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Preventable Hospitalizations in Medi-Cal

Rates of Hospitalization for Ambulatory Care Sensitive Conditions in 2011

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Table of Contents

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Created by DHCS Research and Analytic Studies Division

Abstract

This study was designed to evaluate rates of preventable hospitalization during calendar year (CY) 2011 among individuals enrolled in Medi-Cal, California's Medicaid program. Patient discharge data obtained from the California Office of Statewide Hospital Planning and Development (OSHPD) were matched to Medi-Cal enrollment and claims data, and methods developed by the Agency for Healthcare Research and Quality (AHRQ) were applied to identify hospitalizations for ambulatory care sensitive conditions (ACSCs).

In this study, the Department of Health Care Services' (DHCS) Research and Analytic Studies Division (RASD) compared California statewide and overall Medi-Cal age-sex adjusted rates of preventable hospitalization to nationally observed rates. RASD also compared age-sex adjusted ACSC rates within the Medi-Cal population, comparing distinct study groups with differing eligibility pathways and demographic characteristics to the overall Medi-Cal standard population. Lastly, within these study groups, RASD explored disparities in age-sex adjusted rates of preventable hospitalization among four broad racial/ethnic groups relative to the Medi-Cal standard population.

In general, Medi-Cal's overall observed adult ACSC rates were found to be higher than both the national and statewide rates. Similarly, Medi-Cal's overall age-sex adjusted adult ACSC rate was also found to be higher than the national rate. This was not surprising given the unique role Medi-Cal plays in insuring a diverse group of individuals that in many cases use Medi-Cal as an insurer of last resort. Medi-Cal is a program that serves as a safety net for those with low incomes and few assets, and/or medical expenses that overwhelm an individual's or family's financial resources. Medi-Cal provides coverage to groups such as disabled adults and children, low-income aged individuals, foster care children, the homeless, and individuals diagnosed with specific medical conditions such as pregnancy or breast cancer. In some cases, individuals arrive into the program in the latter stages of disease, having received little or no ambulatory care prior to gaining Medi-Cal coverage.

As expected, DHCS-RASD found significant variability in age-sex adjusted ACSC rates among Medi-Cal's unique eligibility groups. Study groups that included individuals who gained Medi-Cal eligibility through a disabling condition, or were eligible for both Medicare and Medi-Cal, generally produced age-sex adjusted ACSC rates that were higher than Medi-Cal's overall observed rates, while members of the low-income Families and Undocumented study groups generally produced age-sex adjusted ACSC rates that were lower than Medi-Cal's overall observed rates. These differences were greatly influenced by the underlying medical needs associated with each study group.

Roughly seven out of 10 Medi-Cal ACSC discharges were generated by three distinct subpopulations: individuals in the Dual Eligible study group eligible for Medi-Cal and Medicare; individuals subject to a share-of-cost, or who were determined eligible for retroactive months of eligibility; and individuals in Undocumented aid codes eligible for emergency and pregnancy-related services only. Exposure to Medi-Cal's ambulatory care system is limited, non-existent, or unknown for these three subpopulations. Some, like the Dual Eligible study group, receive most of their ambulatory care through Medicare's

delivery system, while others such as the Undocumented are entitled to emergency and pregnancy-related services only.

It was consistently found that African-Americans experienced the highest age-sex adjusted rates of ACSC admissions among adults relative to Medi-Cal's overall observed rates, and produced notably higher age-sex adjusted ACSC rates across a range of chronic conditions. When compared to Medi-Cal's overall observed rates, Whites and Hispanics also generated high age-sex adjusted ACSC rates for specific conditions relative to Medi-Cal's overall observed rates.

Finally, DHCS-RASD identified important Medi-Cal subpopulation characteristics that must be considered when evaluating ACSC rates. Designing appropriate study groups represents an integral part of evaluating and interpreting Medi-Cal's ACSC rates. Because Medi-Cal affords varying benefits packages, covers services received retroactively, and subjects some groups to cost-sharing, evaluating ACSC rates and interpreting the results is a complex process. In some cases, Medi-Cal-covered acute hospitalization events were associated with individuals who had little or no exposure to Medi-Cal's ambulatory care system. In other cases, individuals must meet a share-of-cost amount prior to receiving any Medi-Cal-covered ambulatory care, while others may be afforded coverage for only emergency and pregnancy-related services, or after being diagnosed with a specific medical condition. These unique benefit options and timing of coverage result in Medi-Cal subpopulations that have limited or no exposure to Medi-Cal's ambulatory care system prior to ACSC events. Therefore, evaluations designed to assess Medi-Cal-specific ambulatory care are not appropriate. Instead, more appropriate study questions may focus on the policy and coverage aspects of these groups, and their corresponding association with ACSC events.

Executive Summary

Prevention Quality Indicators (PQIs) and Pediatric Quality Indicators (PDIs) are measurement tools developed by the Agency for Healthcare Research and Quality (AHRQ) designed to evaluate the availability and effectiveness of a community's ambulatory health care services. Elevated PQI/PDI rates may reflect barriers to access or inefficiencies in the delivery of health care services. Information pointing to where high rates exist may provide insights leading to new strategies for improvements in systems of care.

PQIs/PDIs reflect rates of hospital admissions for ambulatory care sensitive conditions (ACSCs), health conditions for which timely ambulatory care may have prevented or reduced the need for hospitalization. These are also known as "preventable" or "avoidable" hospitalizations. While these events occur in the inpatient setting, it is essential to bear in mind that these indicators were designed to provide information regarding the adequacy of ambulatory care provided outside the hospital prior to admission.

Objectives

In this study, by combining information from the California Office of Statewide Health Planning and Development (OSHPD) Patient Discharge Data (PDD) set for Calendar Year (CY) 2011 with Medi-Cal enrollment and paid claims data, the Department of Health Care Services' (DHCS) Research and Analytic Studies Division (RASD):

- Generated both observed and age-sex adjusted PQI/PDI rates. PQI rates among adults ages 18 and older were calculated for three composite and 13 disease-specific measures. PDI rates among children of different age ranges were calculated for three composite and three chronic disease-specific measures;
- Compared California's and Medi-Cal's rates of preventable hospitalization to national rates among adults and children;
- Divided individuals certified eligible for Medi-Cal (referred to as "certified eligibles") into meaningful study groups based on administrative, demographic, and clinical criteria;
- Evaluated differences in rates of preventable hospitalization among the study groups; and
- Evaluated disparities in rates of preventable hospitalization among four broad racial/ethnic groups within the Medi-Cal study groups.

Age-Sex Adjustment

In addition to the calculation of observed PQI/PDI rates, DHCS-RASD also calculated age-sex adjusted rates using AHRQ's standardization methodology. These age-sex adjusted rates were then compared to observed rates from a chosen standard population.

Age-sex adjustment is a tool that can be used to compare data from populations with different demographic characteristics. One can determine what the study population's rates would have been had the study population reflected the same age-sex demographic traits as the standard population (Table PH-1).

All comparisons are expressed relative to the observed rate of the standard population (e.g., "The study group's age-sex adjusted rate was twice that of the standard population's overall observed rate.").

Table PH-1: Standard Population Rates Used Throughout This Study

When Comparing	Standard Population Rates Used
California's and Medi-Cal's PQI/PDI rates to national rates	2008 U.S. Population Rates
Medi-Cal's subpopulations (i.e., eligibility pathway and race/ethnicity)	Medi-Cal's overall population rates

Source: Created by DHCS Research and Analytic Studies Division.

Study Groups

In order to develop meaningful health care statistics for the Medi-Cal population and its diverse subpopulations, DHCS-RASD categorized individuals into study groups based on eligibility pathway and other important administrative and policy criteria. Medi-Cal's eligibility pathways provide a means for dividing the population into study groups comprised of younger, healthier individuals less likely to require hospitalization; and those who are older or more medically vulnerable and have a greater probability of requiring hospitalization.

However, these criteria alone are not sufficient. Administrative and policy criteria also complicate the interpretation of PQI/PDI rates. Therefore, careful consideration of Medi-Cal's unique subpopulations and specific policies were necessary as well.

Administrative and policy criteria related to the responsibility, timing, and scope of Medi-Cal coverage can reduce meaningful exposure to ambulatory care, and create complex interpretive issues regarding what is being evaluated, or whether the rate being produced is actually the true rate.

For example, consider a preventable hospitalization experienced by an individual lacking Satisfactory Immigration Status (SIS), enrolled in an aid code for undocumented immigrants, and eligible for emergency and pregnancy-related services only. This hospitalization cannot be attributed to the adequacy or quality of Medi-Cal's ambulatory care system when the individual in question is not provided coverage for preventive care services under the current legal framework.

Similarly, individuals granted eligibility retroactively following an inpatient hospitalization did not have the same opportunity to utilize Medi-Cal's ambulatory care system as did individuals who were continuously eligible for Medi-Cal benefits prior to hospitalization.

To separate Medi-Cal certified eligibles into meaningful groups reflecting these considerations, DHCS-RASD divided adults into five study groups and children into four study groups.

The study groups included:

- Adults and children enrolled in Families aid codes, entitled to full-scope services, and eligible for Medi-Cal but not Medicare (referred to as "Medi-Cal Only");
- Adults and children enrolled in Seniors and Persons with Disabilities (SPD) aid codes, entitled to full-scope services, and eligible for Medi-Cal Only;
- Dual Eligibles, or individuals eligible for both Medi-Cal and Medicare, and entitled to full-scope services. This study group included adults only. While a small number of children with disabilities were enrolled in both Medi-Cal and Medicare, their numbers were not great enough to constitute a meaningful study group;
- Adults and children lacking SIS, enrolled in Undocumented aid codes, and eligible for emergency and pregnancy-related services only; and

- Adults and children with eligibility granted retroactively, or subject to a share-of-cost (SOC) obligation, or enrolled in restricted-scope aid codes that limit services to those associated with a specific medical condition, such as breast cancer or tuberculosis. Among this study group were individuals who would have been assigned to one of the four eligibility categories listed above, had they not either been granted eligibility retroactively or had a SOC obligation.

Findings

Distribution of ACSC Discharges in California, by Payer Source

In this study, RASD evaluated 2,977,238 acute-care hospital inpatient discharges that occurred in California during CY 2011. Nearly 33% of these were generated by Medi-Cal certified eligibles, and approximately 67% were generated by individuals covered by payers other than Medi-Cal. Overall, 319,485 discharges, or nearly 11%, were classified as ACSCs.

Differences in the proportion of discharges classified as ACSCs were noted by payer type. ACSC discharges represented 13.7% of total acute-care hospital inpatient discharges among Medi-Cal certified eligibles, but only 9.3% of total discharges among individuals covered by payers other than Medi-Cal. The Medi-Cal population generated 42.0% of discharges classified as ACSCs, but represented only 24.5%[1] of the overall state population. Conversely, individuals covered by payers other than Medi-Cal together with the uninsured constituted the remaining 75.5% of the population, but generated only 58.0% of ACSC discharges.

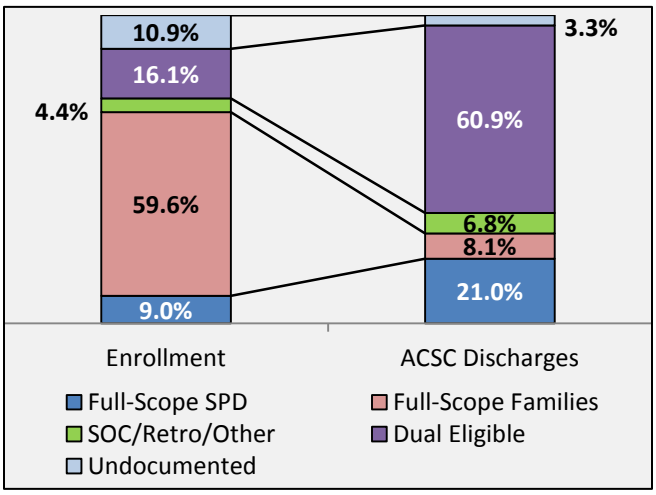
In large part, the larger proportion of ACSC discharges among Medi-Cal certified eligibles, compared to individuals covered by payers other than Medi-Cal, reflects the greater health burden and unique population mix served by Medi-Cal, as well as the greater clinical complexity of Medi-Cal subpopulations such as SPDs and Dual Eligibles. In many cases Medi-Cal serves as the insurer of last resort, providing coverage to foster children; individuals diagnosed with pre-existing conditions; the economically disadvantaged; the homeless; individuals with serious mental illness, or developmental disabilities; and those with other serious or disabling conditions and diseases.

Distribution of Medi-Cal's ACSC Discharges, by Study Group

Medi-Cal's disproportionately high level of avoidable hospitalizations relative to the size of its population is attributable to the medical and clinical characteristics of its population. Evidence of this is found in the distribution of avoidable hospitalizations among its study groups. Together, members of the SPD and Dual Eligible study groups were responsible for nearly 82% of all ACSC discharges generated by Medi-Cal certified eligibles in 2011.

The Dual Eligible study group generated 60.9% of Medi-Cal's ACSC discharges, but represented 16.1% of total certified eligibles. Similarly, SPDs constituted 9.0% of total certified eligibles, but generated 21.0% of ACSC events. The Families study group generated 8.1% of Medi-Cal's ACSC discharges, but represented 59.6% of the total Medi-Cal population. Individuals with eligibility granted retroactively, or having a SOC obligation, or enrolled in a restricted-scope aid code associated with a specific medical condition, generated 6.8% of Medi-Cal's ACSC discharges and represented 4.4% of total certified eligibles. Lastly, certified eligibles in the Undocumented study group generated 3.3% of Medi-Cal's ACSC discharges and represented 10.9% of the Medi-Cal population (Figure PH-1).

Figure PH-1: Distribution of Medi-Cal Enrollment and ACSC Acute-Care Hospital Inpatient Discharges among Medi-Cal Certified Eligibles Ages 6 and Older in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and Medi-Cal enrollment data. Ambulatory care sensitive conditions are those identified under PQI- and PDI-90 (Overall Composites).

The overwhelming majority of ACSC discharges among Medi-Cal certified eligibles were generated by adults. This is due to the much greater likelihood of illness leading to hospitalization among adults compared to children, as well as the greater burden of disability, large senior population, and generally higher level of ill health stemming from various socioeconomic determinants among adults enrolled in Medi-Cal.

In 2011, children ages 6–17 represented 34.8% of all Medi-Cal certified eligibles ages 6 and older, but generated only 4.7% of all acute-care hospital inpatient discharges.[i] Adults ages 18 and older represented 65.2% of the population, but generated 95.3% of acute-care hospital inpatient discharges.

Overall, Acute, and Chronic Composite Rates

The descriptive statistics presented in this study include PQI/PDI rates for specific acute and chronic conditions, as well as composite rates which serve as summary indicators. The Overall Composite indicators, PQI-90 and PDI-90, provide single summary indicators capturing the general concept of potentially avoidable hospitalizations, and encompassing all the individual PQIs/PDIs related to specific diseases and conditions. The Acute Composite indicators, PQI-91 and PDI-91, summarize rates for those specific conditions characterized by a relatively sudden onset of symptoms that are usually severe, followed by recovery to a state of health comparable to what was experienced before the acute episode, or transition to a chronic phase, or in death. The Chronic Composite indicators, PQI-92 and PDI-92, summarize rates for those specific conditions or diseases characterized by long duration, frequent recurrence over a long time, and often by slowly progressing seriousness.

