

The Use of Socioeconomic Vulnerability Indices to Advance Health Equity

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UCLA Center for Neighborhood Knowledge

CDC Social Vulnerability Index (CDC SVI)
A tool to identify socially vulnerable communities

UCLA **Fielding**
School of Public Health



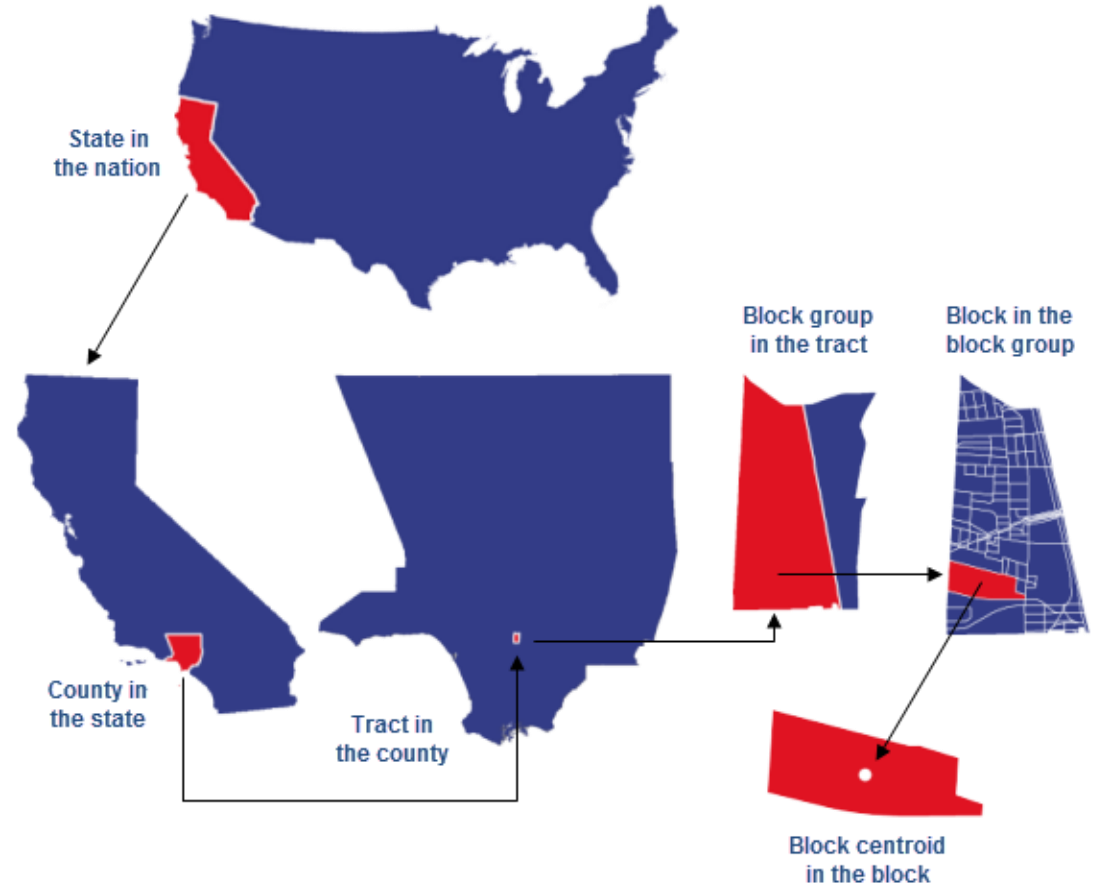
 **The California Healthy Places Index (HPI)**[®]
public health alliance of southern california A Partnership for Healthy Places

Social Drivers of Health (SDOH) Neighborhood Level Indices

- https://www.atsdr.cdc.gov/placeandhealth/svi/fact_sheet/pdf/SVI_FactSheet_v10152020-H.pdf
- <https://healthyplacesindex.org/>
- <https://knowledge.luskin.ucla.edu/>
- <https://www.neighborhoodatlas.medicine.wisc.edu/#pdfs-anchor>

