

# Population Centric Intelligence: Using Data Segmentation and Community Health Assessments for Better Patient Insights

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**UC Irvine Health**

American Nursing Informatics Association



**Stony Brook  
Medicine**

# Nurse Leadership in Population Health

- Historically, Nursing has provided the bridge between the lives that patients live and the healthcare services being delivered to them
- Population Health requires a bridge between the lives that populations live and the positive healthcare decisions we need them to make
- Nurses are the most historically intuitive leaders in the area of population health

# Agenda

- Background, Business Challenges and Implications
- Analytics Strategy and Objectives
- Use Case and Example
- Next Steps

# Background

## UC Irvine Health

- Academic Medical Center and Health System
- Consistently ranked among the nation's best hospitals in the US News and World Report for 15 years
- Only comprehensive Cancer Center and Stroke and Cerebrovascular Center in Orange County, CA



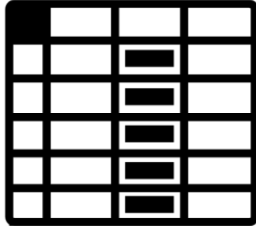
# Business Challenges

- Significant Information Gaps in Value based Care Models
- You are about to go at-risk for a patient population, what do you know about them?
  - Do you know what conditions they have?
  - Do you know what they are being treated for?
  - Do you know what they have that they are not being treated for?
- You have predicted the high-risk patients, now what?
  - Do you know how to best communicate with them?
  - Do you know what is driving non-compliance?
  - If you did know, would you know what to do about it?
- You are contracting with a group of providers, why them?
  - Are they the right providers for your population?
  - Are you giving them the tools they need for your patients?



# Evolution of Healthcare Analytics

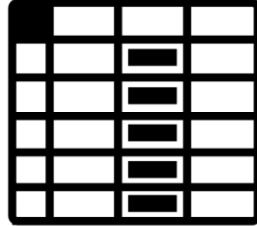
Spreadsheets



Data Visualization



Spreadsheets



Data Visualization



Data Visualization



Big Data Ecosystem



# Implications of these Challenges from a Population Health Management perspective

- Inability to meaningfully segment patient population based on risk, demographics, life style, socio-economic conditions, insurance coverage etc.
- Inability to proactively identify the multi-morbid/highest risk patients for care coordination
- Inability to proactively manage 30 day re-admission rates and other population health metrics resulting in higher penalties and fines
- Inability to differentiate offering based on quality of care delivery thru population health management excellence

# Analytics Strategy

Use advanced population health insights enabled thru  
Visual Analytics for Population Health Management

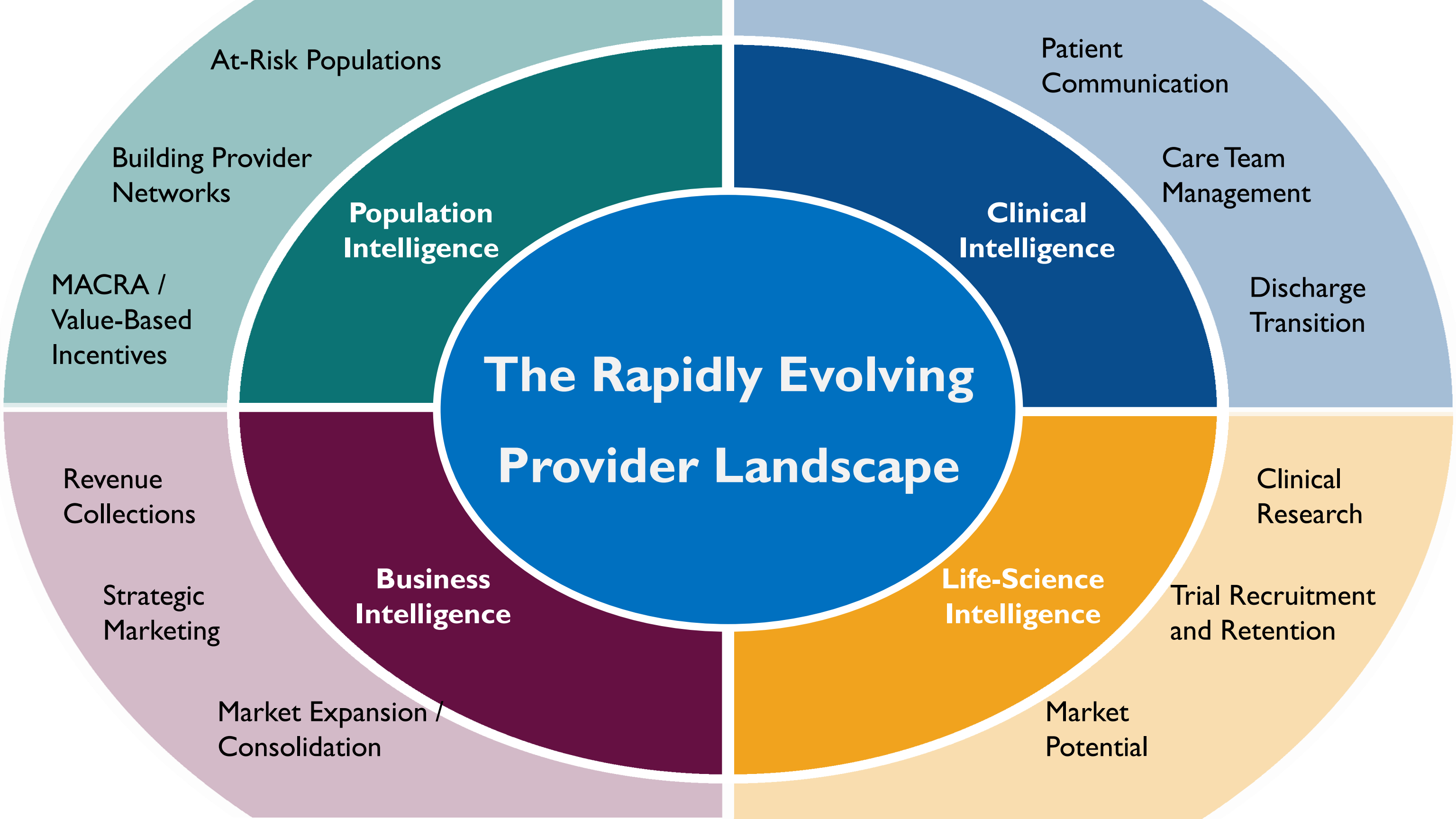
## Profile:

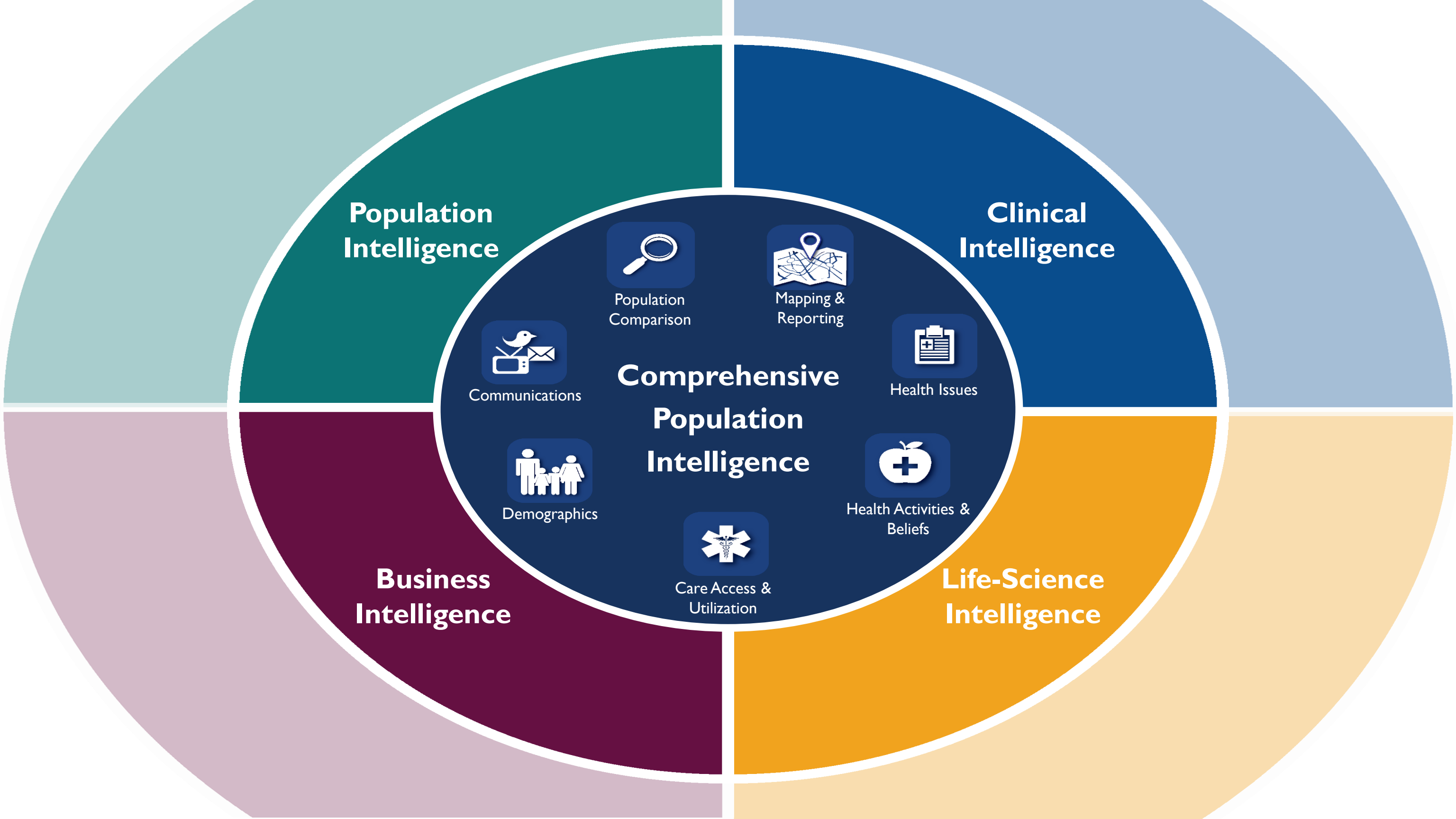
- Our Patients
- Competitors Patients
- Market Area of Interest

## In order to:

- Manage Care
- Manage Risk
- Grow Market Share







**Population Intelligence**

**Clinical Intelligence**



Population Comparison



Mapping & Reporting



Communications



Health Issues



Demographics



Health Activities & Beliefs



Care Access & Utilization

**Comprehensive Population Intelligence**

**Business Intelligence**

**Life-Science Intelligence**

# A Bit About Population Intelligence Data

- Locally sampled
- Self reported surveys (Non-PHI)
- Scalable to any geography
- 2 Billion data points / 100,000+ measures
- Current to the most recent quarter
- Social and economic determinants
  
- Terms
  - Designated Marketing Area (DMA)
  - Block Level

# A Bit About the Sources of Population Intelligence Data

- Exclusive Partnerships with trusted sources
- Geo-spatial and data equalization IP
- Rigorously tested and validated
  - Consistent, representative, equalized
- Methodology validated in multiple markets



# Data Driven Insights

## Demographics

Finance, Assets, Expenses  
Health Insurance  
Language and Ethnicity  
Household Composition  
Age and Gender  
Education  
Housing and Stability

## Care Delivery

Hospital Services  
Service Utilization  
Provider Utilization  
Tests & Procedures  
Monitoring & Testing  
Mobile Health  
Primary Care  
Preventative Care

## Activities

Caregiving  
Where & When  
Activities Done/ Preferred  
Purchasing  
Social Communications  
Restaurant & Grocery  
Anticipated Life Changes  
Driving & Transportation

## Products & Treatment

Treatments by Ailment  
RXN Consumption  
Medication Purchasing  
OTC Consumption  
Brand vs Generic  
Health-Related Products  
Remedies by Ailment  
Satisfaction with Treatment

## Health Behaviors

Food & Nutrition  
Smoking  
Alcohol Consumption  
Exercise  
Sedentary Behaviors  
Diet & Weight Loss  
Dental Care  
Provider-Driven Activities

## Opinions & Attitudes

Self-Care  
Providers,  
Medication & Treatment  
Health Education  
Health Motivation  
Family & Friends  
Lifestyle  
Technology & Information

## Health & Conditions

Conditions – Have/Had  
Treated & Untreated  
Discussed with Doctor  
Condition-Specific Issues Overall  
Health  
Mental Health  
Pain  
Stress & Wellbeing

## Marketing, Media, Technology

Health Information  
General Info. Sources  
Trusted/Valued Sources  
Internet Activities  
Mobile and Computer  
Social Media  
Radio and Television  
Print Media

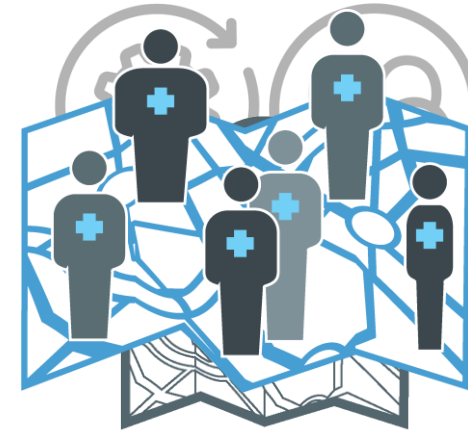
# Rapid Access to Insights: Patient Population



Identify & Locate  
Your Described  
Target Populations  
With Cancer  
Or  
UC Irvine  
Profile Medical  
National  
Addresses

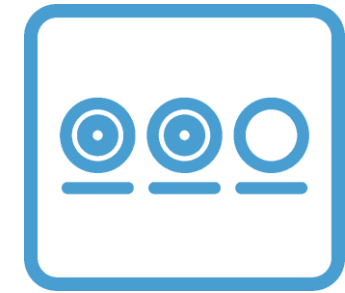


Advanced Many-  
Segmentation  
Process



Understand the Target  
Population  
Mapped and Layered with  
34,000 Insights to Your Specific  
Marketing and Target Populations  
and the Locations of their Care  
Providers

- Health Issues
- Care Access and Utilizations
- Demographics
- Communications
- Health Activities and Beliefs
- Related Provider Locations



