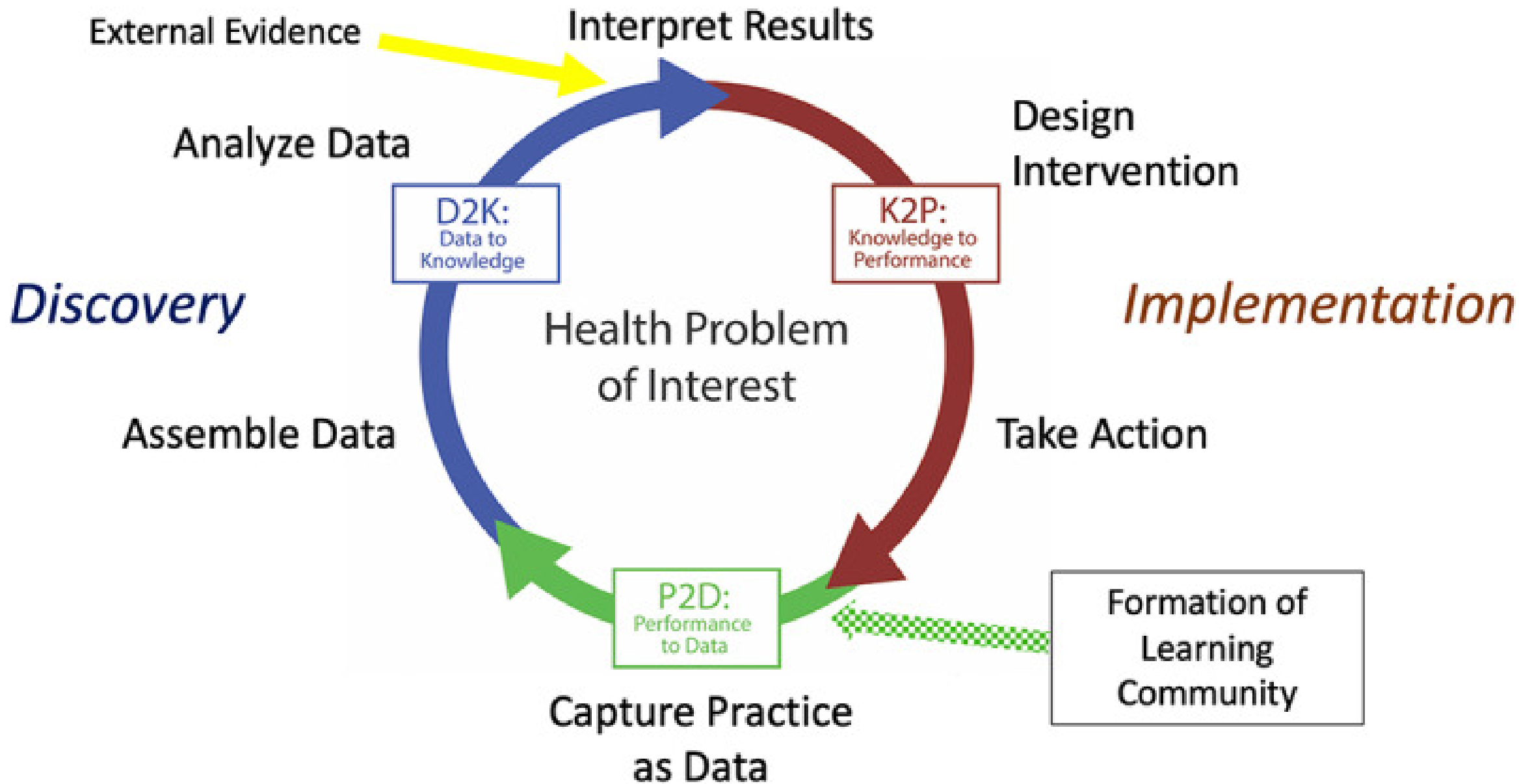
Big Idea

- Every patient should receive person-centered, safe, effective, timely, efficient, and equitable **oral health care**



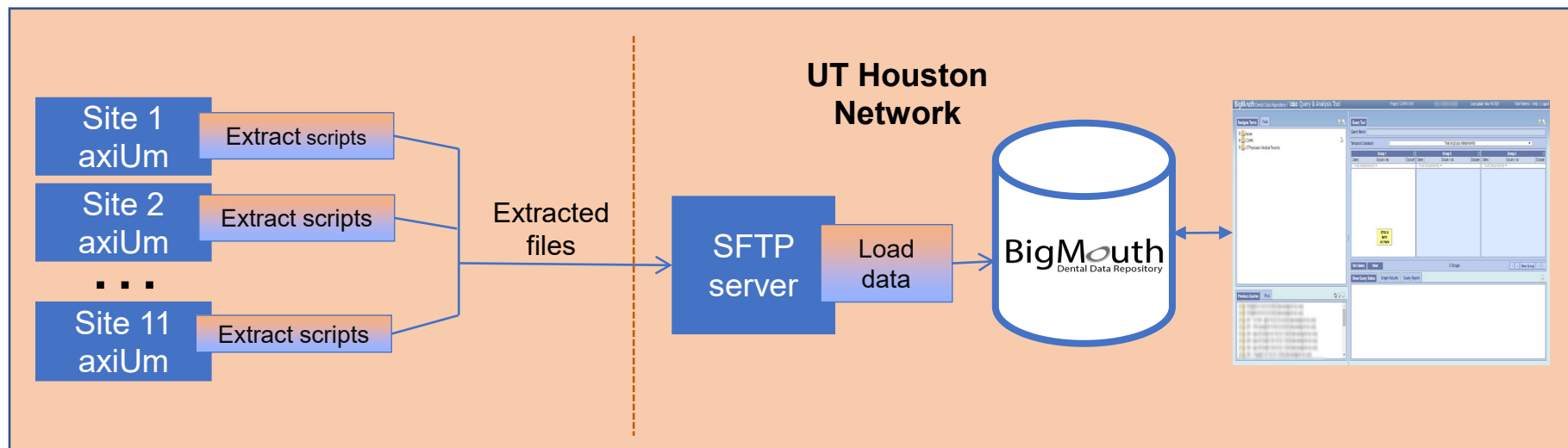
Learning health system and informatics infrastructure

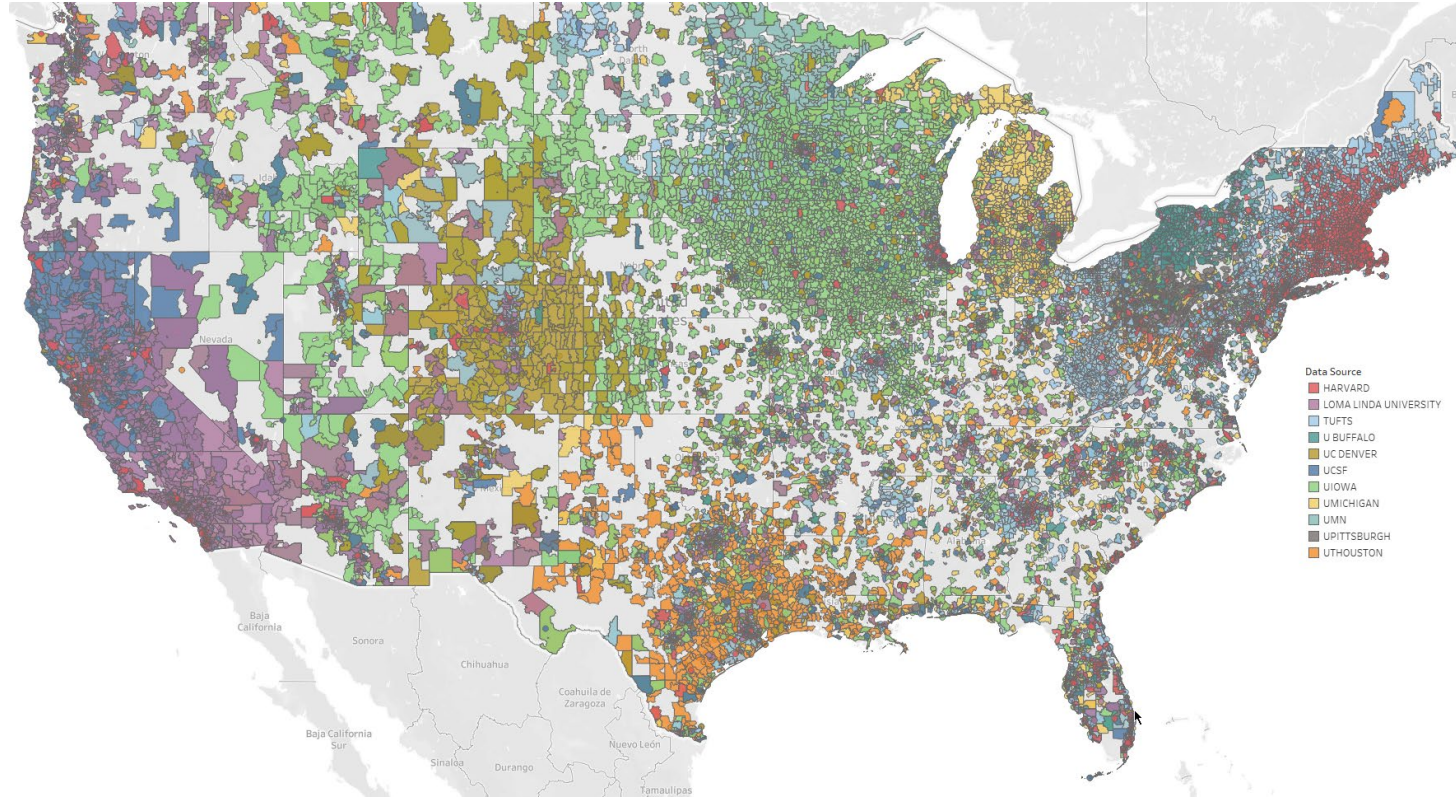
A system in which science, **informatics**, incentives, and culture are aligned for continuous improvement and innovation, with best practices seamlessly embedded in the care process, patients and families as active participants in all elements, and new knowledge is captured as an integral by-product of the care experience



BigMouth Dental Data Repository

- A multi-institutional dental data repository with data from 11 dental schools
- Established in 2012
- 4.59 million patients - Quarterly data updates
- BigMouth's query interface allows non-technical users to query data across all institutions
- 26 research projects completed – Students, residents, and faculty





11 institutions - 4.57 Million patients

Standardized Dental Diagnostic Terminology

Milieu in Dental School and Practice

The Development of a Dental Diagnostic Terminology

Elsbeth Kalenderian, D.D.S., M.P.H.; Rachel L. Ramoni, D.M.D., Sc.D.; Joel M. White, D.D.S., M.S.; Meta E. Schoonheim-Klein, D.D.S., Ph.D.; Paul C. Stark, M.S., Sc.D.; Nicole S. Kimmes, D.D.S.; Gregory G. Zeller, D.D.S.; George P. Willis, D.D.S.; Muhammad F. Walji, Ph.D.

January 2013 ■ *Journal of Dental Education*

Journal of Dental Education ■ Volume 77, Number 1

25

Milieu in Dental School and Practice

Assessing Use of a Standardized Dental Diagnostic Terminology in an Electronic Health Record

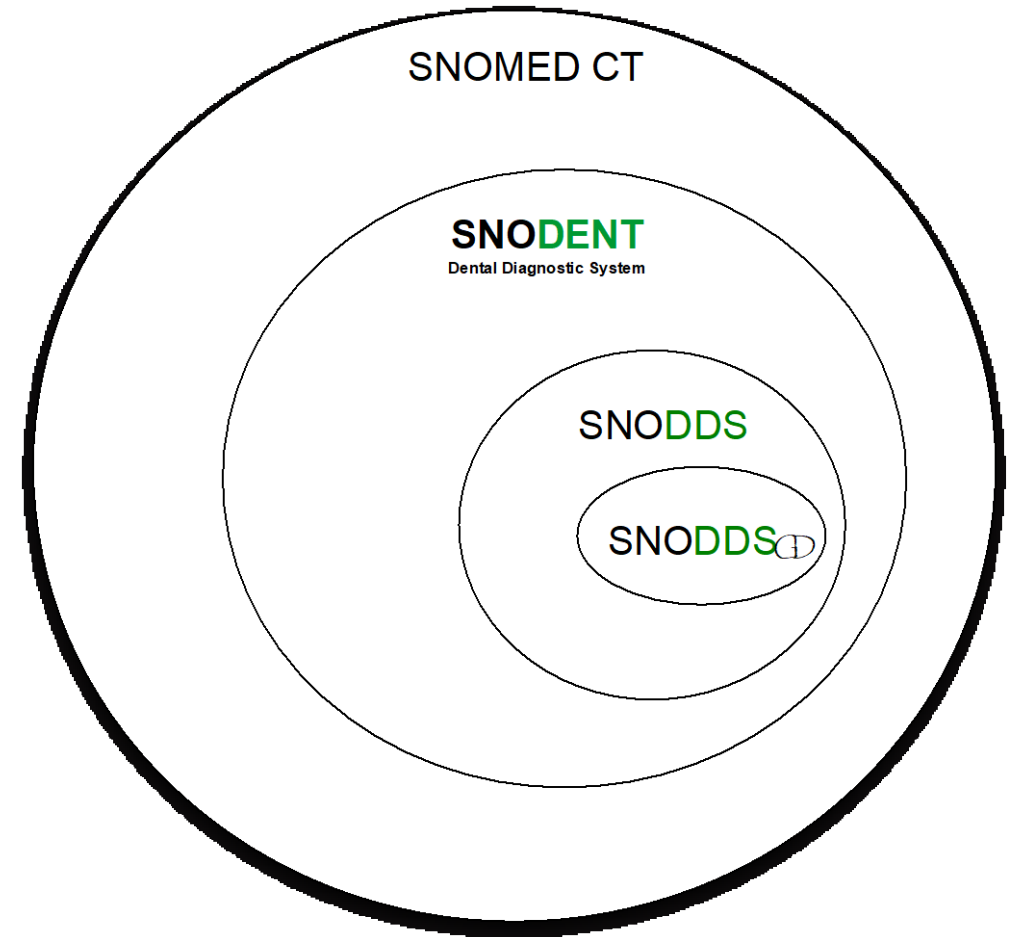
Oluwabunmi Tokede, D.D.S., M.P.H.; Joel White, D.D.S., M.S.; Paul C. Stark, M.S., Sc.D.; Ram Vaderhobli, D.D.S.; Muhammad F. Walji, Ph.D.; Rachel Ramoni, D.M.D., D.M.Sc.; Meta Schoonheim-Klein, D.D.S., Ph.D.; Nicole Kimmes, D.D.S.; Anamaria Tavares, D.D.S.; Elsbeth Kalenderian, D.D.S., M.P.H. *Abstract:* Although standardized terminologies such as the International Classification of Diseases