California - 2018 ADI State Rankings

Use of geographic based proxy measures as imperfect substitutes for non-medical SDOH



Comparison of Available Socioeconomic Indices of Neighborhood Health

Social Vulnerability Index

15 factors
(grouped into four themes)

Developed by: CDC

Data Source: US Census

Level: Census tract/county

Ranking: Higher ranking = Greater vulnerability

Area Deprivation Index

17 characteristics

Developed by: University of Wisconsin

Data source: American Community Survey

Level: Census block

Ranking: Higher ranking = Greater vulnerability

Healthy Places Index

25 factors
(grouped into eight sections)

Developed by: Public Health Alliance of Southern CA /
VCU's Center on Society and Health

Data source: Multiple*

Level: Census tract

Ranking: Lower ranking = Greater vulnerability

Measures within Socioeconomic Indices

Social Vulnerability Index

Socioeconomic status

- Below poverty
- Unemployed
- Income
- No high school diploma

Household composition & disability

- Aged 65 or older
- Aged 17 or younger
- Older than age 5 with a disability
- Single-parent households

Minority status & language

- Minority
- Speak English “less than well”

Housing type & transportation

- Multi-unit structures
- Mobile homes
- Crowding
- No vehicle
- Group quarters

Area Deprivation Index

Education

- Population aged ≥ 25 y with < 9 y of education, %
- Population aged ≥ 25 y with at least a high school diploma, %

Income

- Employed persons aged ≥ 16 y in white-collar occupations, %
- Median family income, \$
- Income disparity
- Families below poverty level, %
- Population below 150% of the poverty threshold, %

Housing

- Median home value, \$
- Median gross rent, \$
- Median monthly mortgage, \$
- Owner-occupied housing units, % (home ownership rate)
- Occupied housing units without complete plumbing, %
- Households with more than 1 person per room, % (crowding)

Employment

- Civilian labor force population aged ≥ 16 y unemployed, % (unemployment rate)

Household composition

- Single-parent households with children aged < 18 y, %

Transportation and Telephone

- Households without a motor vehicle, %
- Households without a telephone, %

Healthy Places Index

Economic

- Employed
- Income

Social

- Two parent household
- Voted in 2012

Education

- In preschool
- In high school
- Bachelor's education or higher

Transportation

- Automobile access
- Active commuting

Neighborhood

- Retail density
- Park access
- Tree canopy
- Supermarket access
- Alcohol outlets

Housing

- Low-income renter (severe housing cost burden)
- Low-income homeowner (severe housing cost burden)
- Housing habitability
- Uncrowded housing
- Homeownership

