Agenda Item 7:

Research Data Center and Healthcare Analytics Branch Update

Facilitators: Eric Neuhauser, Research and Evaluation Section Chief, Health Workforce Development, Research Data Center, HCAI

Phil Morris, Research Scientist, Healthcare Analytics Branch, HCAI

RDC Overview

Research Data Center (RDC) Objectives vis-à-vis the Council:

- Inform the California Health Workforce Education and Training Council (Council) and stakeholders on relevant data that reflects California's healthcare landscape

  - Serve as the central repository for all health care workforce and education data by increasing the number of data-agreements with relevant partner agencies and institutions

  - Evaluate the effectiveness of HCAI workforce programs, share relevant findings with the Council, and solicit expert and stakeholder feedback to support continuous quality improvement

  - Create relevant and readily available data visualizations

Overall Purpose:

- Serve as central source of health care workforce and education data

- Provide better and timelier data and analysis to inform state policy regarding issues of workforce shortage, equity, and distribution.

Health and Safety Code §128051

- Directs HCAI to collect the following data:
  - Supply
  - Geographical Distribution
  - Diversity
  - Demand
  - Educational Capacity

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Agenda

- Developing RDC Dashboards
  - Health Workforce Education Pipelines
  - Health Workforce Practice Metrics

- Healthcare Analytics Branch (HAB) Updates
  - **Administrative data** – Patient Discharge Data (PDD), Emergency Department Data (ED) and Ambulatory Surgery Data (AS)
  - **Healthcare Payments Data** (HPD)

Health Workforce Education Pipeline

- Mapped Integrated Postsecondary Education Data System (IPEDS) data to 41 different health workforce professions
  - Can filter by Workforce Category, License Name, Race & Ethnicity, Gender and County
- Included data from the last 10 academic years
- Key Questions
  - How many training programs for health professionals exist in CA?
  - How many new health professionals can CA's education system produce in a year?
  - What are the demographic breakdowns of CA's health workforce graduates?
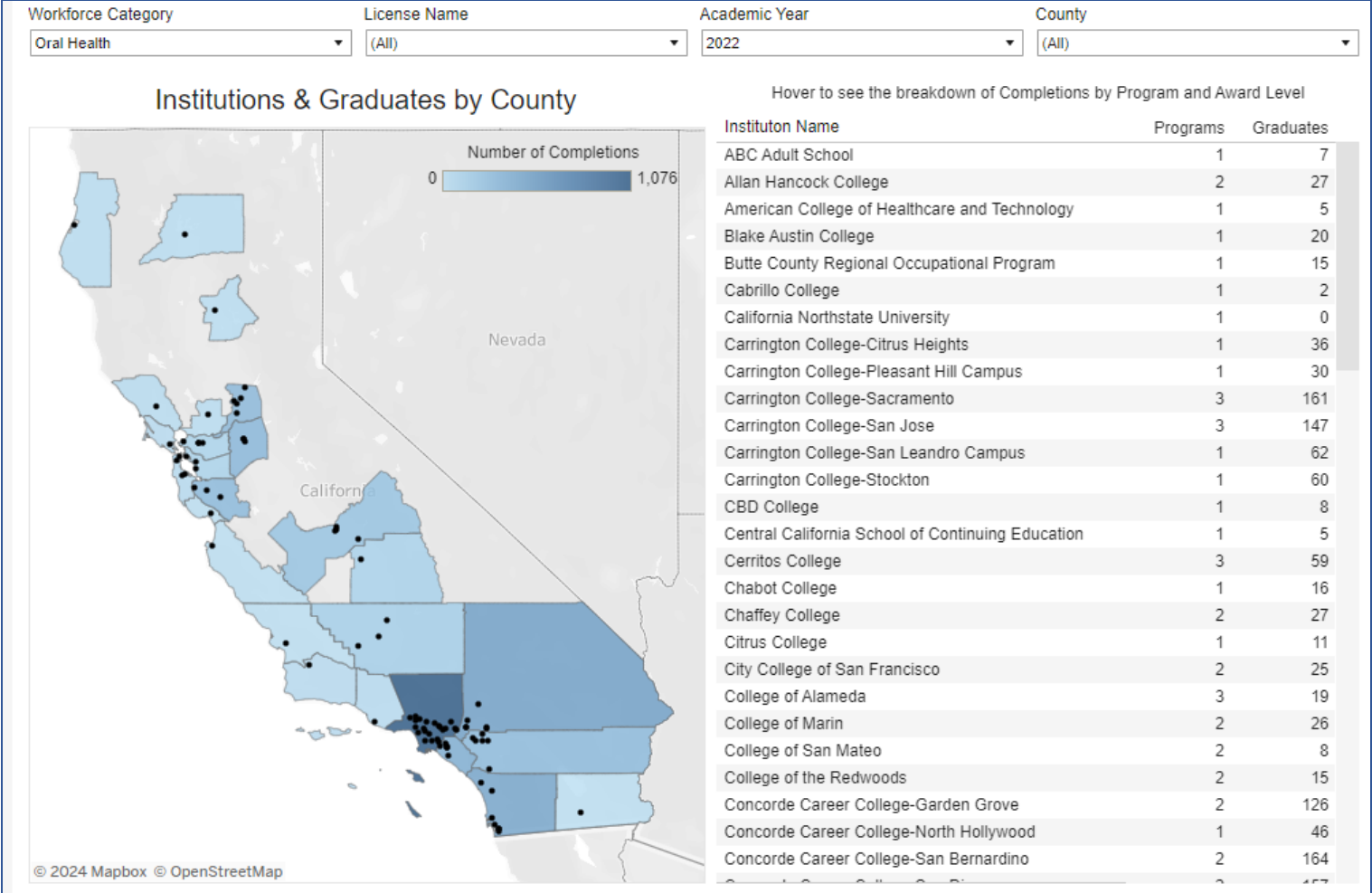- Data will be refreshed annually

Health Workforce Education Pipeline – Institutions, Programs & Grads

- Illustrates trends in the number of institutions, programs and graduates over the last 10 years