Journal of Dental Education ■ Volume 75, Number 5

Evaluating a Dental Diagnostic Terminology in an Electronic Health Record

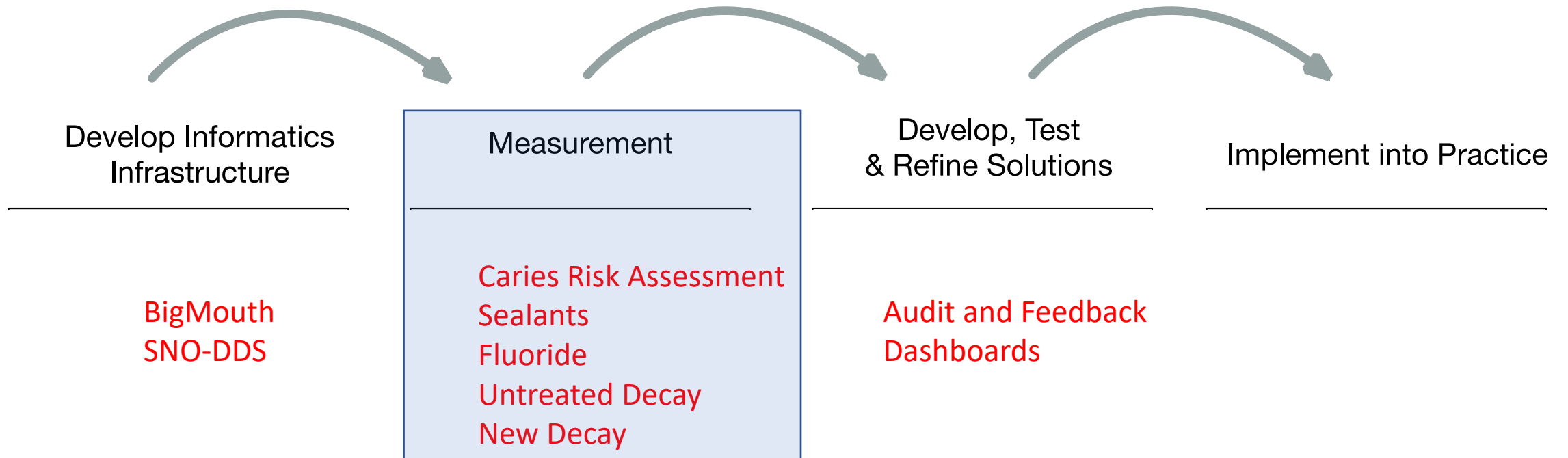
Joel M. White, D.D.S., M.S.; Elsbeth Kalenderian, D.D.S., M.P.H.; Paul C. Stark, M.S., Sc.D.; Rachel L. Ramoni, D.M.D., Sc.D.;

Ram Vaderhobli, B.D.S., M.S.; Muhammad F. Walji, Ph.D. *Abstract:* Standardized treatment procedure codes and



Big Idea

- Every patient should receive person-centered, safe, effective, timely, efficient, and equitable **oral health care**



Dental Quality Measures (DQM)

Caries risk assessment

Did patients receive a caries risk assessment?

Caries preventative treatment

Did patients with “elevated” caries risk receive an appropriate caries treatment?

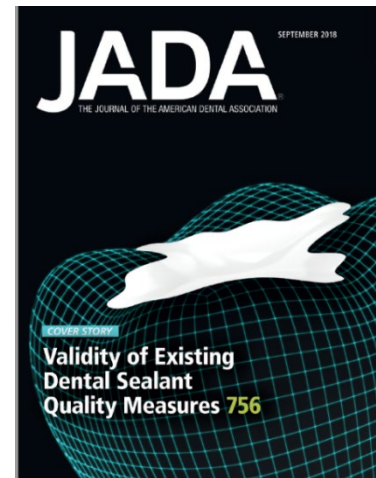


Sealants

Did patients with “elevated” caries risk receive a sealant/preventive resin restoration?

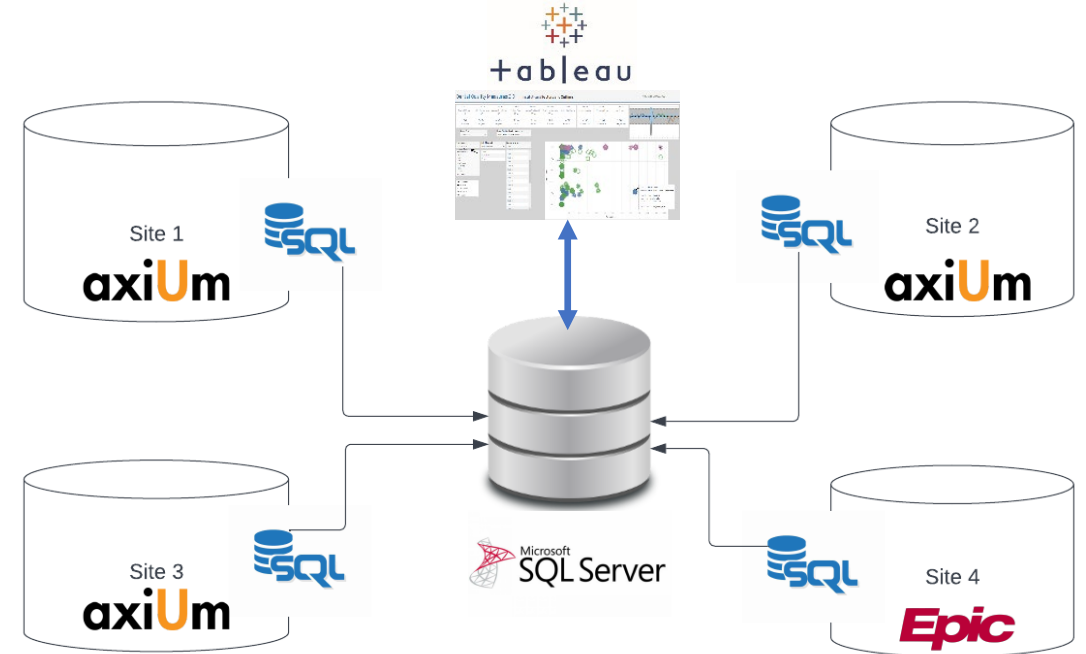
Caries treatment outcome

- Was no new tooth decay found at follow-up?
- Was no untreated active decay found at follow-up?



The heart of the project: DATA

- Systematic data collection
 - 1 million patient visits
 - 4 dental institutions
- Process the data
 - Flag numerator-denominator status on each measure
- Use data to develop an interactive dashboard



Dental Quality Measures (DQM)

Caries risk assessment

Did patients receive a caries risk assessment?



Sealants

Did patients with “elevated” caries risk receive a sealant/preventive resin restoration?



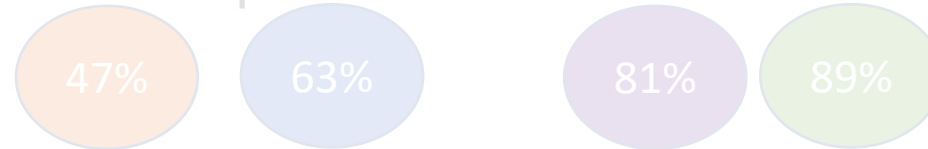
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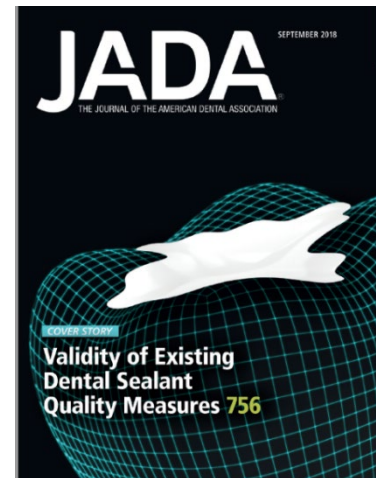
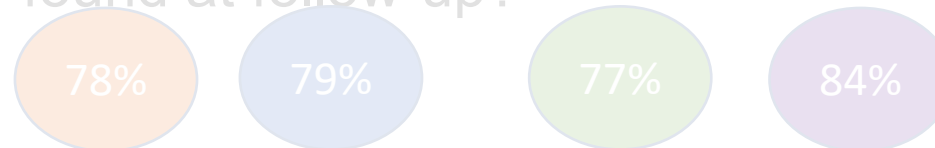


Caries treatment outcome

- Was no new tooth decay found at follow-up?



- Was no untreated active decay found at follow-up?



Dental Quality Measures (DQM)

Caries risk assessment

Did patients receive a caries risk assessment?



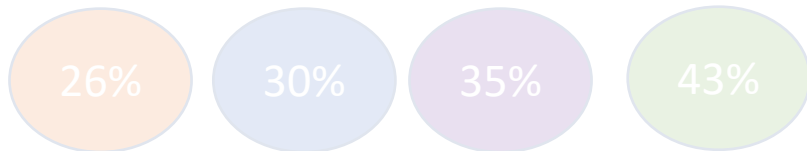
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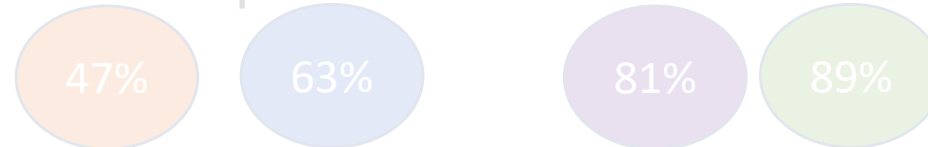
Sealants

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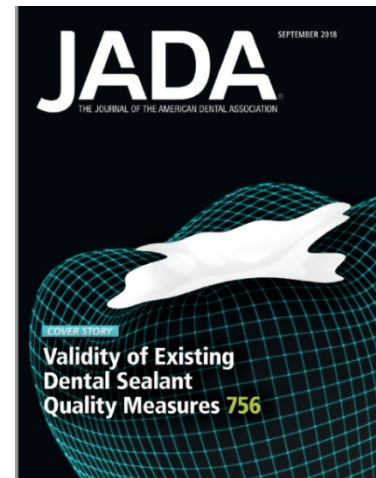
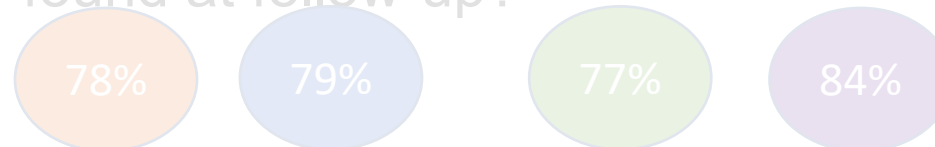


Caries treatment outcome

- Was no new tooth decay found at follow-up?



- Was no untreated active decay found at follow-up?



Dental Quality Measures (DQM)

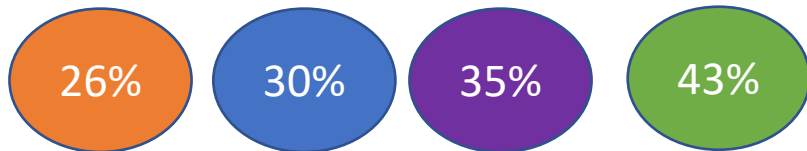
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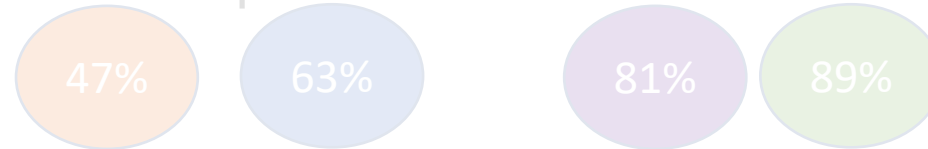
Caries preventative treatment

Did patients with “elevated” caries risk receive an appropriate caries treatment?