Clean Environment

- Ozone
- PM 2.5
- Diesel PM
- Water contaminants

Healthcare

- Insured

Process Flow of Assigning Indices

Convert Patient's
Address to Map
Coordinates

Address:
4550 W Pico Blvd.
Los Angeles, 90019

Coordinates:
X: -118.33485
Y: 34.04862

Identify Census
Tract containing
Map Coordinates

Coordinates:
X: -118.33485
Y: 34.04862

Census Tract FIPS:
06037218120

Assign Index Score
associated with
Census Tract

Census Tract FIPS:
06037218120

CDC SVI Ranking:
83.36

Neighborhood SES Vulnerability Indices Mapped into UCLA Health Data Systems

UCLA Health Attributed Patients* with Mapped Index Available

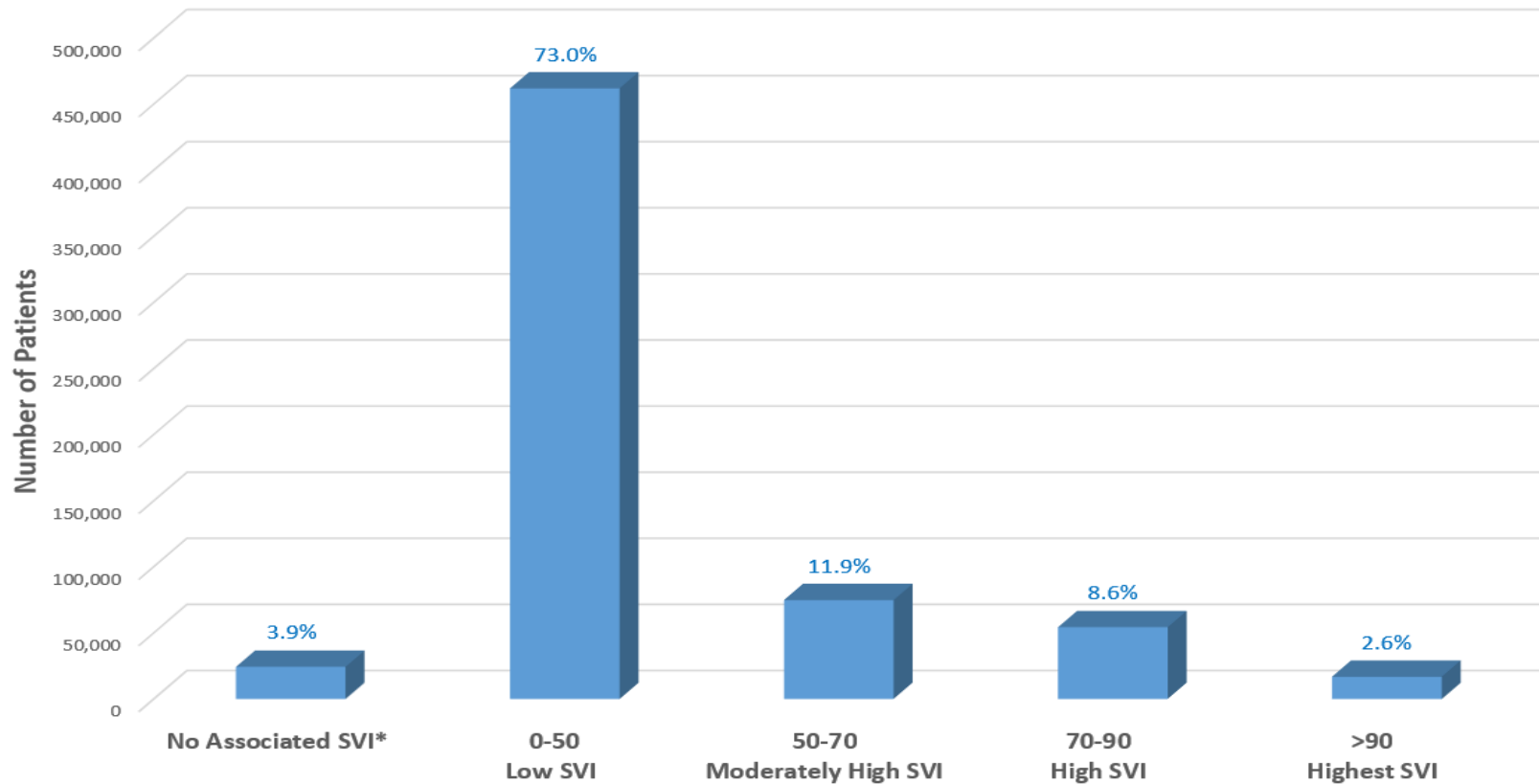
	# of Patients	Availability**
CDC Social Vulnerability Index (SVI)	611,491	95.8%
CA Health Places Index (HPI)	578,637	90.7%
UCLA Fielding School of Public Health Indices:		
Barriers to Accessing Services (BAS)	611,051	95.8%
Built Environment Risk (BEV)	611,491	95.8%
Pre-existing Health Vulnerability (PHV)	611,858	95.9%
Univ. of Wisconsin Area Deprivation Index (ADI)	589,549	92.4%

*Patients who have an enduring relationship with UCLA Health

*Includes all patients 16 years of age or older who are attributed to UCLA Primary Care or Specialty Care. Further clinical risk stratification has been developed to identify patients at severe risk of illness from COVID-19.