- We will use this information in our supply modeling to better predict future supply trends for each license type
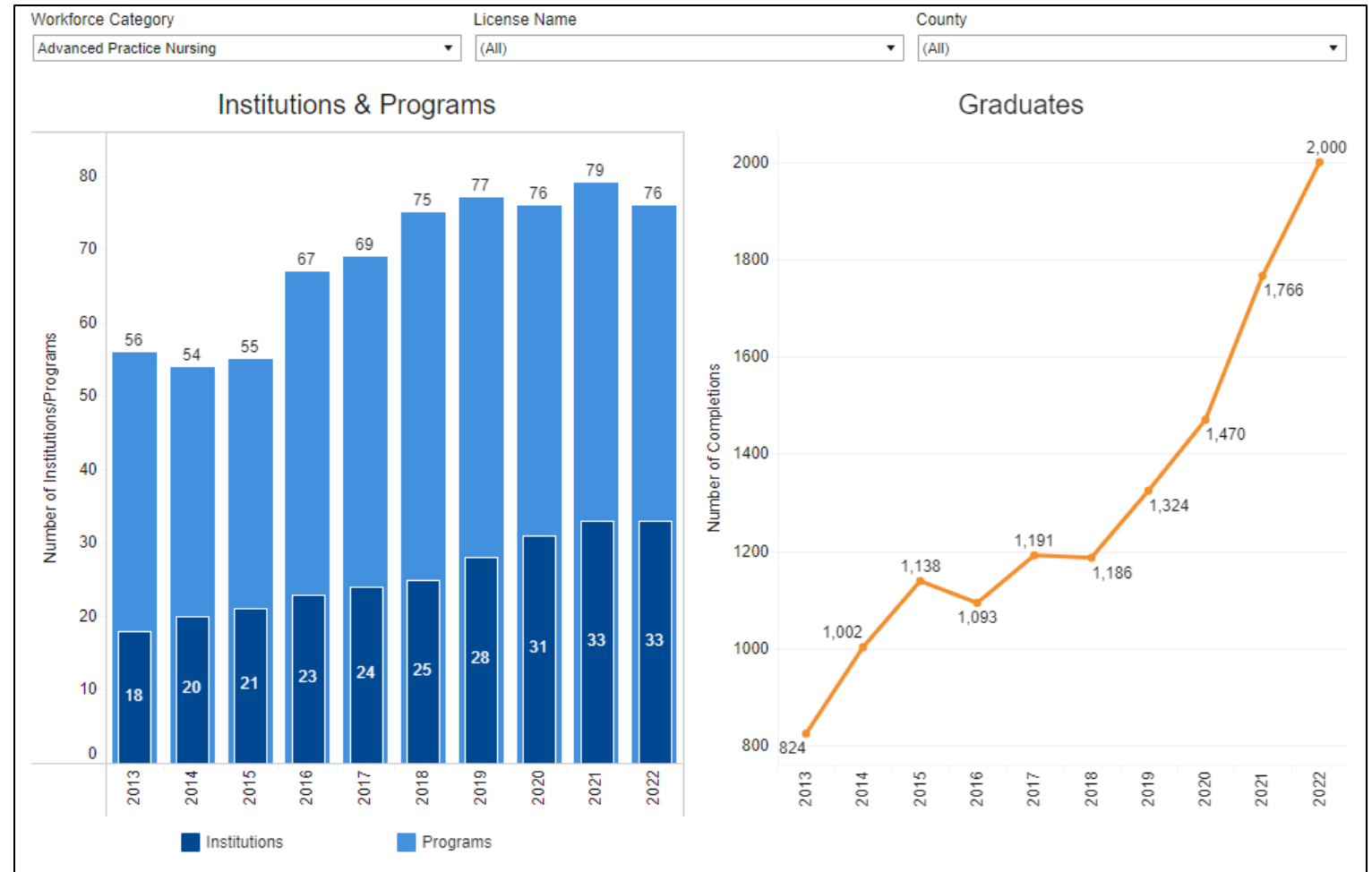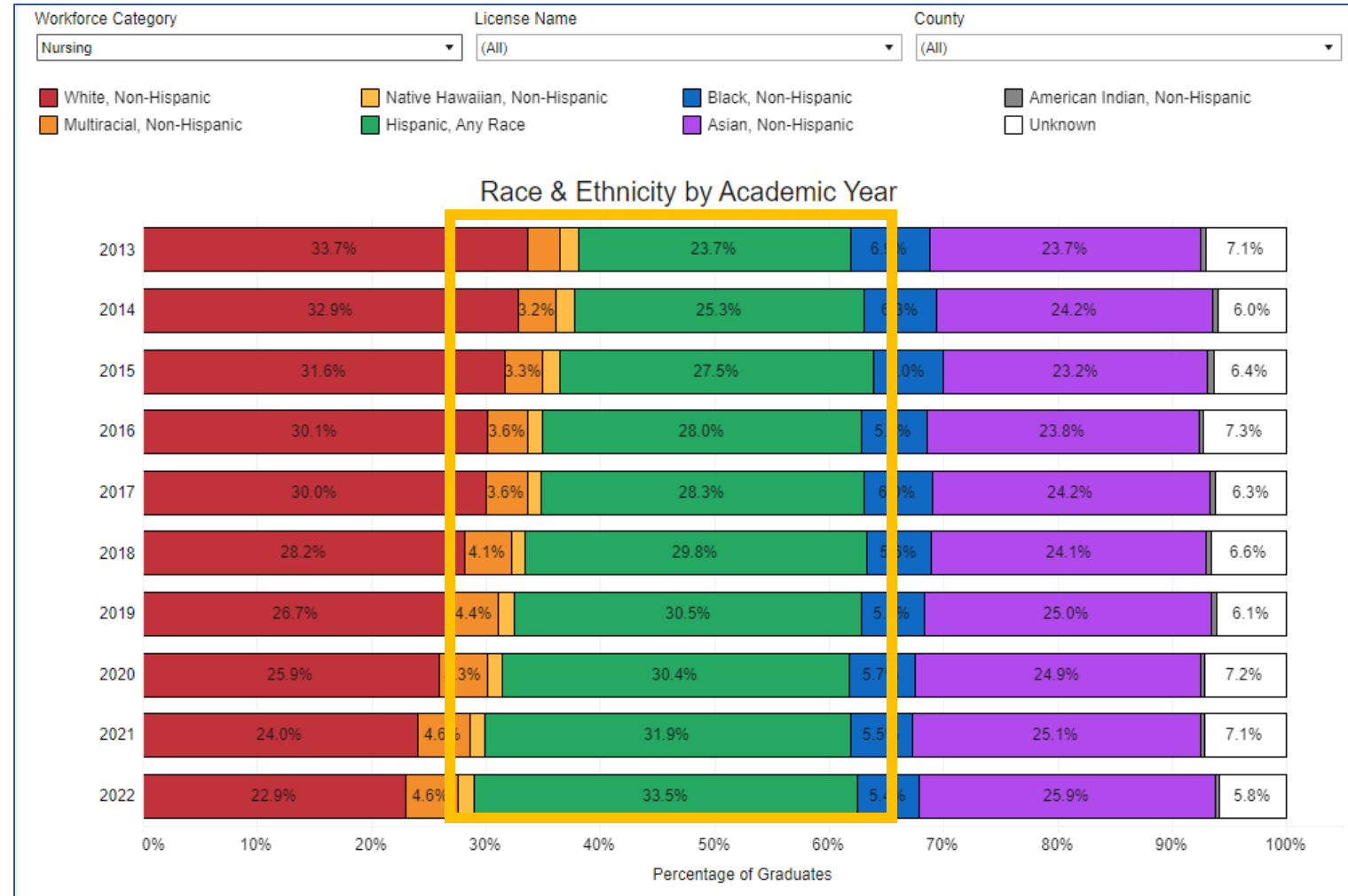
Health Workforce Education Pipeline

- Can see where graduates are coming from, and the number of graduates and programs at each individual school

- Majority of Oral Health graduates in 2022 came out of LA County

- Specifically, USC produced the highest number of graduates at 170 across its three programs

Workforce Category	License Name	Academic Year	County
Oral Health	(All)	2022	(All)

Institutions & Graduates by County

Number of Completions
0 — 1,076

Hover to see the breakdown of Completions by Program and Award Level

Instituton Name	Programs	Graduates
ABC Adult School	1	7
Allan Hancock College	2	27
American College of Healthcare and Technology	1	5
Blake Austin College	1	20
Butte County Regional Occupational Program	1	15
Cabrillo College	1	2
California Northstate University	1	0
Carrington College-Citrus Heights	1	36
Carrington College-Pleasant Hill Campus	1	30
Carrington College-Sacramento	3	161
Carrington College-San Jose	3	147
Carrington College-San Leandro Campus	1	62
Carrington College-Stockton	1	60
CBD College	1	8
Central California School of Continuing Education	1	5
Cerritos College	3	59
Chabot College	1	16
Chaffey College	2	27
Citrus College	1	11
City College of San Francisco	2	25
College of Alameda	3	19
College of Marin	2	26
College of San Mateo	2	8
College of the Redwoods	2	15
Concorde Career College-Garden Grove	2	126
Concorde Career College-North Hollywood	1	46
Concorde Career College-San Bernardino	2	164

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- The Hispanic population is the most underrepresented group in the health workforce

- While the population of California is nearly 40% Hispanic, the Nursing workforce is only 20%

- Most recent graduating class for Nursing professions was 33.5% Hispanic

- Trends in Hispanic graduates for Nursing professions shows a steady increase over the last 10 years

Race & Ethnicity by Academic Year

Legend:
- White, Non-Hispanic
- Multiracial, Non-Hispanic
- Native Hawaiian, Non-Hispanic
- Hispanic, Any Race
- Black, Non-Hispanic
- Asian, Non-Hispanic
- American Indian, Non-Hispanic
- Unknown

Workforce Category: Nursing | License Name: (All) | County: (All)

Year	White	Multiracial	Hispanic	Black	Asian	Unknown
2013	33.7%		23.7%	6.x%	23.7%	7.1%
2014	32.9%	3.2%	25.3%	6.x%	24.2%	6.0%
2015	31.6%	3.3%	27.5%	x.0%	23.2%	6.4%
2016	30.1%	3.6%	28.0%	5.x%	23.8%	7.3%
2017	30.0%	3.6%	28.3%	6.x%	24.2%	6.3%
2018	28.2%	4.1%	29.8%	5.x%	24.1%	6.6%
2019	26.7%	4.4%	30.5%	5.x%	25.0%	6.1%
2020	25.9%	.3%	30.4%	5.7%	24.9%	7.2%
2021	24.0%	4.6%	31.9%	5.5%	25.1%	7.1%
2022	22.9%	4.6%	33.5%	5.x%	25.9%	5.8%

Percentage of Graduates

Health Workforce Practice Metrics

- Primary Area of Practice (AoP), Specialty, Practice Setting, and average weekly Activity Hour metrics for 47 different health professions
  - Can filter by Workforce Category, License Name, and County
- Key Questions
  - What is the distribution of health professionals for each primary area of practice?
  - How does practice setting vary by profession?
  - What is the average amount of time spent on direct patient care?
- Data will be refreshed annually
- Uses: Activity hours to better adjust supply counts and shortage area in future modeling

- Looking at the makeup of Practice Settings within counties allows for better comparison between small and large populations

