

A GEOGRAPHICAL ANALYSIS OF AMBULATORY CARE SENSITIVE CONDITIONS AMONG RACIAL/ETHNIC GROUPS WITHIN CALIFORNIA COUNTIES

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PREVENTABLE HOSPITALIZATIONS

The timely and effective use of primary care can prevent the need for hospitalization

- e.g., properly managed diabetes can reduce the risk of amputations, seizures, and shock

Hospital admissions that may be preventable are termed “ambulatory care sensitive conditions” (ACSCs)

- People with greater access to outpatient care are less likely to be hospitalized for ACSCs (Bindman et al., 1995; Chang et al., 2008)

Access to primary care is influenced by the complex interaction of factors such as race and socio-economic status (SES)

- High resolution geographic analyses can help healthcare stakeholders understand the population factors that influence high and low ACSC rates

AHRQ PREVENTION QUALITY INDICATORS

Agency for Healthcare Research and Quality (AHRQ) provides free software to generate Prevention Quality Indicators (PQIs)—a set of 17 indicators created from hospital inpatient discharge data to evaluate the quality of ambulatory care in counties and metropolitan areas

Four indicators (highlighted in bold) were aggregated in this report to select patient records for a diabetes composite measure

Diabetes, short-term complications (PQI 1)	Urinary infections (PQI 12)
Perforated appendicitis (PQI 2)	Angina without procedure (PQI 13)
Diabetes, long-term complications (PQI 3)	Uncontrolled diabetes (PQI 14)
Chronic obstructive pulmonary disease (PQI 5)	Adult asthma (PQI 15)
Hypertension (PQI 7)	Lower extremity amputations among diabetes patients (PQI 16)
Congestive heart failure (PQI 8)	Overall PQI (Aggregate of all 14 PQIs)
Low birth weight (PQI 9)	Acute PQI (Aggregate of PQI: 10,11,12)
Dehydration (PQI 10)	Chronic PQI (Aggregate of PQI: 1,3,5,7,8,13,14,15,16)
Bacterial pneumonia (PQI 11)	

Issues	Solutions
California has large counties that often encompass diverse populations and healthcare providers	Modify AHRQ SAS software to geographically report the ACSCs at the level of Medical Service Study Areas (MSSA)
Racial/Ethnic groups from different geographical regions have variable access to primary care	Stratify MSSA rates by race/ethnicity
ACSC rates in MSSAs with low populations have unreliable rates that fluctuate due to random factors	Construct 95% confidence intervals to profile MSSAs that are statistically different from the statewide diabetes composite rate
AHRQ software provides numerous indicators, and single indicators measuring rare events are likely unreliable for yearly reports	Construct a composite diabetes index of AHRQ's four diabetes-related indicators

COHORT SELECTION

OSHPD 2007 patient discharge data (administrative claims data)

AHRQ PQI SAS® software to select admissions with diabetes-related complications

Construct population denominators by aggregating race-specific 2007 census tract data for each MSSA

Modified AHRQ's PQI SAS® code to facilitate the use of MSSA denominators

RISK-ADJUSTMENT

Indirect rate adjustment to create risk-adjusted rates

- Logistic regression:
 - Dependent variable: presence or absence of diabetes event
 - Independent variables: age, gender, 100% poverty level, age* gender
- Sum predicted probabilities for each MSSA to get expected number of events
- Risk-adjusted rate:
 - (Observed Rate / Expected Rate) * State Diabetes Rate (136.9 per 100,000)

Adjust for racial/ethnic disease prevalence

- Multiply risk-adjusted rate by disease prevalence ratios obtained from 2005 California Health Interview Survey

PROFILING MSSA OUTLIERS

Construct 95% Confidence Intervals (CI) to profile Low, High, and Not Significant MSSAs

- No outlier ratings reported for MSSAs with 5 or fewer cases
- For MSSAs with greater than 100 diabetes cases, construct traditional Wald CI based on assumptions of normal distribution
- If fewer than 100 cases, construct CI based on Poisson distribution

State average for diabetes composite indicator is 136.9 per 100,000 population

MSSA (by race) rated as Higher if lower CI is higher than statewide diabetes rate