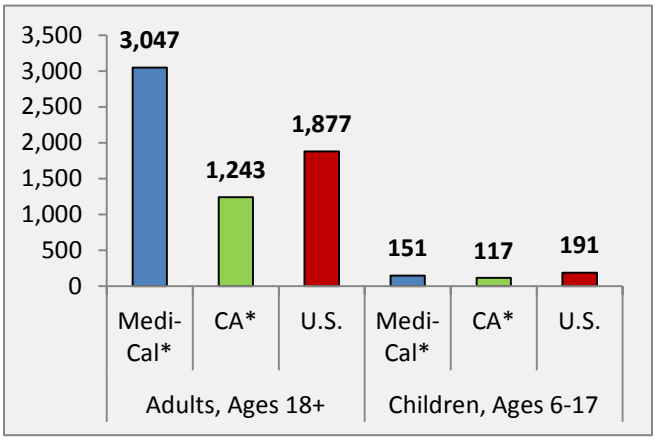
Comparison of California's and Medi-Cal's Rates of Preventable Hospitalization to National Rates among Adults and Children

As noted in the previous discussion of age-sex adjustment methods, DHCS-RASD compared age-sex adjusted PQI/PDI rates for the California and Medi-Cal populations to nationally observed rates derived from 2008 U.S. population rates.

DHCS-RASD found that the child population ages 6–17, in both Medi-Cal and California overall, generated age-sex adjusted Overall Composite rates that were lower than the nationally observed rate. However, while the statewide California adult population ages 18 and older also generated an age-sex adjusted Overall Composite rate that was lower than the nationally observed rate, Medi-Cal's overall age-sex adjusted rate for adults was found to be much higher than the nationally observed rate. (Figure PH-2).

[i] The total Medi-Cal population here was limited to only individuals ages 6 and older because this is the population evaluated in this study. DHCS-RASD did not produce any PQI/PDI measures for individuals ages 5 and younger.

Figure PH-2: PQI-90 and PDI-90 (Overall Composite) Rates among Children Ages 6–17 and Adults Ages 18 and Older in the United States, California, and Medi-Cal per 100,000 Population in 2011



Source: Created by DHCS Research and Analytic Studies Division.

*Medi-Cal and California rates are age-sex adjusted to AHRQ (Version 4.4) national rates. The U.S. rate is the observed rate.

Differences in Rates within the Medi-Cal Population, by Study Group

In addition to comparing the overall age-sex adjusted PQI/PDI rates of Medi-Cal certified eligibles to the U.S. population, DHCS-RASD also compared the aforementioned study groups within Medi-Cal, defined by their differing eligibility pathways, demographic characteristics, and disability burden. DHCS-RASD compared the age-sex adjusted rates for each study group to the observed rate for the entire Medi-Cal population for each PQI/PDI measure.

Adults: Among adults ages 18 and older certified eligible for Medi-Cal, the overall observed PQI-90 (Overall Composite) rate, including both acute and chronic conditions, was 3,302 discharges per 100,000 population (Table PH-2). However, wide disparities in the age-sex adjusted rates relative to Medi-Cal's overall observed rates were seen among members of the five adult study groups, reflecting their underlying clinical and administrative characteristics.

Table PH-2: PQI-90 (Overall Composite) Age-Sex Adjusted Rates among Certified Eligible Adults Ages 18 and Older per 100,000 Population in 2011, by Study Group

Study Group	Age-Sex Adjusted Rate	Observed Rate for All Medi-Cal Adults
SPD	4,070	3,302
Families	1,390	
Dual Eligible	3,634	
SOC/Retro/Other	6,039	
Undocumented	1,530	

Source: Created by DHCS Research and Analytic Studies Division. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

When compared to Medi-Cal's overall observed PQI-90 rate, the highest age-sex adjusted PQI-90 rate was seen among members of the SOC/Retro/Other study group (6,039). This group included individuals subject to a SOC obligation who may have experienced periods of sporadic Medi-Cal participation depending on whether or not they reached their cost-sharing threshold, and who therefore may not have enjoyed a period of meaningful exposure to Medi-Cal-covered ambulatory care prior to admission. It also included individuals who were granted Medi-Cal eligibility retroactively. Therefore, they also did not experience potential exposure to Medi-Cal-covered ambulatory care prior to admission.

In addition, when calculating PQI/PDI rates for individuals who became eligible retroactively, the true denominator cannot be determined using Medi-Cal's administrative data alone. Individuals who are eligible for Medi-Cal but not enrolled must be considered.

Similarly, individuals subject to a SOC obligation require certain adjustments to the denominator due to specific techniques used for counting

Medi-Cal certified eligibles.[ii] If these adjustments are not considered, the denominator for this subpopulation will be understated.

Children: The age-sex adjusted PDI-90 (Overall Composite) rates among Medi-Cal children were compared to Medi-Cal's overall observed PDI-90 rate, by study group. Among all Medi-Cal children ages 6–17, the overall observed PDI-90 rate was 153 discharges per 100,000 population (Table PH-3). As was seen in the adult population, the child study groups generated dramatically different age-sex adjusted PDI-90 rates, which reflected their underlying clinical and administrative differences.

Table PH-3: PDI-90 (Overall Composite) Age-Sex Adjusted Rates among Certified Eligible Children Ages 6–17 per 100,000 Population in 2011, by Study Group

Study Group	Age-Sex Adjusted Rate	Observed Rate for All Medi-Cal Children Ages 6-17
SPD	555	153
Families	127	
SOC/Retro/Other	397	
Undocumented	88	

Source: Created by DHCS Research and Analytic Studies Division. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17.

Differences in Rates, by Study Group and Race/Ethnicity

A number of research studies have identified race/ethnicity as being a factor in preventable hospitalizations, as some racial/ethnic groups experience much higher rates of preventable hospitalization than others. To determine whether this is also true within the Medi-Cal population, and to what extent, DHCS-RASD evaluated PQI/PDI rates among four broad racial/ethnic groups: Non-Hispanic Whites, African-Americans, Hispanics, and Others (primarily Asian and Pacific Islander). DHCS-RASD compared the age-sex adjusted rate for each of these cohorts to the observed rate for the overall Medi-Cal population for each PQI/PDI measure. Differences in rates by race/ethnicity were evaluated among three of the five adult study groups. These included:

- Families;
- SPDs; and
- Dual Eligibles.

Similarly, DHCS-RASD evaluated differences in rates by race/ethnicity among two of the four child study groups:

- Families; and
- SPDs.

[ii] Medi-Cal's administrative "certified eligible" count includes only individuals who have met their SOC obligation for the month. This means that those individuals who have not met their SOC obligation are not included in the denominator unless adjustments are made.

Overall Composite Rate (PQI-90) among Adults

The comparison of preventable hospitalizations among adults, as reflected in the PQI-90 Overall Composite measure, revealed significant disparities by race/ethnicity within each of the study groups. Compared to Medi-Cal's overall observed PQI-90 rate, the African-American racial/ethnic cohort produced the highest age-sex adjusted PQI-90 rate among the racial/ethnic groups evaluated, followed by Whites, Hispanics, and the Other racial/ethnic cohort (Table PH-4).

Table PH-4: PQI-90 (Overall Composite) Age-Sex Adjusted Rates among Certified Eligible Adults Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity

Study Group	Race/ Ethnicity	Age-Sex Adjusted Rate	Observed Rate for All Medi-Cal Adults
SPD	White	4,716	3,302
	African-American	7,336	
	Hispanic	4,904	
	Other	1,272	
Families	White	1,887	3,302
	African-American	2,670	
	Hispanic	1,285	
	Other	543	
Dual Eligible	White	4,402	3,302
	African-American	6,643	
	Hispanic	4,108	
	Other	1,911	

Source: Created by DHCS Research and Analytic Studies Division. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

Acute Composite Rate (PQI-91) among Adults

Acute conditions include dehydration, bacterial pneumonia, and urinary tract infection. The age-sex adjusted PQI-91 (Acute Composite) rates also displayed disparities by race/ethnicity (Table PH-5). Whites generated the highest age-sex adjusted PQI-91 rate relative to Medi-Cal's overall observed PQI-91 rate in two of the three study groups evaluated.

Table PH-5: PQI-91 (Acute Composite) Age-Sex Adjusted Rates among Certified Eligible Adults Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity

Study Group	Race/ Ethnicity	Age-Sex Adjusted Rate	Observed Rate for All Medi-Cal Adults
SPD	White	1,816	1,165
	African-American	1,676	
	Hispanic	1,632	
	Other	436	
Families	White	869	1,165
	African-American	747	
	Hispanic	576	
	Other	260	
Dual Eligible	White	1,770	1,165
	African-American	1,776	
	Hispanic	1,400	
	Other	668	

Source: Created by DHCS Research and Analytic Studies Division. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

Chronic Composite Rate (PQI-92) among Adults

Chronic conditions include diabetes, hypertension, COPD, heart failure, angina, and asthma. The age-sex adjusted PQI-92 (Chronic Composite) rates revealed significant disparities by race/ethnicity. African-American certified eligibles generated age-sex adjusted PQI-92 rates that were significantly higher than Medi-Cal's overall observed PQI-92 rate, while the Other racial/ethnic cohort generated age-sex adjusted PQI-92 rates that were significantly lower than Medi-Cal's overall observed PQI-92 rate (Table PH-6).

Table PH-6: PQI-92 (Chronic Composite) Age-Sex Adjusted Rates among Certified Eligible Adults Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity

Study Group	Race/ Ethnicity	Age-Sex Adjusted Rate	Observed Rate for All Medi-Cal Adults
SPD	White	2,941	2,137
	African-American	5,395	
	Hispanic	3,262	
	Other	834	
Families	White	1,046	2,137
	African-American	1,912	
	Hispanic	727	
	Other	298	
Dual Eligible	White	2,611	2,137
	African-American	4,874	
	Hispanic	2,715	
	Other	1,244	

Source: Created by DHCS Research and Analytic Studies Division. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

Overall Composite Rate (PDI-90) among Children Ages 6–17

While there were differences in the age-sex adjusted PDI-90 (Overall Composite) rates among Medi-Cal children in distinct racial/ethnic cohorts, these differences were not as great as the racial/ethnic disparities seen among adults. Children in the SPD study group generated much higher age-sex adjusted PDI-90 rates relative to Medi-Cal's overall observed PDI-90 rate, reflecting the greater prevalence of disease and disabling conditions associated with the SPD study group (Table PH-7).

Table PH-7: PDI-90 (Overall Composite) Age-Sex Adjusted Rates among Certified Eligible Children Ages 6–17 per 100,000 Population in 2011, by Study Group and Race/Ethnicity

Study Group	Race/ Ethnicity	Age-Sex Adjusted Rate	Observed Rate for All Medi-Cal Children Ages 6-17
SPD	White	822	153
	African-American	1,049	
	Hispanic	932	
	Other	86	
Families	White	168	153
	African-American	219	
	Hispanic	106	
	Other	101	

Source: Created by DHCS Research and Analytic Studies Division. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17.

Acute Composite Rate (PDI-91) among Children Ages 6–17

Greater disparities in PDI rates among certified eligible children in different racial/ethnic cohorts emerged at the acute disease level. Medi-Cal's overall observed PDI-91 (Acute Composite) rate for children was 50 discharges per 100,000 population.

Among child members of the SPD study group, Hispanics generated the highest age-sex adjusted PDI-91 rate relative to Medi-Cal's overall observed PDI-91 rate, followed by Whites and African-Americans (Table PH-8).

Table PH-8: PDI-91 (Acute Composite) Age-Sex Adjusted Rates among Certified Eligible Children Ages 6–17 per 100,000 Population in 2011, by Study Group and Race/Ethnicity

Study Group	Race/ Ethnicity	Age-Sex Adjusted Rate	Observed Rate for All Medi-Cal Children Ages 6-17
SPD	White	397	50
	African-American	179	
	Hispanic	625	
	Other	46	
Families	White	52	50
	African-American	24	
	Hispanic	35	
	Other	28	

Source: Created by DHCS Research and Analytic Studies Division. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17.

Chronic Composite Rate (PDI-92) among Children Ages 6–17

As seen in the adult population, African-American children generated the highest age-sex adjusted PDI-92 (Chronic Composite) rates in both the SPD and Families study groups relative to Medi-Cal's overall observed PDI-92 rate for children (Table PH-9).

Table PH-9: PDI-92 (Chronic Composite) Age-Sex Adjusted Rates among Certified Eligible Children Ages 6–17 per 100,000 Population in 2011, by Study Group and Race/Ethnicity

Study Group	Race/ Ethnicity	Age-Sex Adjusted Rate	Observed Rate for All Medi-Cal Children Ages 6-17
SPD	White	437	103
	African-American	860	
	Hispanic	330	
Families	White	116	103
	African-American	196	
	Hispanic	71	
	Other	72	

Source: Created by DHCS Research and Analytic Studies Division. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17.

Condition-Specific Rates among Adults and Children

In addition to composite PQI/PDI rates, RASD also evaluated disease- and condition-specific PQI/PDI rates by study group and race/ethnicity.

Some of these disease-specific rates revealed notable differences by both study group and race/ethnicity among Medi-Cal certified eligibles. These individual condition-specific indicators also revealed useful information related to the prevalence of specific ACSCs within the Medi-Cal population, and are analyzed in detail in the final section of this study.

Lessons Learned

In this study, DHCS-RASD examined rates of preventable hospitalization among Medi-Cal's diverse population using AHRQ's PQI/PDI measures. These findings provided valuable information concerning Medi-Cal's overall rate of preventable hospitalizations, and highlighted significant disparities among different segments of that population. Additionally, the study yielded important insights into the methodological and interpretive complexities that arise when using AHRQ PQI/PDI measures to evaluate Medicaid populations.

While researchers may be able to draw more straightforward and unambiguous conclusions from PQI/PDI measures derived from demographically and clinically homogeneous populations, the extreme heterogeneity of the Medi-Cal population – combined with the program's unique benefit structures, and its role as an insurer of last resort – add layers of complexity to measurement and interpretation.

As detailed in this study, the first layer of complexity resulted from the many different eligibility pathways into Medi-Cal coverage, which are designed for different groups of individuals with very different demographic characteristics and health statuses. The next layer of complexity is the result of the administrative features of the program, and is driven by differences in the scope, timing, and responsibility of coverage, and the impact these differences have on exposure to meaningful ambulatory care. The final layer of complexity results from environmental and economic factors that may lie beyond the reach of traditional health care systems. Issues related to low socioeconomic status (SES), unsafe neighborhoods, a scarcity of community social resources, homelessness, and other factors may result in higher rates of preventable hospitalization regardless of the ambulatory care delivery network available.