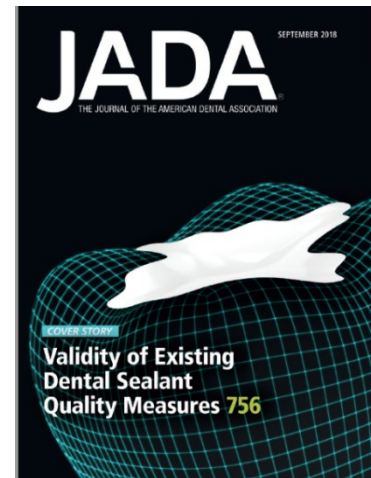
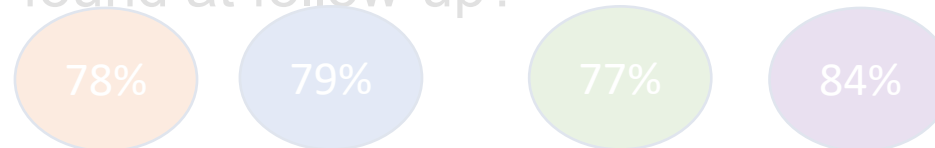


Caries treatment outcome

• Was no new tooth decay found at follow-up?



• Was no untreated active decay found at follow-up?



Dental Quality Measures (DQM)

Caries risk assessment

Did patients receive a caries risk assessment?



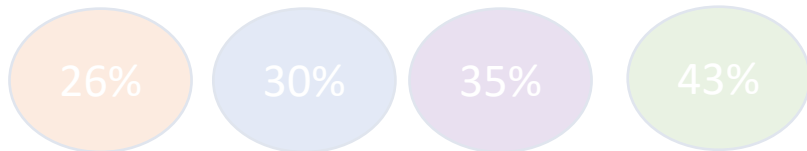
Caries preventative treatment

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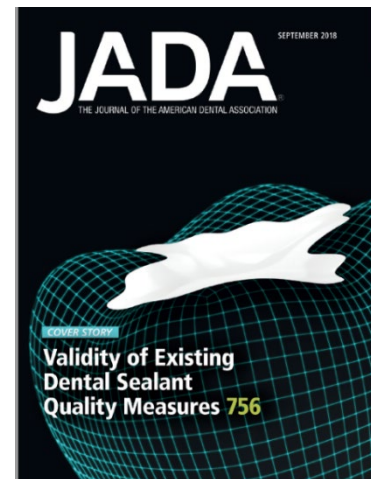


Caries treatment outcome

- Was **no new tooth decay** found at follow-up?



- Was **no untreated active decay** found at follow-up?



Dental Quality Measures (DQM)

Caries risk assessment

Did patients receive a caries risk assessment?



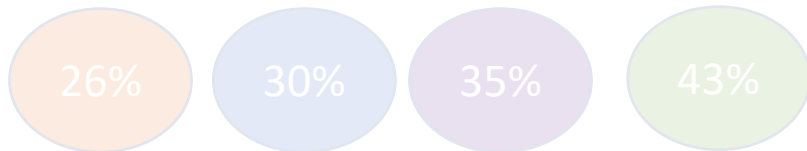
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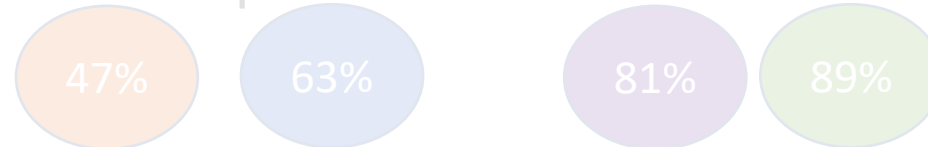
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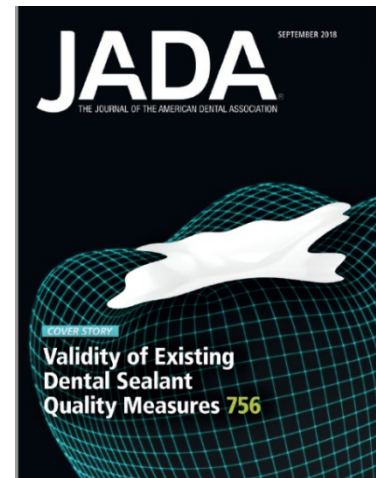
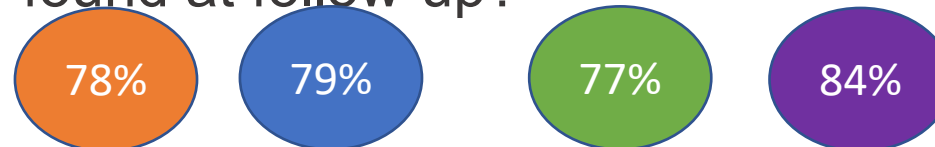


Caries treatment outcome

- Was no new tooth decay found at follow-up?

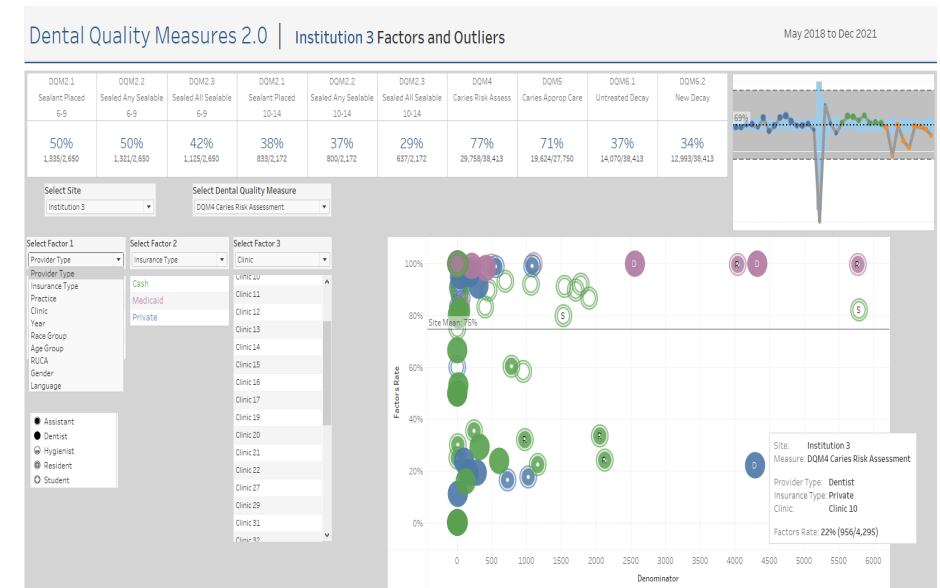


- Was no untreated active decay found at follow-up?



Dashboard - Data-Driven Design

- Interactive data visualization for data exploration
- **Design Principles and Key Features**
 - Provide the big picture first, then drill down
 - Factor in the wide variability in the volume of visits using logarithmic scales
 - Statistical Process Control (SPC) charts - Identify trends in data
 - Analysis of Proportions (ANOP) - Identify outliers in data

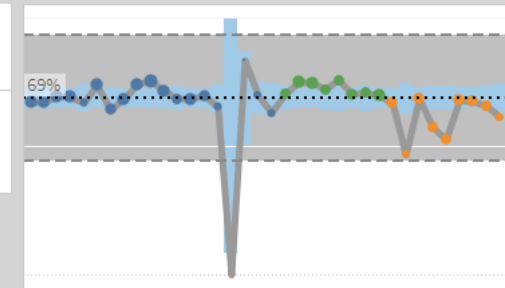


Dashboard Overview - Banner

Dental Quality Measures 2.0 | Institution 3 Factors and Outliers

May 2018 to Dec 2021

DQM2.1	DQM2.2	DQM2.3	DQM2.1	DQM2.2	DQM2.3	DQM4	DQM5	DQM6.1	DQM6.2
Sealant Placed 6-9	Sealed Any Sealable 6-9	Sealed All Sealable 6-9	Sealant Placed 10-14	Sealed Any Sealable 10-14	Sealed All Sealable 10-14	Caries Risk Assess	Caries Approp Care	Untreated Decay	New Decay
50%	50%	42%	38%	37%	29%	77%	71%	37%	34%
1,335/2,650	1,321/2,650	1,125/2,650	833/2,172	800/2,172	637/2,172	29,758/38,413	19,624/27,750	14,070/38,413	12,993/38,413



Banner of all measures rates

Select Site: Institution 3

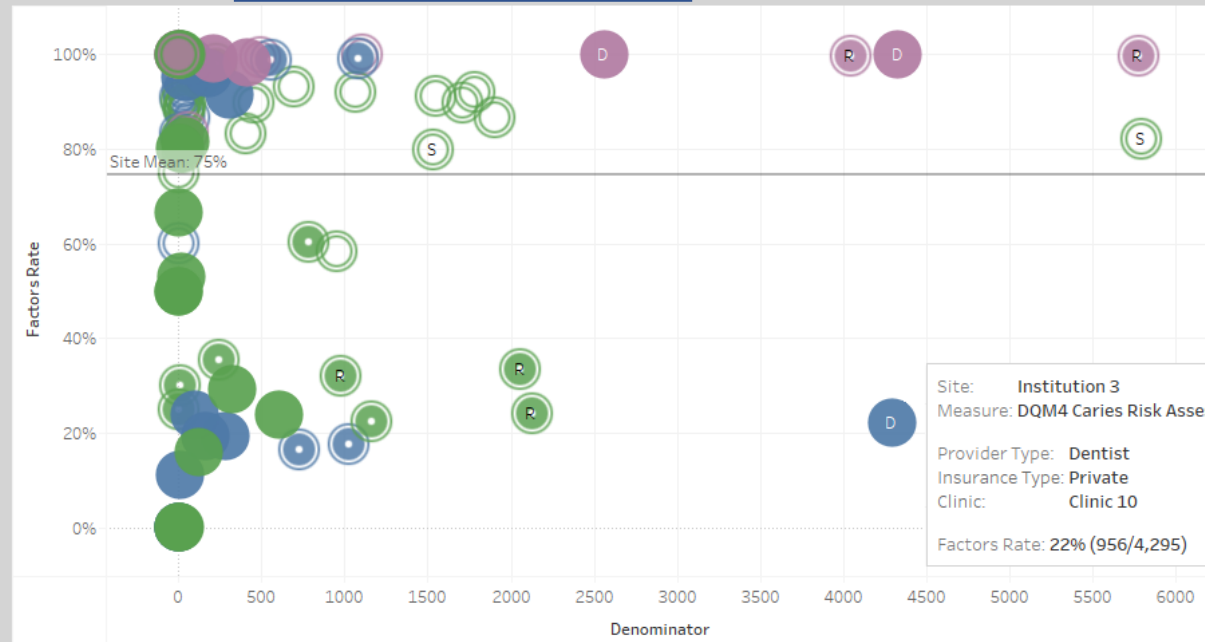
Select Dental Quality Measure: DQM4 Caries Risk Assessment

Select Factor 1: Provider Type

Select Factor 2: Insurance Type (Cash, Medicaid, Private)

Select Factor 3: Clinic (Clinic 10-32)

Legend: Assistant, Dentist, Hygienist, Resident, Student



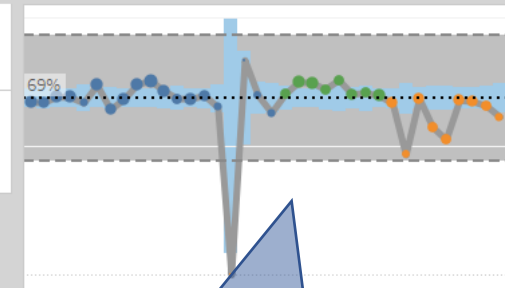
Site: Institution 3
 Measure: DQM4 Caries Risk Assessment
 Provider Type: Dentist
 Insurance Type: Private
 Clinic: Clinic 10
 Factors Rate: 22% (956/4,295)