** **Modified Indices Scores for homeless population has not yet been applied**

UCLA Attributed Patients by SVI Band



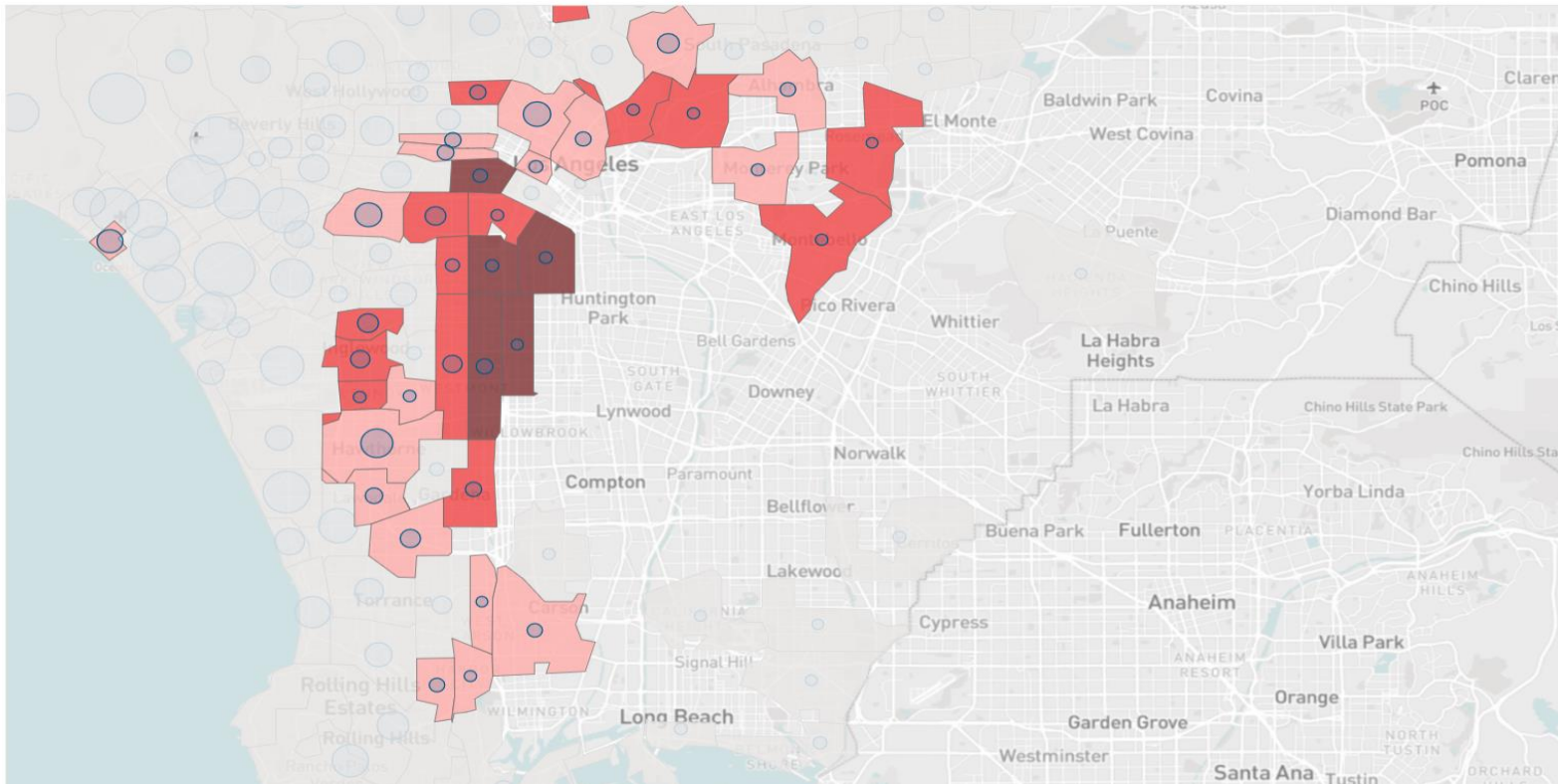
SVI Range: 0-100
High SVI = High
vulnerability

*CDC California SVI source has information on California census tracts. Some census tracts within California do not have SVI rankings.