All of these layers are interwoven and interconnected. Each layer influences the others, and in many cases the interactions are multi-directional. Medi-Cal beneficiaries who are coping with issues such as low SES, diabetes, severe mental illness, and homelessness will have a higher probability of experiencing a PQI/PDI event. In turn, physician practice patterns informed by patient poverty and housing status may in turn influence their hospital admitting decisions.

Consistent with findings from previous research, disparities in rates of preventable hospitalization associated with race/ethnicity were present within the Medi-Cal population. African-Americans enrolled in Medi-Cal generated significantly higher age-sex adjusted rates of preventable hospitalization associated with chronic conditions relative to Medi-Cal's overall observed rates, even during childhood. Hispanic adults experienced high age-sex adjusted rates for specific conditions associated with diabetes relative to Medi-Cal's overall observed rate. Relative to Medi-Cal's overall observed rate, White adults experienced higher age-sex adjusted rates for bacterial pneumonia compared with individuals in the other three racial/ethnic cohorts evaluated. The fourth group, comprised primarily of beneficiaries of Asian ancestry, generated the lowest age-sex adjusted rates of preventable hospitalization for most measures.

Medi-Cal adults generated much higher observed ACSC rates compared with adults statewide, and much higher age-sex adjusted rates than the nationally observed rates. These higher rates can be explained in part by Medi-Cal's much larger proportion of low-income individuals; dually eligible low-income seniors and persons with

disabilities; individuals whose eligibility was based on an underlying medical condition or event; and individuals who use Medi-Cal as an insurer of last resort. In some cases, the Medi-Cal program provides health benefits to individuals with serious and/or advanced conditions when no other payer is willing or able to cover the costs of necessary medical care.

Consistently throughout this study, rates of preventable hospitalization appeared to be strongly associated with the underlying characteristics of the various subpopulations examined. To help readers interpret the findings presented in this report in the context of Medi-Cal's unique role in extending coverage to a complex mix of individuals, DHCS-RASD divided the Medi-Cal population into different study groups comprised of individuals with similar demographic, clinical, and administrative characteristics, as well as similar potential exposure to Medi-Cal's ambulatory care system.

Individuals in study groups experiencing greater degrees of clinical complexity and illness – such as individuals in the SPD and Dual Eligible study groups – generated the highest age-sex adjusted PQI/PDI rates relative to the observed rates of Medi-Cal's overall population.

Roughly seven out of 10 Medi-Cal ACSC adult discharges were generated by three distinct subpopulations: individuals dually eligible for Medicare and Medi-Cal; individuals without SIS and enrolled in aid codes for undocumented immigrants; and individuals subject to a SOC obligation, or who were determined eligible for Medi-Cal retroactively. Exposure to Medi-Cal's ambulatory care system is limited, non-existent, or unknown for these subpopulations. Some, like the Dual Eligible study group, receive most of their ambulatory care through Medicare's delivery system, while others such as Undocumented immigrants are entitled to emergency and pregnancy-related services only.

In addition to revealing significant disparities among Medi-Cal's diverse subpopulations, DHCS-RASD's findings also provided information that informs our understanding of how PQI/PDI rates should be interpreted in light of the underlying demographic, administrative, and clinical differences among these Medi-Cal study groups. As researchers continue to search for appropriate measures for evaluating access to health care services and the quality of ambulatory care, attention must also be focused on understanding Medicaid's unique populations and varied benefit structures. As noted in this study, Medi-Cal's varying benefit structures, the timing of coverage, the heterogeneity of the enrolled population, and its role as an insurer of last resort greatly influence how PQI/PDI measures are interpreted.

Individuals in the full-scope SPD and full-scope Families study groups shared a similar benefit structure and similar access to ambulatory care, but displayed dramatically different clinical and health characteristics. The Families study group was comprised of younger and generally healthier individuals who qualified on the basis of income and had low rates of hospitalization. Members of the SPD study group were older on average, were far more likely to have been diagnosed with a severe or disabling clinical condition, and were hospitalized at much higher rates. Because rates of preventable hospitalization reflected these differences and also varied sharply, these groups were reported separately.

In addition to disability-based coverage, there are other eligibility pathways that draw individuals with more advanced medical conditions into the Medi-Cal program. Some individuals may qualify for Medi-Cal based on a pre-existing medical

condition, such as in the Breast and Cervical Cancer Treatment Program, and in some cases these individuals may arrive into the program in the later stages of disease. Other individuals may enroll into the program with incomes too large to qualify generally, but with health care costs too great to cover with their own resources. These individuals gain Medi-Cal coverage only after incurring a specified health care cost amount, which in many cases suggests treatment for an existing medical condition.

Researchers frequently analyze PQI/PDI rates in order to evaluate the effectiveness and adequacy of the ambulatory care delivery systems. However, Medi-Cal's varying benefit packages afford some groups within the program a restricted scope of coverage, or cover services delivered for periods prior to enrollment into the program. Differences in the scope and timing of coverage may result in populations that have limited or no exposure to Medi-Cal's ambulatory care prior to ACSC events.

Among Dual Eligibles and beneficiaries with a SOC obligation, another entity besides Medi-Cal may have primary responsibility for the provision of ambulatory care. In these instances, evaluations designed to assess Medi-Cal's specific ambulatory care network are not appropriate. More relevant study questions may focus on policy and coverage aspects of these groups and their corresponding association with ACSC events.

Medi-Cal, like other Medicaid programs throughout the nation, provides coverage to economically disadvantaged populations, individuals managing multiple comorbidities, and individuals who are homeless. In many cases factors that are more socioeconomic in origin, and require interventions outside the scope of the traditional health care system, are strongly associated with ACSCs. Recognizing the role of socioeconomic factors, the authors of a recent National Quality Forum report observed, "There is a large body of evidence that various socio-demographic factors influence outcomes, and thus influence results on outcome performance measures…There also is a large body of evidence that there are disparities in health and healthcare related to some socio-demographic factors."[2]

Some studies have noted that provider practice style may influence whether individuals are admitted to a hospital, and these decisions may be driven by a physician's perception of an individual's living arrangements and behavioral health status. Certain populations, such as homeless individuals suffering from multiple comorbidities including serious mental illness, must be evaluated in light of the complex mix of challenges, present outside of the health delivery system, which present significant obstacles to achieving optimal ambulatory care.

How one defines ambulatory care in regards to this population is important. Does the ambulatory care system incorporate such elements as housing, social services, and food support? In this case, can high PQI/PDI rates associated with these individuals be influenced only through the ambulatory care system, which may or may not include necessary social supports?

Finally, when considering the use of PQI/PDI rates, researchers and program directors must consider how modifications to their Medicaid ambulatory care delivery systems may influence PQI/PDI rates. As reported in this study, only about 30% of Medi-Cal's PQI/PDI discharges may be influenced by the program's ambulatory care system. The Dual Eligible study group generated six out of 10 ACSC events, but received almost all of their ambulatory care through Medicare's delivery system. Other groups, such as the Undocumented study group, are entitled to a

restricted scope of benefits that covers emergency and pregnancy-related services only. For these individuals, Medi-Cal's ambulatory care system has no opportunity to influence a PQI/PDI event. Further, a number of individuals receive health care coverage for services or PQI/PDI events that occurred prior to their formal enrollment into Medi-Cal. Therefore, these retroactively covered Medi-Cal services were certainly not influenced by Medi-Cal's ambulatory care system. To influence the vast majority of PQI/PDI events associated with the Medi-Cal program, changes must be considered beyond the scope of Medi-Cal's ambulatory care system.

Because the majority of ACSC admissions were generated by individuals eligible for both Medi-Cal and Medicare, interventions focusing on closer collaboration between the two programs must be considered to effectuate change. Certain incentives must be understood and new methods of developing inclusive systems of care must be implemented.

While an abundance of research has focused on assessing ambulatory care systems and access to care by evaluating PQI/PDI rates, as noted in this study, the evaluation of preventable hospitalizations within Medicaid populations should encompass a broader array of research questions. For example, further research – especially as it relates to Medicaid populations – should focus on physician practice styles, how issues such as homelessness and mental health may influence a physician's propensity to admit, and the corresponding impact on PQI/PDI rates.

Two major recent developments may address some of the aforementioned aspects of the Medi-Cal program that complicate the task of interpreting PQI/PDI rates generated by certain Medi-Cal beneficiaries: the Dual Eligible Coordinated Care Initiative (CCI), also known as the Cal MediConnect program, launched in 2013; and the expansion of Medicaid eligibility under the Affordable Care Act (ACA), which began on January 1, 2014.

As the ACA is more fully implemented, PQI/PDI rates associated with individuals subject to a SOC obligation and individuals incurring PDI/PQI events during retroactive months of eligibility may change. Focusing on how rates of preventable hospitalization have changed among these groups will provide insight into the health care coverage expansion's impact on access to ambulatory care. Because Medi-Cal's enrollment rate has been so high due to the ACA expansion, adding more than 3 million new beneficiaries, it is reasonable to believe that PQI/PDI cases associated with individuals gaining eligibility retroactively may diminish. Individuals may be able to gain exposure to Medi-Cal's ambulatory care network sooner and more consistently than they otherwise would if not for the ACA expansion.

The frequency of preventable hospitalizations among certain groups within the Medi-Cal population may also enhance or diminish the usefulness of PQIs/PDIs as a measurement tool. As noted in this study some groups, such as the Families and Undocumented study groups, constituted a significant proportion of the Medi-Cal population but accounted for only a small proportion of total PQI/PDI cases. For example, the Families study group constituted 1.6 million individuals, but generated only 8,648 PQI/PDI events. Depending upon how you segregate the data, in many cases a PQI/PDI event in this subpopulation represents a fairly rare occurrence. Further, because the PQI/PDI measures are in many cases being used as broad-based measures for assessing access to care or the quality of system-wide ambulatory care, the infrequent

occurrence among these subpopulations may create challenges and result in measures that provide little insight.

It was found that groups for which Medi-Cal either had only a limited role or no role in providing and arranging for ambulatory care experienced the highest PQI/PDI rates and accounted for a disproportionate total of all Medi-Cal PQI/PDI cases. As such, the use of PQIs/PDIs as tools for evaluating Medi-Cal's ambulatory care delivery system must be evaluated in light of these unique subpopulations, and in the context of whether the frequency of PQI/PDI events among the unique subpopulations can be used to evaluate broad-based phenomena.

Specific interventions designed to modify PQI/PDI rates must include other policy levers besides changes to Medi-Cal's ambulatory care delivery system. As noted in this study, approximately six out of 10 PQI cases were generated by individuals eligible for both Medi-Cal and Medicare. For this group of dually eligible individuals, attempts to modify PQI rates must focus on developing coordinated systems of care between two distinct programs. New Medi-Cal policy initiatives, such as the CCI or Cal MediConnect, are attempting to reform this relationship. The implementation of the ACA also provides cause for optimism. Many PQI/PDI cases were generated by individuals eligible for Medi-Cal but not enrolled in the program prior to hospitalization, and therefore lacking prior access to Medi-Cal's ambulatory care delivery system. It is anticipated that the ACA expansion, by enrolling a larger proportion of eligible individuals, may expand meaningful access to ambulatory care. As the take-up rate increases and fewer individuals are found to eligible for Medi-Cal but not enrolled, the PQI/PDI rates associated with this subgroup may be altered.

Introduction

Among individuals suffering from a number of common clinical conditions such as asthma, diabetes, or heart disease, the absence of timely and appropriate ambulatory care can often result in deterioration of health followed by an exacerbation of their underlying condition, culminating in an avoidable hospital admission. Preventable hospitalizations are defined as inpatient hospital admissions related to ambulatory care sensitive conditions (ACSCs) that could have been avoided or made less severe had the patient received timely and appropriate ambulatory care prior to admission, negating the need for hospitalization.

Health care researchers, economists and policy-makers study rates of preventable hospitalization in order to compare the experience of a specific population to others, as well as to identify variations in rates among smaller demographic, clinical, or geographic groups. These variations in rates may reflect problems resulting from potential barriers to ambulatory care, the quality of ambulatory care delivered, or the overall adequacy and performance of the ambulatory care system. Purchasers of health care services may use this information to assess performance and value. Health delivery systems may use these measures to plan health interventions, and later to measure how well those interventions succeeded in reducing the incidence of preventable hospitalizations.

As some of the nation's largest purchasers of health care services in the U.S., state Medicaid agencies have a strong interest in reducing preventable hospitalizations. Medicaid programs are responsible for protecting and improving the health of their beneficiaries, while at the same time purchasing health care services in the most prudent and cost-effective manner possible. Avoidable hospitalizations may represent both a clinical setback for the patient, and a fiscally inefficient and costly outcome for the program.

Hospital expenditures account for a substantial portion of overall Medicaid spending. The Centers for Medicare and Medicaid Services' (CMS) "National Health Expenditure Projections: 2012–2022" estimated hospital costs for Medicaid beneficiaries nationwide at $153.8 billion in 2012, and projected that they would rise to $189.8 billion by 2015. These amounts represent more than a third of total projected Medicaid expenditures for those years.[3] Similarly, inpatient hospital spending accounts for close to 30% of Medi-Cal's spending, or roughly $12 billion annually. Given the magnitude of hospital spending, even a modest decrease in hospitalization rates could potentially result in significant cost-savings.

AHRQ Quality Indicators

The Agency for Healthcare Research and Quality (AHRQ) developed a set of tools for identifying and reporting preventable hospitalizations which is utilized in this study. AHRQ's Evidence-Based Practice Center at the University of California, San Francisco and Stanford University developed these indicators based on the original Healthcare Cost and Utilization Project (HCUP) Quality Indicators created in the early 1990s. The developers designed the measures to ensure that only the type of information found in hospital discharge abstract data would be required for analysis. The intent was to create measures that were based on a common denominator discharge data set, eliminating the need for additional data collection.

In addition to the requirement that the data used to generate the measures must be readily available using only information gleaned from hospital discharge records, the developers also required that the rationale for the measure must be well-documented in relevant literature and identified as an appropriate indicator of prevention quality; exhibit a meaningful relationship to other measures being adopted;

allow for precise measurement; and perform well in empirical tests.[4]

The toolbox of AHRQ Quality Indicators includes Prevention Quality Indicators (PQIs) and Pediatric Quality Indicators (PDIs). These two sets of measures, specifically designed to identify avoidable hospitalizations, are generated by applying the AHRQ software to hospital inpatient discharge records to identify admissions associated with ACSCs, and then matching them to population data in order to calculate rates. The measures are separated into two groups – PQIs and PDIs – because admissions for adults and children require different forms of measurement. Like PQIs, PDIs screen for admissions related to clinical conditions that may be amenable to prevention by changes at the system or provider levels.

The PQIs/PDIs are distinct categories of ambulatory care sensitive hospital admissions. While these events occur in the inpatient setting and utilize hospital inpatient data, it is essential to bear in mind that these measures are designed to provide information regarding the adequacy of ambulatory care provided outside the hospital prior to admission. The PQIs/PDIs were designed to assess ambulatory care services meant to help patients maintain their health or manage their illness, but not to measure the quality of inpatient care.