- Ex: Los Angeles has the highest number of licensees working in a Mental Health Clinic, but Modoc has the highest percentage of their county's workforce working in Mental Health Clinics
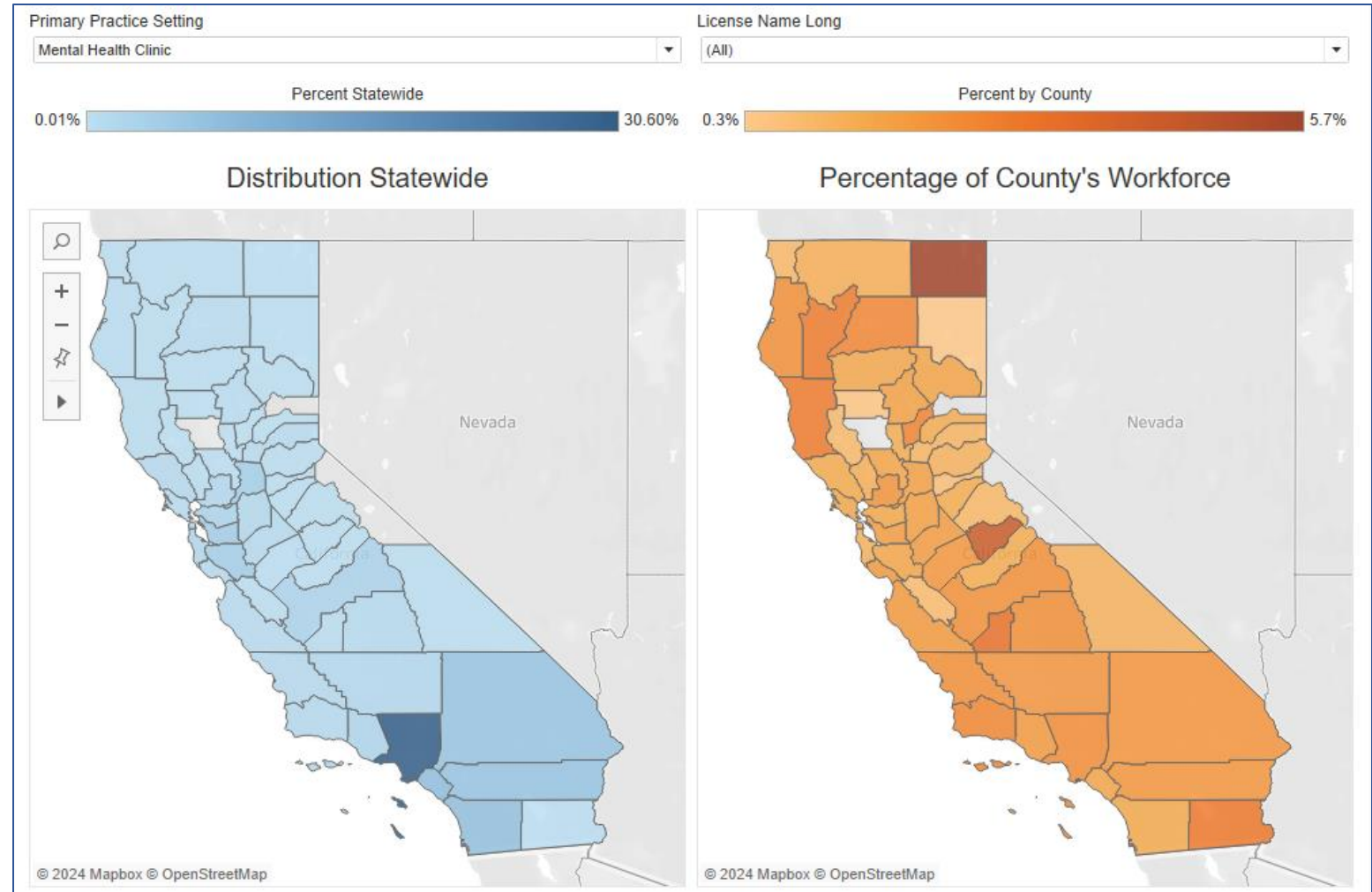
Health Workforce Practice Metrics – Average Activity Hours
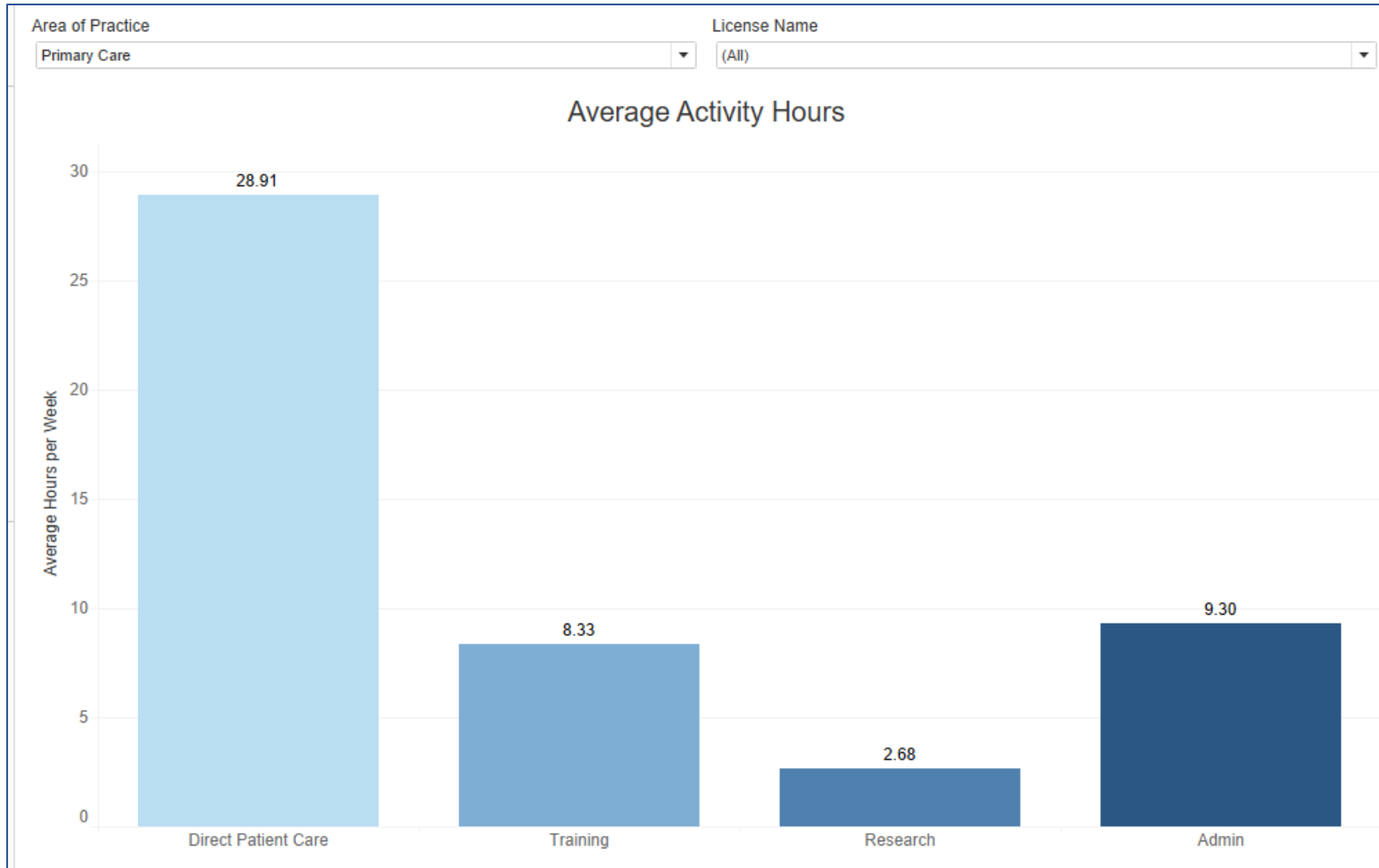
- Primary Care health workers spend an average of 26.1 hours per week on Direct Patient Care

- This information can be used for more accurate supply and demand calculations, as well as shortage calculations

Discussion

- Existing Dashboards
  - Race and Ethnicity
  - Education Pathways
  - Languages Spoken

- Upcoming Dashboards
  - Education Pipeline
  - Practice Metrics

- Ideas/suggestions for future dashboards
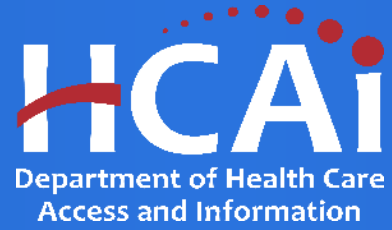
Generational Model of Data Analysis

HCAI'S GOAL TO GROW ANALYTIC CAPABILITIES

- To generationally enhance the usefulness of information being made available as HCAI's knowledge and data develop.

ENGAGING STAKEHOLDERS AND CUSTOMERS

- To meet with stakeholders to identify topics for future analytics and enhancements.

INITIAL ANALYTICS AND PRODUCT RELEASE

- Over time generationally adapting the presentation of the information in a cycle of continual growth. Improving each topic by adding in more data, measures, and visualizations

A Few Workforce Use Cases

- Things to think about:

  - Can you see yourself and others using these products?

    - Are they at the right geographic level?