**Analytics  
Platform**

Block Level Mapping  
Person Level Insights

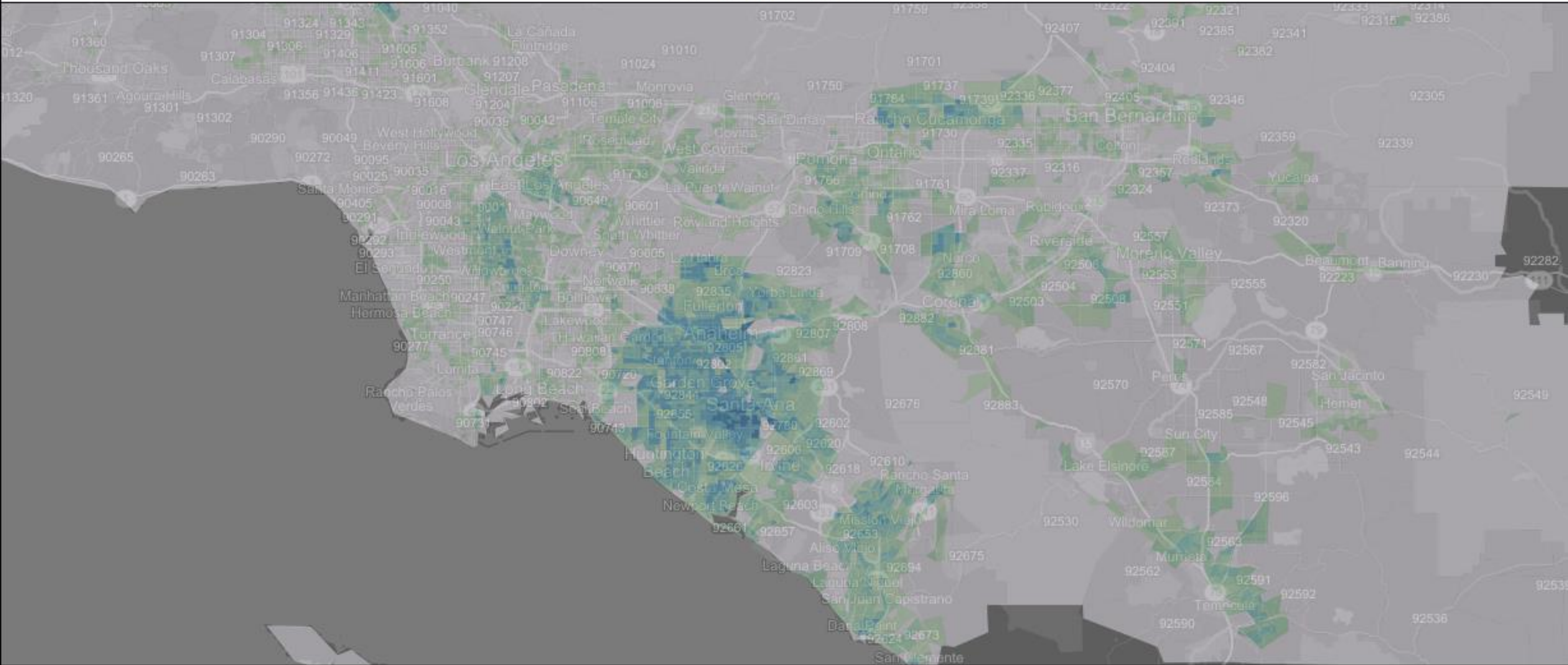
- Manage Risk
- Manage Care
- Grow Share



# Case Study: Understanding UC Irvine Health Patient Population and Markets

# Understanding UCI Patient by Density

UCI Medical Center  
UC Irvine Medical Center



# A Tale of Two Markets – Orange County and Inland Empire

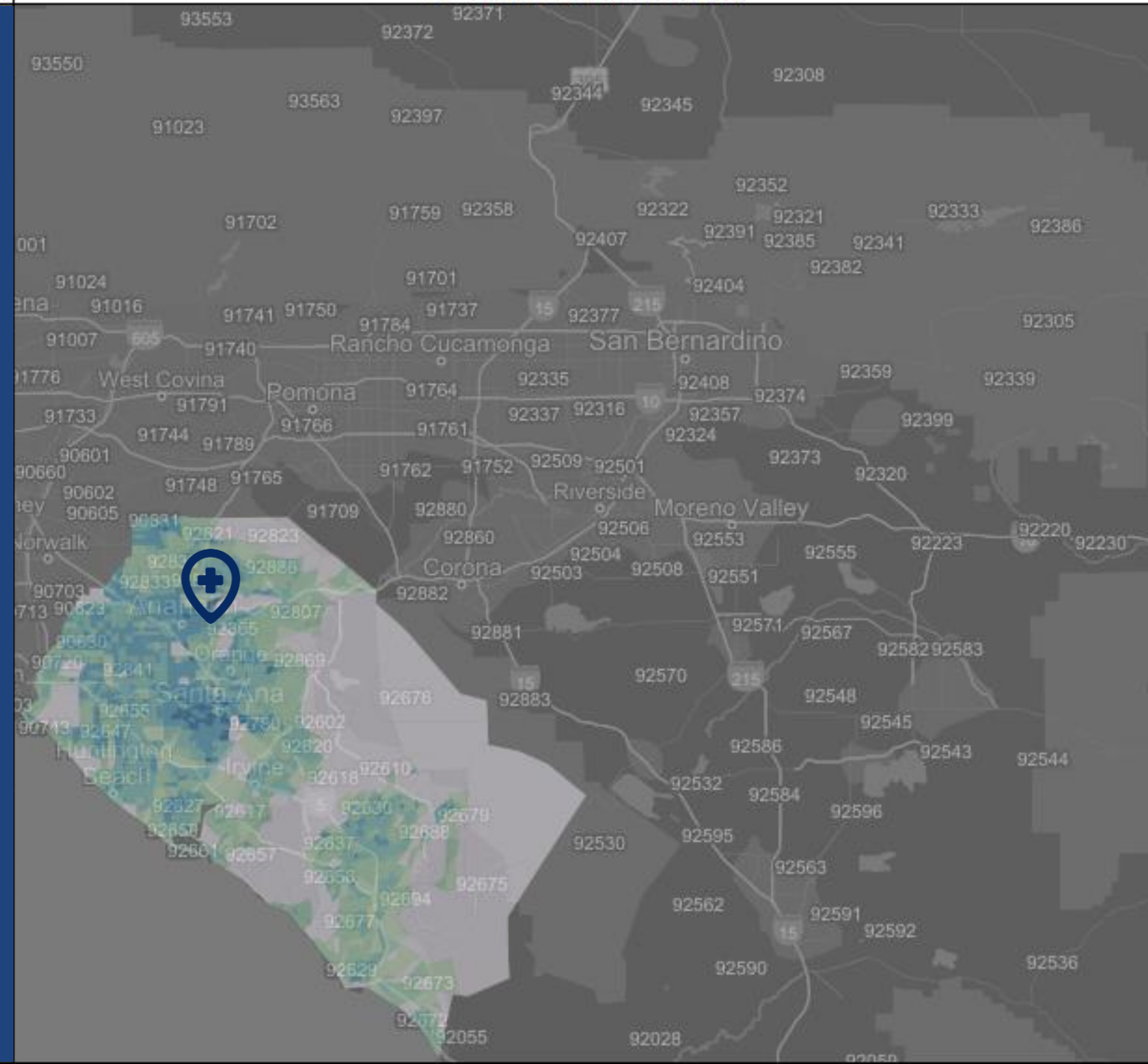
**Inland Empire**  
UC Irvine Medical Center

**Orange County**  
UC Irvine Medical Center

## Orange County

More Likely to:

- Have 2-3 people in the household
- Be Divorced
- Have older children or no children in the household
- Own a condo or town home
- Work in White Collar Jobs including Management and Sales







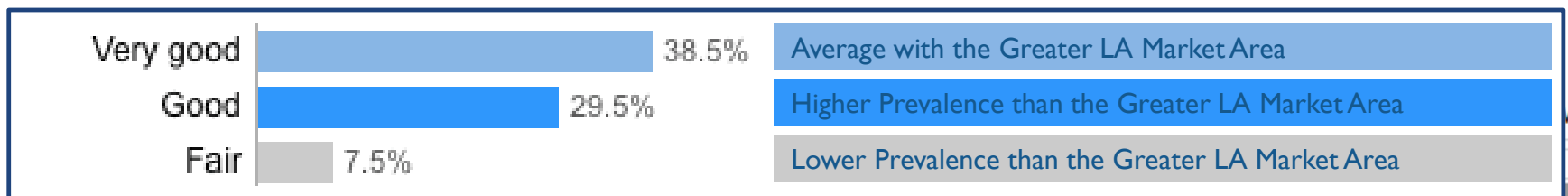
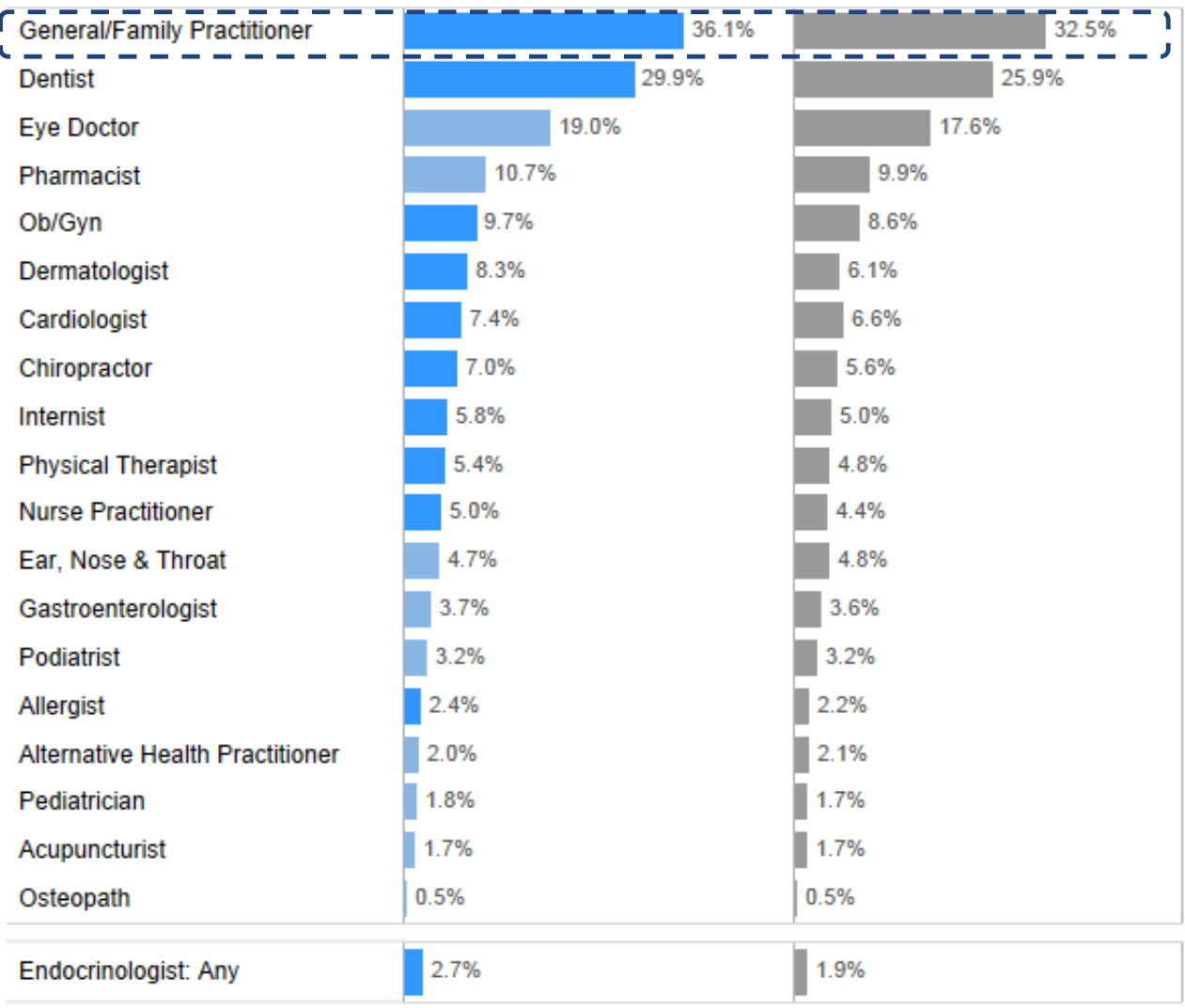
## Care Utilization and Access