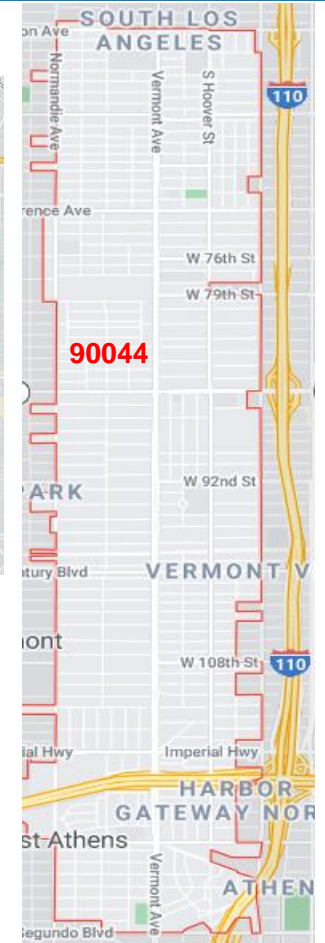
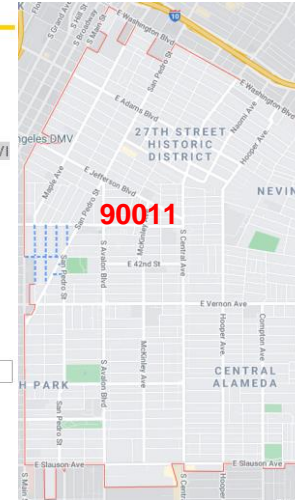
** Modified SVI rankings for homeless population has not yet been applied.

High SVI Areas

This dashboard shows the zip codes of UCLA Health's 638,031 attributed patients.



- SVI Categories**
- Low SVI
 - Moderately High SVI
 - High SVI
 - Highest SVI
- Population Count**
- 500
 - 5,000
 - 10,000
 - 13,849
- Minimum Population**
- 500
- Age Cohort**
- (All)
 - Adults (≥18)
 - Pediatrics (<18)



Clinical Applications and Data Analyses

Use of Social Risk in COVID-19 Vaccination Allocation

Overall Vulnerability		SVI Components	
Overall Vulnerability	Socioeconomic Status	Below Poverty	
		Unemployed	
		Income	
		No High School Diploma	
	Household Composition & Disability	Aged 65 or Older	
		Aged 17 or Younger	
		Older than Age 5 with a Disability	
		Single-Parent Households	
	Minority Status & Language	Minority	
		Speaks English "Less than Well"	
	Housing Type & Transportation	Multi-Unit Structures	
		Mobile Homes	
		Crowding	
		No Vehicle	
		Group Quarters	

What is the CDC Social Vulnerability Index?

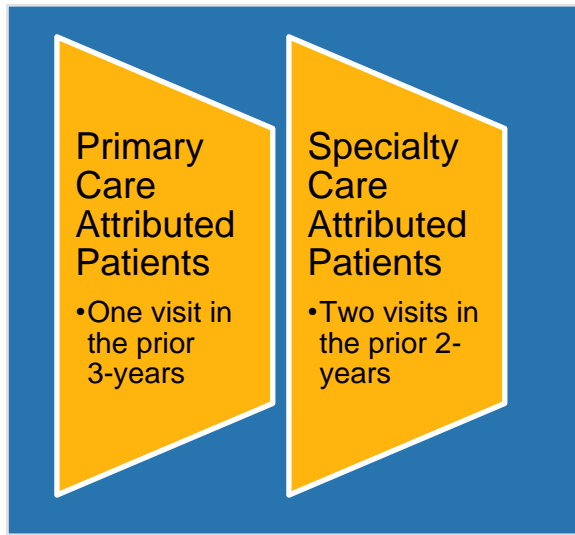
- California-specific index that assigns vulnerability based upon home address and census tract
- UCLA will integrate index into the patient risk stratification model at each phase