PQIs/PDIs represent a valuable tool for evaluating the adequacy and effectiveness of a community's ambulatory health care services, and may be used to uncover underlying explanations for differences in outcomes among various subpopulations and provide insights leading to new strategies for improvement. They are particularly useful for exploring variations in health outcomes that may result from differences in patient access to care. The absence of access to ambulatory care prior to an inpatient admission may result from any one or a combination of a variety of causes, such as regional or geographic differences in physician supply, differences in community resources available to support outpatient health care, physician practice style, and socioeconomic or cultural attitudes influencing the propensity of individuals to seek care.

The PQIs/PDIs measure the influence of ambulatory care on both acute illnesses and chronic conditions. The select PQI/PDI measures evaluated consist of the ACSCs listed in Table PH-10, most of which are expressed as rates of hospital discharges per 100,000 members of a population. [iii]

[iii] PQI-9 (Low Birthweight) was excluded from these analyses. Twelve of AHRQ's PDIs represent measures of hospital performance rather than ACSCs, and were thus excluded from evaluation. PDI-16 (Gastroenteritis) and PDI-18 (Urinary Tract Infection), for children ages 3 months to 17 years, are measures of ACSCs but were excluded from individual analysis due to difficulties matching Medi-Cal data for individuals less than one year of age. Further, PQI-2 (Perforated Appendix among adults) and PDI-17 (Perforated Appendix among children) were excluded from the composite measures because both individual indicators have discharge-based denominators instead of population-based denominators.

Table PH-10: PQI/PDI Measures Evaluated in This Study

Indicator	Type	Diagnosis
PQI-1	Chronic	Diabetes with Short-Term Complications, Adults Ages 18 and Older
PQI-2	Undefined	Perforated Appendix, Adults Ages 18 and Older
PQI-3	Chronic	Diabetes with Long-Term Complications, Adults Ages 18 and Older
PQI-5	Chronic	Chronic Obstructive Pulmonary Disease (COPD)/Asthma, Adults Ages 40 and Older
PQI-7	Chronic	Hypertension, Adults Ages 18 and Older
PQI-8	Chronic	Heart Failure, Adults Ages 18 and Older
PQI-10	Acute	Dehydration, Adults Ages 18 and Older
PQI-11	Acute	Bacterial Pneumonia, Adults Ages 18 and Older
PQI-12	Acute	Urinary Tract Infection, Adults Ages 18 and Older
PQI-13	Chronic	Angina without Procedure, Adults Ages 18 and Older
PQI-14	Chronic	Uncontrolled Diabetes, Adults Ages 18 and Older
PQI-15	Chronic	Asthma, Adults Ages 18–39
PQI-16	Chronic	Lower-Extremity Amputation among Patients with Diabetes, Adults Ages 18 and Older
PQI-90	Composite	Overall, Adults Ages 18 and Older
PQI-91	Composite	Acute, Adults Ages 18 and Older
PQI-92	Composite	Chronic, Adults Ages 18 and Older
PDI-14	Chronic	Asthma, Children Ages 2–17
PDI-15	Chronic	Diabetes with Short-Term Complications, Children Ages 6–17
PDI-17	Undefined	Perforated Appendix, Children Ages 1–17
PDI-90	Composite	Overall, Children Ages 6–17
PDI-91	Composite	Acute, Children Ages 6–17
PDI-92	Composite	Chronic, Children Ages 6–17

Source: AHRQ Prevention Quality Indicators Technical Specifications-Version 4.4, May 2013; Pediatric Quality Indicators Technical Specifications-Version 4.4, May 2013.

Research Findings Related to Preventable Hospitalizations

Studies investigating preventable hospitalizations have sought to evaluate the role of various factors that may be associated with avoidable hospital admissions. These factors have included:

- Population lifestyle and socio-economic status (SES);
- Geography and the income level of the geographic unit;
- Race/ethnicity;
- Cultural factors influencing individual propensity to utilize health care resources;
- Physician supply and access;
- Disease prevalence (particularly chronic disease), severe mental illness, and substance abuse;
- Physician practice behaviors; and
- Community health resources.

In an early study, Bindman and colleagues studied variations in hospital admissions for chronic conditions (asthma, hypertension, congestive heart failure, COPD, and diabetes) among individuals from communities with different income levels. [5] Using zip code-level data and survey-based responses from patients and physicians, the researchers compared admission rates from high- and low-income areas and searched for variations in rates of preventable hospitalization. Their findings revealed a fourfold difference in rates between the high- and low-income areas, with much higher rates observed in areas with a high proportion of uninsured individuals, Medicaid beneficiaries, individuals of low educational attainment, and members of minority racial/ethnic groups. Rates were much lower in areas with a large proportion of patients reporting that they had a usual source of care.

The study provided two major insights. First, self-reported responses indicating lower levels of access to care were strongly associated with higher rates of preventable hospitalization for chronic conditions. Second, preventable hospitalizations also appeared to be inversely related to income and education, and positively associated with the African-American population. Strong relationships between access to care and avoidable hospitalizations persisted even after controlling for demographic differences, income, prevalence of conditions evaluated in the study, propensity to seek care, and physician admitting practice styles. Researchers concluded that the strong correlation between perceived access to care and avoidable hospitalization supported the use of preventable hospitalization rates as an indicator for measuring health care access at the community level.

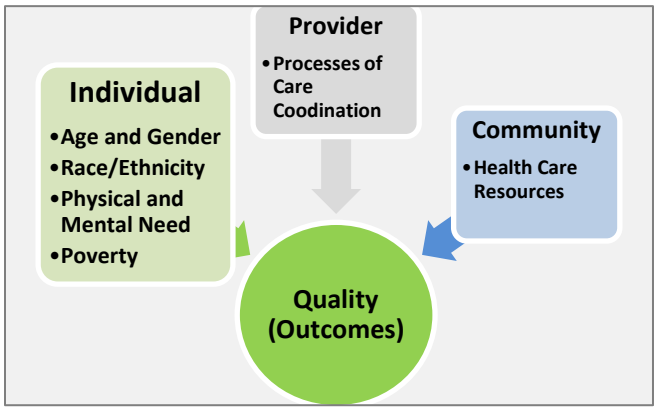
Additional geographic variables associated with variations in rates of preventable hospitalization were uncovered in two subsequent studies. In 1996, Billings, Anderson, and Newman explored the relationship between income and rates of preventable hospitalization by calculating zip code-level ACSC rates, and comparing the differences between low- and high-income areas. They found that average ACSC rates in low-income areas were 3.7 times higher than rates in higher-income areas, and that the association between income and preventable hospitalization actually grew stronger over the study period of 1982–1993.

In 1997, Schreiber and Zielinski studied the roles of poverty; population density; the number of primary care physicians per 1,000 population; hospital proximity; and whether zip codes were located in federally designated primary care health professional shortage areas. [6] They found that of all these factors, poverty was the variable most strongly associated with higher rates of preventable hospitalization. Population density was inversely associated with preventable hospitalization, suggesting problems with access

to care in more sparsely populated rural areas. The proportion of the population identified as African-American was positively associated with preventable hospitalization in primarily urban areas. The most surprising finding was that a greater ratio of providers-to-population resulted in a higher, not lower, preventable hospitalization rate. This left the authors to speculate that some demographic groups could remain underserved within an area with apparently adequate overall provider supply.

As these studies suggest, all of these potential contributing factors operating individually and in concert make the evaluation of preventable hospitalization rates and the formulation of possible interventions a multi-layered exercise. Some of the variables that influence ACSC hospitalizations can be addressed through interventions from within the health care system. Initiatives to reduce preventable hospitalizations from within the health care system include improvements in access to care and the quality of care delivered. Efforts to improve access to care include identifying medically under-served areas and populations, evaluating physician supply, and addressing all other potential barriers to access, whether cultural, social, or economic in nature. Efforts to improve the quality of care may include upgrading systems for outpatient management, adopting treatment standards outlined in clinical practice guidelines, utilizing multi-disciplinary teams, and relying more on supportive services.

Figure PH-3: Barriers and Facilitators to Care that May Influence Rates of Hospitalization for Ambulatory Care Sensitive Conditions



Source: "A Multi-Level Model Assessing Ambulatory Care Sensitive Hospitalizations and 30-Day Readmissions Among Medicaid Beneficiaries: The Role of Patient Characteristics and County-Level Health Care Resources," Wilkins, Tricia Lee and Sambamoorthis, Usha, June 24, 2013.

Other factors influence rates of preventable hospitalization, such as those that are socioeconomic in nature and originate outside the health care system. A British study comparing the health outcomes of individuals provided treatment through various public health authorities found that factors outside the control of the primary care team, such as socioeconomic characteristics, health status, and secondary care supply factors, explained a significant proportion of the variation in preventable hospitalization rates for asthma, diabetes, and epilepsy.[7]

A 2013 German study categorized the principal categories of explanations and causes for preventable hospitalizations into five categories: system-level; physician-level; medical causes; patient-level; and social-level.[8] System-level causes are those resulting from the overall structure and design of a given health care system. Physician-level causes are those related to physician practice patterns and the quality of treatment provided. Medical causes originate in underlying clinical conditions, such as chronic disease or mental illness that are associated with increased rates of preventable hospitalization. Patient-level causes are those associated with the patient's propensity to seek care, or compliance

with medically recommended therapies. Finally, social-level issues include the strength of a patient's social support network – which, if weak or absent, might influence a physician to recommend hospitalization. Social issues may also refer to the situation of the physician who, if perceiving weaknesses in the ambulatory care system, may seek to move patients to other settings of care with greater resources.

Racial/Ethnic Disparities

The literature identifies a number of variables associated with high rates of preventable hospitalization, including an individual's income level and the income level of the zip code in which they reside; educational attainment; cultural attitudes; health status; and ability to access care. Related to all of these, in one way or another, is race/ethnicity.

A number of studies identify race/ethnicity among the variables that appear to be determinants of preventable hospitalizations and ACSCs. A 2001 study analyzed hospital discharge data from 1980–1998 and found that over the course of the study period rates of preventable hospitalization increased nationally, both in aggregate and per 10,000 population. The rate of increase was similar for both Whites and African-Americans ages 65 and older. Rates of preventable hospitalization among Whites under age 65 decreased, while the rate for African-American patients of similar age actually increased during the same period. Researchers also noted that in 1980 the admission rate for African-American patients under age 65 was 72% higher than the rate for White patients, and in 1998 the rate for African-Americans was 131% higher.[9]

In 2006, AHRQ reported on racial/ethnic disparities relating to potentially preventable hospitalizations using HCUP data for 2003. Researchers found that in 2003 African-American patients experienced the highest rates of preventable hospitalization, while Hispanics had the second-highest rates. Compared with White patients, African-Americans experienced higher rates of preventable hospitalization for 15 of the 17 indicators studied, and Hispanics had higher rates than Whites for 14 of the indicators. By contrast, Asians were less likely than Whites to be hospitalized for preventable conditions, with Asians seeing the lowest admission rates for nine out of the 17 indicators.

These disparities were most stark for hospitalizations relating to chronic conditions such as diabetes, hypertension, and asthma. Compared with Whites, rates of admission for these conditions were about three to five times greater among African-American patients, and about two to three times greater among Hispanics. African-American patients experienced the highest rates of preventable hospitalization for all indicators related to diabetes and circulatory diseases.

Admission rates for hypertension and diabetes without complications were approximately five times higher for African-American patients compared with Whites, and African-Americans also saw the highest rates for pediatric and adult asthma, perforated appendix, dehydration, and low birthweight. Hispanics had the highest rates of admission for asthma among older adults, pediatric gastroenteritis, and urinary tract infection. The only indicator in which hospitalization rates were highest for Asian patients was for asthma among patients ages 65 and older, where Asians were 1.8 times more likely than Whites to experience a preventable hospitalization.[10]

In a study published in the Medical Care Research and Review, researchers examined hospital discharge data for 1996 from 10 states (Arizona, California, Florida, Massachusetts, Missouri, New Jersey, New York, Pennsylvania, South Carolina, and Virginia), evaluating the effects of race/ethnicity on preventable hospitalizations. Researchers noted that many prior studies of this topic had relied heavily on self-reports and were

limited by their subjectivity. For more objective measures of access to care, researchers examined data relating to death rates from selected causes, incidence of illness, and rates of preventable hospitalization. They also focused heavily on Hispanic populations, as previous studies focused largely on disparities between elderly African-American and White populations, in spite of the fact that Hispanics have the highest uninsured rate and also face language- and culture-based barriers to health care access. The 10 states chosen for the study represented approximately 42% of the entire U.S. population, and approximately 60% of the country's Hispanic population.

Examining observed rates of preventable hospitalization, researchers found that African-American and Hispanic patients were more likely than White patients to experience hospitalizations relating to an ACSC. In particular, Hispanic children, African-American adults under age 65, and elderly patients from both minority groups were at greater risk than their White counterparts to experience an ACSC-related hospitalization.

Comparing data grouped by age and race/ethnicity, researchers found that African-Americans and Hispanics faced a greater risk of preventable hospitalization in 46 of 60 possible comparisons. After adjusting data to control for patient characteristics, SES, and county health system characteristics, statistically significant disparities were still found – although they were not as stark as those found in the unadjusted data.

The study also identified racial/ethnic disparities among patients within the same insurance classification. Disparities among Medicare patients were more consistent but not as stark as those among privately insured and uninsured patients, and patients covered by state Medicaid programs displayed the fewest racial/ethnic disparities. However, researchers noted that the disparities among Medicare and Medicaid patients were still surprising because these programs are structured to provide uniform health care services. Because of this, researchers concluded that expanding coverage alone would not eliminate access barriers among these populations, and policymakers must also address cultural differences in care-seeking and variations in how physicians care for their patients.[11]

Relationships between Socioeconomic Status/Disability and Rates of Preventable Hospitalization

A wide body of research has established that there is a strong association between income level and health outcomes. Differences have been documented between the citizens of rich nations and poor nations, between people living in comparatively wealthier and poorer geographic areas within the same nation, and between higher- and lower-income residents of the same geographic area. Related problems such as the impacts of racial inequality, economic segregation, and social environment compound the effect of income on health.[12]

In 1973, researchers Kitagawa and Hauser performed one of the most extensive studies of mortality differentials ever conducted in the U.S., matching a sample of death certificates for individuals ages 25 and older who died from May–August 1960 with census records on the same individuals listed in the 1960 census on April 1, 1960. They found that in 1960, groups with higher SES exhibited lower rates of all-cause mortality than did lower-SES groups. One of their principal measures of SES was educational attainment as assessed by years of schooling completed.[13]

In 1995, Jo C. Phelan and Bruce G. Link developed the "theory of fundamental causes," which argued that social factors such as SES and social support are likely "fundamental causes of disease that, because they embody access to important resources, affect multiple disease outcomes through multiple mechanisms, and

consequently maintain an association with disease even when intervening mechanisms change." [14]

Studies showing correlations between income, educational attainment, race/ethnicity, and life expectancy followed. In 2006, a study utilizing the Social Security Administration's 2002 Continuous Work History Sample found "strong empirical support to a negative relationship between individual lifetime income and mortality." [15]

More recent research has studied the relationships between adult mortality and income, educational attainment, and race/ethnicity against the backdrop of widening wealth and income disparities in the U.S. Some studies found that certain groups lagged behind despite overall advances in life expectancy in the U.S. Montez, Hummer, et al., found that the:

> educational gradient of mortality among U.S. adults aged 45–84 became steeper across the 1986 to 2006 period for some race-gender-age subgroups. In other words, the gap in mortality risk between lower- and higher-educated adults in these subgroups expanded to create even larger disparities in the length of life among many Americans – continuing a trend that began at least as early as the mid-twentieth century – despite major policy initiatives designed to reduce socio-economic disparities in health.[16]

In 2012, Olshansky, et al., explored the combined impact of education and race/ethnicity on life expectancy, noting that "education is an important variable found to influence health inequalities, and is also a principal component of (SES)." The authors found that in 2008, U.S. adults with fewer than 12 years of education had a life expectancy not much better than the average for all adults during the 1950s and 1960s. The gap in life expectancy widened further when race/ethnicity and education were considered together – 14.2 years for men and 10.3 years for women.[17]

Research has also uncovered an association between low SES and preventable hospitalizations. A study of individuals covered by Medicare found that the proportion of individuals who experienced preventable hospitalizations was greater among patients with lower income and educational attainment, advanced age, a history of chronic diseases, and poorer self-rated health status.[18]

The CDC Health Disparities and Inequalities Report 2001–09 investigated disparities in preventable hospitalizations across a wide range of variables related to diseases, behavioral risk factors, environmental exposures, social determinants, and health care access. In that study, the CDC used zip code-level area income data, based on the income of the neighborhood in which a patient lived, as a proxy for SES.