### Care Utilization

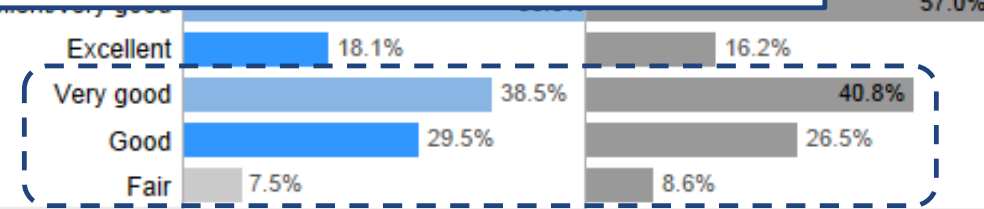
#### Population

Orange County

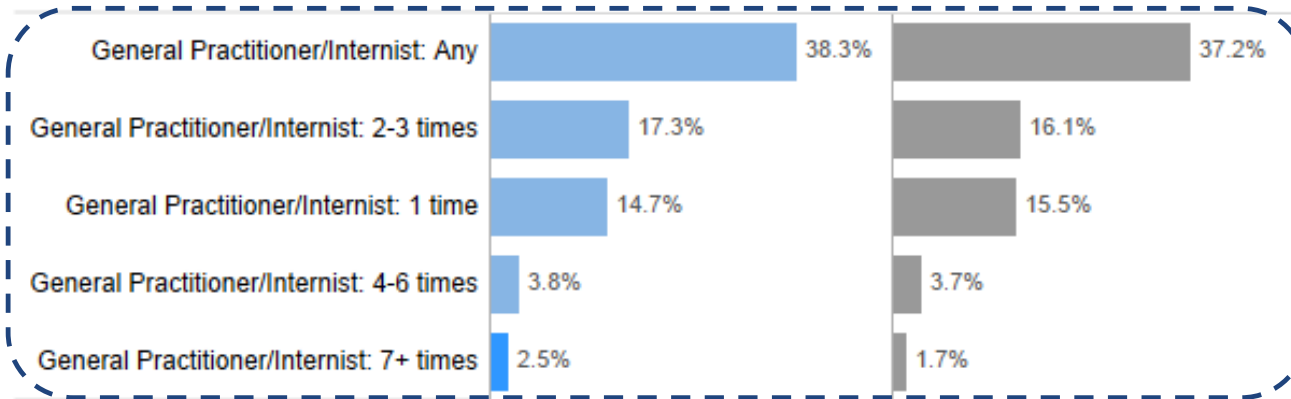
% Population Los Angeles DMA



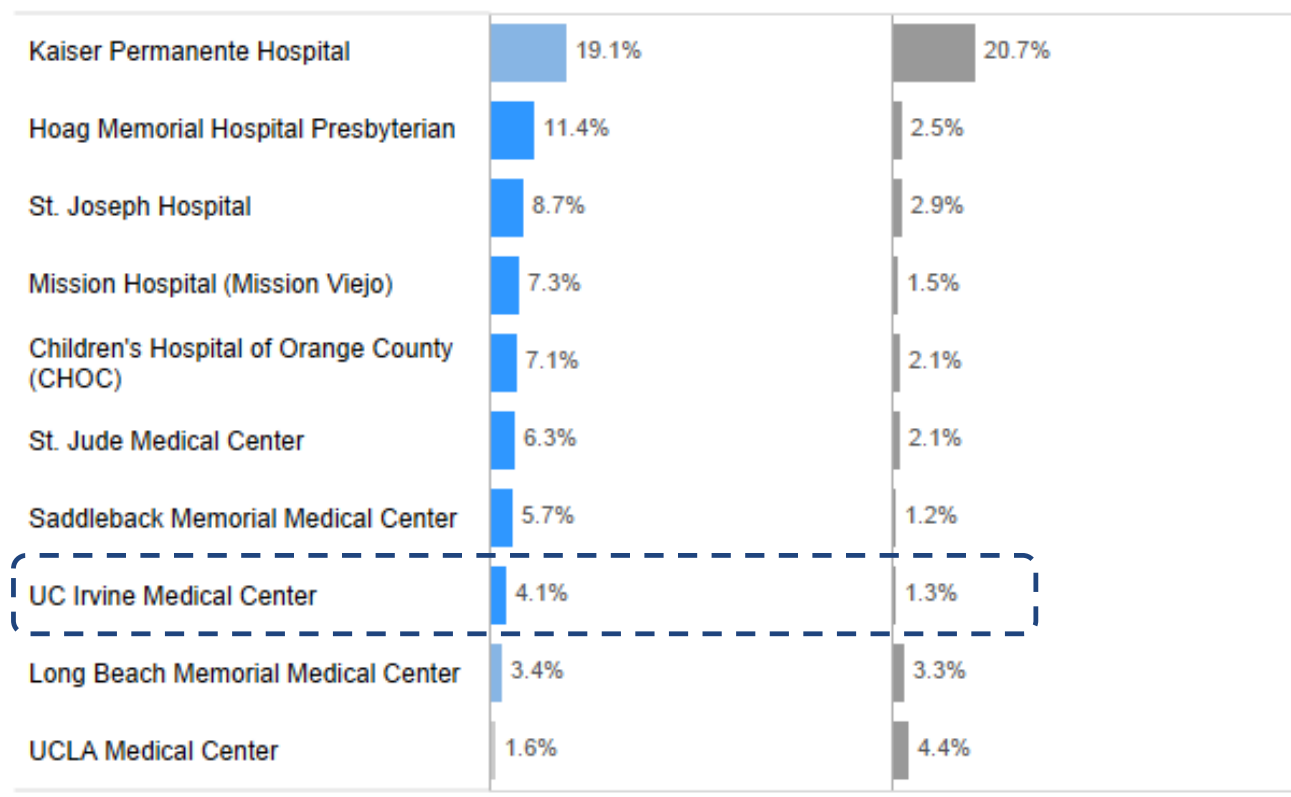
#### Describe Relationship with Primary Care Physician



#### # of Times Used General Practitioner



#### Hospitals Used (Household - past 3 years)



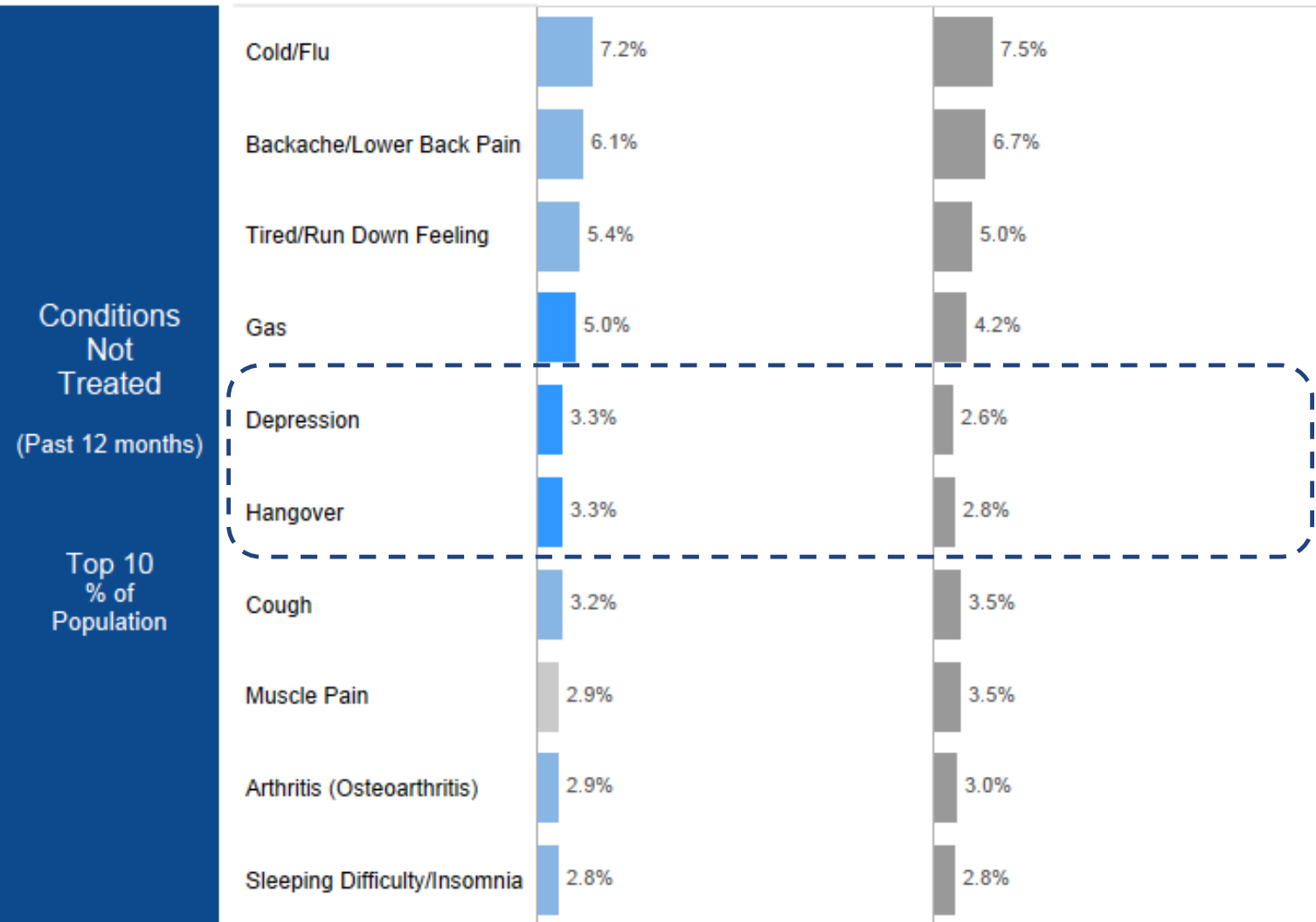
#### Practitioners Seen (last 12 months)



## Health Issues Conditions Not Treated

**Population**  
Orange County

% Population      Los Angeles DMA



**Market**  
Los Angeles DMA

Index      % Population

**High Index**  
Much more likely than the comparative market

**Conditions Not Treated**  
(past 12 months)

**Low Index**  
Much less likely than the comparative market

Condition	Index	% Population
Nerve Pain	165	2.2%
Food Allergy	146	2.0%
Hyperhidrosis/Excessive Sweating	130	0.3%
Depression	128	3.3%
Constipation/Irregularity	122	1.1%
Gas	119	5.0%
Hangover	115	3.3%
Psoriasis	115	1.1%
COPD (including Chronic Bronchitis and Emphysema)	109	0.5%
Tired/Run Down Feeling	107	5.4%
Overactive Bladder	64	1.1%
Sinus Congestion/Sinus Headache	63	1.5%
Dry Skin/Eczema	60	1.0%
Body Ache	58	1.5%
Fibromyalgia	58	0.2%
Yeast Infections	58	0.2%
Kidney Disease	53	0.1%
Enlarged Prostate/Benign Prostate Hyperplasia	51	0.2%
Gout	43	0.2%
Bipolar Disorder	37	0.3%



# Orange County — 3 of 3

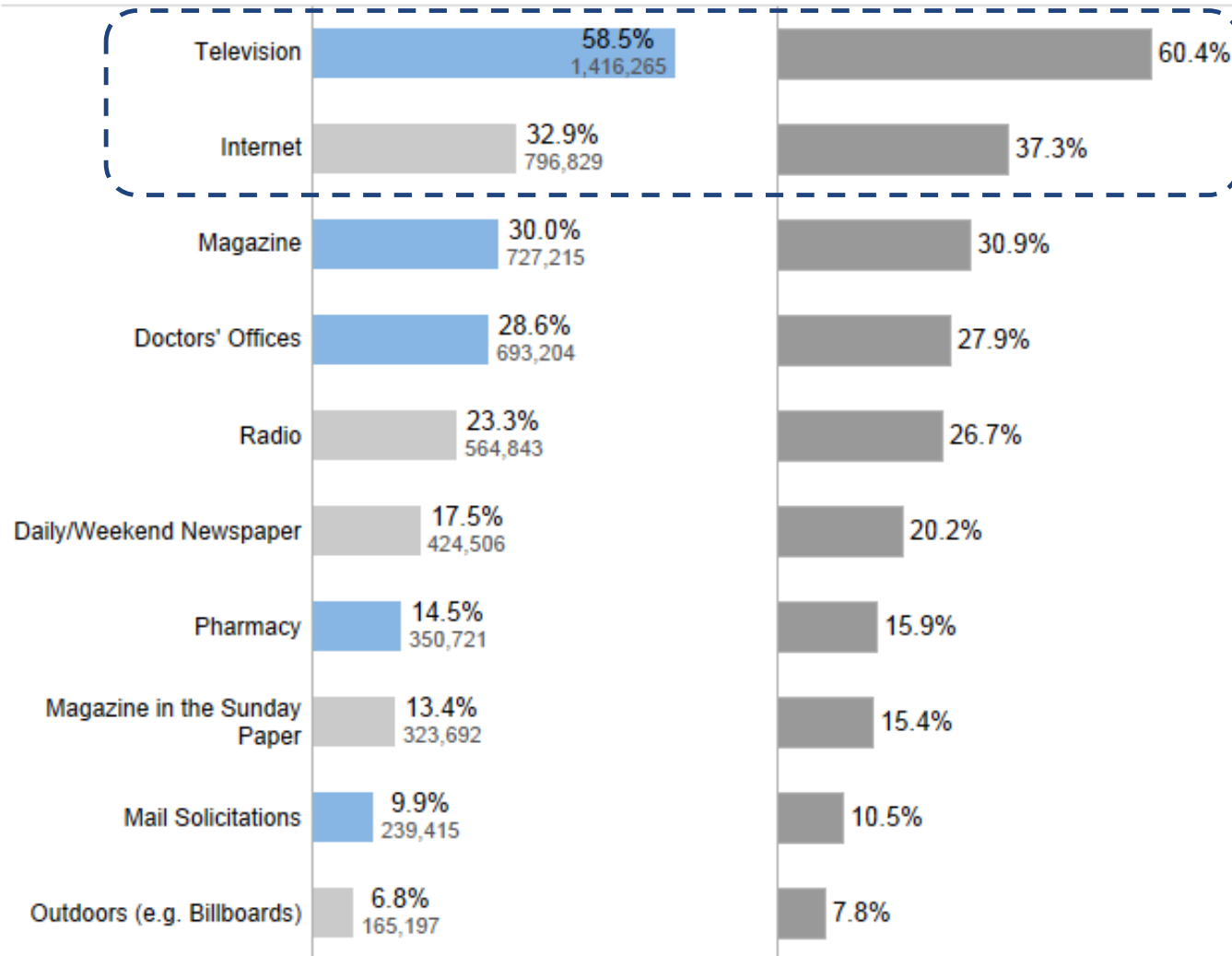
Patient Profiler



## Communication Health Marketing

Population Orange County

% Population Los Angeles DMA



Place Saw Healthcare Ads

Past 12 Months

Market

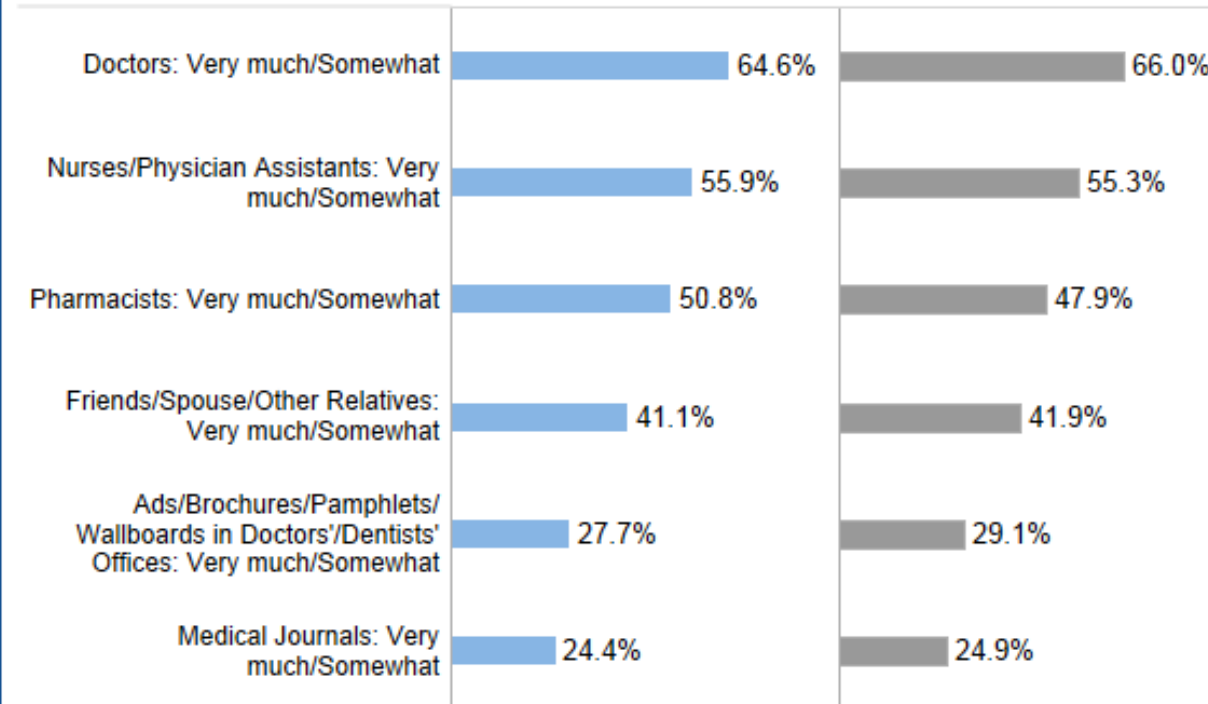
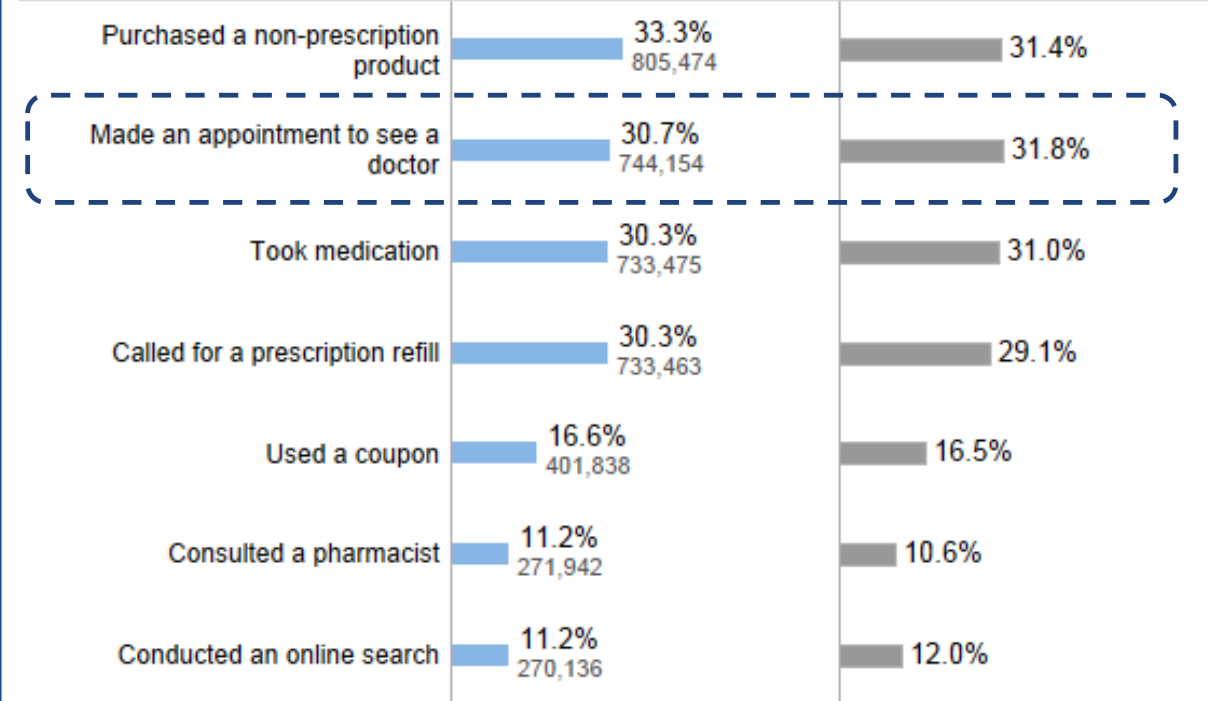
Los Angeles DMA