SVI Index Range	Points
0-50 th Percentile	0
>51 st - 70 th Percentile	1
>70 th - 90 th Percentile	2
>90 th Percentile	3

COVID-19 Vaccine Patient Allocation Scoring

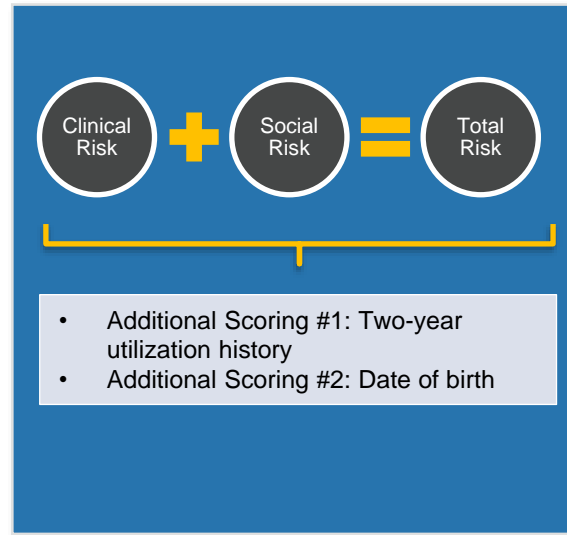
Step #1:

Determine Attributed Patients Ages 16 & Older



Step #2:

Apply Patient Vaccination Risk Stratification Model



Step #3:

