# PM 566 Final Report - California Supplier Diversity and Net Income

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**Introduction and Background**

To accelerate efforts to reduce health care disparities, hospitals and health systems increase their efforts in core areas such as staff and leadership diversity and cultural competence. However, the economic relationship between healthcare systems and the communities they serve are growing in importance.

Supplier diversity refers to when an organization procures goods and services from a variety of businesses, including those that are at least 51% owned, managed, and operated from marginalized and minority groups. These include women, veterans, African Americans, LGBTQIA+, and more. The private sector, including the healthcare industry has incorporated supplier diversity programs into their business practices after historically being adopted by the federal government and its contractors. According to the Harvard Business Review, supplier diversity programs are important in combatting social injustice and systemic racism in the US as they actively include diverse representation and inclusion in hospital operations and supply chains. In addition, for the moral and ethical arguments, supplier diversity programs have commercial in hospitals and health systems. These benefits include greater innovation and value through cost reductions, expansions of external partnerships, local job creation, better understanding of supply chain sourcing process and sources, and easier compliance with government and grant contracts.

On an annual basis (individual hospital fiscal year), individual hospitals and systems report detailed facility level financial data to the Department of Health Care Access and Information (HCAI). This data includes detailed facility level data on services capacity, inpatient/outpatient utilization, revenues, and expenses by type and payer. In addition, the Health and Safety Code Section 1339.85-1339.87 requires individual hospitals with operating expenses over $50 million to report hospital supplier and diversity reports explaining the hospitals’ supplier diversity statement and procurement efforts regarding minority, women, LGBT, and disabled veteran enterprises.

Medi-Cal eligible patients are also a significant portion of the population in California, making up a large portion of the state’s healthcare system. The HCAI’s financial report also reveals the revenue generated by hospitals from Medi-Cal patients, offering valuable insights into the economic pressures that hospitals face while serving this demographic. As the hospitals system increasingly rely on reimbursements from Medi-Cal, it is important to examine how hospitals' procurement practices might influence their financial performance, including revenue from Medi-Cal patients.

This report merges the annual financial data and supplier diversity reports for 2023 to answer the question **Are California hospitals with diverse suppliers profitable?** Supplier diversity aims to increase innovation and drive down prices for supplies and goods though competition while also aiming to improve health equity and combat social injustice in the US through business practices. This exploratory data analysis aims to see if funds dedicated to goods and services from diversely owned businesses can lead to better financial outcomes.

**Methods**

This analysis investigates the relationships between hospital procurement from minority-owned suppliers, medical revenue, and the hospitals' performance across various diversity categories. The data used in this analysis were derived by merging two key datasets: HCAI's Hospital Annual Financial Disclosure Report for 2023 and HCAI’s Supplier Diversity Report for 2023. These datasets, both required by state law, are submitted annually to the Hospital Council of California (HCAI) by hospitals across the state. The Hospital Annual Financial Disclosure Report includes critical financial metrics such as hospital net income, revenue, and expenditures, while the Supplier Diversity Report provides details on procurement from minority-owned suppliers, categorized by the type of minority group (e.g., African American, Hispanic American, Native American, LGBT, women, and disabled veterans). The two datasets were merged by the same hospital name variable.

The dataset includes both procurement and financial data for hospitals, categorized by the type of supplier and the specific minority group served. Key variables analyzed in this study include hospital name, net income, and combined total spent on minority owned suppliers, which represents the total amount spent by each hospital on suppliers that are owned by minority groups. This includes specific groups such as African America, Hispanic, LGBTQ, and more The procurement ratios of each diversity category relative to total hospital procurement were calculated and compared with medical revenue to assess potential correlations. A text sentiment analysis was also conducted to understand supplier diversity statements made by each hospital.

Several data cleaning and preprocessing steps were performed to prepare for analysis. After merging the two datasets, several variables related to procurement from diverse backgrounds were recoded into numeric values. These variables, which were originally categorical, were transformed into numerical data to facilitate quantitative analysis

Address-related variables were also recoded into latitude and longitude coordinates to facilitate geospatial analysis. The tidygeocoder package was used to convert hospital addresses into geographic coordinates, and the leaflet package was employed to visualize the hospital locations on interactive maps. Lastly, to ensure data integrity, any records with missing values in key columns—such as total procurement values, financial metrics, or geographical coordinates—were excluded from the analysis. Only rows with complete data for the selected variables were retained for further analysis.

To explore the relationship between procurement from minority-owned suppliers and hospital revenue, the analysis involved calculating procurement ratios for each diversity category. The combined  procurement for each minority group was divided by the total procurement for each hospital to generate the ratio and percentage for each category. This ratio provided a quantitative measure of the percentage of procurement allocated to minority-owned suppliers.