% Population

Los Angeles DMA

Actions taken due to Healthcare Ads Past 12 Months

Value of Healthcare Sources

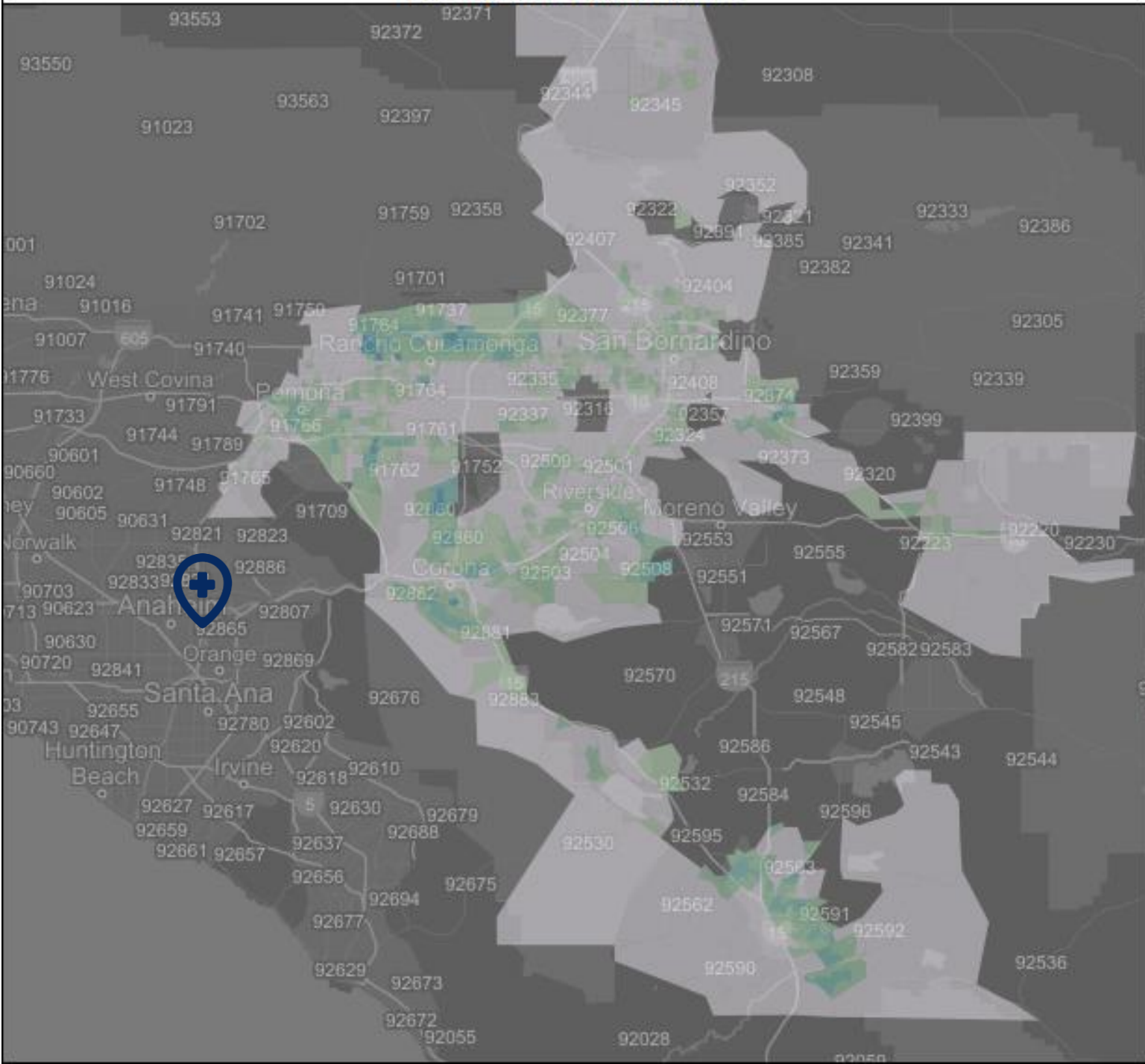




# A Tale of Two Markets – Inland Empire

**Inland Empire**  
UC Irvine Medical Center

**Orange County**  
UC Irvine Medical Center



## Inland Empire

More Likely to:

- Have 5-6 People in the household
- Be Married
- Have a child of any age living in the household
- Own a single family home
- Work in blue collar jobs including transportation and production

# Inland Empire – 1 of 3

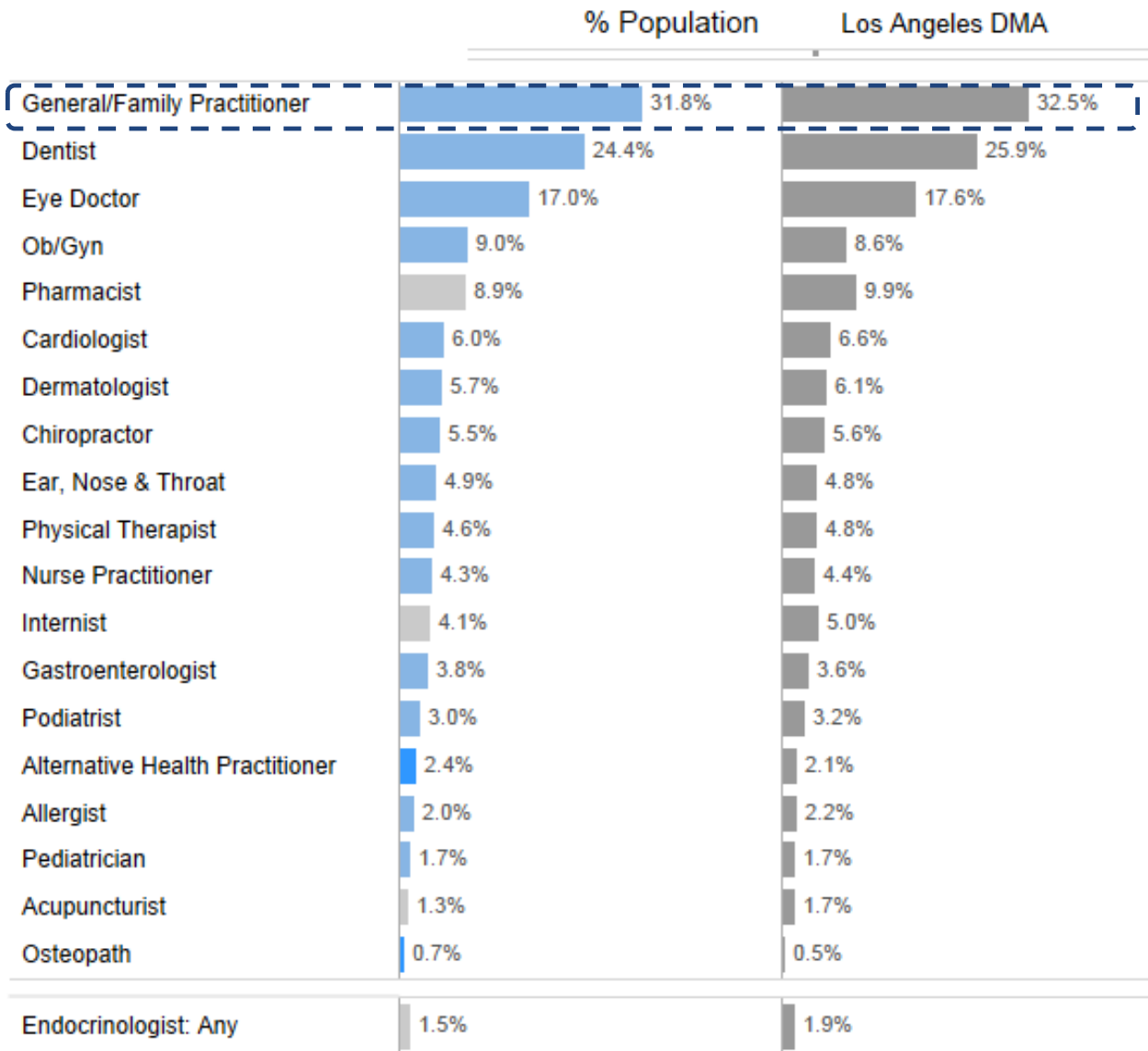
Patient Profiler



## Care Utilization and Access

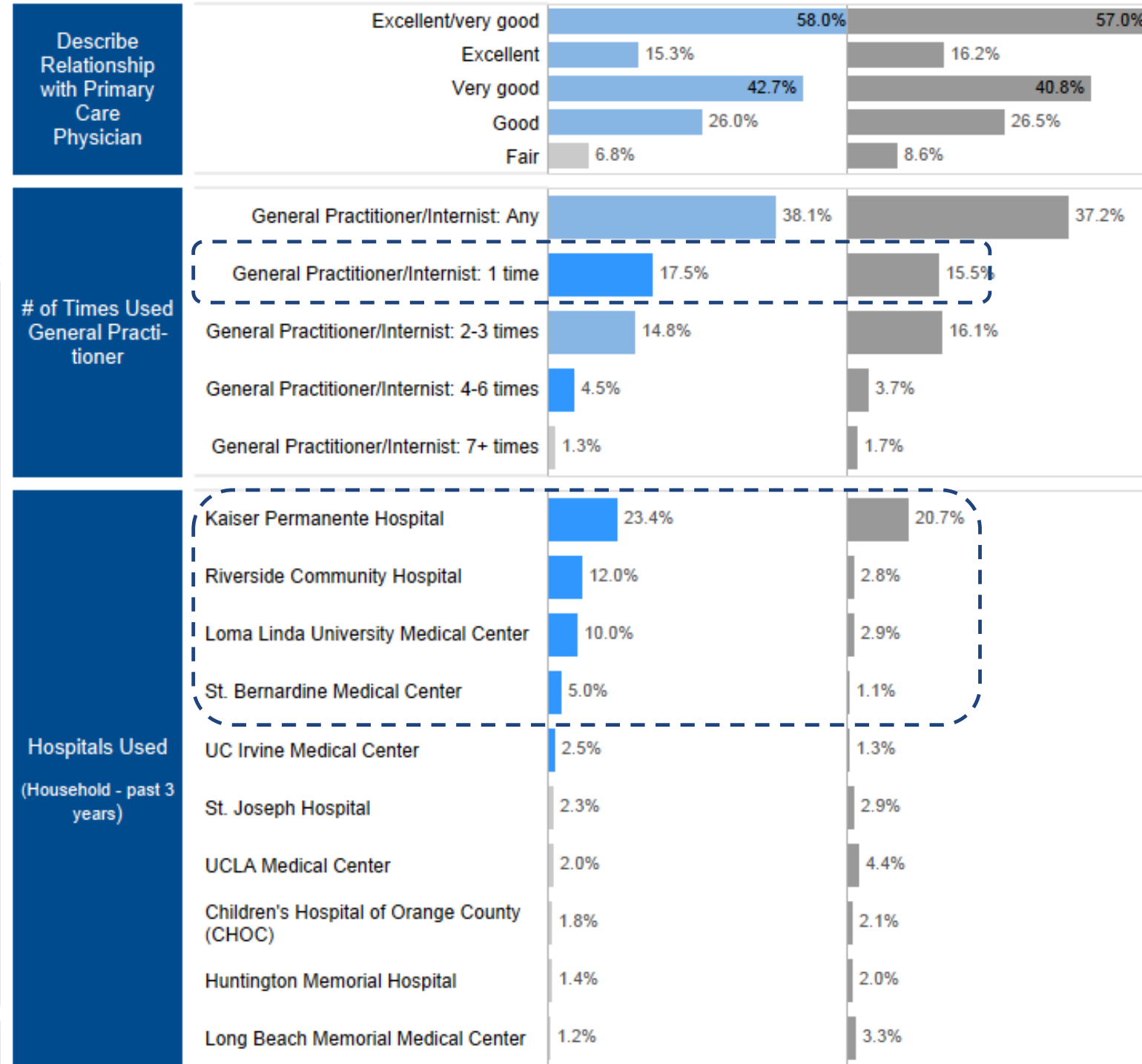
### Care Utilization

Population  
Inland Empire



Practitioners  
Seen  
(last 12 months)