The CDC found that in 2009, if residents of the lowest-income neighborhoods had a rate of hospitalization identical to that of residents of the highest-income neighborhoods, they would have seen about 500,000 fewer hospitalizations and saved $3.6 billion in related costs. If residents of the two central income quartiles had the same hospitalization rates as residents of the highest-income neighborhoods, they would have had about 220,000 and 90,000 fewer hospitalizations and saved $1.7 billion and $700 million, respectively, in 2009.[19]

Both studies highlight the idea that low SES itself encompasses a number of competing but related variables which operate together to adversely influence health outcomes and increase rates of preventable hospitalization. Higher rates of preventable hospitalization among low-income individuals are compounded by difficulties in accessing care.

A Canadian study found that even after controlling for the effect of access barriers, low income continued to drive higher rates of preventable hospitalization. The authors proposed a number of possible explanations, including the fact that individuals from lower-income SES groups may have a difficult time keeping scheduled appointments due to transportation costs and difficulties taking time off work or obtaining help with child care. The costs of medication and supplies, which are not universally covered by insurance, may limit the ability of low-income patients to benefit from the care they receive. Due to these and other issues, researchers theorized that wealthier individuals may have an easier time navigating the health care system.[20]

Characteristics of the Medi-Cal Population

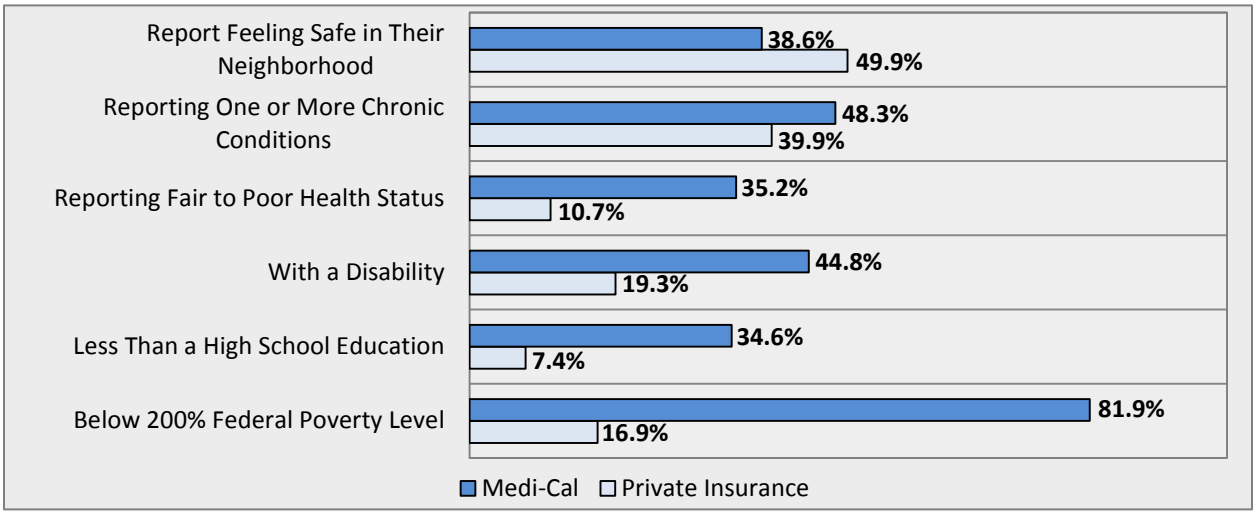
In 2011, Medi-Cal's average monthly enrollment totaled 7,585,530 individuals, while 9,238,571 individuals were certified eligible for Medi-Cal coverage for at least one month during the year.

Medi-Cal, California's Medicaid program, is a public health insurance program that provides comprehensive health care services at no or low cost for low-income individuals including families with children, seniors, persons with disabilities, foster care children, and pregnant women.

Some individuals may also be eligible for Medicare. These individuals, commonly referred to as Dual Eligibles, receive services paid for by both programs. Other low-income California residents who are eligible for Medicare Savings Programs also receive support from the Medi-Cal program through payment of Medicare Part B premiums and/or cost-sharing, but are not entitled to Medi-Cal-covered services.

Medi-Cal's eligibility requirements mean that individuals enrolled in the program are more likely than privately insured individuals to belong to a lower-income group, have a disability, and reside in a nursing care facility. Medi-Cal certified eligibles are also more likely to report fair or poor health status, have less than a high school education, and have incomes below 200% of the Federal Poverty Level (FPL) than the privately insured population (Figure PH-4).

Figure PH-4: Comparison of California's Nonelderly Population, by Insurance Coverage



Source: Created by DHCS Research and Analytic Studies Division using data from the 2011-12 California Health Interview Survey.

Medi-Cal's population is both demographically and clinically heterogeneous. It includes both the very young and the very old, and every age in between. It includes large numbers of healthy children who may rarely require medical services, and much smaller numbers of children with special needs, including the developmentally disabled, children eligible for Medi-Cal due to their placement in foster care, and children receiving assistance from the California Children's Services (CCS) program.[iv]

The Medi-Cal population is comprised of groups that are economically and socially challenged, including many who are homeless for part or all of the year. Medi-Cal also provides coverage to large numbers of women of reproductive age, as well as large numbers of disabled and/or chronically ill adults and elderly individuals who may require medical services on a frequent and ongoing basis. Among low-income, non-elderly adults, Medicaid beneficiaries (35%) are much more likely to have a chronic mental illness compared to the uninsured (13%).[21]

The set of criteria by which an individual qualifies for Medi-Cal benefits is known as an eligibility pathway. These eligibility pathways attract specific population characteristics that have been found to influence health care utilization and access to health care services. In turn, some of these groups are at increased risk of inpatient hospitalization and/or preventable hospital admissions.

For example, Medi-Cal certified eligibles enrolled under a Families aid code qualify for benefits on the basis of various income, asset, or deprivation requirements. Individuals enrolled under this category include members of families receiving cash assistance through Temporary Assistance for Needy Families (TANF), as well as those who do not receive cash assistance but qualify under Section 1931(b) of the Social Security Act because they have a dependent child living with

[iv] The CCS program provides diagnostic and treatment services, medical case management, and physical and occupational therapy services to children under age 21 with CCS-eligible medical conditions. Examples of CCS-eligible conditions include, but are not limited to, chronic medical conditions such as cystic fibrosis, hemophilia, cerebral palsy, heart disease, cancer, traumatic injuries, and infectious diseases producing major sequelae. CCS also provides medical therapy services that are delivered at public schools. The CCS program is administered as a partnership between county health departments and DHCS. Currently, approximately 70% of CCS-eligible children are also eligible for Medi-Cal.

them; have income and resources that would have qualified them for Aid to Families with Dependent Children (AFDC) coverage under the State Plan in effect on July 16, 1996; or meet certain deprivation requirements, and are pregnant woman, children, or parents or caretaker relatives. Individuals who qualify through this eligibility pathway have incomes at or below 100% FPL in 2011. In many cases, they have lower educational attainment than other comparable groups outside of Medi-Cal. They may be unemployed or underemployed, and are often single parents or caretaker relatives of dependent children.

Others become eligible based on a disabling condition. These individuals receive Supplemental Security Income, have incomes below 83% FPL, and may be suffering from multiple co-occurring chronic diseases. Individuals who qualify for Medi-Cal under this eligibility pathway represent a clinically complex population with a significantly greater and ongoing need for medical services, including inpatient hospitalization. Medi-Cal's disabled population includes both individuals who have had disabilities since birth as well as those who acquired disabling conditions through disease, chronic illness, or trauma.

Still others may become eligible solely because they have a qualifying medical condition such as breast or cervical cancer or tuberculosis, are pregnant, or have specific health care needs such as dialysis. While these individuals may not qualify for Medi-Cal absent the specifically recognized health conditions, their income is too low to purchase insurance, or their preexisting condition does not allow them to gain health care coverage. Consequently, these individuals seek coverage from Medi-Cal. In some cases, they arrive into the program in the latter stages of disease and may have received little or no care prior to Medi-Cal enrollment.

Some children become eligible because they are wards of the state. These children in foster care and adoption assistance programs may be receiving treatment for a number of complex medical conditions, and are in need of services from a coordinated network of mental, social, and physical health providers. Many aged individuals dually eligible for both Medi-Cal and Medicare become eligible due to low income and need financial assistance to help pay for Medicare cost-sharing. Those with incomes low enough to qualify for Medi-Cal receive Medi-Cal-covered services, while others may have incomes too high to qualify for Medi-Cal coverage but not high enough to finance Medicare cost-sharing. These individuals generally suffer from more complex health conditions than the general Medi-Cal population. Many are in need of help with activities of daily living. Studies indicate that these individuals are sicker and have a greater prevalence of chronic health conditions.

Other factors associated with low SES affect all groups, which creates obstacles to achieving optimal health. These factors include homelessness; employment with little or no flexibility; limited access to personal transportation; low educational attainment; difficulties obtaining childcare; and living alone.

Recent research compiled by DHCS-RASD has found that in 2011–12, approximately 52% of adults enrolled in Medi-Cal had incomes below 100% FPL, compared to 28.5% among adults without insurance and 5.3% among the privately insured. Adults with private insurance were more than twice as likely (48.3%) to have a college degree than adults with no insurance (17.3%), and more than five times more likely than adults enrolled in Medi-Cal (8.5%). Adults enrolled in Medi-Cal were far more likely to experience food insecurity (42.2%) than the uninsured (28.7%) and privately insured (5.8%). Adults enrolled in Medi-Cal were more than twice as likely to have serious psychological distress as the privately

insured (6.6%) and 1.5 times more likely than the uninsured (9.3%).[22]

When making comparisons between Medi-Cal and other populations, the program's role as a safety net must be kept in mind. Medi-Cal certified eligibles represent unique groups that arrive into the program with specific characteristics. Some may have come to Medi-Cal in the latter stages of their disease, and many come from populations that are economically disadvantaged. In many cases, it may not be possible to construct a comparison group – or, more importantly, it may not be appropriate to compare the Medi-Cal population to other commercially insured groups. Specific benchmarks may also present complicated interpretative issues. Therefore, analyses focusing on subpopulations within Medi-Cal, or evaluating specific Medi-Cal subpopulations over time, may provide more meaningful information.

Rationale for Division into Study Groups

DHCS-RASD grouped certified eligibles by eligibility pathway and other important administrative and policy criteria. These groupings allow readers to evaluate each unique subpopulation, taking into account important limitations and interpretative considerations.

Medi-Cal's eligibility pathways are useful for developing meaningful study populations which can be used as proxies for medical conditions, age, income, medical acuity, health resource use, race/ethnicity, and gender (Table PH-11). For example, using Medi-Cal aid codes designated for disability, researchers can develop a homogeneous subgroup based on individuals who became eligible due to specific disability criteria. The disabled subpopulation is more costly than other Medi-Cal subgroups, includes many individuals suffering from multiple complex chronic medical conditions, and uses health resources at a much higher rate than many other groups.

Certain subgroups, such as individuals becoming eligible due to their lack of SIS — often referred to as the Undocumented — are predominantly of Hispanic ethnicity.[v] This subgroup, like others, allows researchers to focus on specific races/ethnicities with unique characteristics and health needs that are afforded limited health care coverage.

Other subgroups, such as the 200% FPL–Pregnancy aid category, include individuals with a specific medical condition, in this case pregnant women. The Families study group is comprised primarily of children and their caretakers, with approximately 70% of individuals under age 18.

While eligibility pathways can be used as a proxy for various population characteristics and help researchers develop homogeneous subgroups, these pathways alone do not address some important policy and statutory constraints when evaluating PQI/PDI rates among the Medi-Cal population.

When evaluating PQI/PDI rates with the intent of assessing the quality and effectiveness of Medi-Cal's ambulatory care, it is important to divide Medi-Cal's population into meaningful subgroups that identify individuals having potential exposure to ambulatory care. While not all Medi-Cal subpopulations are exposed to Medi-Cal's ambulatory health care system, these subpopulations are still worth evaluating relative to PQIs/PDIs. Instead of evaluating Medi-Cal's ambulatory care system, researchers will be focusing on a particular policy's impact on ACSCs. For example, does a monthly SOC obligation result in increased PQI/PDI rates?

[v] Roughly 94% of Medi-Cal's Undocumented population is Hispanic.

Unique Medi-Cal Subpopulations Requiring Special Interpretive Consideration When Evaluating PQI/PDI Rates

Individuals without Satisfactory Immigration Status (SIS) – These certified eligibles are entitled to a restricted scope of services covering emergency and pregnancy-related services only. Therefore, they may lack meaningful exposure to ambulatory care services prior to an ACSC admission.

Individuals gaining eligibility due to a specific diagnosed disease or condition – These individuals become eligible due to specific diseases or conditions such as cancer or pregnancy. The scope of coverage is limited to treatment of the illness or services related to the condition establishing eligibility. In many cases, these subpopulations are small and the duration of eligibility is short. They may become eligible for Medi-Cal in the latter stages of their disease, having limited or no exposure to Medi-Cal ambulatory care.

Individuals with a SOC requirement – These individuals may have experienced periods of sporadic Medi-Cal enrollment depending on whether or not they reached their cost-sharing threshold, and therefore may not have enjoyed a period of meaningful exposure to Medi-Cal-covered ambulatory care prior to admission. Or, if they did utilize ambulatory care outside of Medi-Cal, the program would not have a record of these services. In addition, Medi-Cal administrative data and the counting of "certified eligibles" require adjustments to derive a true PQI/PDI rate.