MSSA (by race) rated as Lower if upper CI is lower than statewide diabetes rate

RESULTS

From 541 MSSAs in California, African Americans and Hispanics are more likely than Whites and Asians to be rated with high MSSA diabetes rates (Table 1)

High and low diabetes outliers for Whites, African Americans, and Hispanics in Los Angeles county are shown in the maps below

DISCUSSION

A trade-off exists between reporting “actionable” data (e.g., single year, sub-county, specific diseases) and data that are more statistically reliable (e.g., aggregated years, county-level, composite measures)

- To facilitate yearly reports at the MSSA level by race, OSHPD created a diabetes composite measure

Low population MSSAs stratified by race create statistical reliability problems

- One solution is construct 95% confidence intervals to profile MSSAs that are statistically significant from the state average

Large and diverse counties (e.g., Los Angeles) create a need to understand health outcomes at the sub-county level

- Finer units of aggregation may provide more meaningful public health information, and allow policymakers to take action at different political levels

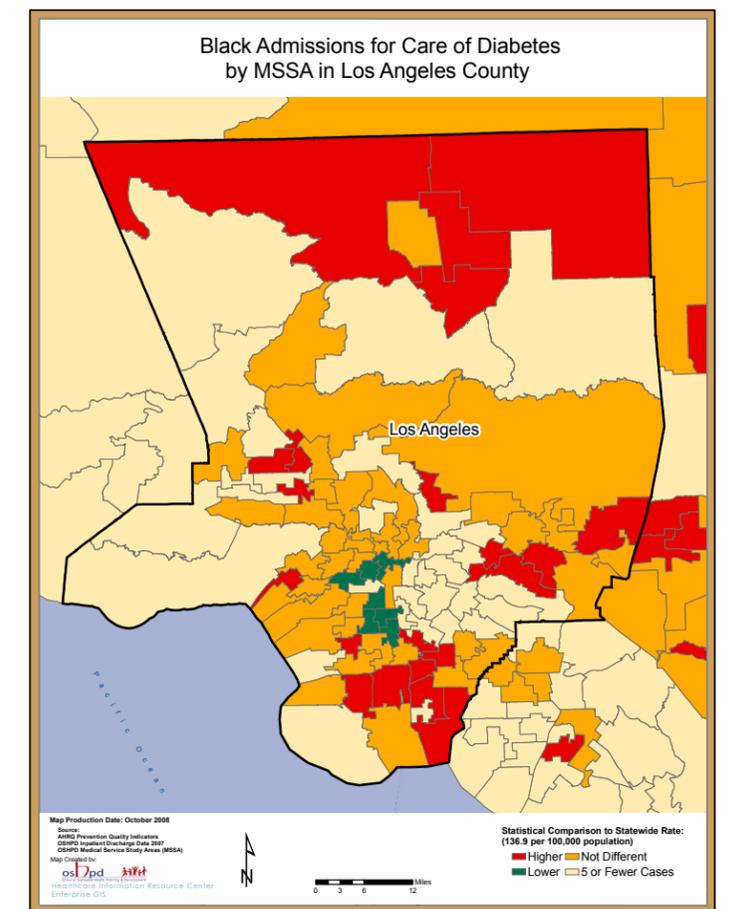
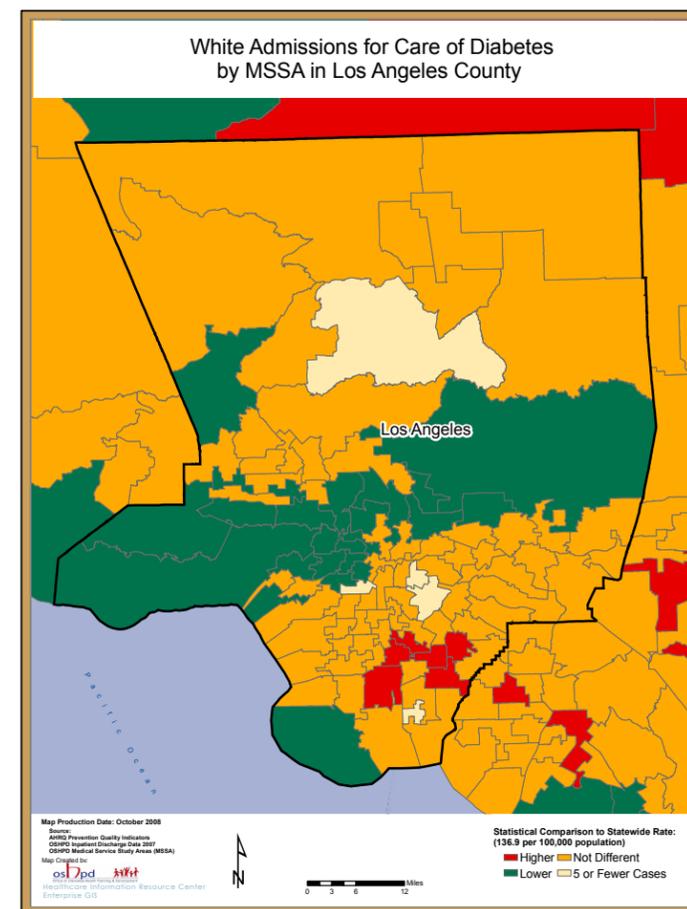
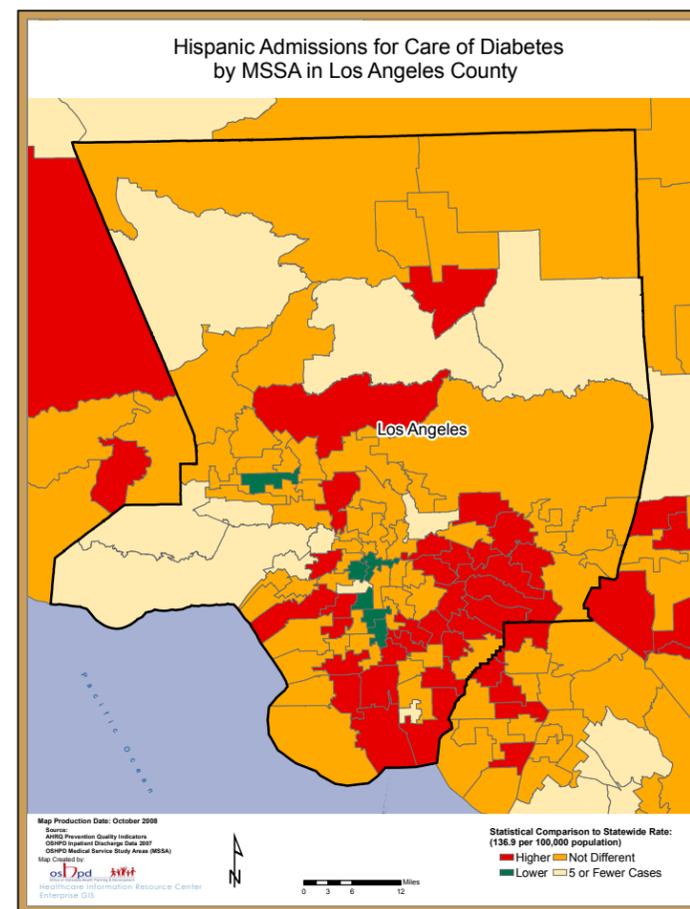
How do we explain high and low rates?

- Perform additional geographic analyses to explore association between outliers and MSSA socio-economic status, access to health plans, and other social indicators such as crime rates

Table 1. Statewide MSSA Outliers

	Higher	Not Sig.	Lower	5 Cases or Fewer*
White	48 (9%) **	286 (53.6%)	99 (18.5%)	101
Hispanic	78 (14.7%)	242 (45.5%)	18 (3.4%)	194
African American	79 (15.7%)	121 (24%)	8 (1.6%)	296
Asian/ PI	12 (2.4%)	123 (24.3%)	20 (3.9%)	351
American Indian	2 (0.41%)	1 (0.2%)	0	485

*Not rated as Higher or Lower
** Percentage = number of outliers divided by total MSSAs (N=541)



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