Market  
Los Angeles DMA



# Inland Empire – 2 of 3

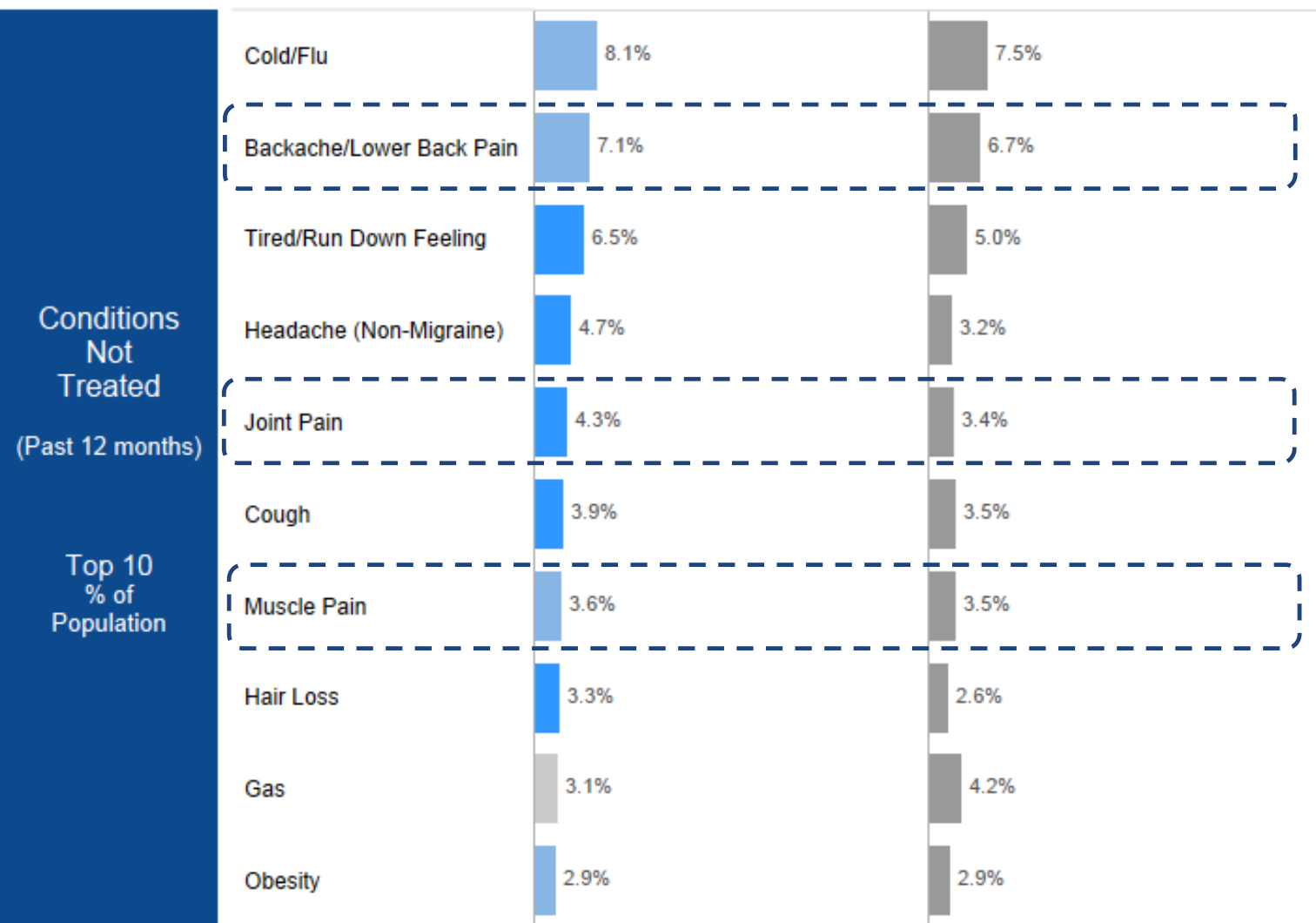
Patient Profiler



## Health Issues Conditions Not Treated

Population  
Inland Empire

% Population Los Angeles DMA



Market  
Los Angeles DMA

Index % Population

**High Index**  
Much more likely than the comparative market

**Conditions Not Treated**  
(past 12 months)

**Low Index**  
Much less likely than the comparative market

Condition	Index	% Population
Kidney Disease	233	0.5%
Diabetes (Insulin User)	201	0.4%
Irritable Bowel Syndrome (IBS)	193	1.4%
Enlarged Prostate/Benign Prostate Hyperplasia	192	0.9%
Herpes	191	0.4%
Anemia	183	0.9%
Urinary Tract Infections	175	0.9%
Diabetic Nerve Pain/Neuropathy	168	0.7%
Bipolar Disorder	152	1.1%
Headache (Non-Migraine)	150	4.7%
High Cholesterol	80	2.1%
Constipation/Irregularity	79	0.7%
Depression	76	2.0%
Dry Skin/Eczema	74	1.2%
Gas	74	3.1%
Athlete's Foot	73	0.4%
Erectile Difficulty	64	0.9%
Shingles	57	0.4%
Hypertension/High Blood Pressure	53	0.7%
Menstrual Cramps/Pain	45	0.7%

Compared to the DMA Population: [More Likely](#) [Equally Likely](#) [Less Likely](#)

# Inland Empire – 3 of 3

Patient Profiler

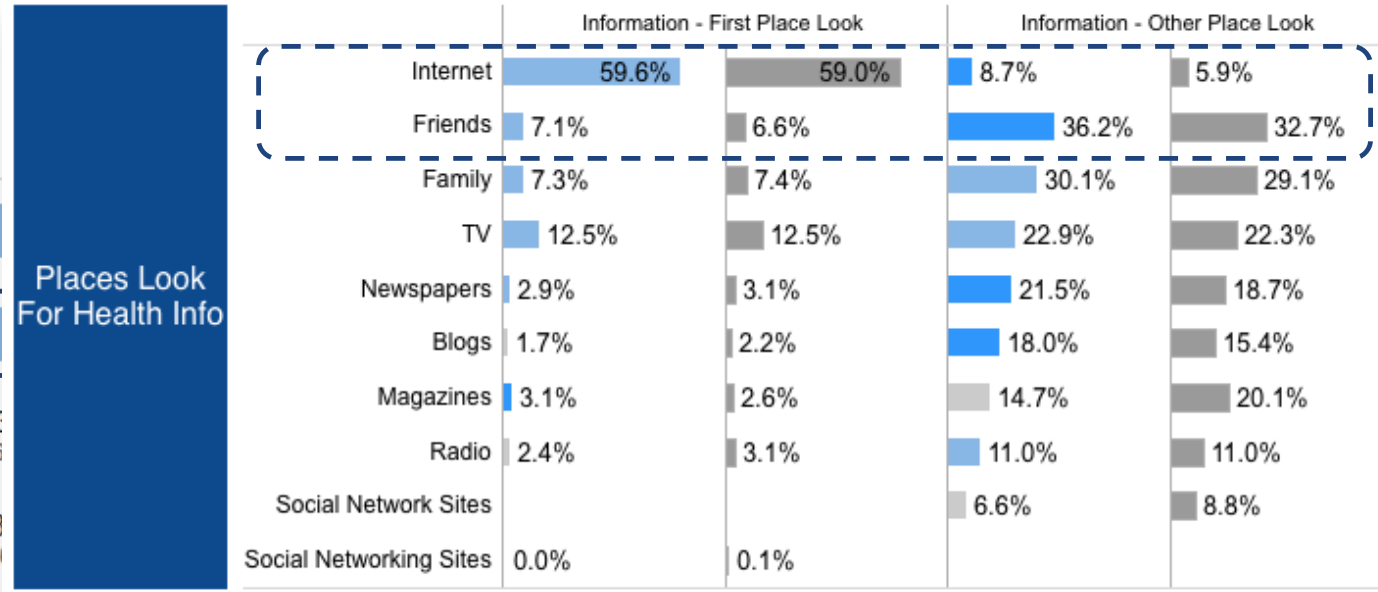
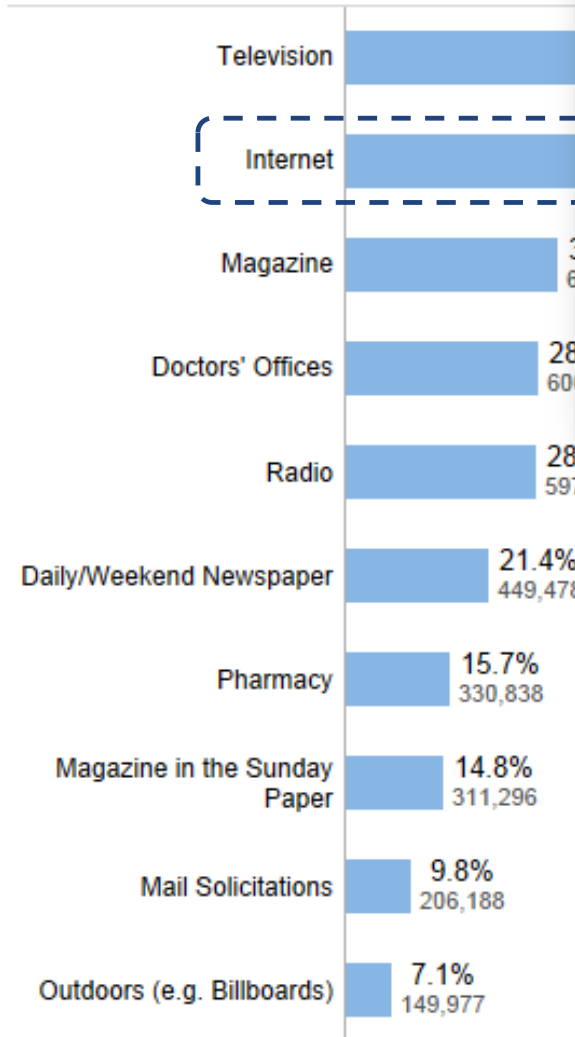


## Communication Health Marketing

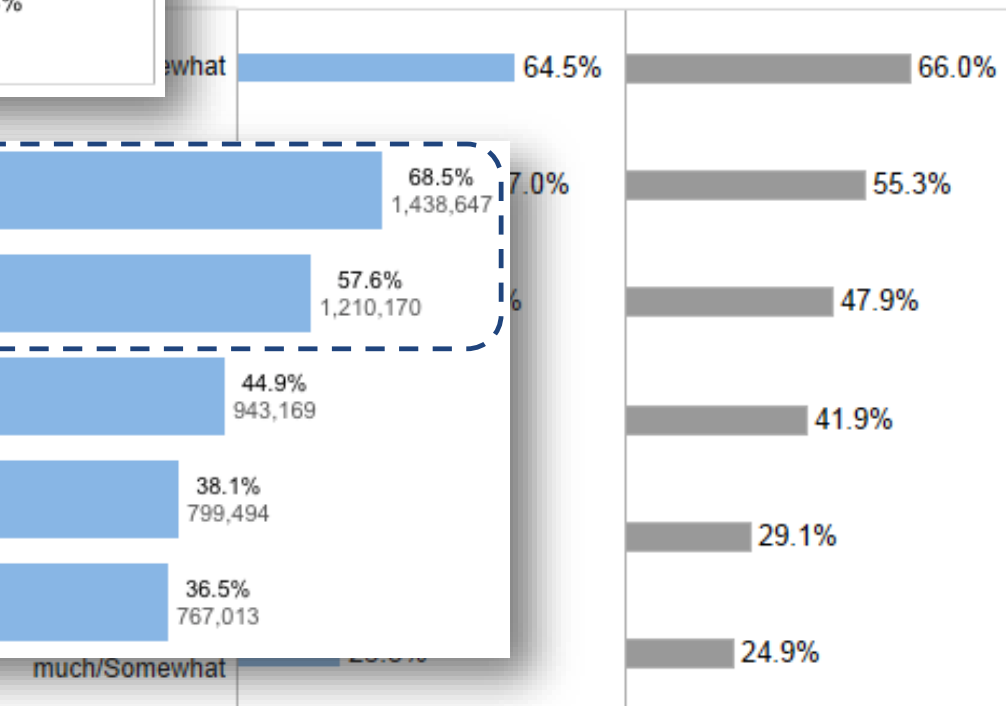
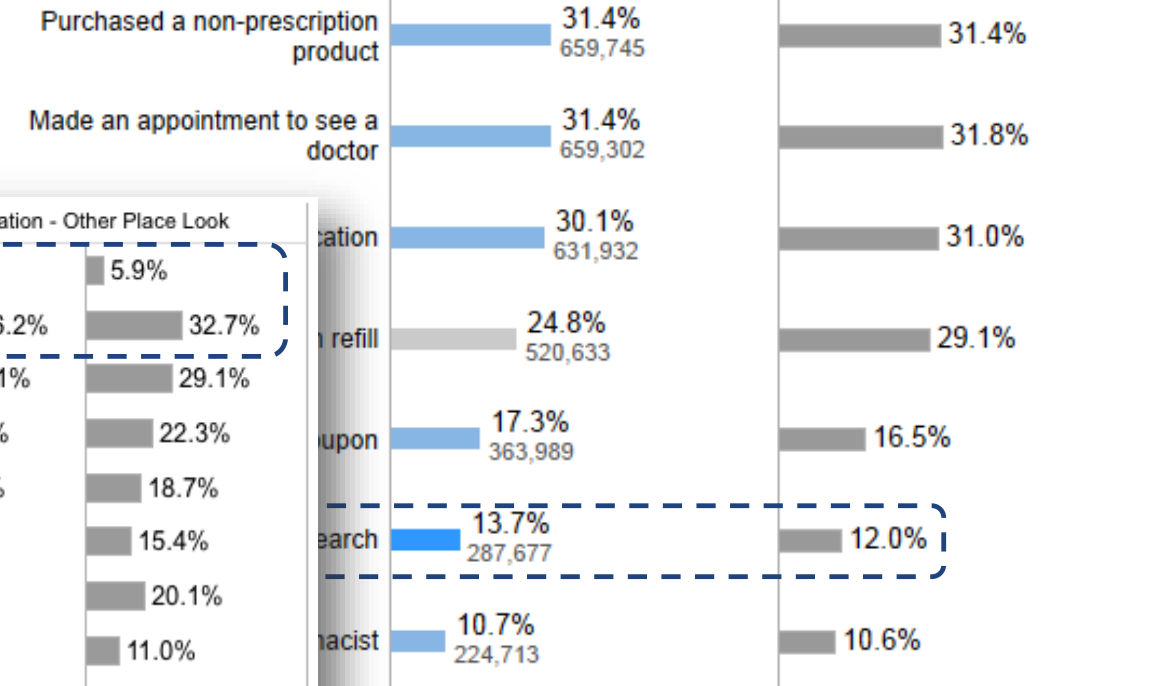
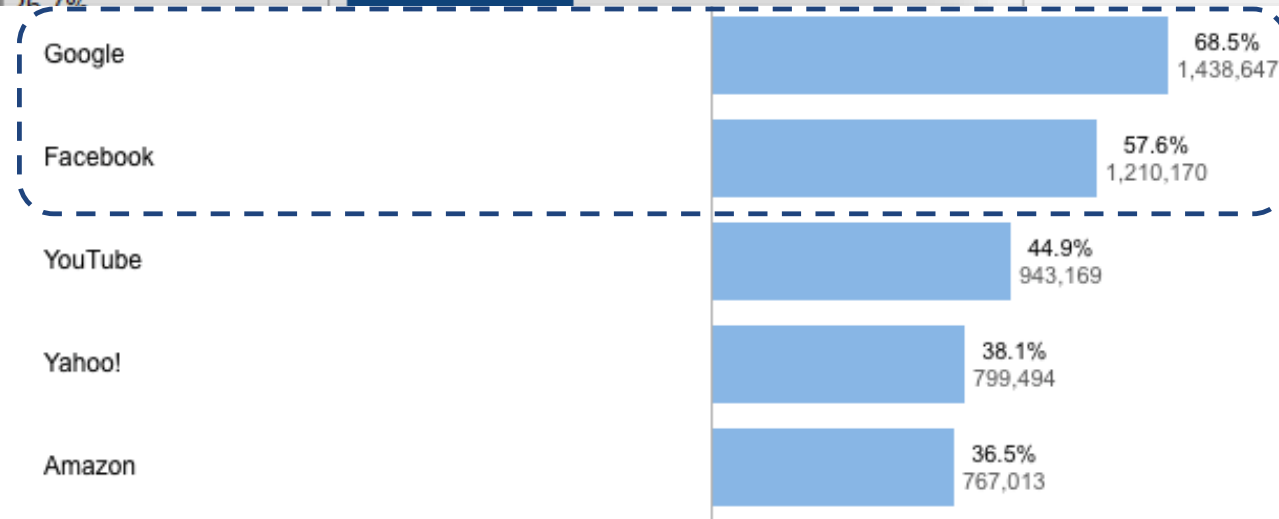
Population Inland Empire