Dashboard Overview – SPC Chart

Dental Quality Measures 2.0 | Institution 3 Factors and Outliers

May 2018 to Dec 2021

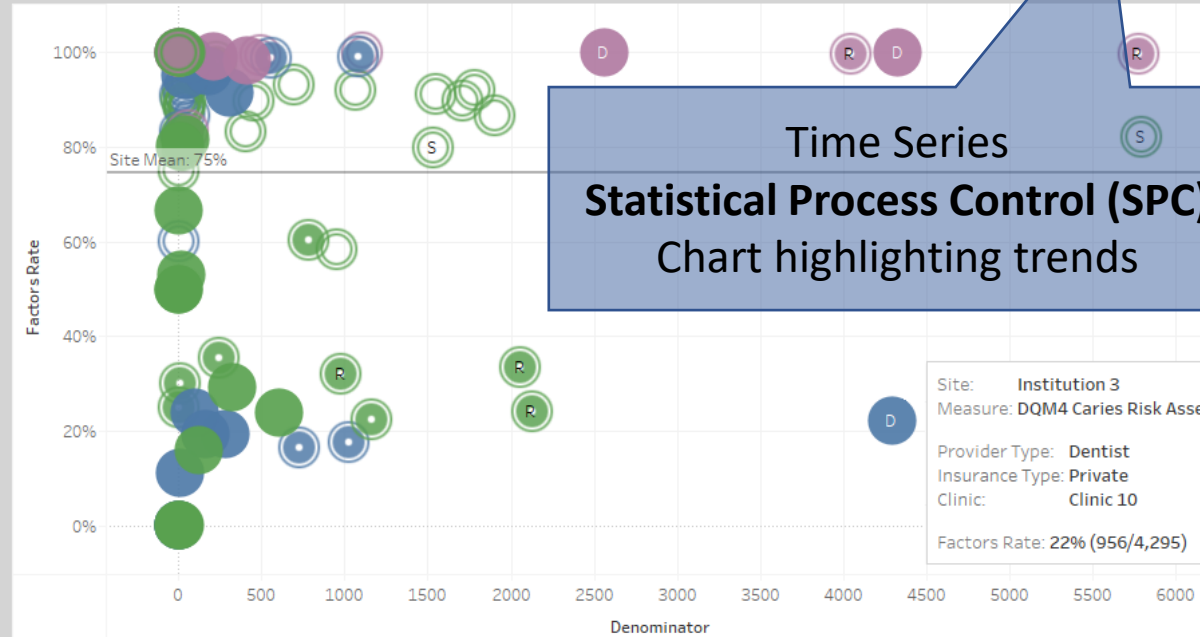
DQM2.1	DQM2.2	DQM2.3	DQM2.1	DQM2.2	DQM2.3	DQM4	DQM5	DQM6.1	DQM6.2
Sealant Placed	Sealed Any Sealable	Sealed All Sealable	Sealant Placed	Sealed Any Sealable	Sealed All Sealable	Caries Risk Assess	Caries Approp Care	Untreated Decay	New Decay
6-9	6-9	6-9	10-14	10-14	10-14				
50%	50%	42%	38%	37%	29%	77%	71%	37%	34%
1,335/2,650	1,331/2,650	1,125/2,650	833/2,172	800/2,172	637/2,172	29,758/38,413	19,624/27,750	14,070/38,413	12,993/38,413



Metric selection

Select Dental Quality Measure
 Institution 3
 DQM4 Caries Risk Assessment

Select Factor 1: Provider Type
 Select Factor 2: Insurance Type (Cash, Medicaid, Private)
 Select Factor 3: Clinic (Clinic 10-32)
 Legend: Assistant, Dentist, Hygienist, Resident, Student

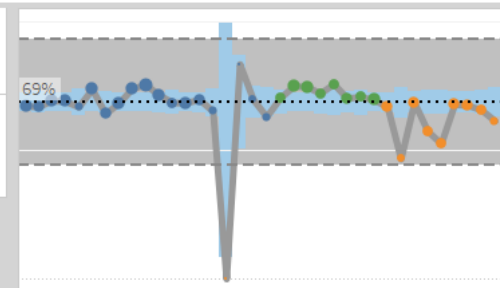


Dashboard Overview - Factors

Dental Quality Measures 2.0 | Institution 3 Factors and Outliers

May 2018 to Dec 2021

DQM2.1	DQM2.2	DQM2.3	DQM2.1	DQM2.2	DQM2.3	DQM4	DQM5	DQM6.1	DQM6.2
Sealant Placed 6-9	Sealed Any Sealable 6-9	Sealed All Sealable 6-9	Sealant Placed 10-14	Sealed Any Sealable 10-14	Sealed All Sealable 10-14	Caries Risk Assess	Caries Approp Care	Untreated Decay	New Decay
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Select Site: Institution 3

Select Dental Quality Measure: DQM4 Caries Risk Assessment

Select Factor 1: Provider Type

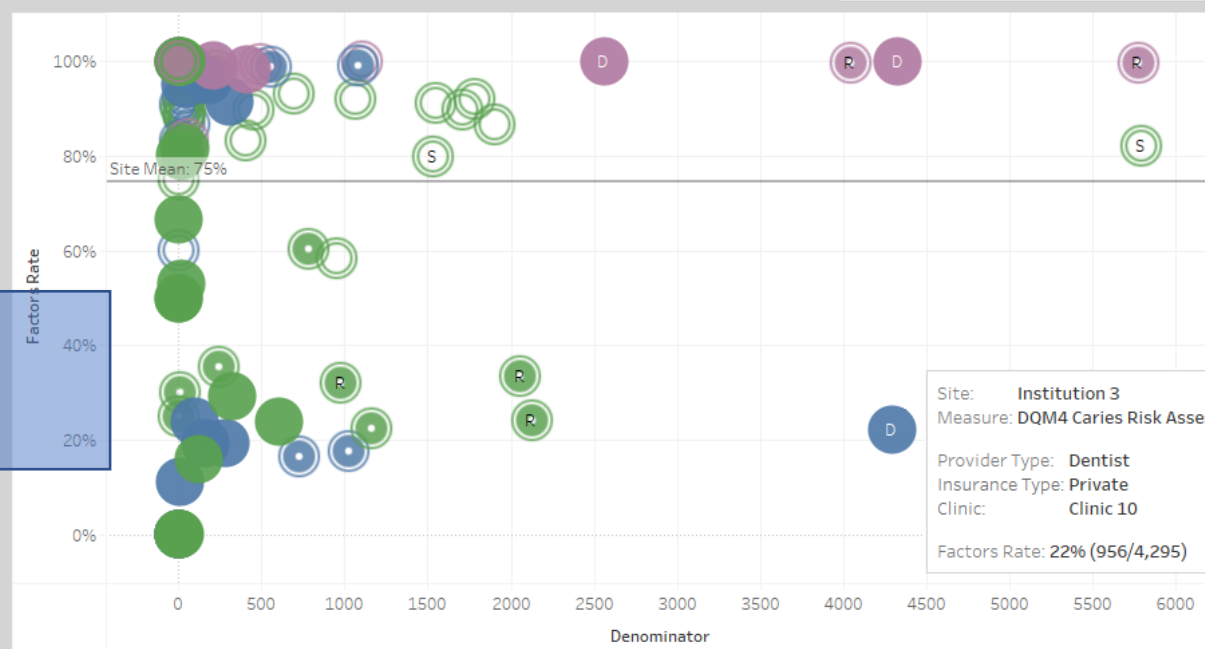
Select Factor 2: Insurance Type

Select Factor 3: Clinic

- Assistant
- Dentist
- Hygienist
- Resident
- Student

Dimensions

1. Provider factors
2. Patient factors



Site: Institution 3
 Measure: DQM4 Caries Risk Assessment

Provider Type: Dentist
 Insurance Type: Private
 Clinic: Clinic 10

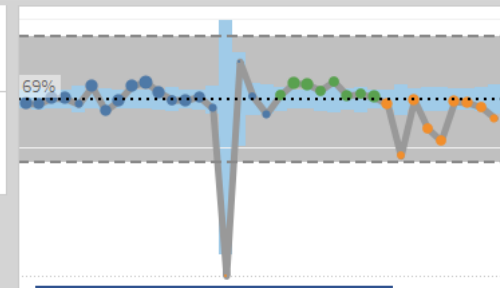
Factors Rate: 22% (956/4,295)

Factor Analysis – Level 1

Dental Quality Measures 2.0 | Institution 3 Factors and Outliers

May 2018 to Dec 2021

DQM2.1	DQM2.2	DQM2.3	DQM2.1	DQM2.2	DQM2.3	DQM4	DQM5	DQM6.1	DQM6.2
Sealant Placed 6-9	Sealed Any Sealable 6-9	Sealed All Sealable 6-9	Sealant Placed 10-14	Sealed Any Sealable 10-14	Sealed All Sealable 10-14	Caries Risk Assess	Caries Approp Care	Untreated Decay	New Decay
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Select Site
Institution 3

Select Dental Quality Measure
DQM4 Caries Risk Assessment

Select Factor 1
Provider Type

Select Factor 2
Provider Type

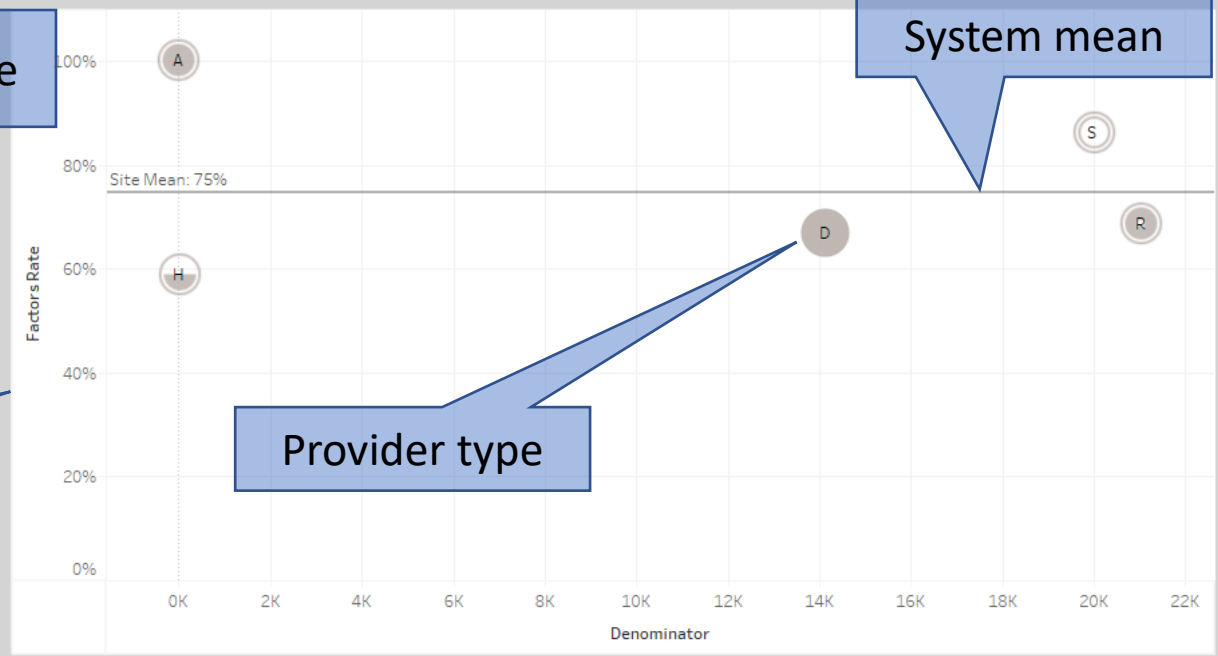
Select Factor 3
Provider Type

Assistant	Assistant	Assistant
Dentist	Dentist	Dentist
Hygienist	Hygienist	Hygienist
Resident	Resident	Resident
Student	Student	Student

Level 1- Provider type

System mean

- Assistant
- Dentist
- Hygienist
- ⊙ Resident
- ⊙ Student



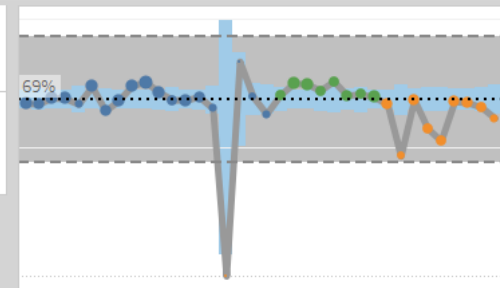
Main graph –
Measure Rate Vs Total visits

Factor Analysis – Level 2

Dental Quality Measures 2.0 | Institution 3 Factors and Outliers

May 2018 to Dec 2021

DQM2.1 Sealant Placed 6-9	DQM2.2 Sealed Any Sealable 6-9	DQM2.3 Sealed All Sealable 6-9	DQM2.1 Sealant Placed 10-14	DQM2.2 Sealed Any Sealable 10-14	DQM2.3 Sealed All Sealable 10-14	DQM4 Caries Risk Assess	DQM5 Caries Approp Care	DQM6.1 Untreated Decay	DQM6.2 New Decay
50% 1,335/2,650	50% 1,321/2,650	42% 1,125/2,650	38% 833/2,172	37% 800/2,172	29% 637/2,172	77% 29,758/38,413	71% 19,624/27,750	37% 14,070/38,413	34% 12,993/38,413