    - Are they detailed enough?

    - Are there additional components that could improve the product?

  - If not, why not?

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Current State of Two Data Assets

- Administrative data – (Patient Discharge Data (PDD), Emergency Department Data (ED) and Ambulatory Surgery Data (AS)):
  - Has been around forever and is of known good quality.
  - Hospitals only.
  - All patients – insured or not.

- Healthcare Payments Data (HPD):
  - It is brand new, and we have just started evaluating quality of the data.
  - All healthcare settings.
  - Only patients with insurance (employer self-insured plans are not included).

Use Case #1: Preferred Languages Spoken in California Facilities

Facility and Preferred Language Counts, 2021

County	Facility Name
(All) ▼	(All) ▼

Health Professional Shortage Area (HPSA) - Primary Care	Health Professional Shortage Area (HPSA) - Mental Health
(All) ▼	(All) ▼

Facilities with at Least 50 Patients Who Prefer to Speak:
(All) ▼

Facilities in the Top 25% of Patients Who Prefer to Speak:
(All) ▼

Number of Facilities

469

Click on a language group below for more information by facility

Language Group: African Languages, Asian/Pacfic Islander Languages, English Language and 6 more

Facility: All

Advanced Endoscopy Center	English Language	2,220 (68.0%)	English	14,214,760
	Spanish Language	980 (30.0%)	Spanish	1,932,170
	Asian/Pacfic Islander Languages	62 (1.9%)	Vietnamese	56,629
	Middle Eastern Languages	1 (0.0%)	Cantonese; Yue Chinese	37,833
	Latin American Languages	1 (0.0%)	Chinese	34,692
Adventist Health and Rideout	English Language	66,160 (91.6%)	Arabic	29,906
	Spanish Language	4,010 (5.6%)	Armenian	26,651
	Asian/Pacfic Islander Languages	1,877 (2.6%)	Mandarin	26,168
	Middle Eastern Languages	113 (0.2%)	Tagalog	24,211
	European Languages	6 (0.0%)	Korean	22,641
	Latin American Languages	2 (0.0%)		

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Preferred Languages Spoken in California Facilities

- HCAI has collected Patient Discharge Data (PDD) for the past 20+ years, which includes patient demographics like patient preferred language spoken.

- Upon admission, each patient identifies the language they prefer to use when discussing their health care.

- **Use Case #1:** Identify specific language spoken by patients in facilities that are located in shortage areas.

- Link: https://hcai.ca.gov/visualizations/preferred-languages-spoken-in-california-facilities/

Facilities and Preferred Language Counts

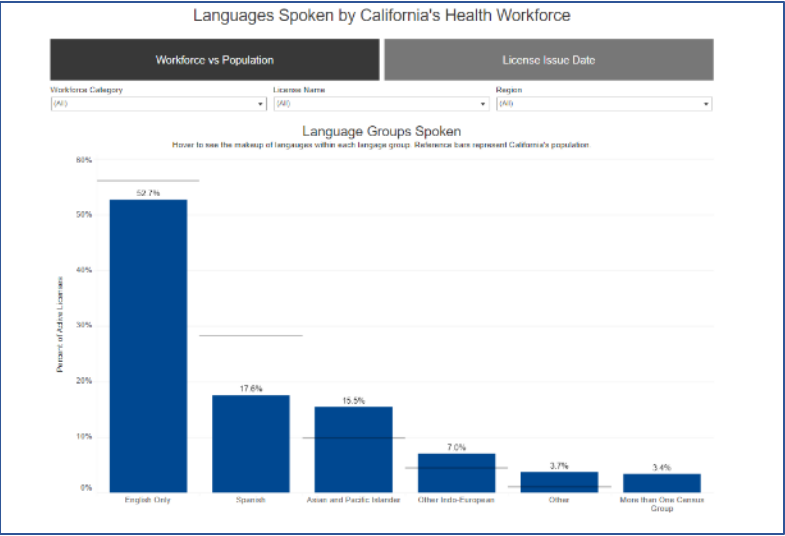Facility and Preferred Language Counts, 2021

County
(All)

Facility Name
(All)

Health Professional Shortage Area (HPSA) - Primary Care
Yes

Health Professional Shortage Area (HPSA) - Mental Health
(All)

Facilities with at Least 50 Patients Who Prefer to Speak:
(All)

Number of Facilities

1

Facilities in the Top 25% of Patients Who Prefer to Speak:
Asian/Pacific Islander Languages

Click on a language group below for more information by facility

Language Group: Asian/Pacfic Islander Languages

Facility: Garden Grove Hospital and Medical Center

Adventist Health and Rideout	Asian/Pacfic Islander Languages	1,877 (2.6%)
Clovis Community Medical Center	Asian/Pacfic Islander Languages	943 (1.1%)
Community Regional Medical Center – Fresno	Asian/Pacfic Islander Languages	2,442 (1.8%)
Garden Grove Hospital and Medical Center	Asian/Pacfic Islander Languages	1,861 (8.8%)
Greater El Monte Community Hospital	Asian/Pacfic Islander Languages	645 (3.4%)
Hollywood Presbyterian Medical Center	Asian/Pacfic Islander Languages	1,933 (4.2%)
Kaiser Foundation Hospital – Baldwin Park	Asian/Pacfic Islander Languages	1,661 (1.8%)

Vietnamese	1,483
Korean	368
Bengali	1
Chinese	1
Gujarati	1
Hindi	1

Generational Approach in Action

Patient Level Language Visualization

Provider Level Language Visualization

Coming Soon:
Brand New Language Visualization Mixing Patient and Provider Data

# Use Case #2: Top 5 Major Diagnostic Categories for each Hospital
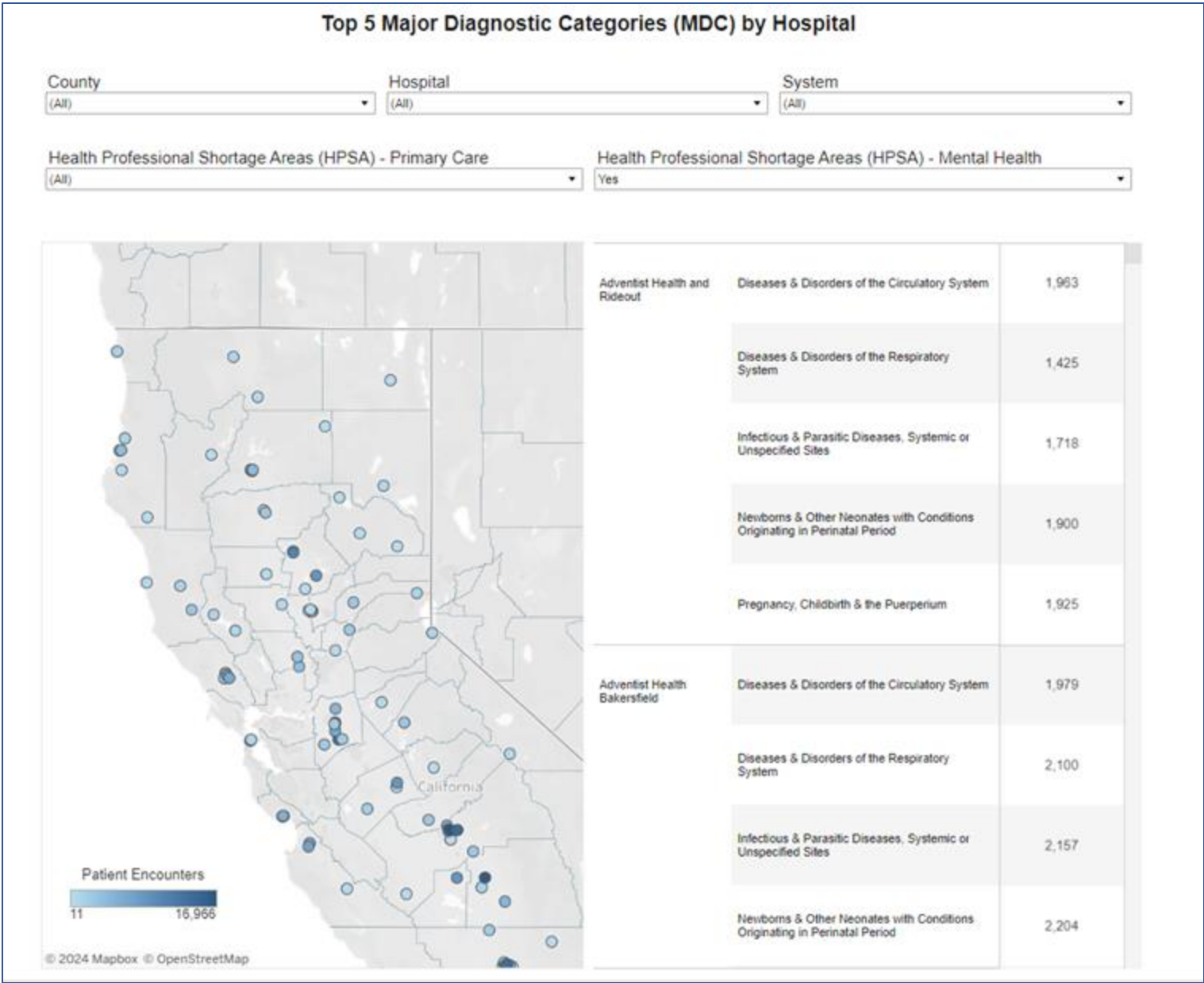
Top 5 Major Diagnostic Categories for each Hospital

- HCAI has collected Patient Discharge Data (PDD) for the past 20+ years, which includes patient diagnoses.