Market Los Angeles DMA

% Population Los Angeles DMA



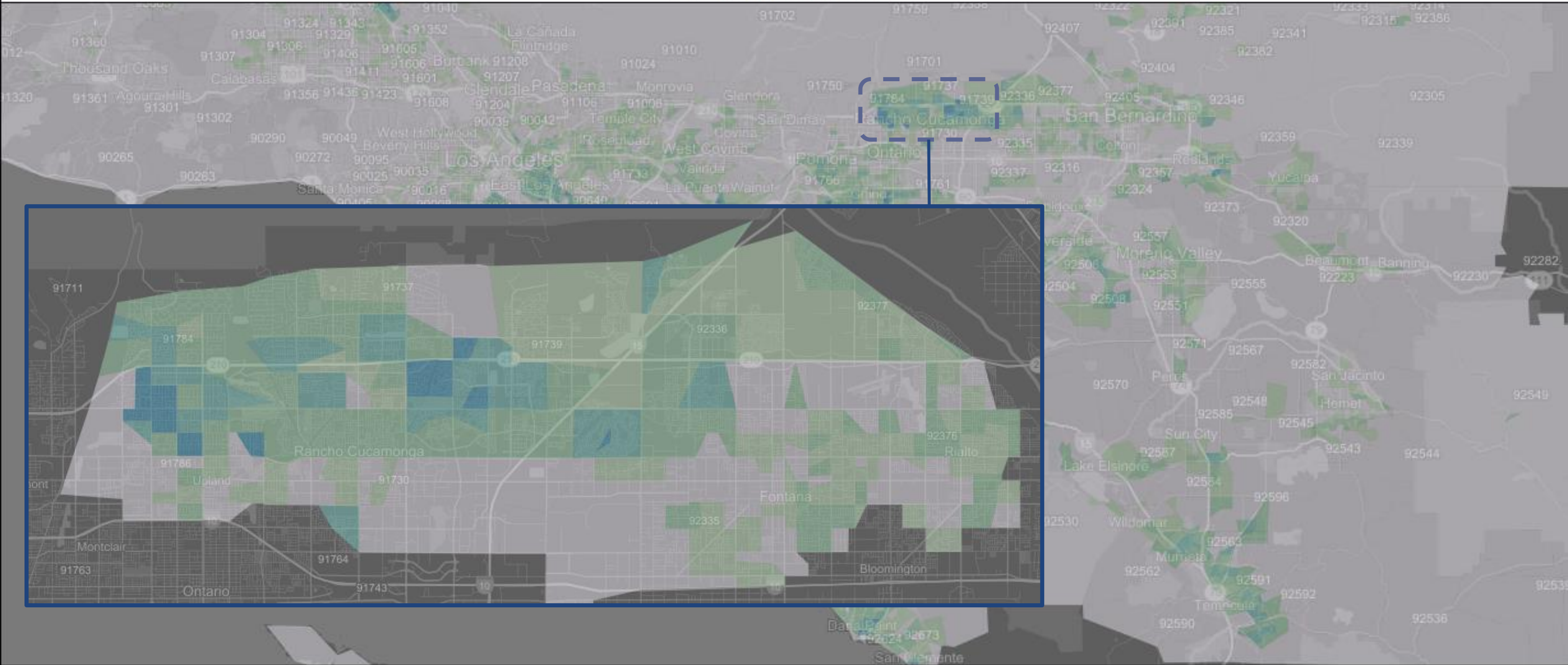
### Internet sites visited/apps used past 30 days



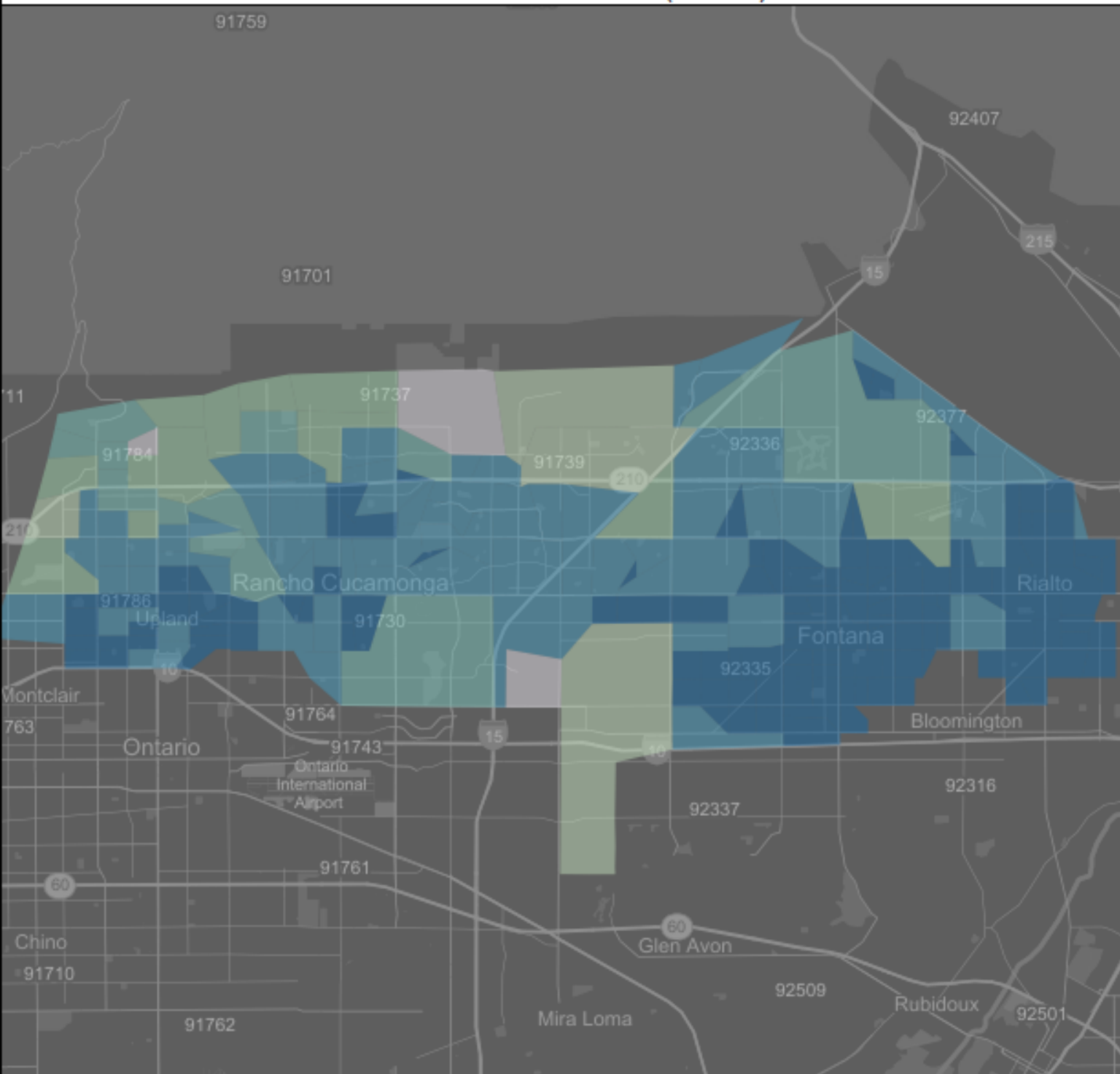


# Focusing on Opportunities: Rancho Cucamonga

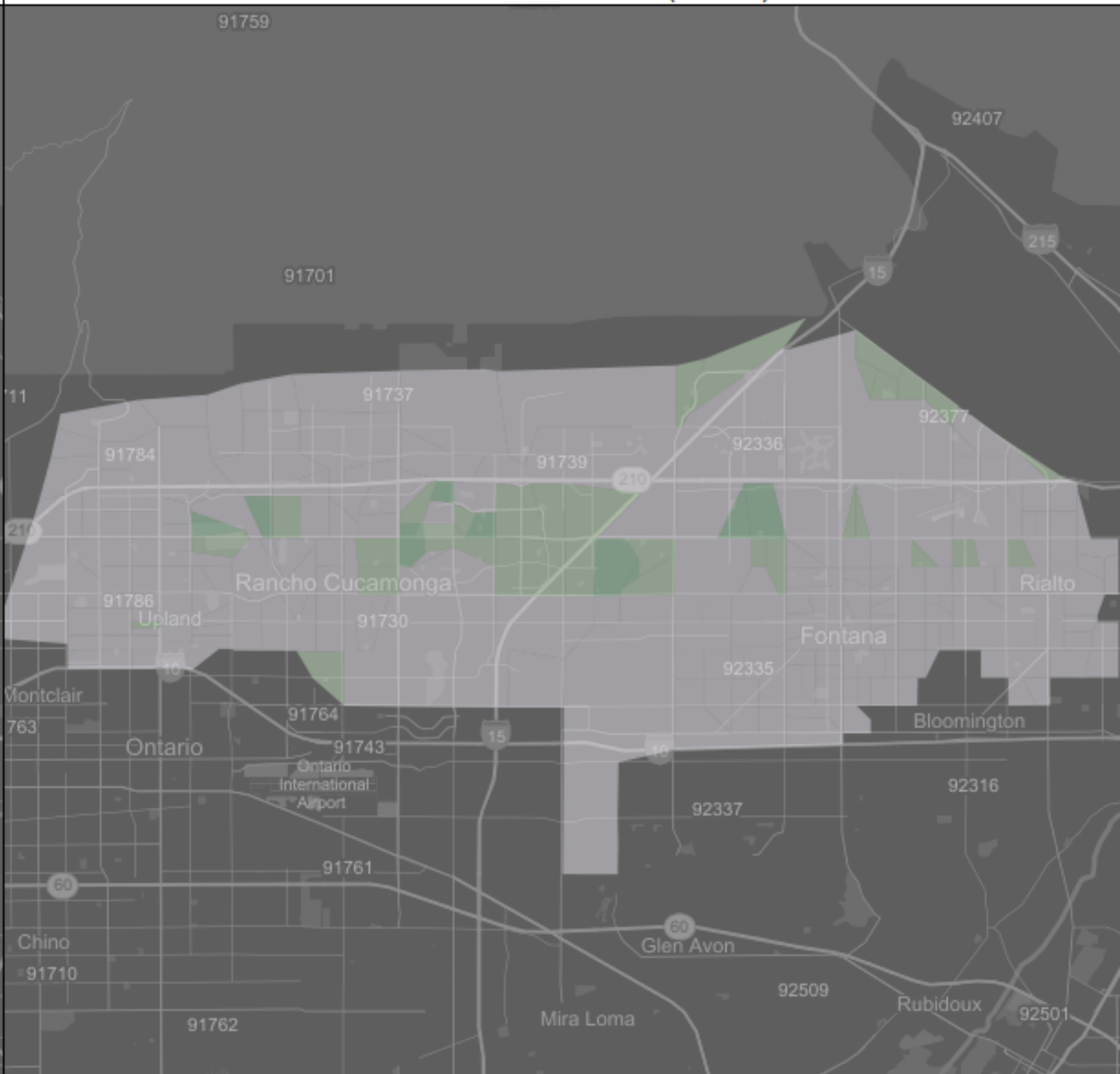
UCI Medical Center  
UC Irvine Medical Center