Dentist + Medicaid

Select Site
Institution 3

Select Dental Quality Measure
DQM4 Caries Risk Assessment

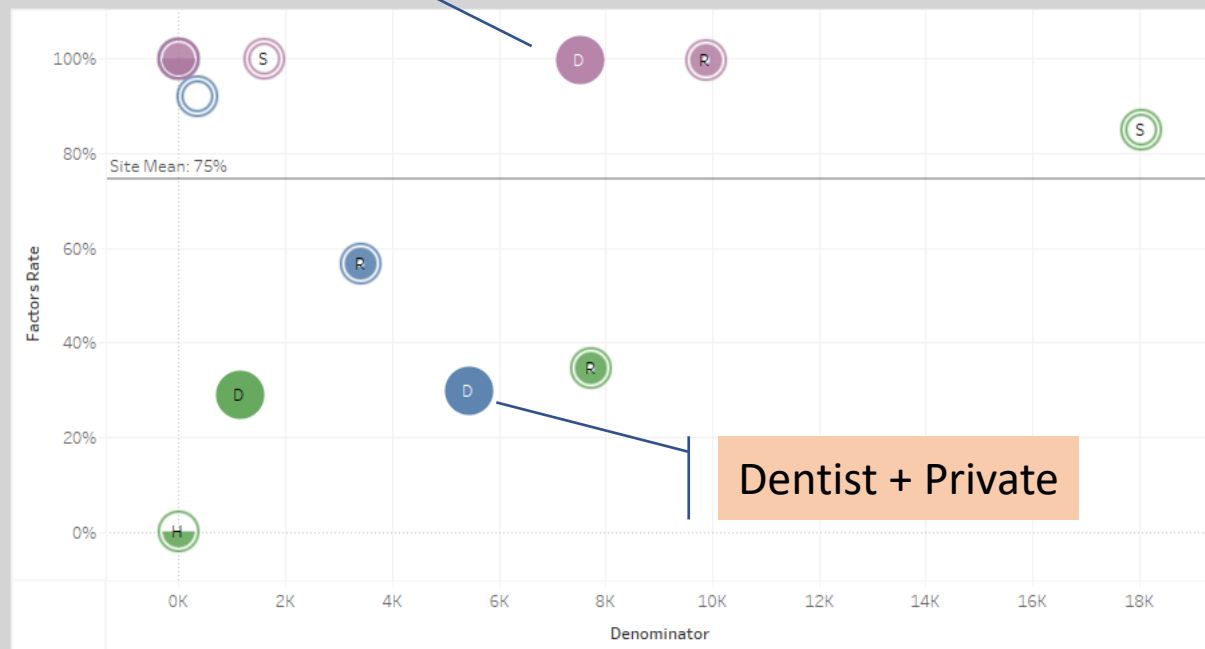
Select Factor 1
Provider Type

Select Factor 2
Insurance Type

Select Factor 3
Provider Type

Assistant	Cash	Assistant
Dentist	Medicaid	Dentist
Hygienist	Private	Hygienist
Resident		Resident
Student		Student

Level 2-
Payment/Insurance type



Cash

Medicaid

Private

- Assistant
- Dentist
- Hygienist
- Resident
- Student

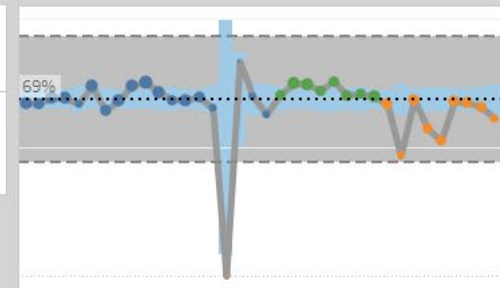
Dentist + Private

Factor Analysis – Level 3

Dental Quality Measures 2.0 | Institution 3 Factors and Outliers

May 2018 to Dec 2021

DQM2.1 Sealant Placed 6-9	DQM2.2 Sealed Any Sealable 6-9	DQM2.3 Sealed All Sealable 6-9	DQM2.1 Sealant Placed 10-14	DQM2.2 Sealed Any Sealable 10-14	DQM2.3 Sealed All Sealable 10-14	DQM4 Caries Risk Assess	DQM5 Caries Approp Care	DQM6.1 Untreated Decay	DQM6.2 New Decay
50% 1,335/2,650	50% 1,321/2,650	42% 1,125/2,650	38% 833/2,172	37% 800/2,172	29% 637/2,172	77% 29,758/38,413	71% 19,624/27,750	37% 14,070/38,413	34% 12,993/38,413



Select Site
Institution 3

Select Dental Quality Measure
DQM4 Caries Risk Assessment

Select Factor 1
Provider Type

- Assistant
- Dentist**
- Hygienist
- Resident
- Student

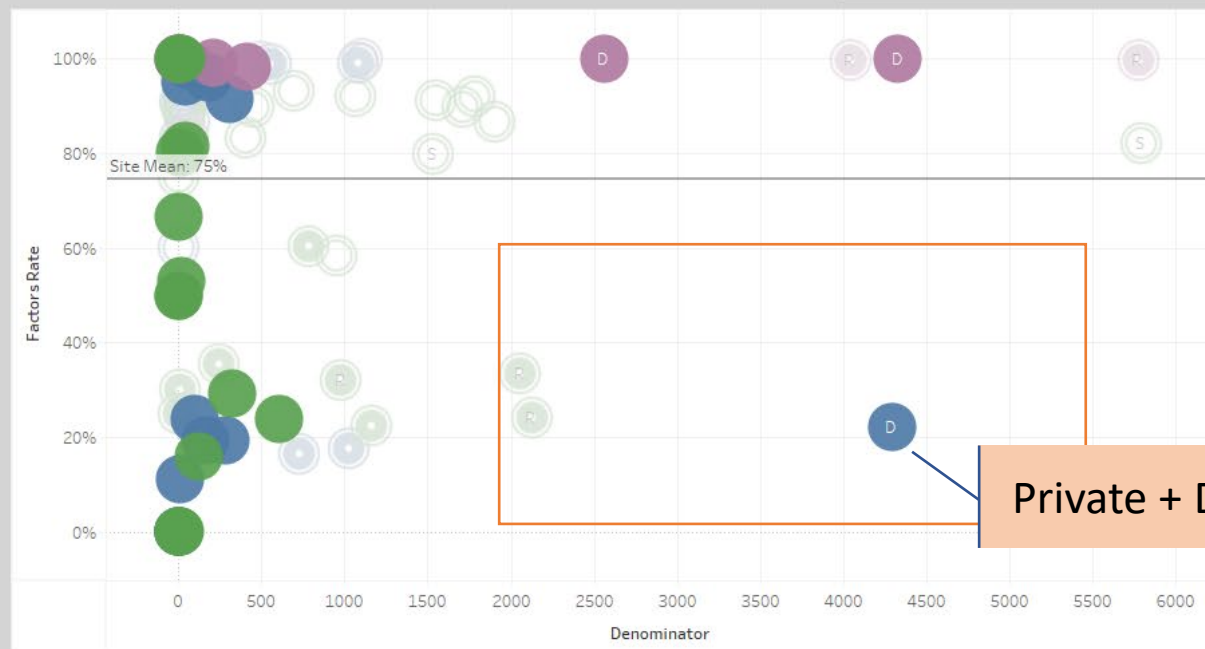
Select Factor 2
Insurance Type

- Cash
- Medicaid
- Private

Select Factor 3
Clinic

- Clinic 03
- Clinic 04
- Clinic 06
- Clinic 10
- Clinic 11
- Clinic 12
- Clinic 13
- Clinic 14
- Clinic 15
- Clinic 16
- Clinic 17
- Clinic 19
- Clinic 20
- Clinic 21

Level 3- Clinic



Cash

Medicaid

Private

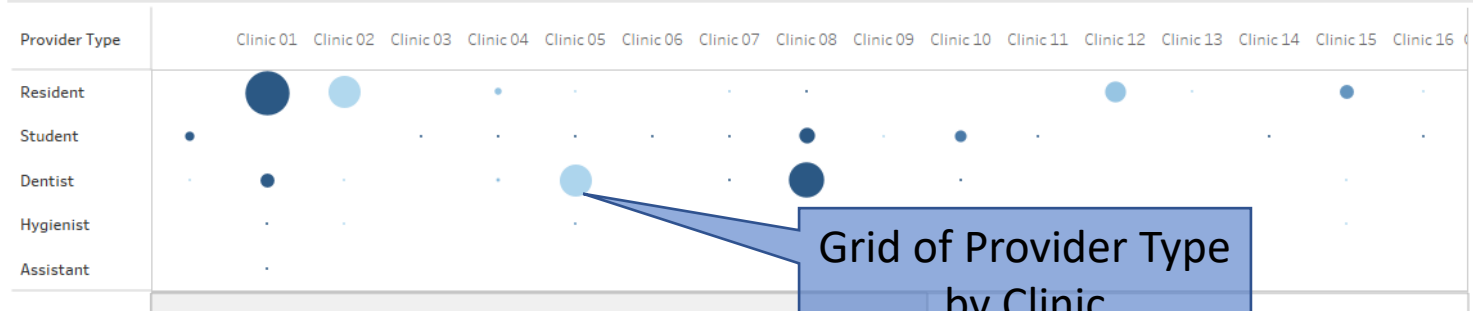
- Assistant
- Dentist
- Hygienist
- Resident
- Student

Private + Dentist + Clinic 10

Outlier Analysis - Grouping

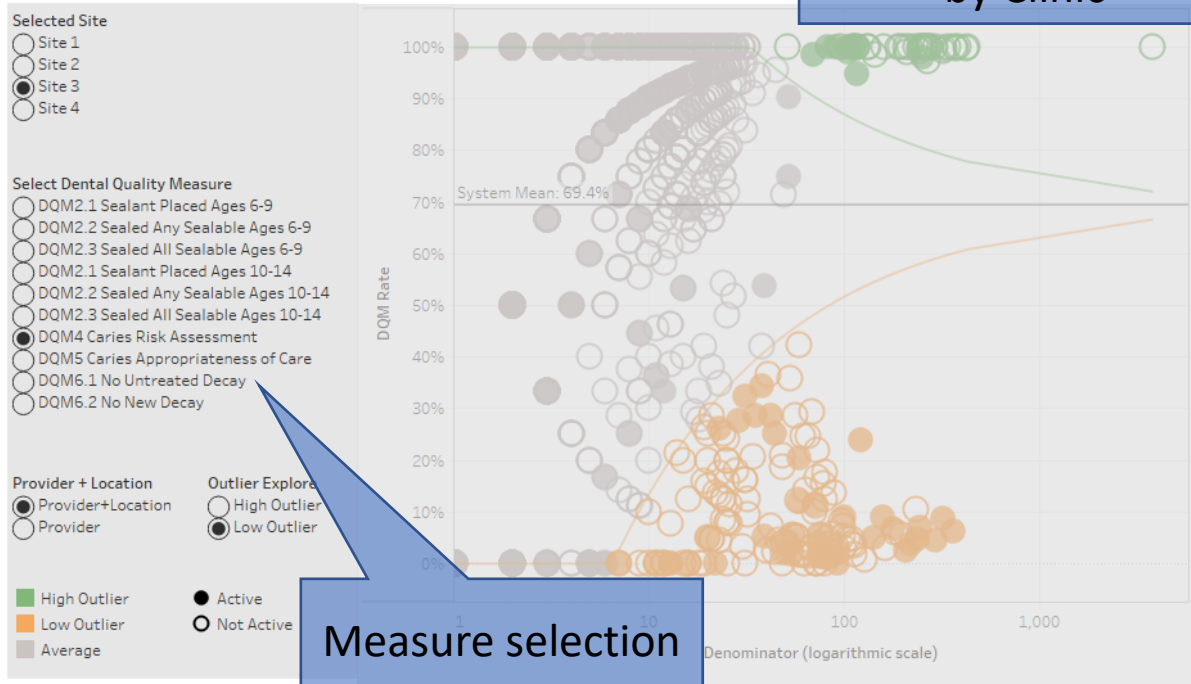
DQM Opportunities | Site 3 Date Range: Jan 2019 to Dec 2021

DQM F2.1	DQM F2.2	DQM F2.3	DQMS 2.1	DQM S2.2	DQM S2.3	DQM 4	DQM 5	DQM 6.1	DQM 6.2
49.0%	48.6%	41.1%	38.8%	37.4%	29.9%	69.4%	64.7%	48.0%	69.2%



Actions:

- Clicking on a circle on the graph on the immediate left will pick a Provider Type - Location combination which will highlight those Providers in the bottom left graph. Lighter color circles indicate lower DQM score.
- Clicking on a Provider's dot will highlight that Provider's status across all the DQM Measures.
- The DQM Status Table is arranged by - number of Measures with Low Outliers - then largest number of Denominator cases of any of their measures.