- Patient diagnoses have been grouped together into 25 mutually exclusive Major Diagnostic Categories (MDC), which are based on major organ systems, such as Respiratory System, Circulatory System and Digestive System.

- **Use Case #2:** Identify type of specialists needed for each hospital by locating hospitals which have high utilization of a specific category of diagnoses (MDC). For example, a hospital with more circulatory system diagnoses might need more cardiac specialists.

- Link: https://hcai.ca.gov/visualizations/top-five-major-diagnostic-categories-mdc-for-california-hospitals/

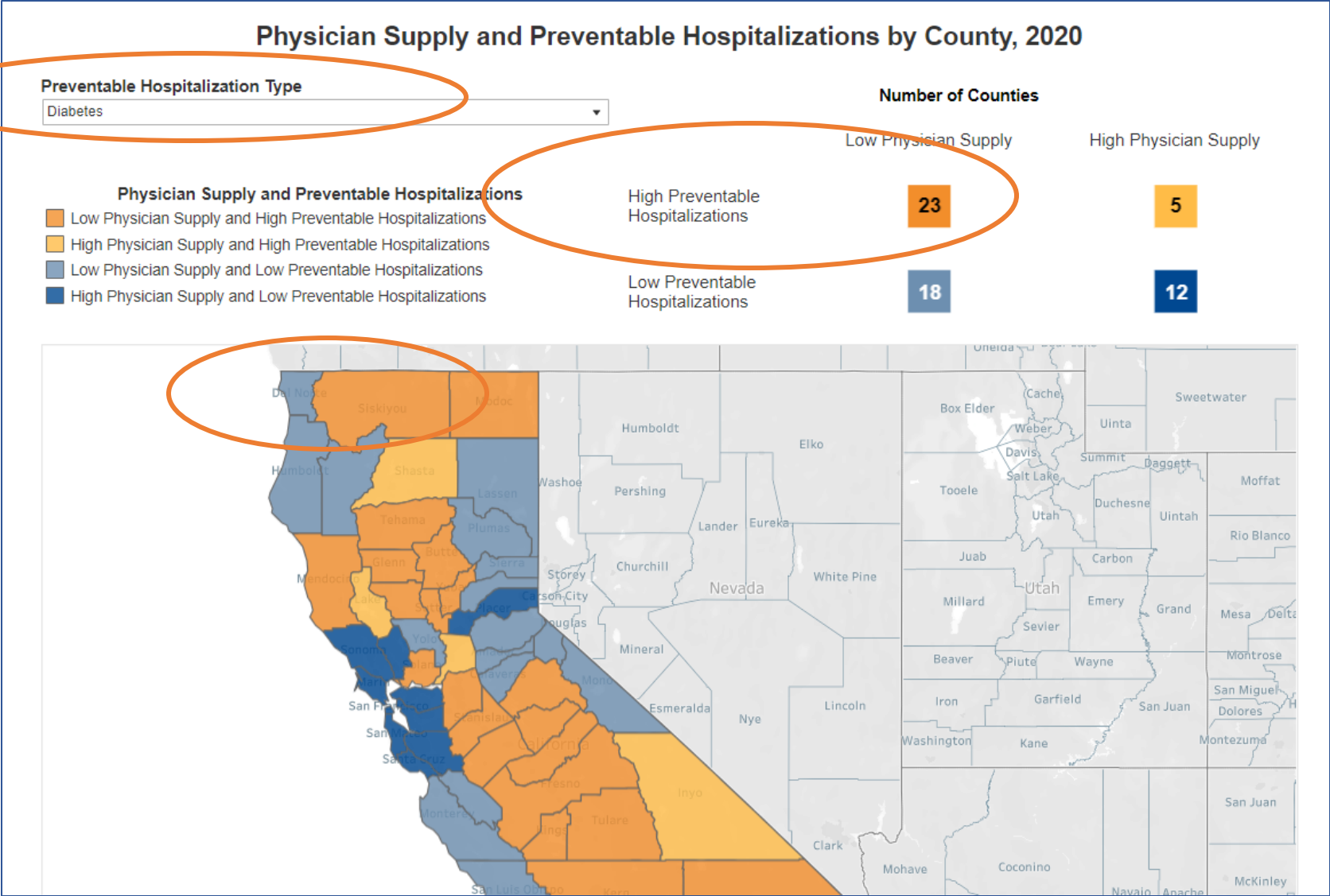# Top 5 Major Diagnostic Categories for each Hospital by Major Diagnostic Category
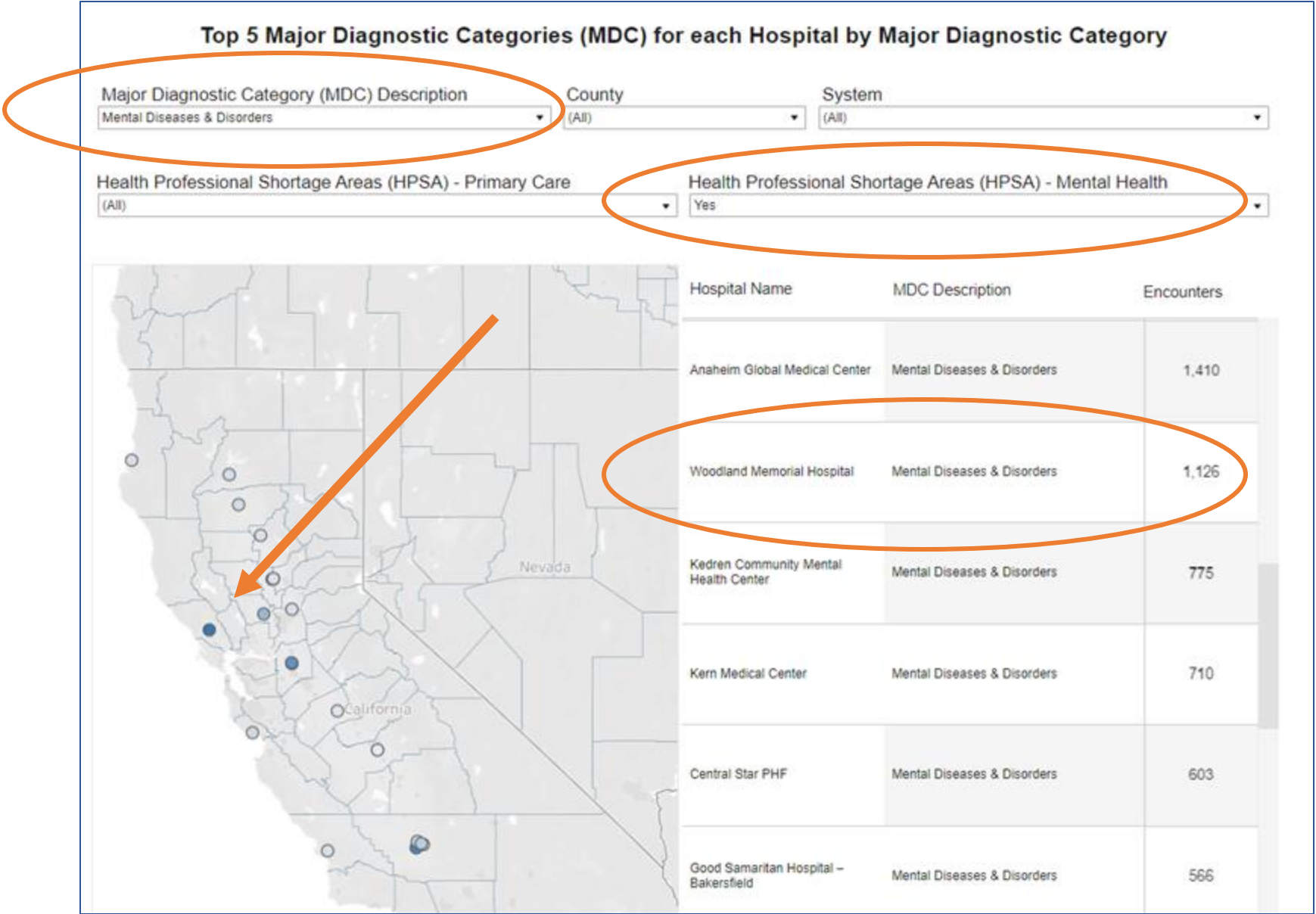