### Inland Empire Medicaid or Uninsured (<100K)

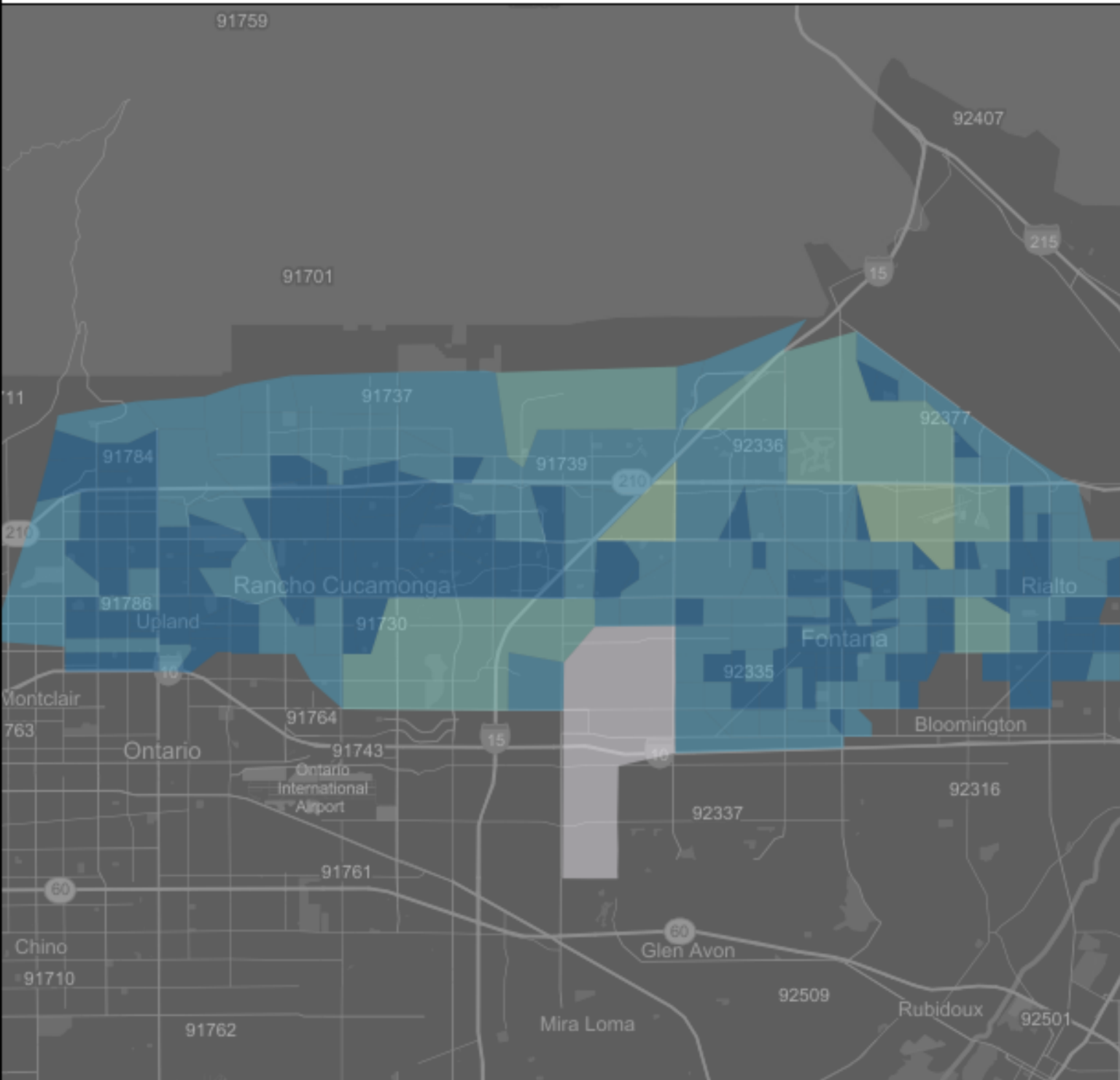


### UCI Medical Center Medicaid or Uninsured (<100K)

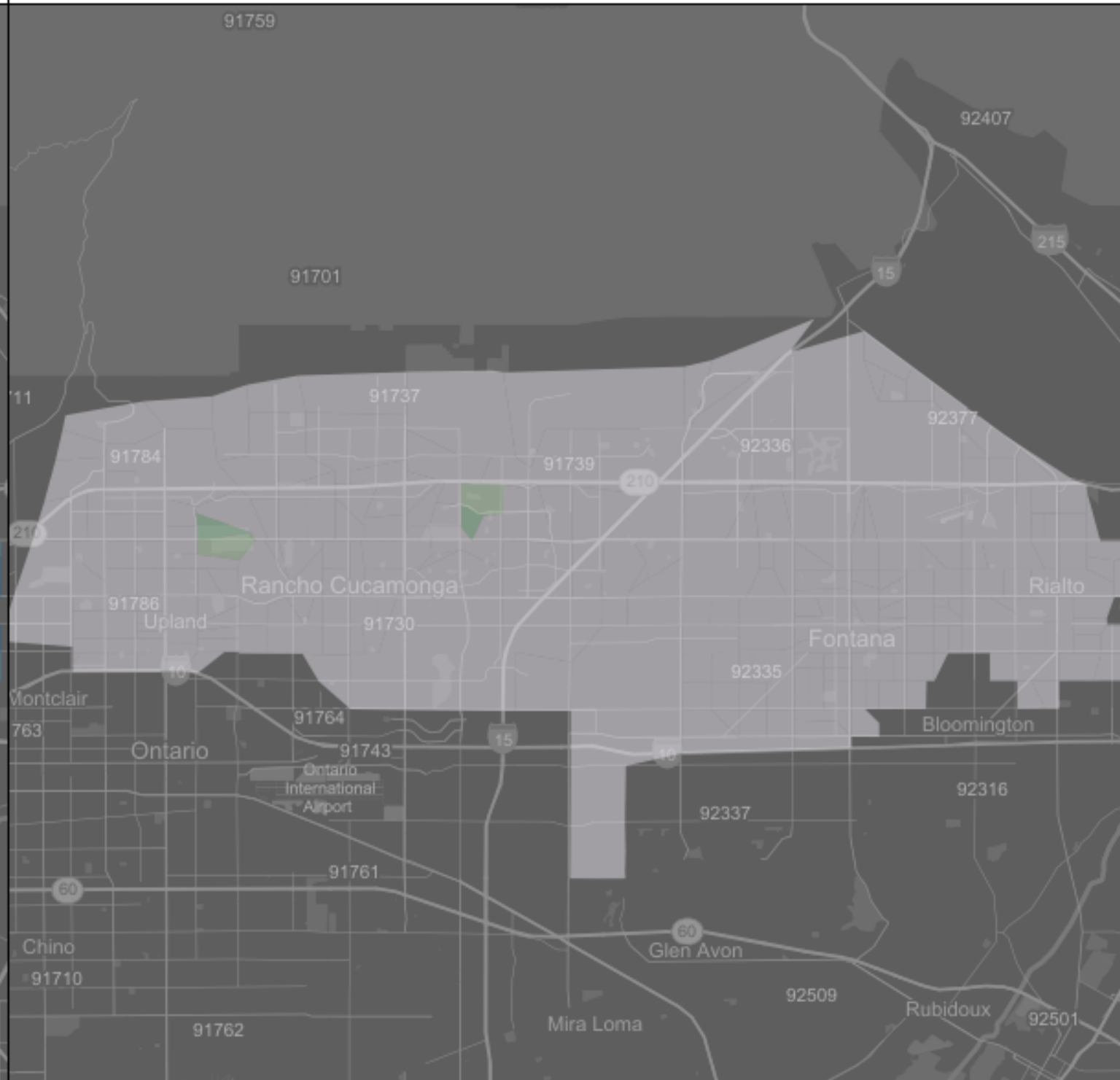




## Inland Empire Medicare

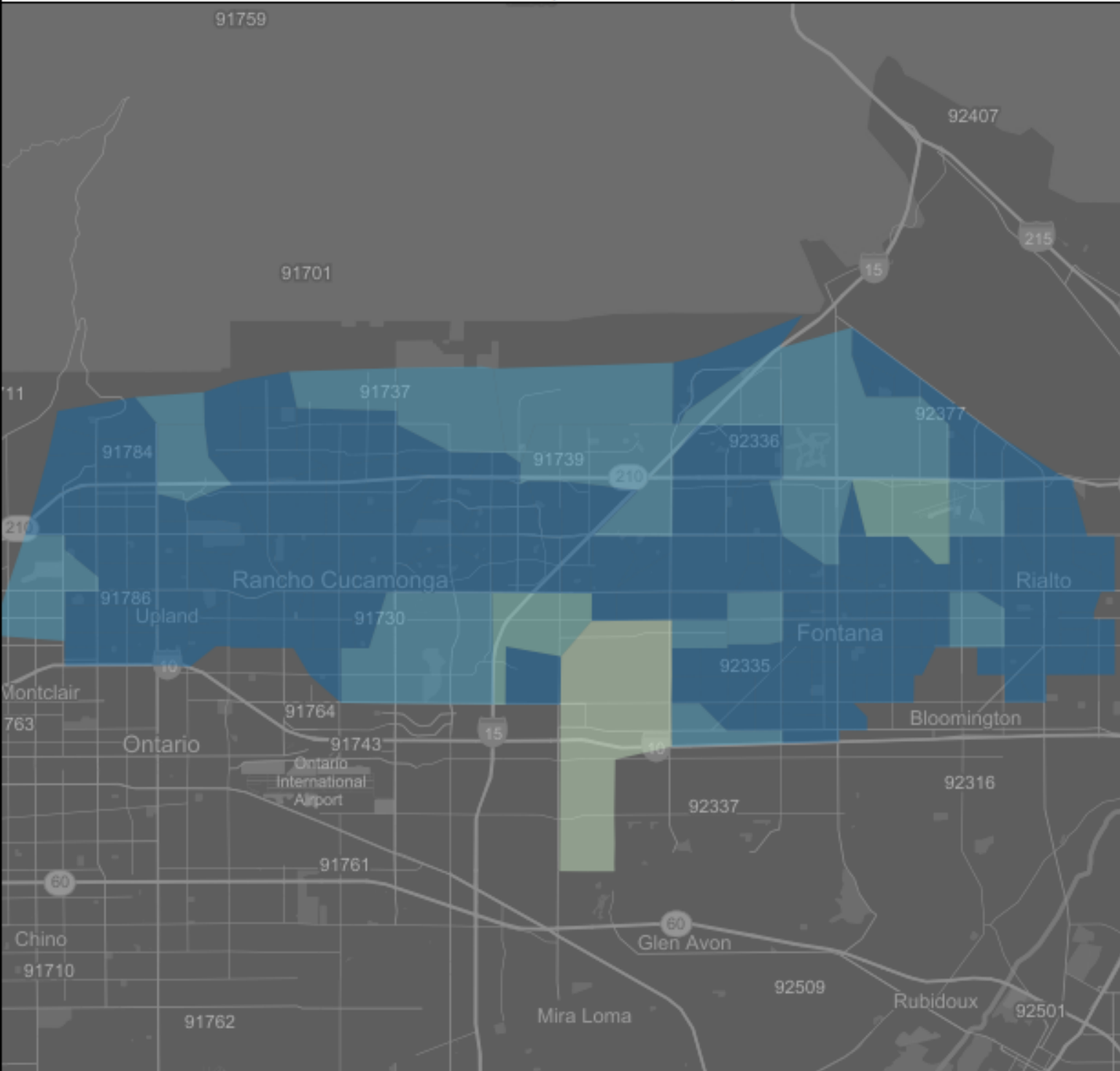


## UCI Medical Center Medicare



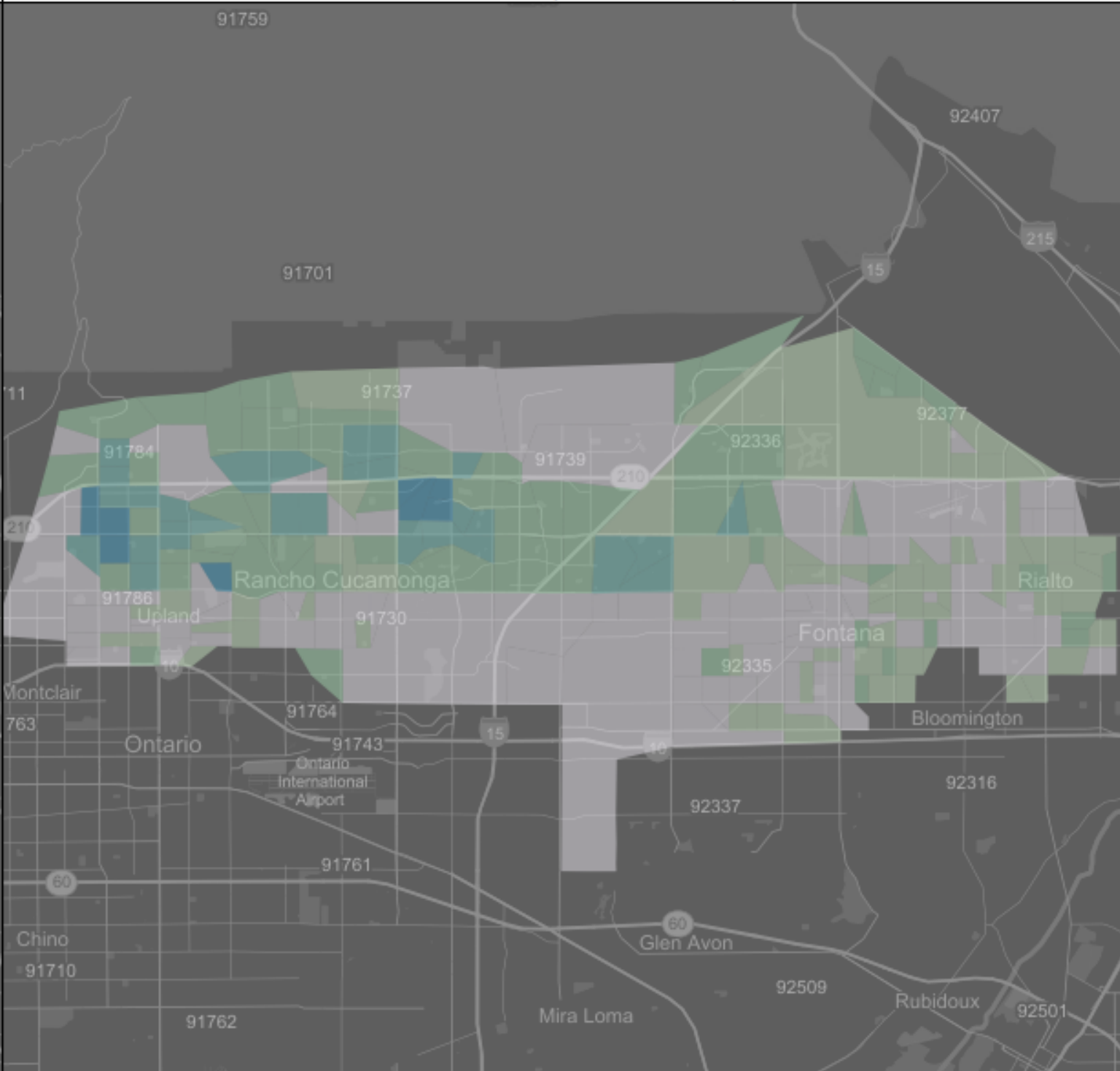
# Inland Empire

Commercial (HMO or PPO)