Pearson’s correlation coefficient was then calculated to assess the linear relationship between procurement ratios for each diversity category and net and Medi-Cal revenue. This quantified the economic impact of diversity procurement on hospital revenue. The correlation analysis allowed for the identification of any significant relationships between hospitals that allocate a higher percentage of procurement to minority suppliers and their corresponding medical revenue. Pearson’s correlation coefficient was chosen for its suitability in quantifying the strength and direction of the linear relationship between procurement ratios and medical revenue. A positive correlation would indicate that hospitals that spend more on minority-owned suppliers tend to have higher medical revenue, while a negative correlation would suggest the opposite. Only rows with complete data for the relevant variables were used in the correlation analysis, ensuring the integrity of the results.

To better communicate the findings, several visualization techniques were employed. Maps were generated using the leaflet package, which allowed for the interactive display of the geographic locations of the top performing hopsitals in each categories. In addition to the maps, tables were created, which allowed users to explore correlations between procurement ratios and medical revenue across different hospitals and diversity categories. This feature provided a dynamic way to view the data and compare performance across hospitals. Finally, a summary table was generated to present the correlations between procurement ratios for each diversity category and hospital medical revenue. This table provided a concise overview of the relationships, highlighting the strength and direction of each correlation.

**Results:**

his report analyzes data from 372 hospitals in California that reported both financial and supplier diversity data to the HCAI in 2023. These hospitals, on average, earned over $24 million annually and allocated $9.6 million to procurement from diverse suppliers, representing approximately 9% of their total annual procurement spending. A majority of these hospitals (320) are located in urban areas, with significant clusters in major metropolitan regions such as San Francisco, San Diego, and Los Angeles. Over 53% of the hospitals are nonprofit organizations, including church-related facilities (Tables 1–3).

#### Supplier Diversity Procurement

Hospitals across California show varying levels of investment in diverse suppliers. Washington Hospital in Fremont leads as the top spender on minority-owned suppliers, with $265,276,375, followed by Stanford Health Care at $113,963,711. Specific procurement patterns reveal leaders across diversity categories:

* **African American Suppliers:** Kaiser Permanente Santa Clara reports the highest spending.
* **Hispanic and Asian/Pacific Suppliers:** Stanford Health Care leads in these categories.
* **Unknown Minority Suppliers:** Washington Hospital Fremont tops this category.
* **Women-Owned Suppliers:** Kaiser Foundation Hospital San Diego stands out.
* **LGBT-Owned Suppliers:** Contra Costa Regional Medical Center ranks highest.

Notably, Washington Hospital in Fremont accounts for 76.71% of total procurement spending on minority-owned suppliers across all categories. (Tables 4 -6)

#### Geographic Trends

Hospitals leading in supplier diversity procurement are predominantly located in urban areas. Northern California, particularly in the Bay Area, with key contributors including Stanford Health Care and UC San Francisco, report some of the highest overall spending on diverse suppliers. Southern California hospitals, such as those in Los Angeles and San Diego, report significant spending in specific categories like women-owned and disabled veteran-owned suppliers.

#### Relationship Between Procurement and Net Income

Analysis shows a moderate positive correlation between net hospital income and Tier 1 procurement from Hispanic-owned and women-owned suppliers, with correlation coefficients of 0.56 and 0.60, respectively. Conversely, Tier 2 procurement from LGBT-owned and women-owned suppliers exhibits slight negative correlations, suggesting potential challenges in translating these partnerships into financial performance gains. The top-earning hospitals include Stanford Health Care ($808,452,386), Cedars-Sinai Medical Center ($570,706,272), and Rady Children’s Hospital – San Diego ($522,677,659). However, high net income does not consistently align with substantial supplier diversity investment, as evidenced by Cedars-Sinai and other leading earners. (Table 7)

#### Correlation with Medical Revenue

Procurement from diverse suppliers shows minimal correlations with medical revenue, with slight negative trends observed for African American, Hispanic, and Native American suppliers. These findings suggest that while supplier diversity remains a priority, its direct impact on medical revenue is limited.

#### Commitment to Supplier Diversity

Hospitals articulate their commitment to supplier diversity through statements highlighting competition, cost efficiency, and support for minority communities. Text analysis of these statements reveals key terms such as “business needs” and “competition,” reflecting a focus on the economic and operational benefits of engaging with diverse suppliers. The TF-IDF analysis by hospital types also reveal that State-controlled hospitals emphasize regulatory terms like "dsh" and "agreements," while investor-owned hospitals use generalized corporate terms. Non-profits highlight mission-driven language like "impact," and University of California hospitals focus on institutional identity with terms like "ucsf" and "university." Notably, smaller or nonsensical words like "n" and "y" may reflect human data entry errors, potentially indicating reluctance from some entities to include meaningful diversity statements in their reports. (Table 10)