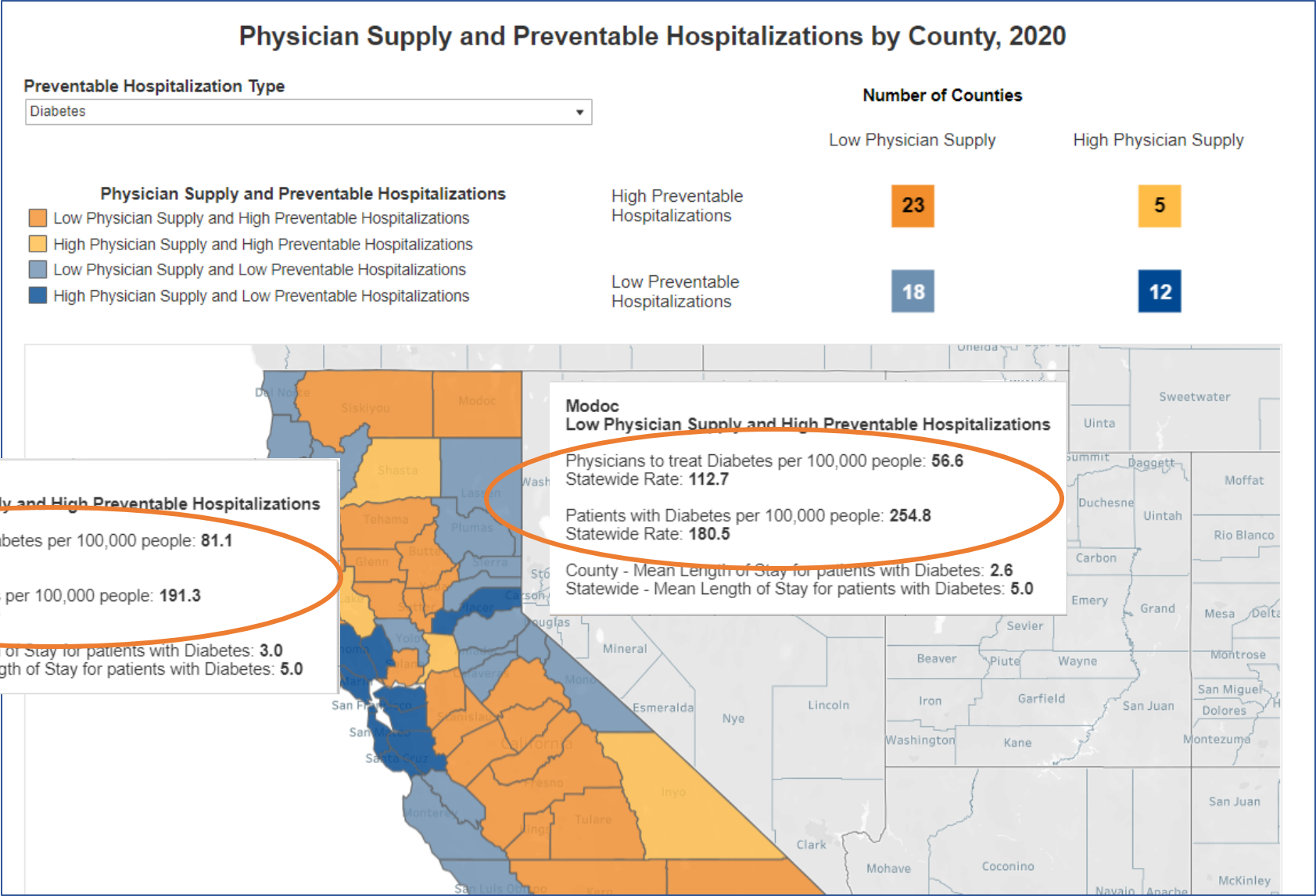# Use Case #3: Physician Supply and Preventable Hospitalizations by County
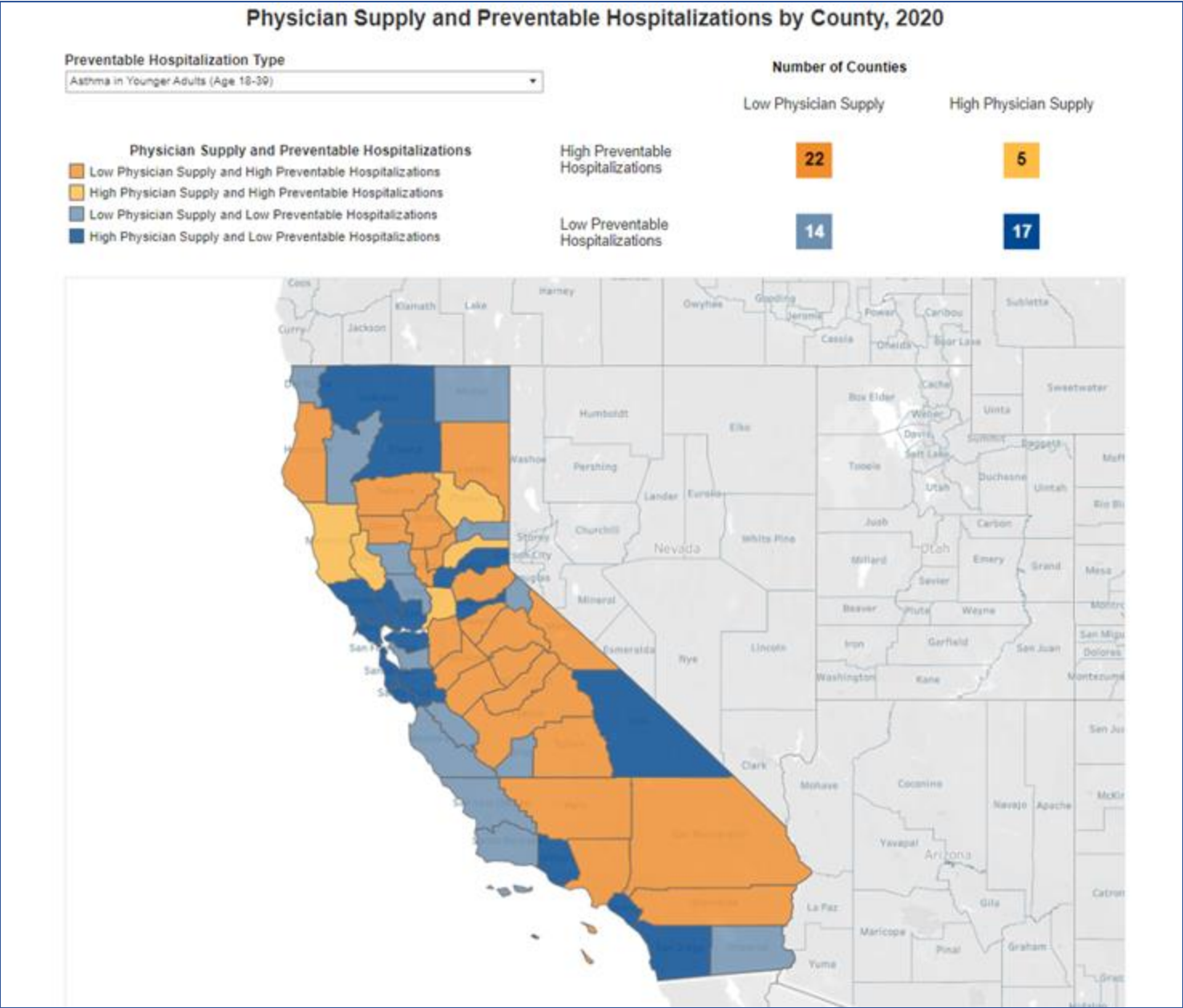
Physician Supply and Preventable Hospitalizations by County

- HCAI collects physician information from the Medical Board of California and Osteopathic Board of California. Including physician's patient hours and medical specialty.

- Physician supply was identified by physicians who responded that they work with patients full-time (40 or more hours a week).

- HCAI's Patient Discharge Data (PDD) also includes patient demographics, procedures performed and patient diagnoses.

- Patient diagnoses are used to identify patients whose hospitalization could have been prevented, had they received quality primary health care. These are known as Prevention Quality Indicators (PQIs).