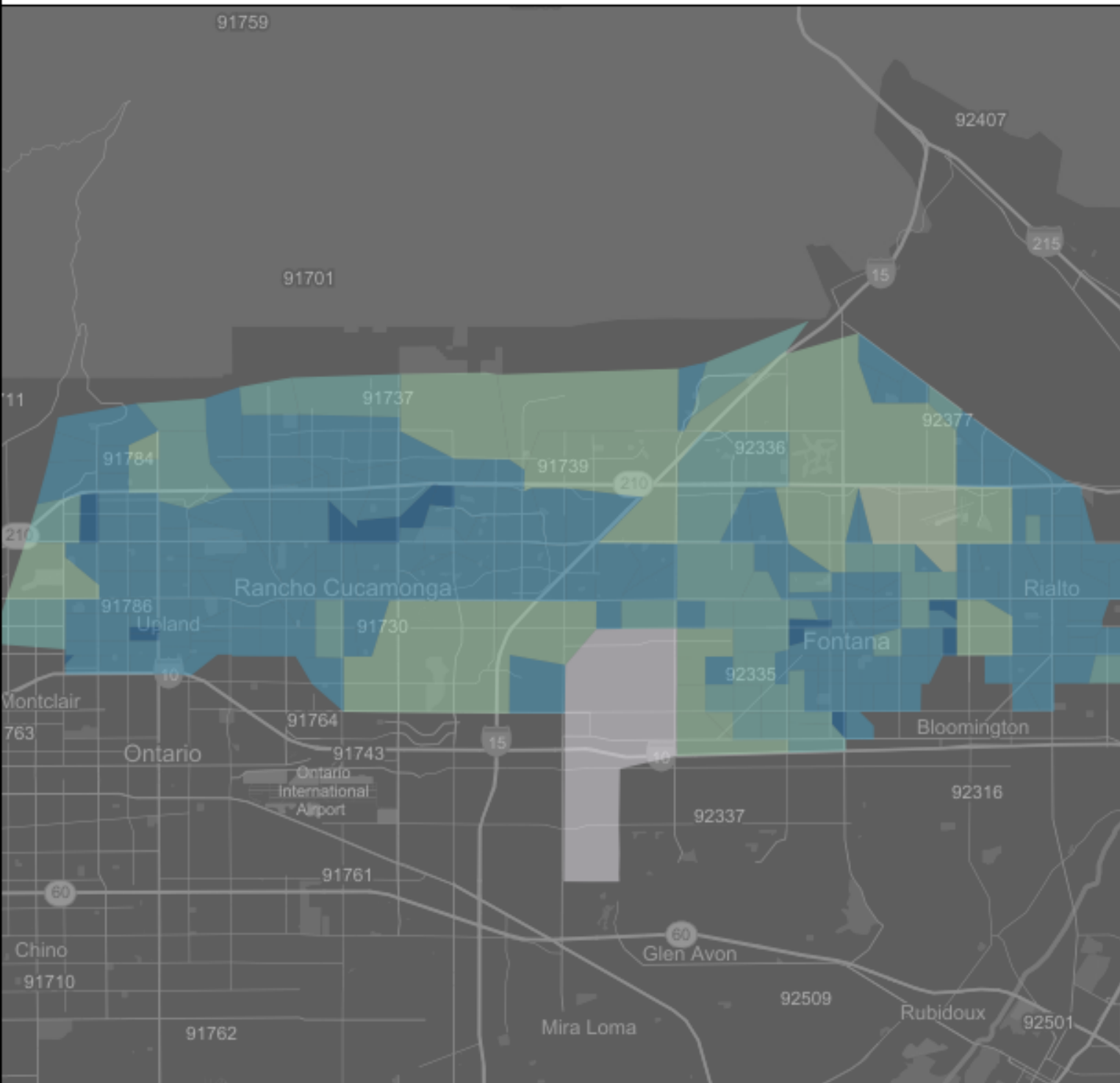


# UCI Medical Center

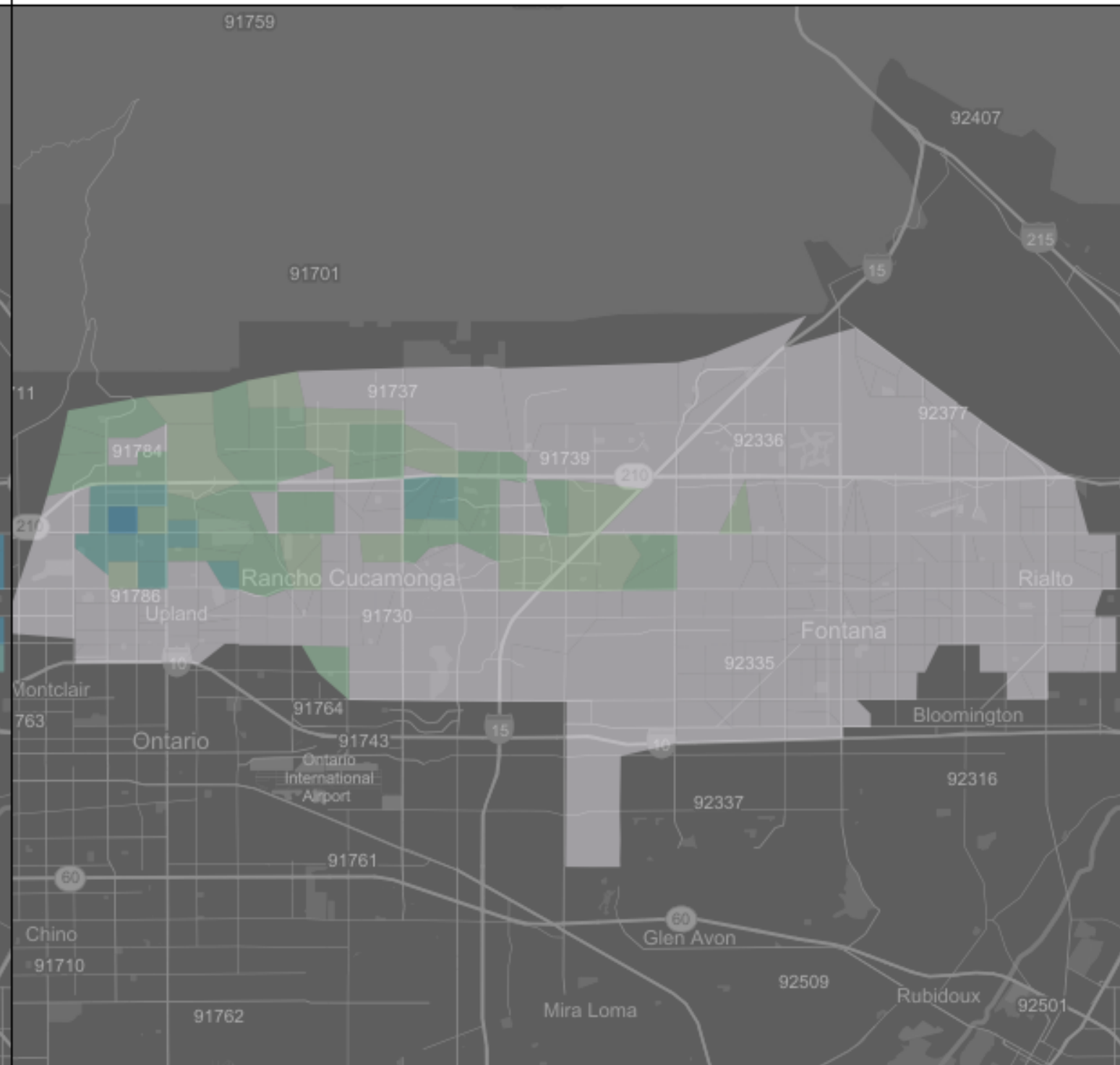
Commercial (HMO or PPO)



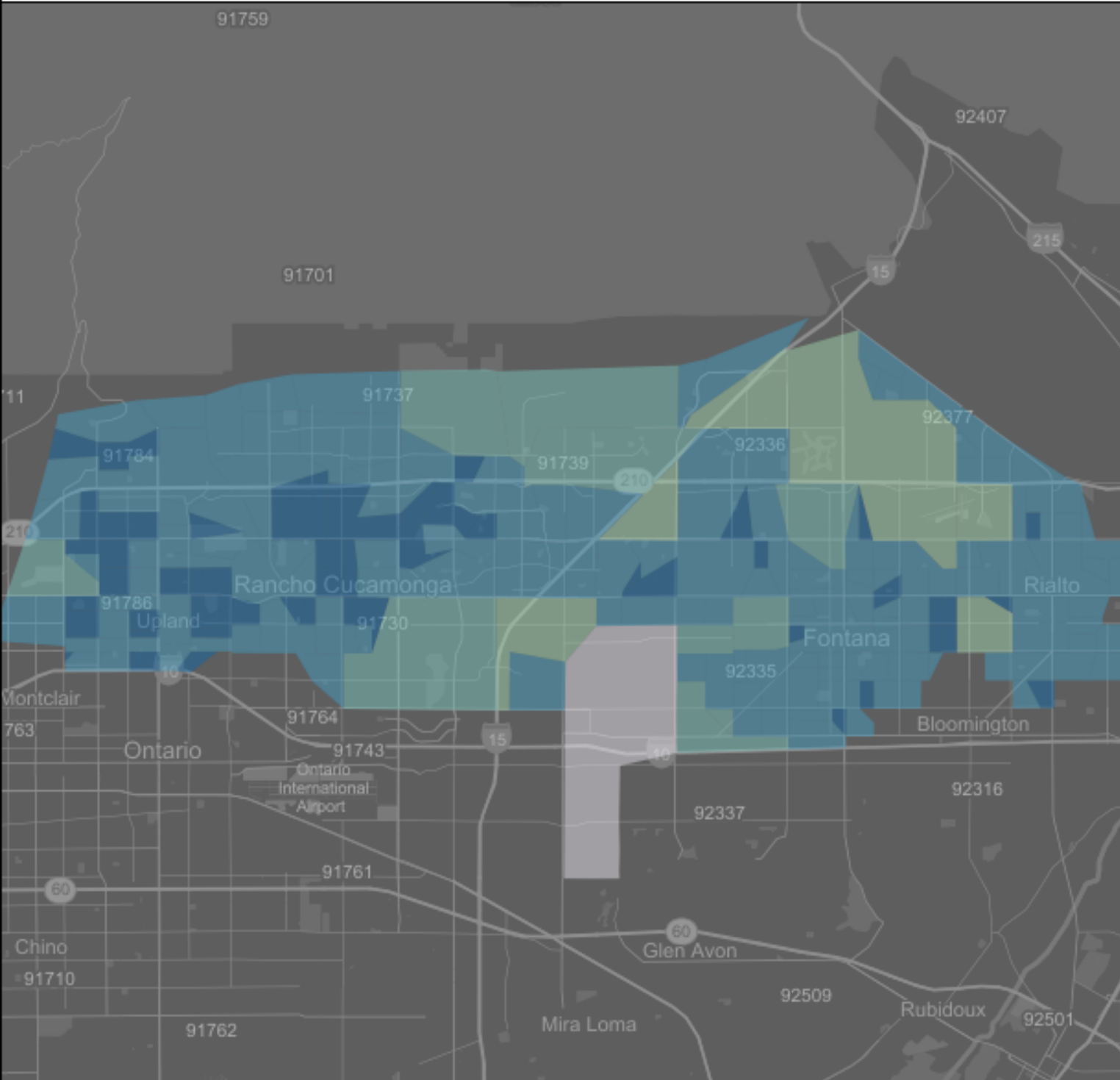
## Inland Empire Cancer



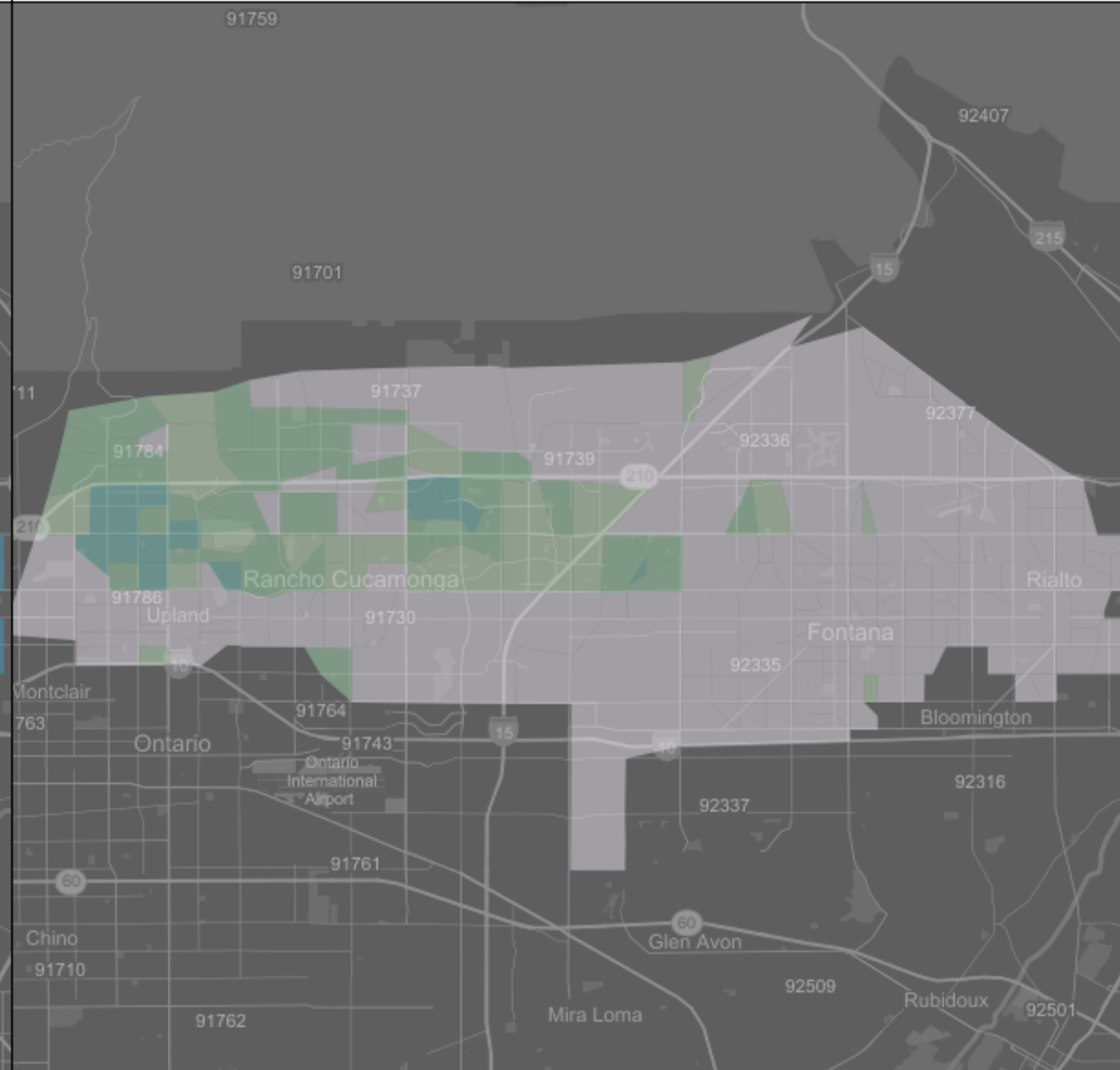
## UCI Medical Center Cancer



## Inland Empire Hypertension-High Blood Pressure



## UCI Medical Center Hypertension-High Blood Pressure



# Anticipated Benefits

- The Population Health Segmentation insights helped us understand the unique attributes of our attributed Patient Population
- These population health insights will dramatically impact the way we view, segment, and target our patients for the delivery of high quality, cost-effective care
- These insights are key enablers of value-based care at a lower risk, while helping us meet our population health metrics

# Community Needs Assessment

- Description of Health Care Resources and Community Resources
- Description of the Community Served
  - Demographics of the Population
    - Population Size, Age, Sex and Race/Ethnicity
    - Income, Education and Employment
  - Health Status
    - Leading Cause of Death
    - ER Utilization
    - Mental Health
    - Tobacco Use
    - Cancer
- Service Challenges
- Assets & Resources
- Suffolk County, NY
  - <http://tinyurl.com/pdtf564>



# Paradox of Population Health

- Understanding the Patient as a Person
  - Social Determinates
  - Demographic Issues
- A Person's Personal "Big Data"
  - Medical IoT
  - Omics
- High Quality and Value Care at the Personal Level
  - Quality Measures for the Masses
- Making it Personal
  - Access to and Understanding the Longitudinal Record

# Contact Me @

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@N2InformaticsRN



**UC Irvine Health**



**Stony Brook**  
**Medicine**