Rank Patients Based on Phases*



*Example: Phase 1B Tier One being patients ages 65 & older

MOVERS Dashboard

MOVERS Highlights PROCESS MEASURES PUBLIC RANKING DEPT SUPPORT

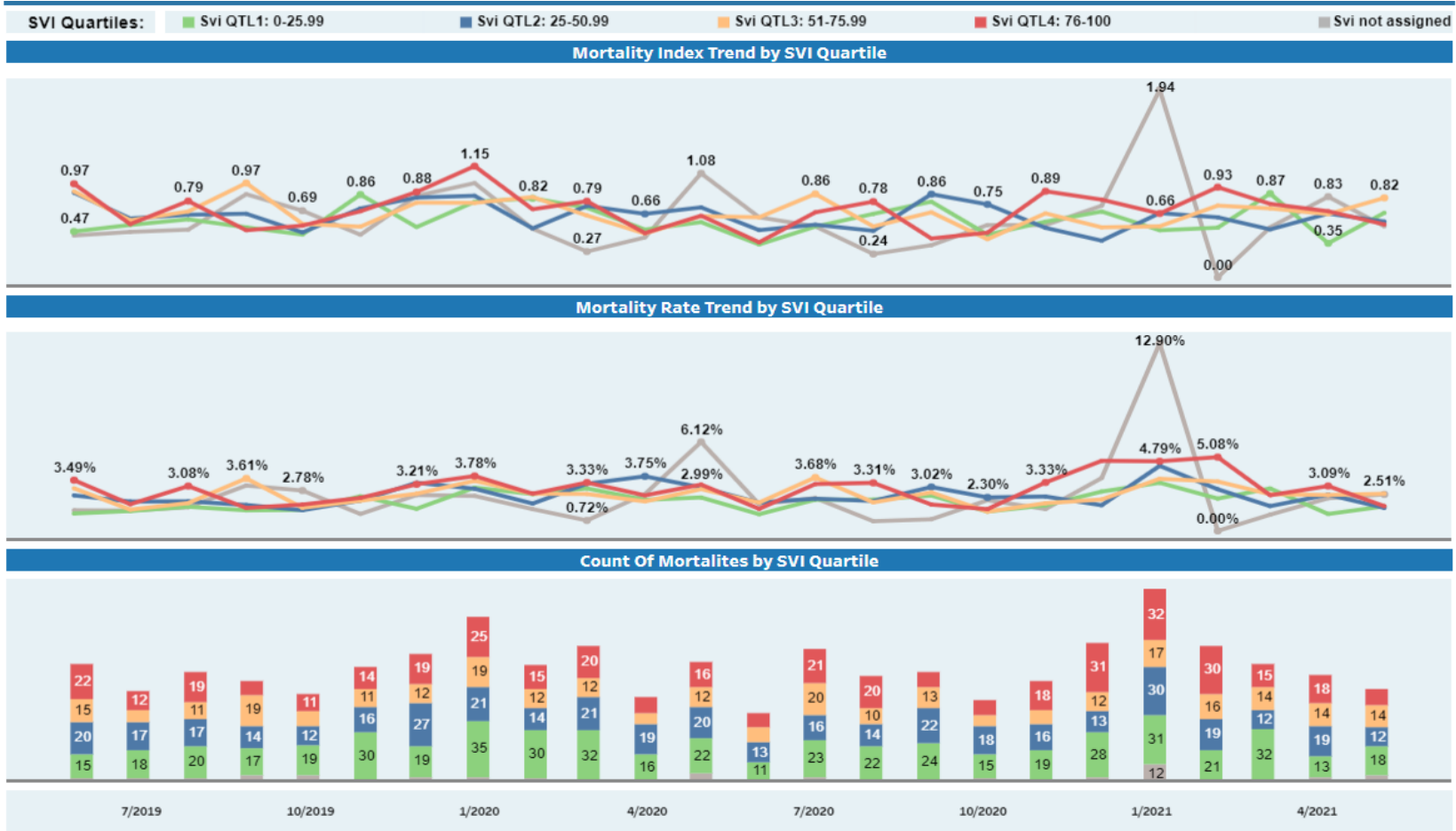
Patient Experience Medical Coding

UCLA Health **MOVERS Star Rating (UCLA Health)** DOCUMENTATION Quality Informatics & Analytics

★ 12-20 Points
★★ 21-24 Points
★★★ 25+ Points
2020Q4 ★★★
Below Threshold
Meet Threshold
Reach Target
Stretch
FY2021 MOVERS
Quarterly Scores
Monthly Scores