- Link: https://hcai.ca.gov/visualizations/physician-supply-and-preventable-hospitalizations-by-county/

# Physician Supply and Preventable Hospitalizations by County

Physician Supply and Preventable Hospitalizations by County, 2020

Preventable Hospitalization Type: Diabetes

Physician Supply and Preventable Hospitalizations
- Low Physician Supply and High Preventable Hospitalizations
- High Physician Supply and High Preventable Hospitalizations
- Low Physician Supply and Low Preventable Hospitalizations
- High Physician Supply and Low Preventable Hospitalizations

Number of Counties

	Low Physician Supply	High Physician Supply
High Preventable Hospitalizations	23	5
Low Preventable Hospitalizations	18	12

Physician Supply and Preventable Hospitalizations by County

Physician Supply and Preventable Hospitalizations by County, 2020

Preventable Hospitalization Type
Diabetes

Number of Counties

	Low Physician Supply	High Physician Supply
High Preventable Hospitalizations	23	5
Low Preventable Hospitalizations	18	12

Physician Supply and Preventable Hospitalizations
- Low Physician Supply and High Preventable Hospitalizations
- High Physician Supply and High Preventable Hospitalizations
- Low Physician Supply and Low Preventable Hospitalizations
- High Physician Supply and Low Preventable Hospitalizations

Siskiyou
Low Physician Supply and High Preventable Hospitalizations

Physicians to treat Diabetes per 100,000 people: **81.1**
Statewide Rate: **112.7**

Patients with Diabetes per 100,000 people: **191.3**
Statewide Rate: **180.5**

County - Mean Length of Stay for patients with Diabetes: **3.0**
Statewide - Mean Length of Stay for patients with Diabetes: **5.0**

Modoc
Low Physician Supply and High Preventable Hospitalizations

Physicians to treat Diabetes per 100,000 people: **56.6**
Statewide Rate: **112.7**

Patients with Diabetes per 100,000 people: **254.8**
Statewide Rate: **180.5**

County - Mean Length of Stay for patients with Diabetes: **2.6**
Statewide - Mean Length of Stay for patients with Diabetes: **5.0**

Prevention Quality Indicator and Physician Primary Area of Medical Focus

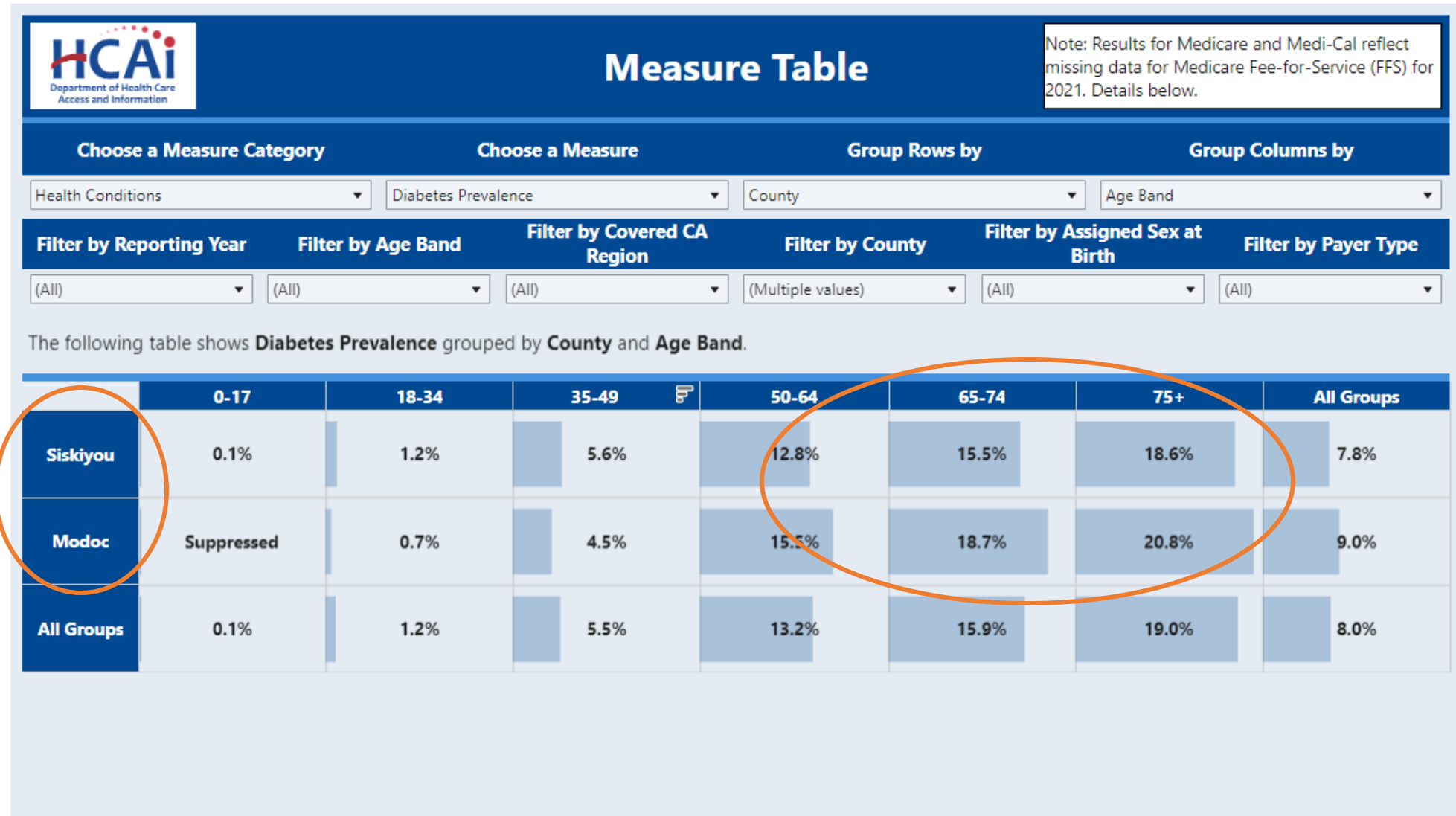| Prevention Quality Indicator	Physician Primary Area of Medical Focus
Chronic Obstructive Pulmonary Disease (COPD) (chronic bronchitis or emphysema) or Asthma in Older Adults (ages 40 and over; PQI#5)	Allergy & Immunology, Family Medicine, General Practice, Geriatric Medicine, Internal Medicine, Pulmonary, and Radiology
Hypertension (high blood pressure; PQI#7)	Cardiology, Emergency Medicine, Family Medicine, General Practice, Geriatric Medicine, Internal Medicine, and Nephrology
Heart Failure (PQI#8)	Cardiology, Emergency Medicine, Family Medicine, General Practice, Geriatric Medicine, Internal Medicine, and Pulmonary
Community-Acquired Pneumonia (PQI#11)	Family Medicine, General Practice, Geriatric Medicine, Infectious Disease, Internal Medicine, Pathology, and Pulmonary
Urinary Tract Infection (UTI; PQI#12)	Family Medicine, General Practice, Internal Medicine, Obstetrics and Gynecology, and Urology
Asthma in Younger Adults (ages 18-39; PQI#15)	Allergy & Immunology, Family Medicine, General Practice, Internal Medicine, Pulmonary, and Radiology
Diabetes (PQI#93)	Endocrinology, Cardiology, Neurology, Family Medicine, General Practice, Geriatric Medicine, Internal Medicine, Nephrology, and Ophthalmology

Healthcare Payments Data (HPD) Measures: Health Conditions, Utilization, and Demographics
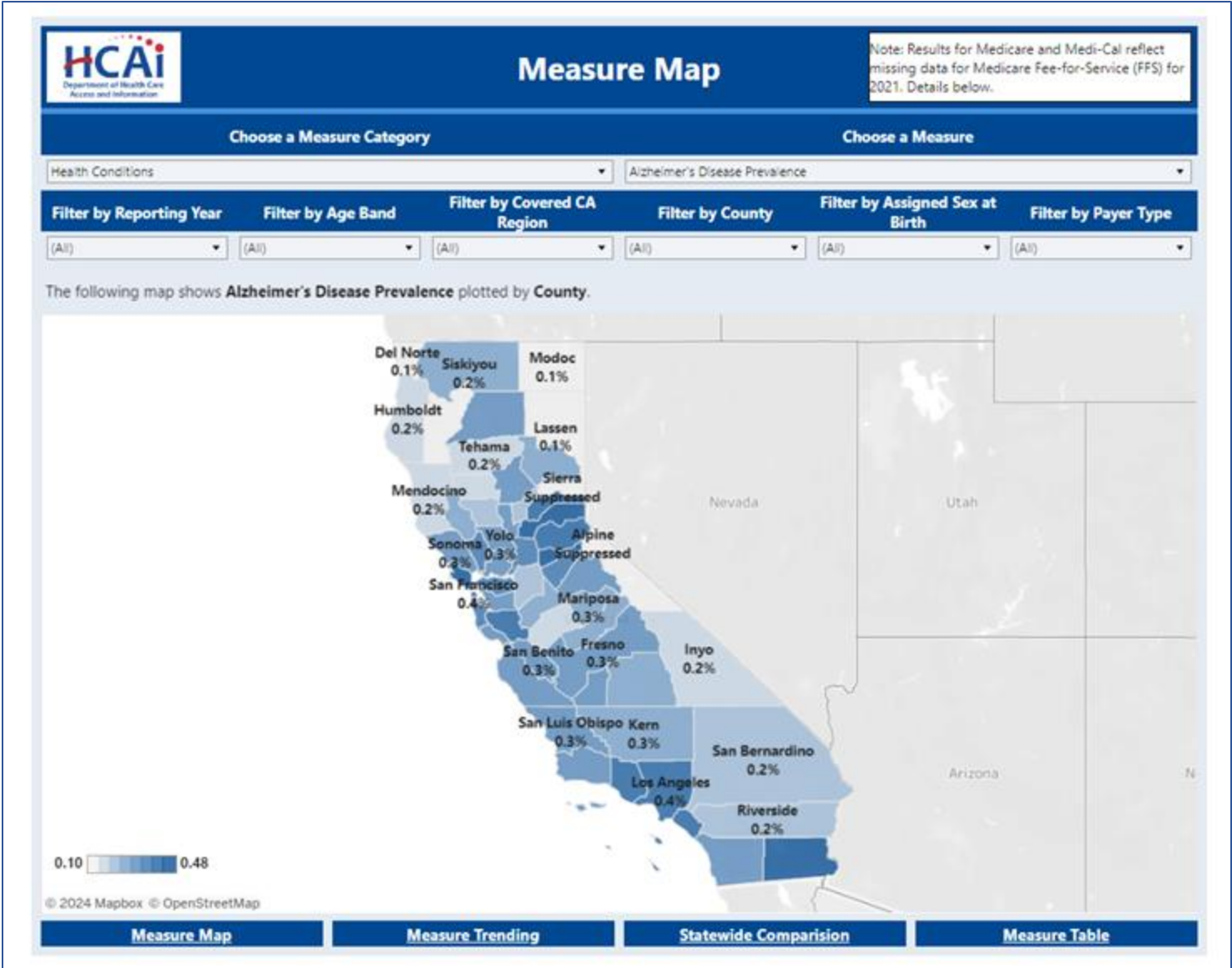
Healthcare Payments Data (HPD) Measures: Health Conditions, Utilization, and Demographics