Outlier C.	UPPER([Provide..	Active?	Location	Max Denomi..	Ages 6-9			Ages 10-14						
					2.1	2.2	2.3	2.1	2.2	2.3	4	5	6.1	6.2
5	DQWIEAZ	Not Active	Clinic 01	3747	■	■	■	■	■	■	■	■	■	■
2	DIEIEP	Active	Clinic 05	236							■	■	■	■
	RQAIEU	Not Active	Clinic 03	59							■	■	■	■
	RQAIEI	Not Active	Clinic 03	53							■	■	■	■
1	DZOIEZ	Active	Clinic 05	362				■	■	■	■	■	■	■
	DQUIQZZ	Active	Clinic 05	319				■	■	■	■	■	■	■
	RQOIQP	Not Active	Clinic 04	293	■	■	■	■	■	■	■	■	■	■
	DOEIEWA	Active	Clinic 05	292							■	■	■	■
	DWEIZQ	Active	Clinic 04	252	■	■	■	■	■	■	■	■	■	■
	DPEIPZ	Active	Clinic 05	244							■	■	■	■
	RQOIYA	Not Active	Clinic 02	231							■	■	■	■
	DQOIEU	Active	Clinic 05	220				■	■	■	■	■	■	■
	DOEIOEA	Active	Clinic 05	205				■	■	■	■	■	■	■
	RQOIWP	Not Active	Clinic 02	198							■	■	■	■
	RQAIQZ	Not Active	Clinic 02	184							■	■	■	■
	DQWIEEY	Active	Clinic 05	177	■	■	■				■	■	■	■
	RQOIYE	Not Active	Clinic 02	162				■	■	■	■	■	■	■
	DQYIEWQ	Active	Clinic 05	158				■	■	■	■	■	■	■
	DYEIIW	Active	Clinic 06	142				■	■	■	■	■	■	■
	RQOIPU	Not Active	Clinic 02	127							■	■	■	■
	DQUIQWO	Active	Clinic 05	121	■	■	■	■	■	■	■	■	■	■
	RQOIPP	Not Active	Clinic 02	113				■	■	■	■	■	■	■
	RQOIWQ	Not Active	Clinic 02	112							■	■	■	■
	RQAIOW	Not Active	Clinic 02	109							■	■	■	■

Outlier Analysis – Funnel Plot

DQM Opportunities | Site 3

DQM F2.1	DQM F2.2	DQM F2.3	DQMS 2.1	DQM S2.2	DQM S2.3	DQM 4	DQM 5	DQM 6.1	DQM 6.2
49.0%	48.6%	41.1%	38.8%	37.4%	29.9%	69.4%	64.7%	48.0%	69.2%

Date Range: Jan 2019 to Dec 2021

Provider Type

Provider Type	Clinic 01	Clinic 02	Clinic 03	Clinic 04	Clinic 05	Clinic 06	Clinic 07	Clinic 08	Clinic 09	Clinic 10	Clinic 11	Clinic 12	Clinic 13	Clinic 14	Clinic 15	Clinic 16
Resident	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Student	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Dentist	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hygienist	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Assistant	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Actions:

- Clicking on a circle on the graph on the immediate left will pick a Provider Type - Location combination which will highlight those Providers in the bottom left graph. Lighter color circles indicate lower DQM score.
- Clicking on a Provider's dot will highlight that Provider's status across all the DQM Measures.
- The DQM Status Table is arranged by:
 - number of Measures with Low Outliers
 - then largest number of Denominator cases of any of their measures.

Selected Site

- Site 1
- Site 2
- Site 3
- Site 4

Select Dental Quality Measure

- DQM2.1 Sealant Placed Ages 6-9
- DQM2.2 Sealed Any Sealable Ages 6-9
- DQM2.3 Sealed All Sealable Ages 6-9
- DQM2.1 Sealant Placed Ages 10-14
- DQM2.2 Sealed Any Sealable Ages 10-14
- DQM2.3 Sealed All Sealable Ages 10-14
- DQM4 Caries Risk Assessment
- DQM5 Caries Appropriateness of Care
- DQM6.1 No Untreated Decay
- DQM6.2 No New Decay

Provider + Location

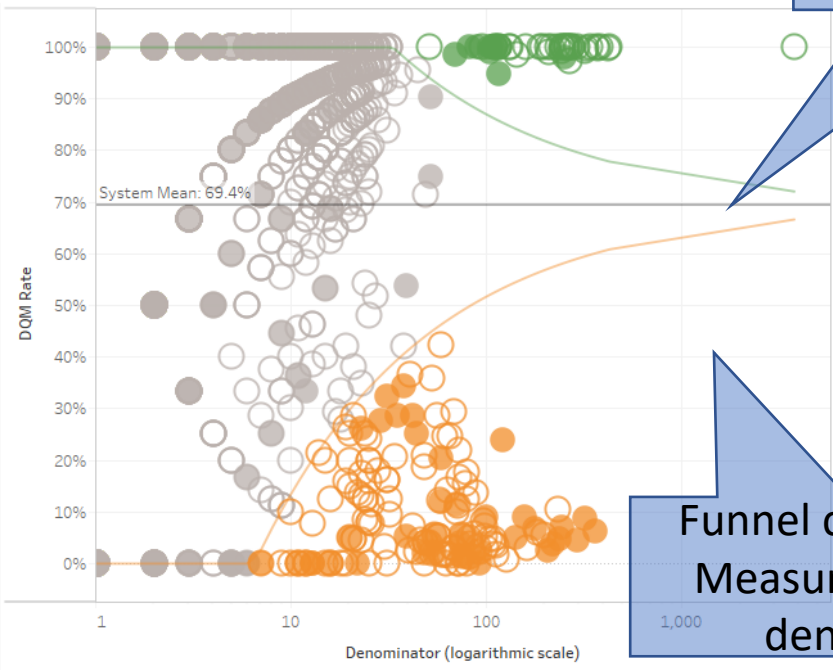
- Provider+Location
- Provider

Outlier Explore

- High Outlier
- Low Outlier

Legend:

- High Outlier
- Low Outlier
- Average
- Active
- Not Active



Outlier C.	UPPER	Provide..	Active?	Location	Max Denomi..	Ages 6-9			Ages 10-14			4	5	6.1	6.2	
5	DQWIEAZ	Not Active	Clinic 01	3747	■	■	■	■	■	■	■	■	■	■	■	■
2	DIEIEP	Active	Clinic 05	236								■	■	■	■	■
	RQAIEU	Not Active	Clinic 03	59								■	■	■	■	■
	RQAIEI	Not Active	Clinic 03	53								■	■	■	■	■
1	DZOIEZ	Active	Clinic 05	362								■	■	■	■	■
	DQUIQZZ	Active	Clinic 05	319								■	■	■	■	■
	RQIQIP	Not Active	Clinic 04	293								■	■	■	■	■
	DOEIEWA	Active	Clinic 05	292								■	■	■	■	■
	DWEIZQ	Active	Clinic 04	252				■				■	■	■	■	■
	DPEIPZ	Active	Clinic 05	244								■	■	■	■	■
	RQOIYA	Not Active	Clinic 02	231								■	■	■	■	■
	DQQIEIU	Active	Clinic 05	220								■	■	■	■	■
	DOEIOEA	Active	Clinic 05	205								■	■	■	■	■
	RQOIWP	Not Active	Clinic 02	198								■	■	■	■	■
	RQAIOZ	Not Active	Clinic 02	184								■	■	■	■	■
	DQWIEEY	Active	Clinic 05	177				■	■	■		■	■	■	■	■
	RQOIYE	Not Active	Clinic 02	162								■	■	■	■	■
	DQOIEU	Active	Clinic 05	158								■	■	■	■	■
	DQOIEV	Active	Clinic 06	142								■	■	■	■	■
	RQOIEP	Not Active	Clinic 02	127								■	■	■	■	■
	RQOIEQ	Not Active	Clinic 05	121				■	■	■		■	■	■	■	■
	RQOIEB	Not Active	Clinic 02	113								■	■	■	■	■
	RQOIEP	Not Active	Clinic 02	112								■	■	■	■	■
	RQAIOV	Not Active	Clinic 02	109								■	■	■	■	■

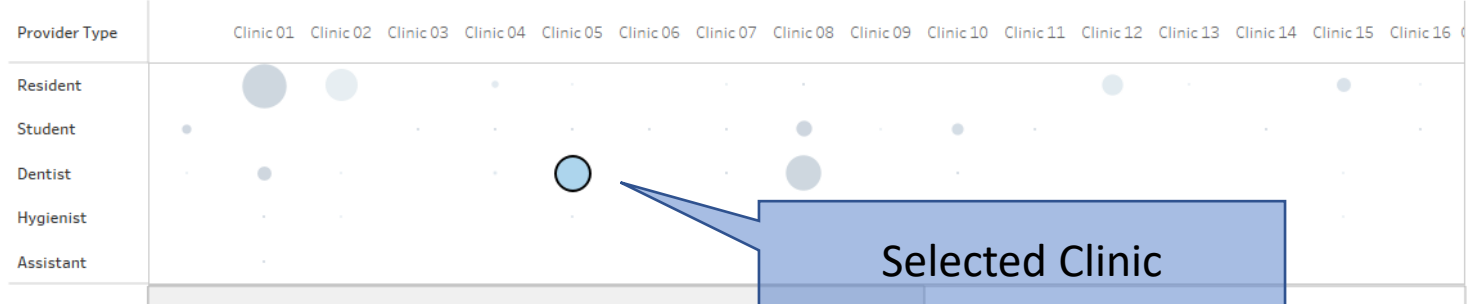
System mean

Funnel chart (ANOP) - Measure rate by the denominator

Outlier Analysis – Highlight Providers

DQM Opportunities | Site 3 Date Range: Jan 2019 to Dec 2021

DQM F2.1	DQM F2.2	DQM F2.3	DQMS 2.1	DQM S2.2	DQM S2.3	DQM 4	DQM 5	DQM 6.1	DQM 6.2
49.0%	48.6%	41.1%	38.8%	37.4%	29.9%	69.4%	64.7%	48.0%	69.2%



- Actions:**
- Clicking on a circle on the graph on the immediate left will pick a Provider Type - Location combination which will highlight those Providers in the bottom left graph. Lighter color circles indicate lower DQM score.
 - Clicking on a Provider's dot will highlight that Provider's status across all the DQM Measures.
 - The DQM Status Table is arranged by - number of Measures with Low Outliers - then largest number of Denominator cases of any of their measures.

Selected Site

- Site 1
- Site 2
- Site 3**
- Site 4

Select Dental Quality Measure

- DQM2.1 Sealant Placed Ages 6-9
- DQM2.2 Sealed Any Sealable Ages 6-9
- DQM2.3 Sealed All Sealable Ages 6-9
- DQM2.1 Sealant Placed Ages 10-14
- DQM2.2 Sealed Any Sealable Ages 10-14
- DQM2.3 Sealed All Sealable Ages 10-14
- DQM4 Caries Risk Assessment**
- DQM5 Caries Appropriateness of Care
- DQM6.1 No Untreated Decay
- DQM6.2 No New Decay

Provider + Location

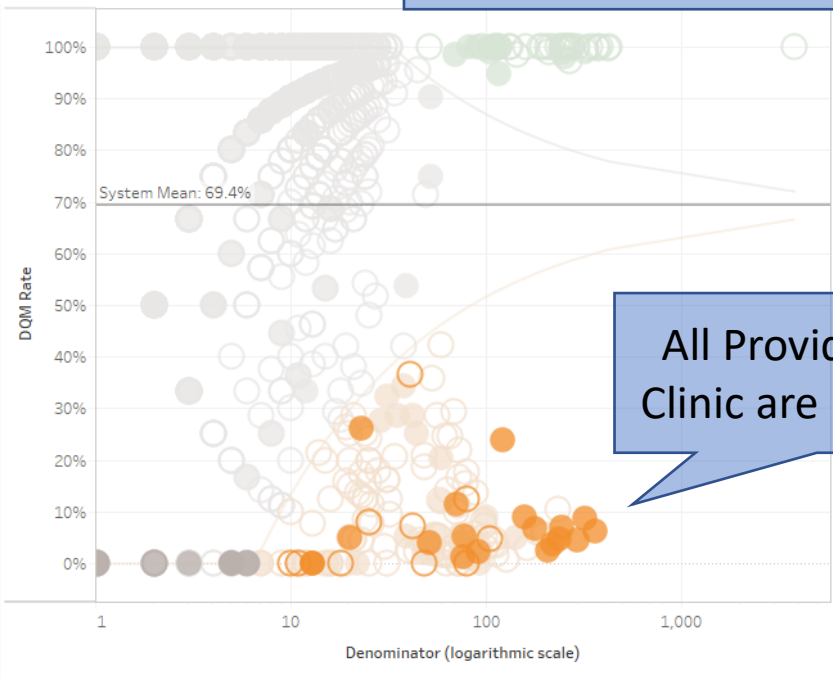
- Provider+Location
- Provider

Outlier Explore

- High Outlier
- Low Outlier

Legend:

- High Outlier (Green)
- Low Outlier (Orange)
- Average (Grey)
- Active (Black dot)
- Not Active (White circle)