Individuals granted a period of retroactive eligibility – These individuals initiated their period of Medi-Cal eligibility retroactively. Therefore, they did not enjoy potential exposure to Medi-Cal-covered ambulatory care. Additionally, because retroactively eligible individuals represent a subset of a much wider population of individuals eligible for but not enrolled in Medi-Cal, the calculation of a corresponding denominator is problematic.

Individuals eligible for both Medi-Cal and Medicare – These individuals receive a significant proportion of their ambulatory care through Medicare's Part B program. Therefore, assessing PQI/PDI rates involves evaluating the combined health care systems, or in many cases only Medicare's health care delivery system.

Table PH-11: Possible Proxies for Eligibility Pathways

	Proxy
Eligibility Pathway (Aid Category)	Medical Conditions
	Age
	Income
	Medical Acuity
	Health Resource Use
	Ethnicity
	Gender
	SES

Source: Created by DHCS Research and Analytic Studies Division

As noted, developing homogeneous subgroups using eligibility pathways is a necessary step in evaluating PQI/PDI rates, but specific administrative and statutory/regulatory requirements also play an important role in interpreting PQI/PDI results. These administrative and statutory/regulatory operational requirements create complex interpretative issues, and also generate questions regarding what is truly being evaluated. That is, are we assessing Medi-Cal's ambulatory care system and its performance, or some other policy variable such as cost-sharing or scope of service limitations?

With these issues in mind, DHCS-RASD divided the Medi-Cal population into unique subpopulations designed to group individuals into analytically meaningful categories. These included:

1) Groups that were potentially exposed to meaningful ambulatory care;
2) Groups that were awarded a limited scope of coverage that did not include primary care, or groups for which primary care received could not be validated using Medi-Cal administrative data alone;

3) Groups whose population total was not readily determinable from Medi-Cal administrative data alone; and

4) Groups whose ambulatory care was directed and managed by health care delivery systems other than Medi-Cal, such as individuals dually eligible for both Medi-Cal and Medicare.

Not all individuals enrolled in Medi-Cal are afforded the same level of coverage. The timing of coverage varies as well, based on statutory and administrative policy. Therefore, five important criteria were considered when developing groups for study. It should be noted that some subpopulations may actually be classified into more than one unique study group. These criteria included:

- Other health care coverage;
- Scope of coverage;
- Timing of coverage;
- Cost-sharing; and
- Potential denominator.

Other Health Care Coverage

Some Medi-Cal subpopulations, such as those eligible for Medicare Part B, receive most of their ambulatory care through Medicare's delivery system.[vi] As such, evaluating PQI/PDI rates, and assessing the quality and effectiveness of ambulatory care, essentially represents a mixed picture. While evaluating PQI/PDI rates may identify areas that require further research, the results must be evaluated in the context of the dual systems of Medicare and Medi-Cal. Designing interventions and identifying the root cause of higher- or lower-than-expected PQI/PDI rates is complicated by the intersection of the Medicare and Medi-Cal delivery systems.

In addition to Medi-Cal's Dual Eligible subpopulation, other subgroups include individuals who are:

- Covered by other health insurance in addition to Medi-Cal;
- Enrolled in Undocumented aid codes;
- Enrolled in Pregnancy Only aid codes;
- Enrolled in Breast and Cervical Cancer Treatment Program (BCCTP) aid codes; and/or
- Subject to a SOC obligation.

These groups may receive ambulatory care services that are financed by the patients themselves or an insuring organization other than Medi-Cal. Therefore, whether the subpopulation is the Dual Eligibles or another subpopulation where the financing of ambulatory care is not the responsibility of Medi-Cal, the question that arises is how to interpret the PQI/PDI rates. Some issues to consider are:

- How to allocate the outcome when multiple systems deliver ambulatory care;
- How to identify ambulatory care that may have been financed by the individual or insuring organizations other than Medi-Cal; and
- How to determine what is actually being evaluated: Medi-Cal eligibility policy, a health delivery system, the lack of exposure to ambulatory care, or cost-sharing and its impact on PQI/PDI rates.

Scope of Coverage

The scope of Medi-Cal coverage creates complexity and interpretive problems in the context of PQI/PDI rates. Not all Medi-Cal certified eligibles have a scope of coverage that provides them with potential exposure to ambulatory care – or, if they do, Medi-Cal's administrative data may not provide evidence of it. Medi-Cal affords various scopes of coverage

[vi] Part B Medicare covers most medically necessary doctors' services, preventive care, durable medical equipment, hospital outpatient services, laboratory tests, x-rays, mental health care, and some home health and ambulance services.

based on an individual's eligibility pathway into the program. For example, individuals lacking SIS and enrolled in Undocumented aid codes are eligible to receive Medi-Cal-covered services, but are provided with only limited coverage. These individuals receive coverage for emergency and pregnancy-related services only. In general, for these individuals Medi-Cal does not provide preventive primary care or other ambulatory care services not classified as emergency- or pregnancy-related. This subpopulation introduces additional interpretive issues, as the results may point to something other than how well Medi-Cal's ambulatory care system is performing.

There are a number of subpopulations in which eligibility is granted based on the presence of a specific medical condition or disease, and the scope of coverage is limited to services related to the specific condition or disease establishing eligibility.

For example, individuals who become eligible through pregnancy-related pathways are entitled to pregnancy-related services only.[vii] Without Medi-Cal, many of these individuals would be unable to gain access into the health care system.

These subpopulations, which are sometimes small, present unique issues when interpreting PQI/PDI rates. Some subpopulations, such as individuals who qualify for Medi-Cal based on a specific diagnostic condition such as breast cancer or pregnancy, require more narrowly focused studies to interpret the resulting rates and their significance within the context of PQIs/PDIs. Many of these individuals arrive into the Medi-Cal program in the latter stages of their condition or disease, in some cases having accessed almost no ambulatory care outside of a hospital emergency department. Adding to the interpretative complexity is the population size and the number of events, which may be small. This in turn may lead to methodological problems when calculating rates.

Timing of Coverage

In some cases, individuals may be granted Medi-Cal coverage retroactively for months of enrollment prior to their initial application for Medi-Cal. In such cases, the individuals were not actually exposed to Medi-Cal's ambulatory care system during retroactive months of eligibility. Therefore, any ACSC events occurring during the retroactive period would not provide information regarding Medi-Cal's ambulatory care system.

When determining rates for individuals who experience ACSC events during retroactive months of eligibility, we are not assessing how well Medi-Cal's ambulatory care system manages the patient's care; we may actually be identifying a potential coverage issue. That is, assuming the individual had no other access to ambulatory care prior to their retroactive enrollment in Medi-Cal, the ACSC event represents not an assessment of Medi-Cal's ambulatory care, but rather a statement regarding the individual's lack of ambulatory care coverage prior to Medi-Cal enrollment.

Additional complexity is also introduced due to limited data availability related to care received during retroactive months of eligibility. Medi-Cal administrative datasets may or may not contain evidence of care patterns during this timeframe. Therefore, assessing ambulatory care received prior to Medi-Cal enrollment may not be feasible.

Cost-Sharing

Individuals subject to a SOC obligation also present unique issues. Individuals subject to a SOC obligation must reach their monthly threshold before Medi-Cal will cover the cost of health care services. Individuals within this subpopulation may or may not have access to

[vii] Note that women enrolled in a pregnancy-related aid code such as aid code 44 may also be eligible for Medi-Cal under a medically needy aid code and subject to a SOC obligation. There are a number of exceptions and additional complicating factors that have to be considered as well.

ambulatory care services prior to meeting their SOC obligation. This leads to a number of interpretative complexities. First and foremost, one must determine what is actually being measured:

- Do the results reflect ambulatory care quality and effectiveness?
- Do the results reflect access issues relative to ambulatory care arising from cost-sharing?
- How can the responsible ambulatory care system be determined when care may be received from multiple financiers?

All of these issues, and many more, create additional interpretative complexity when evaluating Medi-Cal subpopulations subject to cost-sharing requirements.

Identifying the Population (Denominator)

In addition to meaningful exposure to ambulatory care, another methodological issue that arises concerns identifying the proper denominator. Correct PQI/PDI rates cannot be ascertained when the proper denominator is not identified or is not readily identifiable using Medi-Cal administrative data alone.

Some Medi-Cal subpopulations that fall into this category include individuals granted Medi-Cal eligibility retroactively, or individuals subject to a SOC obligation.

If data sources other than Medi-Cal's administrative datasets are not incorporated and/or adjustments are not considered, individuals who were awarded eligibility for a retroactive period or subject to a SOC obligation would present PQI/PDI rates that were based on an understated denominator, which will produce incorrect rates.

The understatement of the denominator is primarily driven by how Medi-Cal defines individuals as "certified eligible" within its administrative datasets. Medi-Cal makes use of a specific definition for counting individuals eligible for the program. This definition includes all individuals who have been deemed eligible for the program based on a valid eligibility determination. Only certified eligibles may receive Medi-Cal-covered services.

Individuals who have not met their monthly SOC obligation are not counted as certified eligibles because they are not eligible to receive Medi-Cal-covered services. In addition, the certified eligible definition does not count individuals who are eligible for Medi-Cal, but not enrolled. There are a number of Californians who are eligible to participate in the Medi-Cal program, but have not elected to enroll or apply for Medi-Cal coverage.

In terms of PQI/PDI rates, both a numerator and denominator must be established. In the case of individuals who are determined retroactively eligible, a numerator — or number of ACSC events — can be determined by evaluating Medi-Cal hospital discharges occurring during retroactive months of enrollment, as we have done in this report. But even this data source may understate the true number of events that occurred. This could happen if an individual that was eligible for Medi-Cal, but not enrolled, incurred an inpatient event classified as an ACSC that was financed by someone other than Medi-Cal, or not financed at all.[viii]

While the numerator can be derived from Medi-Cal administrative data subject to limitation, the denominator presents another challenge. Using Medi-Cal administrative data as a source to produce a denominator would generate a denominator consisting of only those individuals who were determined retroactively eligible for Medi-Cal.[ix] In general, this is the three-month

[viii] This assumes that the hospital rendered services and did not pursue Medi-Cal eligibility. In most cases, this would represent only a small number of events.

[ix] California Code of Regulations, Title 22 § 50197, Retroactive Eligibility: "(a) In addition to the period of eligibility specified in Section 50703, an applicant shall be

period prior to the date of application.[x] In this study, the calculation was performed as follows:

Equation 1.1

Number of ACSC cases occurring during retroactive months of eligibility during the observation period

———————————

Average monthly number of certified eligibles determined retroactively eligible for Medi-Cal during the observation period

=

PQI/PDI rate for Medi-Cal certified eligibles

While Equation 1.1 will produce a PQI/PDI rate, it does not truly represent the rate for the subpopulation who became eligible retroactively, who are referred to as "individuals eligible for but not enrolled in Medi-Cal." In many cases, these individuals were eligible for Medi-Cal before the medical event that precipitated the retroactive eligibility, but had not pursued enrollment into the program.

For example, an individual who presents to a hospital and then is admitted for a condition that is classified as an ACSC would have been eligible prior to the hospital event, but had not enrolled into the program. In this scenario, the individual would be included in both the numerator and the denominator. But in reality, the denominator consists of the total number of individuals who were eligible for Medi-Cal during retroactive months of eligibility, as well as individuals who were eligible for Medi-Cal but not enrolled. As previously noted, individuals eligible for Medi-Cal but not enrolled are not reflected in Medi-Cal's administrative data. Individuals who are eligible but not enrolled in Medi-Cal are not recognized as certified eligibles.

Adding these individuals to the denominator incorporates individuals who had the potential to incur an event, but were not included in the Medi-Cal administrative eligibility dataset. Therefore, the true PQI/PDI rate for this subpopulation would be calculated as follows:

Equation 1.2

Number of ACSC cases occurring among individuals eligible for Medi-Cal but not enrolled during the observation period (+) Number of ACSC cases occurring among individuals determined retroactively eligible for Medi-Cal and included in Medi-Cal's administrative dataset

———————————

Number of individuals eligible for Medi-Cal but not enrolled during the observation period[xi] (+) Number of individuals eligible for Medi-Cal during retroactive months of eligibility and included in Medi-Cal's administrative dataset

=

PQI/PDI rate for individuals eligible for Medi-Cal but not enrolled

In terms of reporting PQI/PDI rates for individuals subject to a SOC obligation, DHCS-RASD's administrative counting technique results in a possible overstatement of the rate if the numerator and denominator are not adjusted. This is due to how the Medi-Cal administrative datasets are constructed and "certified eligible" counts are defined. As noted previously, the "certified eligible" count includes only individuals eligible to receive Medi-Cal-covered services. Therefore, among certified eligibles with a SOC,

eligible for Medi-Cal in any of the three months immediately preceding the month of application or reapplication..."

[x] Those eligible but not enrolled essentially include two subpopulations: those eligible but not enrolled; and those who were eligible and not enrolled, but became eligible retroactively.

[xi] Note that in order to identify the total number of individuals who were eligible for Medi-Cal but not enrolled, survey data such as the California Health Interview Survey would have to be utilized. Therefore, instead of the average monthly eligibles, the calculation would most likely entail the use of a point-in-time estimate for this population.

only those who have met their monthly SOC obligation will be included among both the numerator and denominator for the purposes of this study. Using Medi-Cal's "certified" administrative dataset alone, as used in this study, produces PQI/PDI rates as follows:

Equation 1.3

Number of ACSC cases occurring among certified eligibles with a SOC obligation during the observation period

———————————

Average monthly certified eligibles with a SOC obligation during the observation period

=

PQI/PDI rate for SOC population deemed certified eligible

In the above formula, the rate produced represents a rate for only those individuals who met their SOC obligation. In this case, both the numerator and denominator are understated since the individuals who have an unmet SOC have not been incorporated. The true rate for the SOC subpopulation would entail adding to the numerator and denominator those members of the SOC subpopulation who have not met their SOC obligation.

Equation 1.4 presents the modified formula that would adjust the numerator and denominator to incorporate individuals not meeting their monthly SOC obligation.

Equation 1.4

Number of ACSC cases among certified eligibles with a SOC obligation (includes both those that have met their SOC obligation and those that have not) during the reporting period

———————————

Average monthly number of eligibles with a SOC obligation (both certified and non-certified) during the monitoring period

=

PQI/PDI rate for SOC subpopulation which includes both certified eligible as well as those who are not deemed certified eligible

Methods for Identifying Study Groups

To ensure that the PQI/PDI measures produce rates that provide an indication of what is being evaluated, DHCS-RASD developed specific subgroups for analysis. Consistent with the aforementioned limitations and unique population characteristics, DHCS-RASD created study groups that will allow readers to clearly assess PQI/PDI rates given the unique Medi-Cal subpopulations' characteristics, ambulatory care system participation, scope of coverage, timing of enrollment, and cost-sharing requirements.