- The HPD measures dashboard can be used to better understand the patient characteristics of the underlying population of several health conditions.

  - Patient characteristics includes Sex, Age Categories, Payer type (Medi-Cal, Medicare and Commercial coverage) and County of Residence.

  - Health conditions includes Asthma Prevalence, Hip/Pelvic Fracture Prevalence and Diabetes Prevalence.

- Link: Healthcare Payments Data (HPD) Measures: Health Conditions, Utilization, and Demographics - HCAI

Measure Table

Measure Table

Measure Table

Generational Approach in Action

Original PQI Dashboard

Risk-Adjusted Rates for Prevention Quality Diabetes Composite by County, 2020
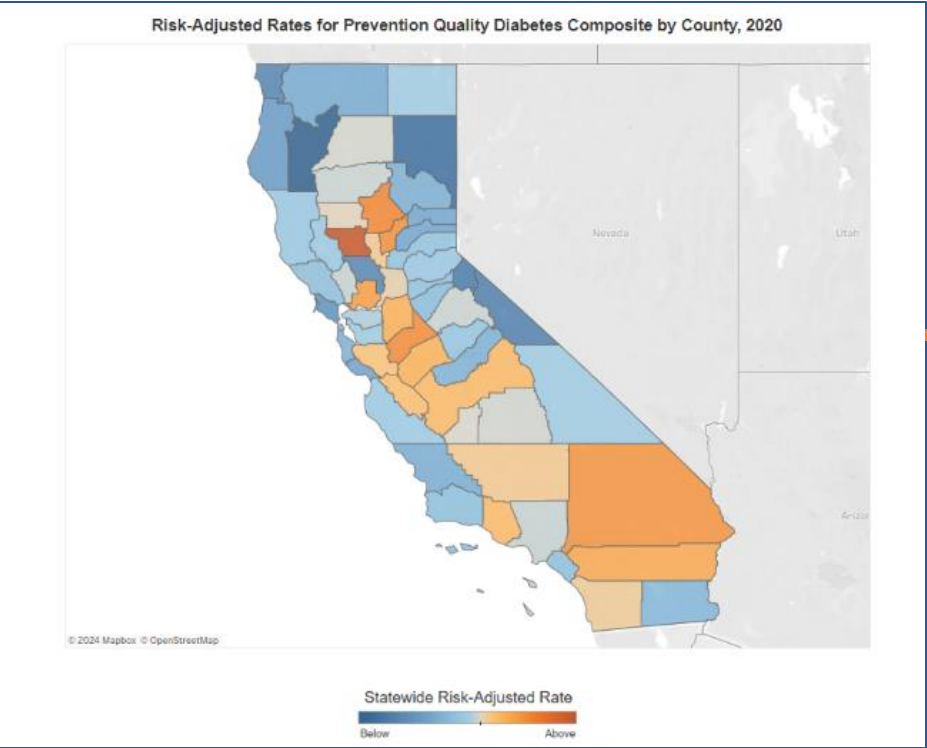
Augmented PQI Dashboard

Physician Supply and Preventable Hospitalizations by County, 2020
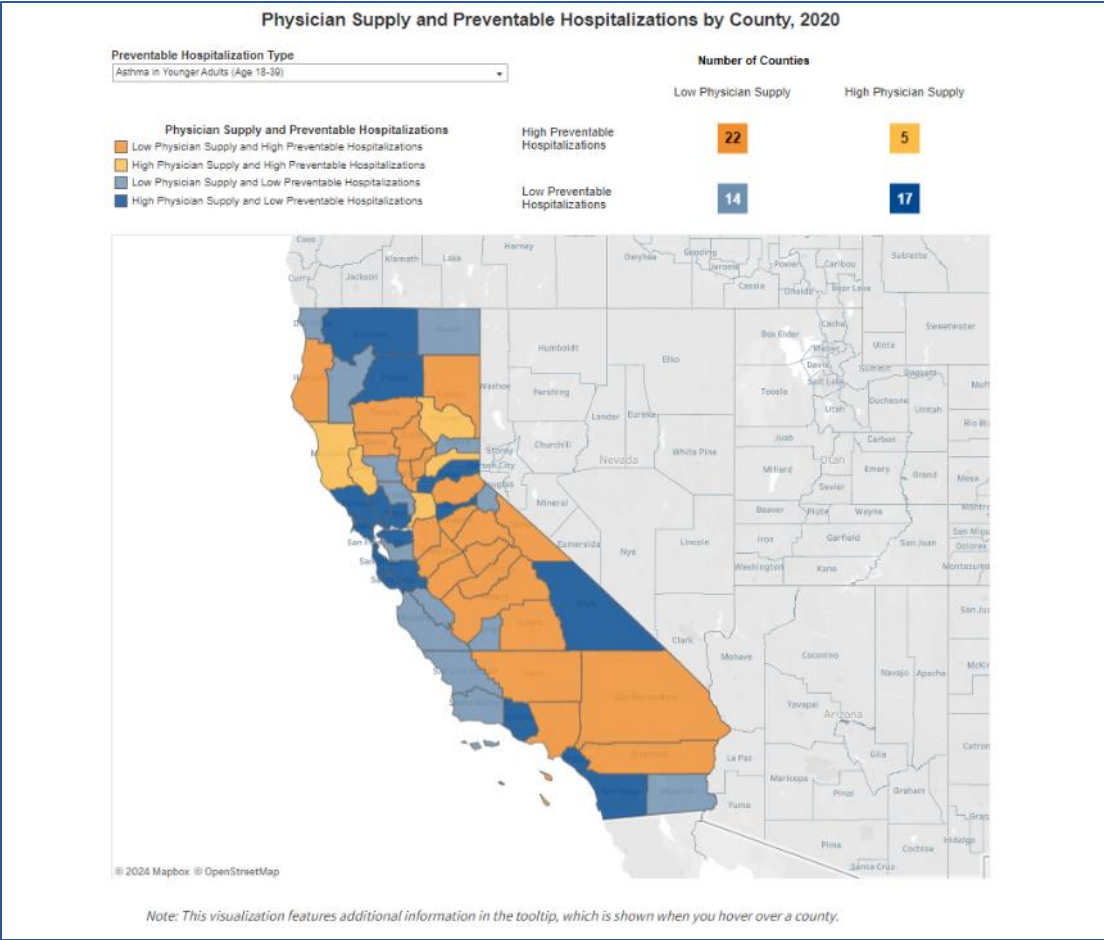
Discussion

A Few Workforce Use Cases

- Things to think about:

    - Can you see yourself and other using these products?

        - Are they at the right geographic level?

        - Are they detailed enough?

        - Are there additional components that could improve the product?

    - If not, why not?

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Three Use Cases

- Identify language matches between clinician and patient for facilities that need additional medical staff (Languages).

- Identify the type of specialists needed at each hospital by locate hospitals that have high utilization of a specific category of diagnoses (MDC) among their inpatient population (Top 5 DX).

- Identify counties that have an increased number of preventable hospitalizations and a smaller number of physicians available to identify and treat the underlying condition (Physicians by Hospitalizations for each county).