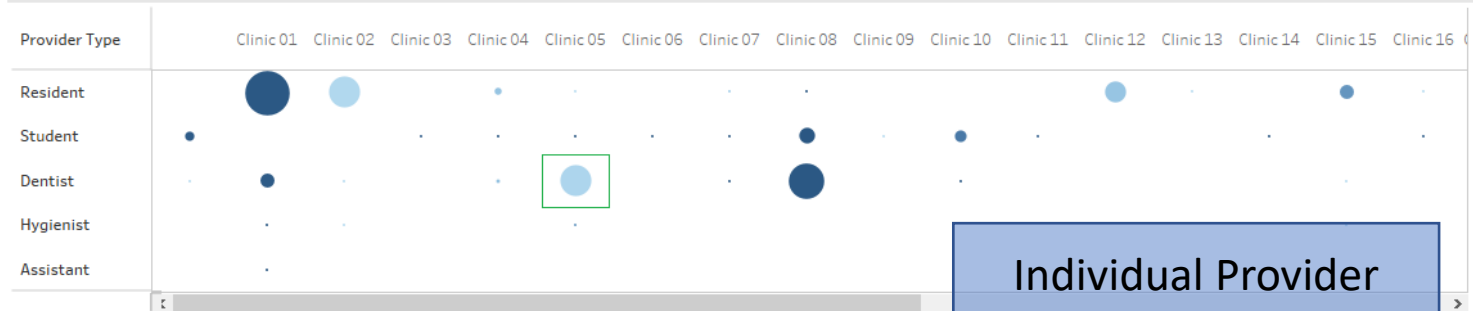


Outlier C.	UPPER([Provide..	Active?	Location	Max Denomi..	Ages 6-9			Ages 10-14			4	5	6.1	6.2
5	DQWIEAZ	Not Active	Clinic 01	3747	■	■	■	■	■	■	■	■	■	■
2	DIEIEP	Active	Clinic 05	236							■	■	■	■
	RQAIEU	Not Active	Clinic 03	59							■	■	■	■
	RQAIEI	Not Active	Clinic 03	53							■	■	■	■
1	DZOIEZ	Active	Clinic 05	362				■	■	■	■	■	■	■
	DQUIQZ	Active	Clinic 05	319				■	■	■	■	■	■	■
	RQOIQP	Not Active	Clinic 04	293							■	■	■	■
	DOEIEWA	Active	Clinic 05	292							■	■	■	■
	DWEIZQ	Active	Clinic 04	252	■	■	■	■	■	■	■	■	■	■
	DPEIPZ	Active	Clinic 05	244							■	■	■	■
	DQOIEA	Not Active	Clinic 02	231							■	■	■	■
	DQOIEA	Active	Clinic 05	220							■	■	■	■
	DQOIEA	Active	Clinic 05	205				■	■	■	■	■	■	■
	RQAIOZ	Not Active	Clinic 02	198							■	■	■	■
	RQAIOZ	Not Active	Clinic 02	184							■	■	■	■
	DQWIEEY	Active	Clinic 05	177	■	■	■				■	■	■	■
	RQOIYE	Not Active	Clinic 02	162							■	■	■	■
	DQYIEWQ	Active	Clinic 05	158				■	■	■	■	■	■	■
	DYEIIW	Active	Clinic 06	142				■	■	■	■	■	■	■
	RQOIPU	Not Active	Clinic 02	127							■	■	■	■
	DQUIQWO	Active	Clinic 05	121	■	■	■	■	■	■	■	■	■	■
	RQOIPP	Not Active	Clinic 02	113							■	■	■	■
	RQOIQW	Not Active	Clinic 02	112							■	■	■	■
	RQAIOW	Not Active	Clinic 02	109							■	■	■	■

Outlier Analysis – Provider Details Table

DQM Opportunities | Site 3 Date Range: Jan 2019 to Dec 2021

DQM F2.1	DQM F2.2	DQM F2.3	DQMS 2.1	DQM S2.2	DQM S2.3	DQM 4	DQM 5	DQM 6.1	DQM 6.2
49.0%	48.6%	41.1%	38.8%	37.4%	29.9%	69.4%	64.7%	48.0%	69.2%



Actions:

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 Site 2
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 Site 4

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 DQM2.3 Sealed All Sealable Ages 10-14
 DQM4 Caries Risk Assessment
 DQM5 Caries Appropriateness of Care
 DQM6.1 No Untreated Decay
 DQM6.2 No New Decay

Provider + Location

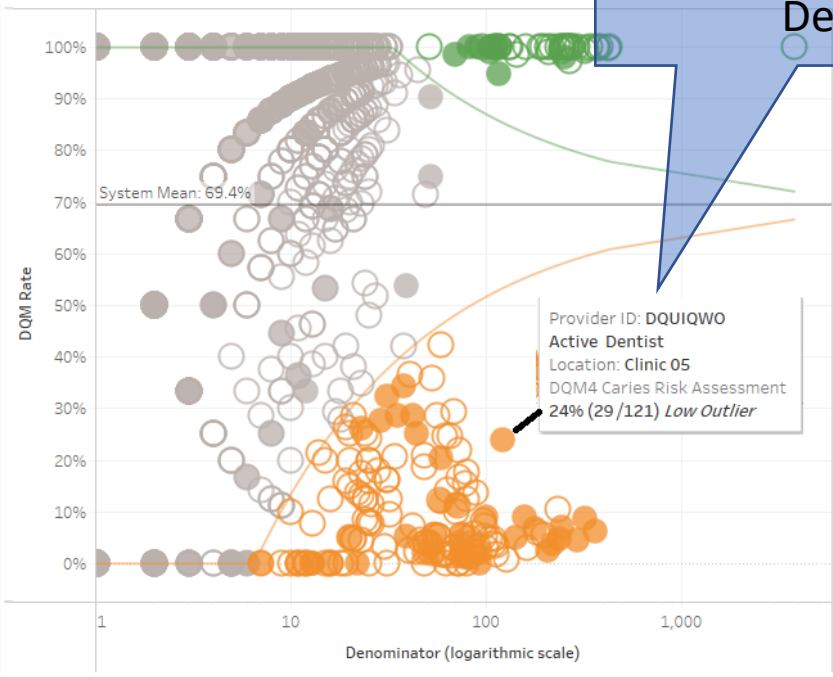
Provider+Location
 Provider

Outlier Explore

High Outlier
 Low Outlier

Active
 Not Active

High Outlier
 Low Outlier
 Average

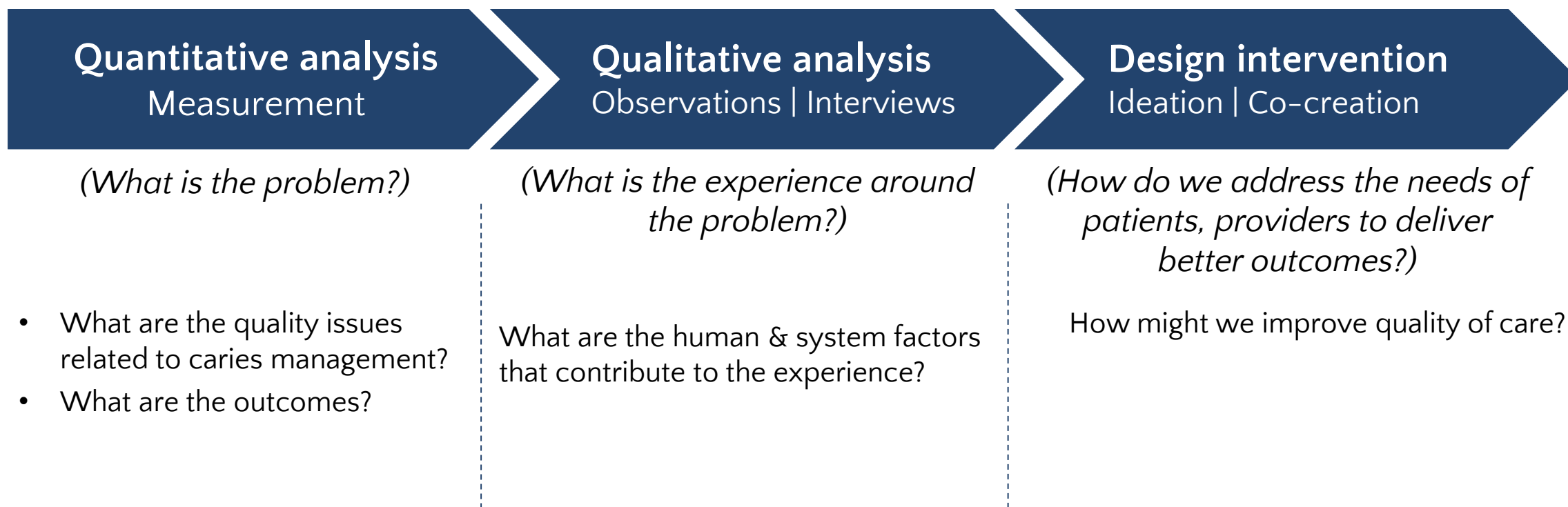


Individual Provider Detail

	UPPER([Provide.. Active?])	Location	Max Denomi..	Ages 6-9			Ages 10-14							
				2.1	2.2	2.3	2.1	2.2	2.3	4	5	6.1	6.2	
5	DQWIEAZ	Not Active	Clinic 01	3747										
2	DIEIEP	Active	Clinic 05	236										
	RQAIEU	Not Active	Clinic 03	59										
	RQAIEI	Not Active	Clinic 03	53										
1	DZOIEZ	Active	Clinic 05	362										
	DQUIQZZ	Active	Clinic 05	319										
	RQOIQP	Not Active	Clinic 04	293										
	DOEIEWA	Active	Clinic 05	292										
	DWEIZQ	Active	Clinic 04	252										
	DPEIPZ	Active	Clinic 05	244										
	RQOIYA	Not Active	Clinic 02	231										
	DQQIEIU	Active	Clinic 05	220										
	DOEIOEA	Active	Clinic 05	205										
	RQOIWP	Not Active	Clinic 02	198										
	RQAIQZ	Not Active	Clinic 02	184										
	DQWIEEY	Active	Clinic 05	177										
	RQOIYE	Not Active	Clinic 02	162										
	DQYIEWQ	Active	Clinic 05	158										
	DYEIIW	Active	Clinic 06	142										
	RQOIPU	Not Active	Clinic 02	127										
	DQUIQWO	Active	Clinic 05	121										
	RQOIPP	Not Active	Clinic 02	113										
	RQOIWQ	Not Active	Clinic 02	112										
	RQAQIW	Not Active	Clinic 02	109										

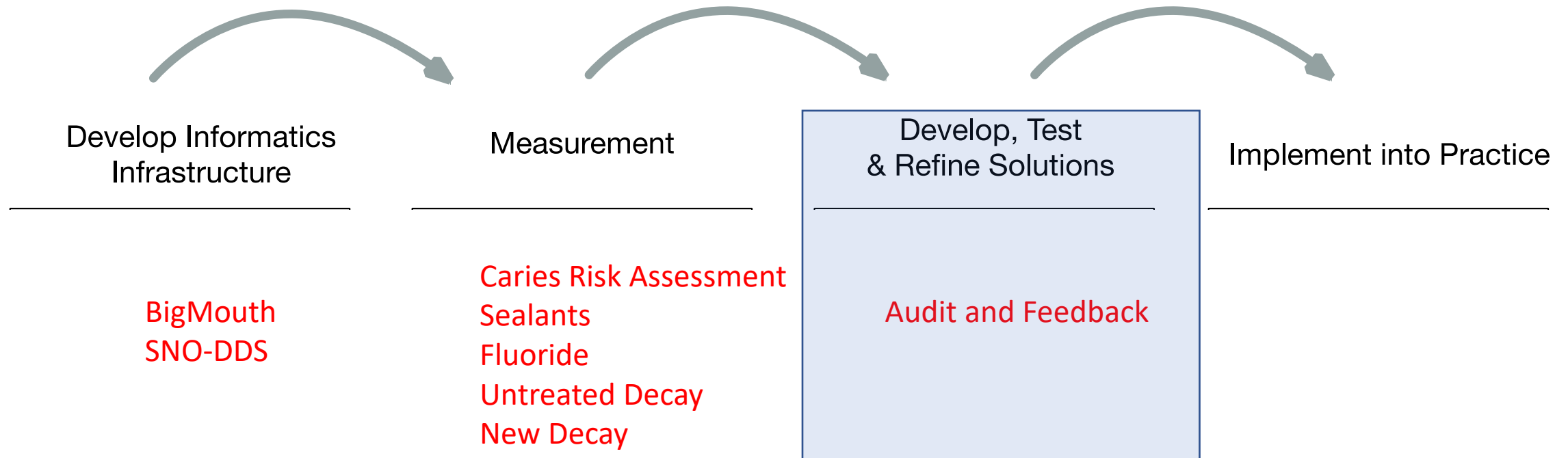
That Provider's Performance on all Measures

Measurement to Understanding



Big Idea

- Every patient should receive person-centered, safe, effective, timely, efficient, and equitable **oral health care**