Initially, Medi-Cal's population was stratified into four unique groups:

- **Group 1 –** Adults and children eligible for Medi-Cal Only and entitled to full-scope benefits with no SOC obligation;
- **Group 2 –** Adults dually eligible for both the Medicare and Medi-Cal programs;
- **Group 3 –** Adults and children without SIS entitled to restricted-scope Medi-Cal benefits; and
- **Group 4 –** Adults and children enrolled in an aid code or eligibility group who were not members of Groups 1 through 3. Individuals who experienced retroactive months of eligibility or those with a SOC obligation were also included in this group.

While DHCS-RASD presents PQI/PDI rates using the available Medi-Cal administrative and OSHPD data for all ACSC events and Medi-Cal subpopulations, readers should evaluate the results in the light of the limitations discussed previously. DHCS-RASD has incorporated specific subpopulations into the overall analysis that are subject to certain limitations; therefore, their individual subpopulation rates should be interpreted with caution and in recognition of these limitations.

Some of these subpopulations will be more fully evaluated and studied at a later time. Because additional datasets from outside Medi-Cal will have to be utilized and specific adjustments will have to be incorporated, additional research is required to resolve methodological issues and interpret findings.

Within **Group 1**, the study population was further stratified into two broad eligibility groups defined by Medi-Cal's eligibility pathways: (A) Families, and (B) SPDs.

1. The full-scope Families study group included parents, caretaker relatives, children, pregnant women, and other non-disabled adults who qualified for Medi-Cal on the basis of having income and resources below certain eligibility thresholds.
2. The full-scope SPD study group included individuals enrolled in aid codes designated for SPDs and eligible for Medi-Cal Only. These certified eligibles typically qualified for Medi-Cal on the basis of age, disability/health status, and/or a linkage to Supplemental Security Income.

Group 2 consisted of adults dually eligible for both Medi-Cal and Medicare, and entitled to full-scope Medi-Cal benefits. Individuals included in this Dual Eligible study group included those who were classified as Aged, as well as those who qualified for Medicare due to a disability.

Group 3 included individuals without SIS and entitled to a restricted scope of services that covers emergency and pregnancy-related services only. As noted previously, these individuals were not entitled to Medi-Cal-covered ambulatory care. In many cases, individuals within this study group may have limited or no access to ambulatory care. In cases where they accessed ambulatory care outside of emergency or pregnancy-related services, Medi-Cal did not have a record of the event.

Finally, **Group 4** included individuals who were not members of Groups 1 through 3. Individuals who were eligible during retroactive months of eligibility, those subject to a SOC obligation, and individuals who were granted Medi-Cal eligibility due to a specific condition or disease were also members of this group.[xii]

Five study groups were created for certified eligible adults ages 18 and older, reflecting the differences discussed above and incorporating the specific constraints required by AHRQ's PQI/PDI algorithm:

1. Adults entitled to full-scope benefits, eligible for Medi-Cal but not Medicare, and enrolled in SPD aid codes;
2. Adults entitled to full-scope benefits, eligible for Medi-Cal but not Medicare, and enrolled in Families aid codes;
3. Adults dually eligible for both Medi-Cal and Medicare, and entitled to full-scope Medi-Cal benefits;
4. Adults without SIS, entitled to restricted-scope benefits, eligible for Medi-Cal but not Medicare, and enrolled in Undocumented aid codes; and
5. Adults enrolled in an aid code or eligibility group who were not members of study groups A through D. Individuals who experienced retroactive months of eligibility or those with a SOC obligation were also included in this group.

Four study groups were created for certified eligible children ages 1–17, also reflecting the administrative and eligibility pathway differences within the child denominator population:

1. Children entitled to full-scope benefits, eligible for Medi-Cal but not Medicare, and enrolled in SPD aid codes;
2. Children entitled to full-scope benefits, eligible for Medi-Cal but not Medicare, and enrolled in Families aid codes;
3. Children without SIS, entitled to restricted-scope benefits, eligible for Medi-Cal but not Medicare, and enrolled in Undocumented aid codes; and
4. Children enrolled in an aid code or eligibility group who were not members of study groups A through C. Individuals who experienced retroactive months of eligibility or those with a SOC obligation were also included in this group.

Children who were dually eligible for both Medi-Cal and Medicare were not separately evaluated, as they represented only a small subpopulation. Children who were dually eligible were grouped into the SOC/Retro/Other study group, or group D.

Table PH-12 presents a summary of the unique study groups identified and the types of PQI/PDI-based evaluative studies that may be performed – that is, the general research questions that may be posed in light of the study group's administrative standing within Medi-Cal. As noted above, the major differences among the groups relate to potential exposure to meaningful Medi-Cal-covered ambulatory care, and whether a denominator can be readily determined. This in turn influences the type of research question that can be evaluated. It is important to note that even those study groups that cannot be used to directly evaluate Medi-Cal's ambulatory care system are worth studying, as a number of important policy questions may be evaluated.

[xii] The following aid code populations constituted 74% of the eligible months associated with Group 4: aid code 44 (200% FPL–Pregnancy); aid code 3N (1931[b] Non-CalWORKS); aid code 0P (BCCTP); and aid code 60 (Disabled/Supplemental Security Income/Cash Assistance).

Table PH-12: Summary of Study Groups, Their Potential Exposure to Medi-Cal Ambulatory Care, and Possible Research Questions

Medi-Cal Study Group	Potentially Exposed to Meaningful Medi-Cal-Covered Ambulatory Care	Possible Research Questions
Families entitled to full-scope Medi-Cal services, not eligible for Medicare	Yes	How well does Medi-Cal's ambulatory care system perform? This may include aspects of evaluating access to health care services where appropriate. Similarly, studies focusing on SES, race/ethnicity, physician practice, etc. may be evaluated as well.
SPDs entitled to full-scope Medi-Cal services, not eligible for Medicare	Yes	How well does Medi-Cal's ambulatory care system perform? This may include aspects of evaluating access to health care services where appropriate. Similarly, studies focusing on SES, race/ethnicity, physician practice, etc. may be evaluated as well.
Individuals without SIS entitled to restricted-scope Medi-Cal services (Undocumented)	No	Since Medi-Cal covers only emergency and pregnancy-related services, ambulatory care is generally received outside of Medi-Cal's ambulatory care system. Therefore, evaluating Medi-Cal's ambulatory care system is not possible. Researchers may want to evaluate how restricted-scope services impact PQI/PDI rates. The research question may focus on a specific question related to eligibility or benefit structure.
Individuals eligible for both Medi-Cal and Medicare, and entitled to full-scope services (Dual Eligible)	No	Medicare finances and directs most ambulatory care services through Medicare Part B. Therefore, the PQI/PDI rates will essentially represent an evaluation of Medicare's ambulatory care system. Researchers may want to study whether the dual systems (i.e., Medi-Cal and Medicare) and coordination between the two systems influence PQI/PDI rates.
Individuals with a SOC obligation, eligible for Medi-Cal during a retroactive eligibility period, and others entitled to limited or specific scopes of Medi-Cal services (SOC/Retro/Other)	Some have limited exposure, while others have little or no exposure	Most of this study group consists of individuals who had little or no meaningful exposure to Medi-Cal-covered ambulatory care. Further, some subpopulations, like those eligible but not enrolled (retroactive), do not easily lend themselves to calculating a proper PQI/PDI rate (see the previous discussion regarding denominator limitations). Researchers may want to study specific policy issues related to eligibility and/or benefits regarding cost-sharing, enrollment outreach, or continuous eligibility.

Figure PH-5: Adult Study Groups (Ages 18 and Older)

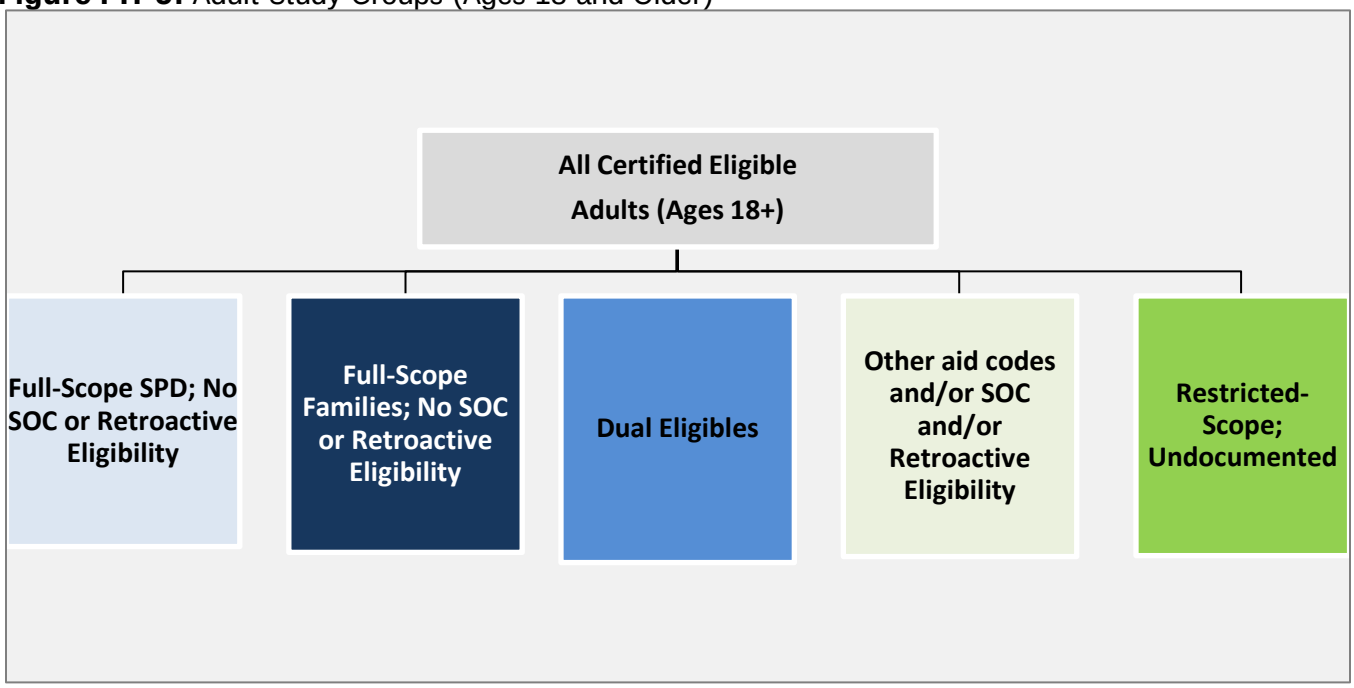
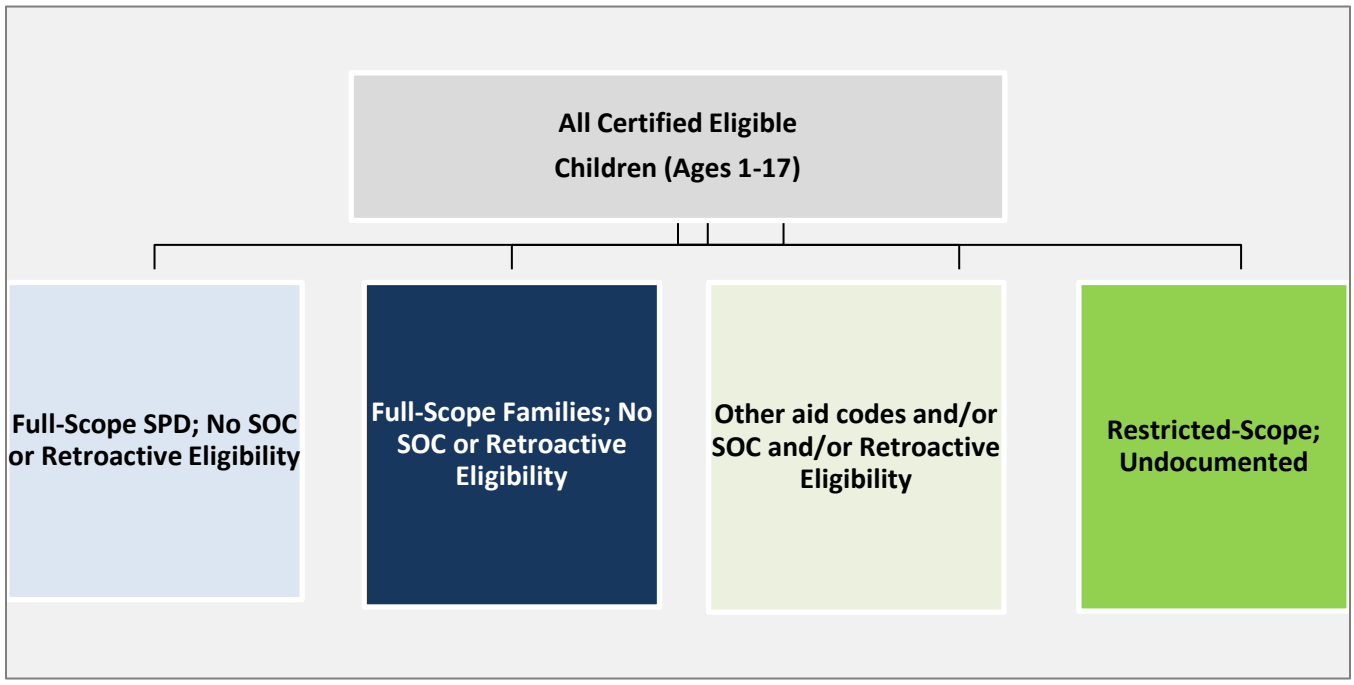


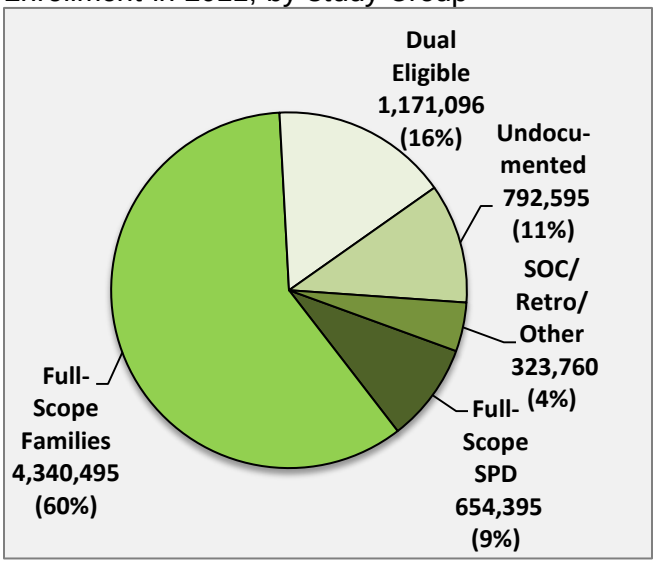
Figure PH-6: Child Study Groups (Ages 1–17)



Demographic Characteristics of the Population

Of the five study groups, Families was the largest with an average monthly enrollment of 4.3 million individuals, representing about 60% of the total Medi-Cal population. The Dual Eligible study group was the second-largest with an average monthly enrollment of 1.2 million individuals, representing about 16% of the total. The Undocumented study group was the third-largest with an average monthly enrollment of 793,000, representing about 11% of the population. The SPD study group was the fourth-largest with an average monthly enrollment of 654,000, representing about 9% of the population. Lastly, the SOC/Retro/Other had an average monthly enrollment of 324,000, representing about 4% of the population (Figure PH-7).