MOVERS Points												2020Q4	2021Q1	2021Q2	2021Q3	
												30.7	28.8	16.3		
Domain	Measure	Site	Threshold	Target	Stretch	Baseline					Rolling Quarterly Performance	Quarterly Scores				
						FY16	FY17	FY18	FY19	FY20		2020Q4	2021Q1	2021Q2	2021Q3	
MORTALITY	Reduce Risk-Adjusted Mortality Index	RRMC	0.91 (50%)	0.86 (40%)	0.80 (25%)	0.88	0.85	0.72	0.68	0.65	↓	0.61	0.66	0.68	≡	
		SMH	0.91 (50%)	0.86 (40%)	0.80 (25%)	0.67	0.67	0.59	0.56	0.63	↑	0.56	0.66	0.45	≡	
	Sepsis Risk-Adjusted Mortality Index	RRMC	1.15 (50%)	1.09 (40%)	0.99 (25%)	-	1.17	0.99	0.98	0.85	↓	0.86	0.84	0.96	≡	
		SMH	1.28 (50%)	1.20 (40%)	1.10 (25%)	-	0.85	0.71	0.68	0.83	↑	0.80	1.02	0.61	≡	
OUTCOMES	VBP Quality Performance Ranking	RRMC	55	60	65	-	79	79	56	56	↓	51	≡	≡	≡	
		SMH	55	60	65	-	78	43	37	80	↓	82	≡	≡	≡	
	Pop-Based Quality Measures HBIPS (Psychiatry)	AMB	70.00	80.00	90.00	83.00	78.00	83.00	88.75	82.75	⊖	80.00	≡	≡	≡	
		NPH	75.00	80.00	90.00	87.25	92.50	80.25	83.75	80.00	↑	95.00	≡	≡	≡	
VALUE	ED ThroughPut (Door to Discharge)	RRMC	179.85 (B*1.1)	163.50 (B)	158.60 (B*0.97)	-	-	154.00	159.92	163.50	↑	175.00	159.00	≡	≡	
		SMH	100.93 (B*1.1)	91.75 (B)	89.00 (B*0.97)	-	-	95.50	98.50	91.75	↑	88.00	85.00	≡	≡	
	LOS: Actual Days	All	6.36 (*B)	6.26 (*B-.10)	6.16 (*B-.20)	6.25	6.12	6.10	6.06	6.36	↑	6.48	6.53	6.26	≡	
		All	1.02 (*B)	1.01 (*B-.01)	1.0 (*B-.02)	1.10	1.07	1.01	0.98	1.02	↓	0.98	0.99	0.98	≡	
	LOS EDI: SVI Q4	RRMC	-	-	-	-	-	-	-	-	⊖	0.96	1.04	0.98	≡	
		SMH	-	-	-	-	-	-	-	-	⊖	1.02	0.98	0.99	≡	
EXPERIENCE	Overall Rating (Pctl)	RRMC	88.75	90.13	91.5	88.00	87.25	83.75	89.00	88.75	↑	95.00	90.00	≡	≡	
		SMH	81.75	84.63	87.5	85.00	82.25	80.75	82.00	81.75	⊖	88.00	91.00	≡	≡	
		NPH	49.75	54.63	59.5	79.00	52.75	54.50	60.50	49.75	↑	44.00	37.00	≡	≡	
		AMB	92.58	92.88	93.18	95.00	95.00	74.00	73.00	92.88	⊖	72.67	93.30	≡	≡	
		All	85.52	87.36	89.32	88.70	87.14	81.41	80.82	85.97	↑	86.99	88.88	≡	≡	
READMISSIONS	Reduce Unplanned 30-day Readmissions	RRMC	11.36 (40%)	10.68 (30%)	10.00 (20%)	11.51	11.42	12.08	11.21	11.71	↓	10.47	10.99	11.01	≡	
		SMH	11.36 (40%)	10.68 (30%)	10.00 (20%)	11.73	11.40	10.54	9.89	10.17	↑	10.81	10.13	9.72	≡	
	Readmission EDI: SVI Q4	RRMC	-	-	-	-	-	-	-	-	⊖	13.64	14.87	14.23	≡	
		SMH	-	-	-	-	-	-	-	-	⊖	12.29	11.78	10.00	≡	
SAFETY	Safety Bundle (PSI 6, 9, 11, 13)	- 06 Iatrogenic Pneumothorax	RRMC	0.43 (B*.85)	0.4 (B*.80)	0.38 (B*.75)	-	-	-	-	-	⊖	2.00	2.00	≡	≡
			SMH	0.00 (B*.85)	0.00 (B*.80)	0.00 (B*.75)	-	-	-	-	-	⊖	1.00	0.00	≡	≡
		- 09 Perioperative Hemorrhage or Hemat	RRMC	5.95 (B*.85)	5.60 (B*.80)	5.25 (B*.75)	-	-	-	-	-	⊖	2.00	5.00	≡	≡
			SMH	2.13 (B*.85)	2.00 (B*.80)	1.88 (B*.75)	-	-	-	-	-	⊖	1.00	0.00	≡	≡
		- 11 Postoperative Respiratory Failure	RRMC	2.34 (B*.85)	2.20 (B*.80)	2.06 (B*.75)	-	-	-	-	-	⊖	0.00	0.00	≡	≡
			SMH	1.06 (B*.85)	1.00 (B*.80)	0.94 (B*.75)	-	-	-	-	-	⊖	1.00	0.00	≡	≡

Mortality by SVI



Patients group during Covid-19 ⓘ

(All)

Data Filters Reset

REM Scales: (All)

2-Hospital: (All) 3-Hospital: (All)

Admission Source: (All) Disposition: (All)

Discharge Date: Jun 2019 - May 2021

UCLA Inpatient Attribution Model Specialty: (All)

Unit: (All)

MS-DRG: (All) APR-DRG: (All)

ICD10 Procedure: (All) ICD10 Diagnosis: (All)

Vizient Definition

Service Line: (All) Sub-Service Line: (All) Primary Payer: (All)

Treatment Team (IM only): (All) Age Group: (All)

QIA SVI QTL: (All)

LOS by SVI