The Design of Everyday Things



Donald A. Norman

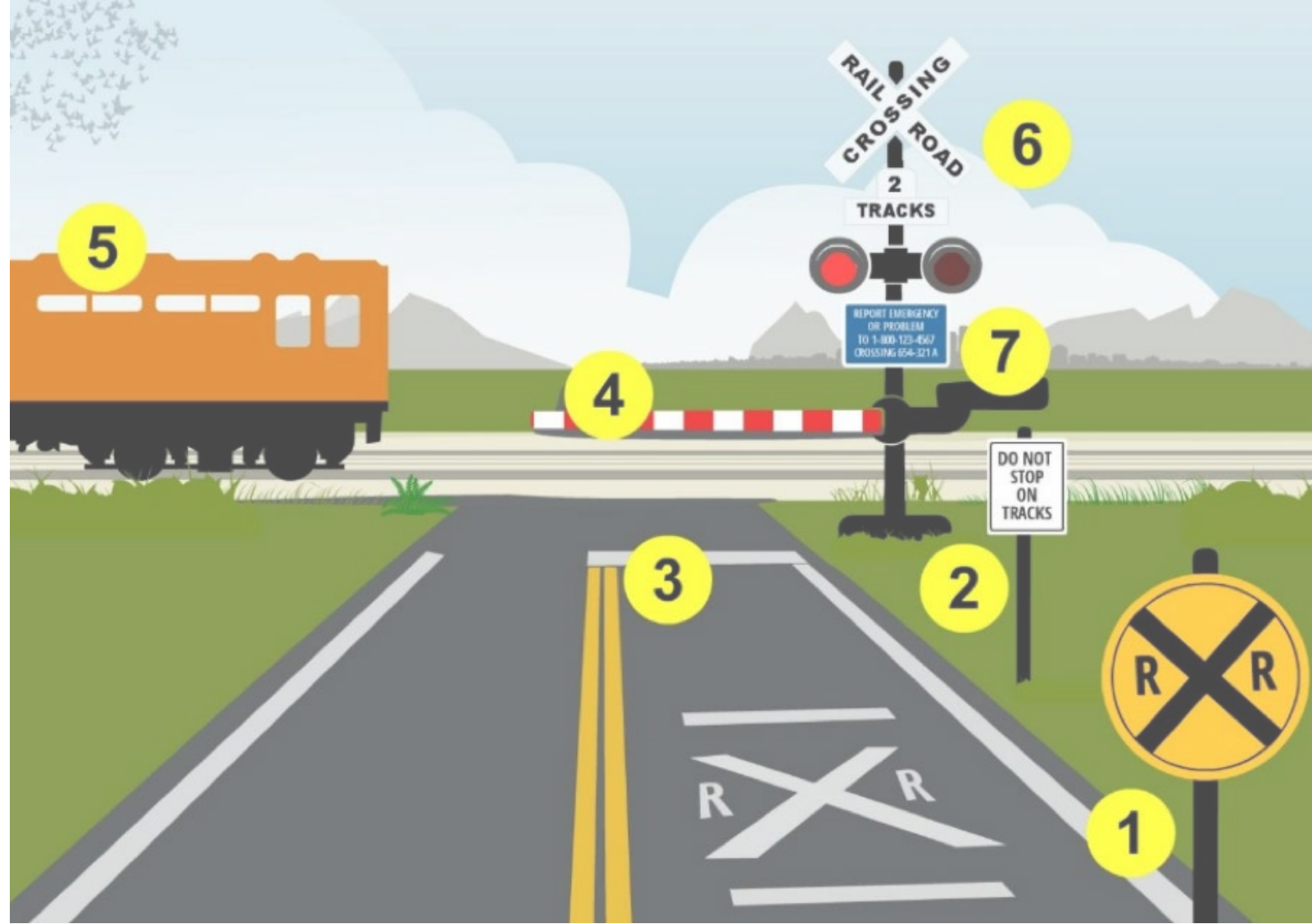


STOP

RAILROAD

RAILROAD

1. Stop, look both ways, and listen. Remember that trains always have the right of way.
2. Make sure you have room to get across. Once you enter the crossing, keep moving.
3. Stop 15 feet away from flashing red lights, lowered gates, a signaling flagman or a stop sign.
4. Never try to drive around a lowering gate. Never ignore signals, and always use caution.
5. Before you begin to cross, wait for gates to fully rise and for all lights to stop flashing.
6. Never assume that there is only one train coming from a single direction.
7. If your car stalls on a rail track, quickly get everyone out - even if you don't see a train coming. Then, run away from the tracks and your car. Avoid running in the same direction that the train is coming, because you could be hit by flying debris if a train hits your car. When it's safe to do so, call the number on the blue Emergency Notification System sign. If the sign is not visible to you, call 911.





"Dentists should consider nonsteroidal anti-inflammatory analgesics as the first-line therapy for acute pain management." *

*Recommended by the American Dental Association (ADA), Centers for Disease Control and Prevention (CDC) and National Institute of Dental and Craniofacial Research (NIDCR)

[Link to UTSD Guidelines on Opioid Prescribing](#)

Dr. XXXXXX:

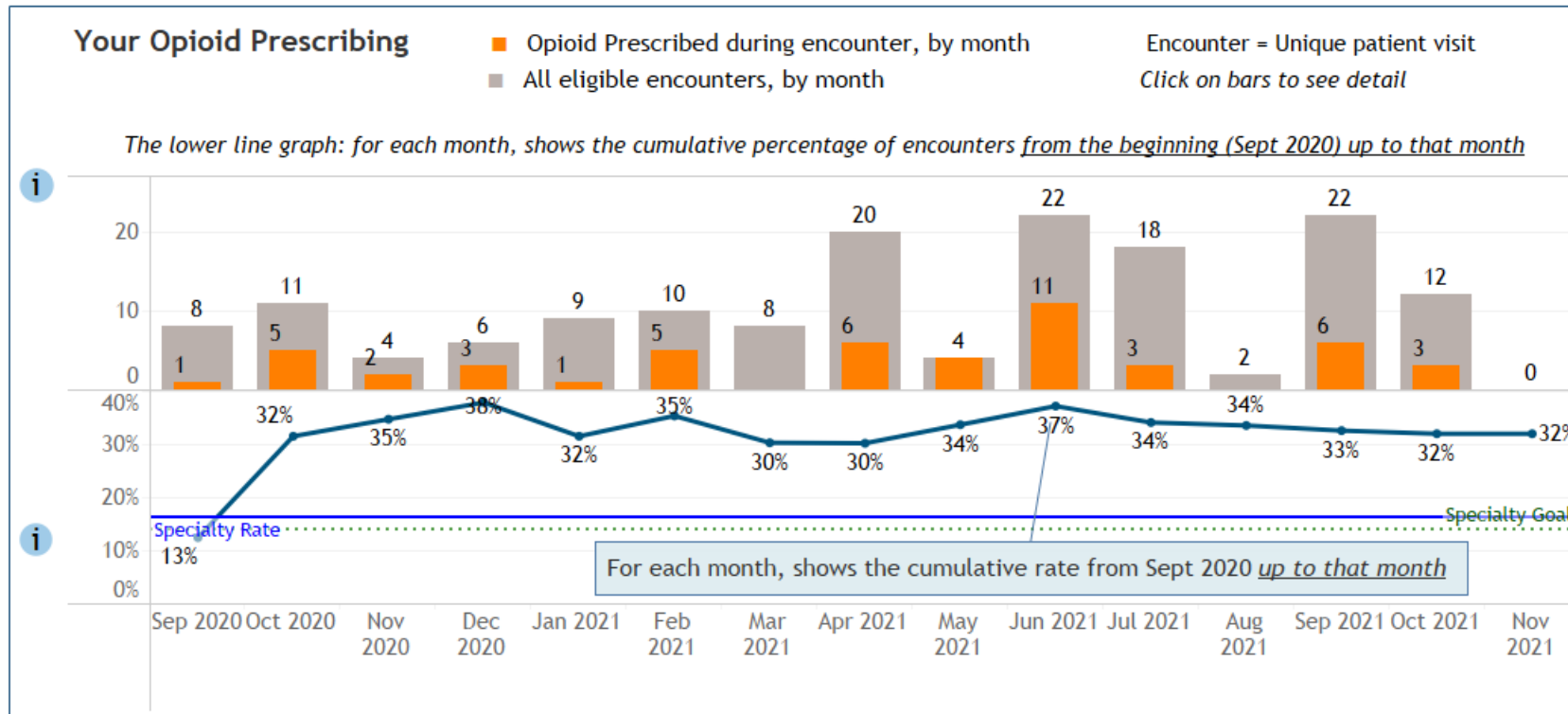
Your 3 month opioid prescribing rate is higher than your specialty's goal.

Your 15 month opioid prescribing rate is higher than your specialty's goal.

Your 3mo Rate	Your 15mo Rate	Oral Surgery Goal	Opioid Encounters	Total Encounters	Other Opioid Rxs
26.5%	32.1%	< 14.0%	50	156	0

Click here to view

Opioid Prescribing Rates by Procedure Type

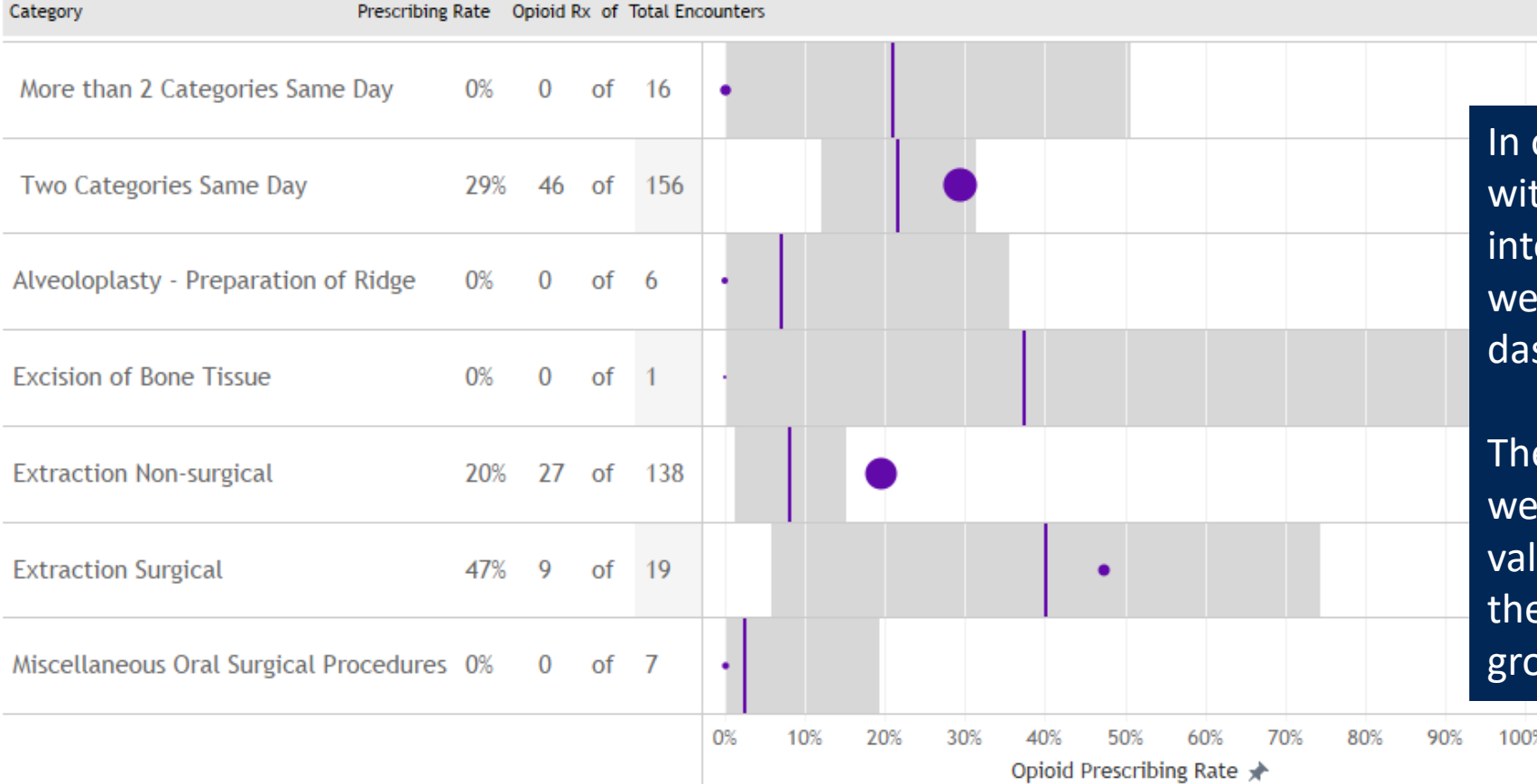


"Dentists should consider nonsteroidal anti-inflammatory analgesics as the first-line therapy for acute pain management." *

[Link to UTSD Guidelines on Opioid Prescribing](#)

*Recommended by the American Dental Association (ADA), Centers for Disease Control and Prevention (CDC) and National Institute of Dental and Craniofacial Research (NIDCR)

Category Prescribing Rate in Comparison to UTSD Oral Surgery Peers



In our pilot RCT at one academic site with 37 providers, we found an intervention effect when dentists were sent monthly prescribing dashboards.

The odds of prescribing an opioid were reduced by 72% (OR= 0.31, p-value < 0.00013, 95%CI: 0.16, 0.55) in the dashboard group vs the control group



Acknowledgements

- **G08LM010075** (NLM): Development of an Inter-University Oral Health Research Database
- **R01DE021051** (NIDCR): A Cognitive Approach To Refine And Enhance Use Of A Dental Diagnostic Terminology
- **R01DE023061** (NIDCR): A Whole Systems Approach To Implementing Standardized Dental Diagnostic Terms
- **R01DE024166** (NIDCR): Implementing Dental Quality Measures in Practice

Muhammad.F.Walji@uth.tmc.edu



Thank you!