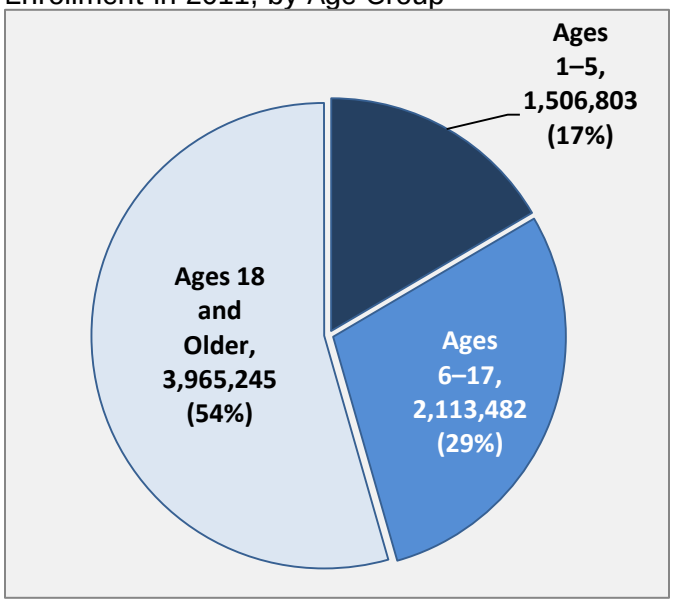
Figure PH-7: Distribution of Average Monthly Enrollment in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division.

Certified eligible children ages 1–17 numbered approximately 3.6 million and comprised about 46% of the study population. Adults ages 18 and older numbered approximately 3.9 million and comprised about 54% of the study population (Figure PH-8). However, the age distribution varied dramatically among study groups.

Figure PH-8: Distribution of Average Monthly Enrollment in 2011, by Age Group

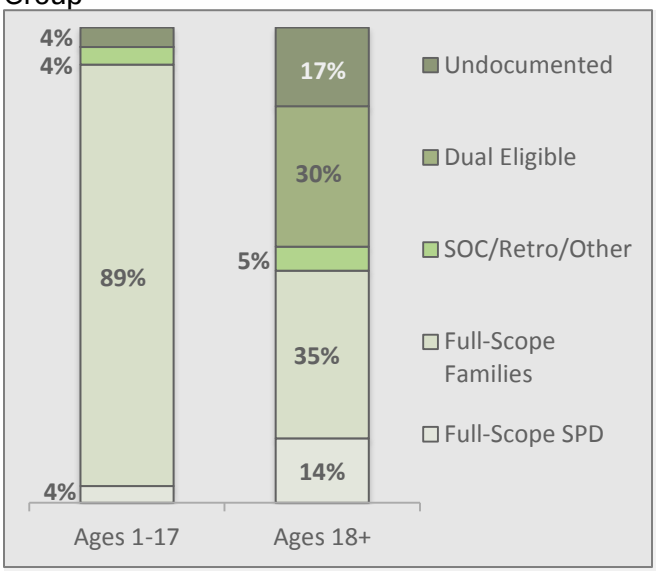


Source: Created by Research and Analytic Studies Division.

Nearly 89% of children ages 1–17 were members of the Families study group, while the SPD, Undocumented and SOC/Retro/Other study groups each constituted about 4% of the certified eligible child population (Figure PH-9).

Among adults, two study groups constituted 65% of the population. The Families study group constituted approximately 35% of the adult population, while Dual Eligible study group made up about 30% of the adult population. The Undocumented study group accounted for about 17% of the adult population, and the SPD study group accounted for roughly 14%.

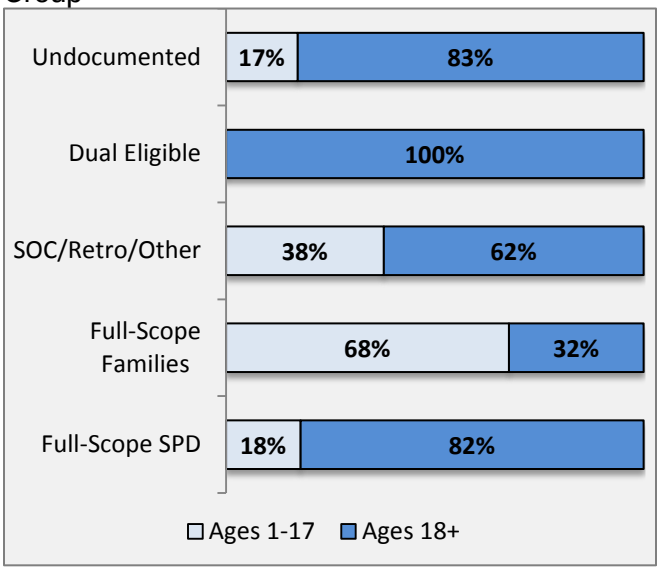
Figure PH-9: Distribution of Average Monthly Enrollment in 2011, by Age Group and Study Group



Source: Created by DHCS Research and Analytic Studies Division.
Note: Percentages may not total 100% due to rounding.

Adults and seniors comprised 100% of the Dual Eligible study group; 83% of the Undocumented study group; 82% of the SPD study group; 62% of the SOC/Retro/Other study group; and 32% of the Families study group (Figure PH-10).

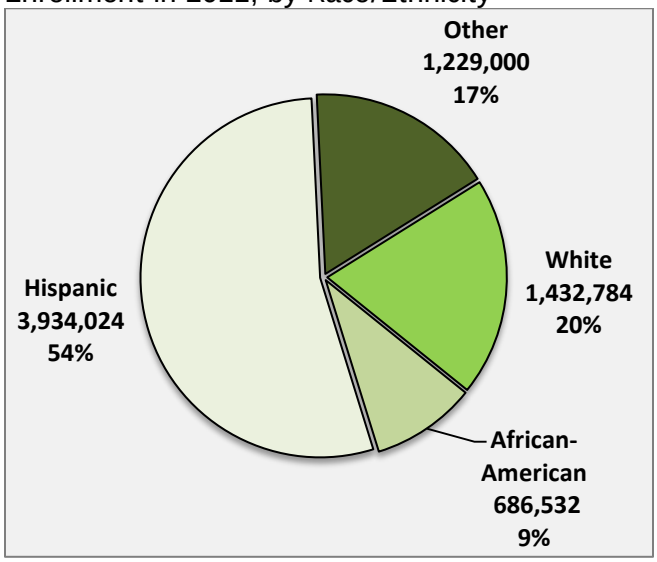
Figure PH-10: Distribution of Average Monthly Enrollment in 2011, by Study Group and Age Group



Source: Created by DHCS Research and Analytic Studies Division.

Four broad racial/ethnic groups were used to describe the population: Hispanic, White, African-American, and Other (primarily Asian ethnicities). Of these, Hispanics were the largest group, numbering 3.9 million and representing approximately 54% of the overall population. Whites numbered 1.4 million and comprised about 20% of the population. Members of the Other racial/ethnic cohort numbered 1.3 million and comprised about 17% of the overall population. Finally, African-Americans numbered 686,000 and comprised about 9% of the overall population (Figure PH-11).

Figure PH-11: Distribution of Average Monthly Enrollment in 2011, by Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division.

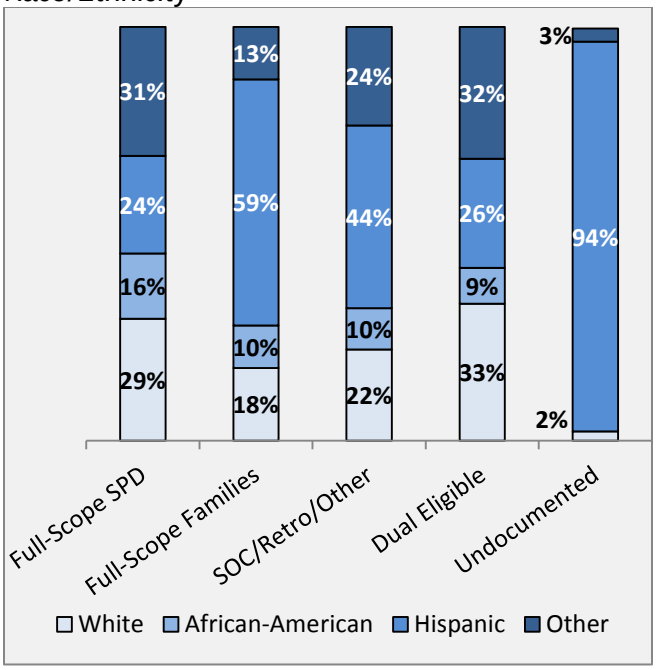
Figure PH-12 presents average monthly enrollment for each study group, by race/ethnicity. Differences were noted among the study groups in regards to race/ethnicity. Hispanics were found to be the predominant race/ethnicity among the Undocumented study group (94%) and represented approximately 60% of the Families study group.

Among the SPDs, the Other racial/ethnic cohort constituted about 31% of the population, while Whites and Hispanics each accounted for approximately 29% and 24%, respectively. African-Americans represented about 16% of the SPD study group. Among Dual Eligibles, Whites and the Other racial/ethnic cohort each made up about one-third of the study group. Hispanics constituted about 26% of the Dual Eligible study

group, and African-Americans represented about 9% of the Dual Eligible study group.

The SOC/Retro/Other study group's enrollment distribution by race/ethnicity was very similar to the Families study group, with some differences. A smaller proportion of the SOC/Retro/Other study group was classified as Hispanic and a greater proportion was classified as Other, compared to the Families study group.

Figure PH-12: Distribution of Average Monthly Enrollment in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division. Percentages may not total 100% due to rounding.

Methods

To evaluate preventable hospitalizations, DHCS-RASD used AHRQ software (Version 4.4)[xiii] to derive PQI rates for adults and PDI rates for children.

Separate denominators were created for each subpopulation evaluated. To calculate statewide rates, DHCS-RASD utilized state-specific census counts derived from the Census Bureau's 2011 residential population figures for the state of California. Monthly enrollment data for 2011 captured from the Medi-Cal Eligibility Data System (MEDS) were utilized to construct Medi-Cal-specific denominators.

The PQIs evaluated in this study included 13 individual ACSC indicators and three composites: PQI-90 (Overall Composite); PQI-91 (Acute Composite); and PQI-92 (Chronic Composite). All PQIs were applied to adult populations ages 18 and older, with the exception of PQI-5 (Chronic Obstructive Pulmonary Disease [COPD]/Asthma), which was applied to adults ages 40 and older; and PQI-15 (Asthma), which was applied to adults ages 18–39.

The PDIs evaluated in this study included three individual ACSC indicators: PDI-14 (Asthma among children ages 2–17); PDI-15 (Diabetes with Short-Term Complications among children ages 6–17); and PDI-17 (Perforated Appendix among children ages 1–17). In addition, three composites were also evaluated: PDI-90 (Overall Composite); PQI-91 (Acute Composite); and PQI-92 (Chronic Composite), all among children ages 6–17.

DHCS-RASD did not evaluate AHRQ's PDI-16 (Gastroenteritis) or PDI-18 (Urinary Tract Infection) for children ages 3 months to 17 years because of difficulties linking Medi-Cal enrollment data to OSHPD data for children less than one year of age.

The PQI/PDI composites included in this study are important summary indicators of ACSCs. The Overall Composites are summary indicators capturing the general concept of potentially avoidable hospitalization that connects the individual ACSCs. The Acute Composite indicators summarize rates for those specific conditions characterized by a relatively sudden onset of symptoms that are usually severe, followed by recovery to a state of health comparable before the acute episode, or passage into a chronic

[xiii] See AHRQ Quality Indicators Software Instruction, SAS. Version 4.4.

phase, or in death. Acute conditions include dehydration, bacterial pneumonia, and urinary tract infection. The Chronic Composite indicators summarize rates for those specific conditions or diseases characterized by long duration, frequent recurrence over a long time, and often by slowly progressing seriousness. Chronic conditions include diabetes, hypertension, COPD, heart failure, angina, and asthma.

In this study, PQI-2 (Perforated Appendix among adults) and PDI-17 (Perforated Appendix among children) are excluded from the composites because both individual indicators have discharge-based denominators instead of population-based denominators.

The PDI composite measures, which span multiple clinical conditions, are also useful evaluation tools. While some of the condition-specific measures, such as PDI-16 (Gastroenteritis) and PDI-18 (Urinary Tract Infection), apply to more narrow age ranges, the composite measures report rates for all children ages 6–17 and incorporate elements of PDI-16 and PDI-18.

Population Parameters and Subgroups

To calculate PQI/PDI rates, both a numerator and denominator must be established. The denominator represents the population at risk of incurring an ACSC. The numerator consists of all ACSC events, as defined by AHRQ, occurring among the population at risk during the observation period.

For this study, DHCS-RASD has defined various at-risk populations (i.e., denominators) and calculated distinct PQI/PDI rates for each study population (Table PH-13). Beginning at the state level, DHCS-RASD calculated PQI/PDI rates for California's entire population. At this level, DHCS-RASD utilized population counts derived from the Census Bureau's 2011 residential population figures for the state of California.[xiv] Therefore, these initial PQI/PDI rates reflect the rates for California's entire population – including individuals with Medi-Cal, Medicare, and private insurance coverage, as well the uninsured.

Table PH-13: Populations at Risk (Denominators Used)

PQI/PQI Measure	Population at Risk (Denominator)
Statewide PQI/PDI Rates	Statewide California population, 2011
Overall Medi-Cal PQI/PDI Rates	Medi-Cal certified eligibles during 2011, expressed as the average monthly enrollment (person-year equivalent)
Specific Medi-Cal Study Groups' PQI/PDI Rates	Medi-Cal certified eligibles for each unique subpopulation, expressed as the average monthly enrollment (person-year equivalent)

Source: Created by DHCS Research and Analytic Studies Division.

To calculate overall Medi-Cal-specific PQI/PDI rates, DHCS-RASD redefined the denominator by limiting it to only certified eligibles who were enrolled in Medi-Cal during 2011. DHCS-RASD divided the total member months of Medi-Cal enrollments from the Medi-Cal eligibility data by 12 to derive the average monthly members, or person-year equivalents.

The overall Medi-Cal PQI/PDI rates allow readers to evaluate differences in PQI/PDI rates among Medi-Cal, the entire state of California, and the nation as a whole.

Next, DHCS-RASD calculated PQI/PDI rates for the different study groups within the Medi-Cal population. This provided the opportunity to study differences in preventable hospitalizations between groups with different eligibility pathways and/or differences in the scope, timing, and responsibility of coverage.

[xiv] See 2012 Population File for Use with AHRQ Quality Indicators Version 4.4.

Finally, DHCS-RASD calculated PQI/PDI rates by racial/ethnic cohort within three Medi-Cal study groups: (1) Families; (2) SPDs; and (3) Dual Eligibles. DHCS-RASD evaluated racial/ethnic differences for only three of the five study groups in order to limit comparisons to those groups where the results were not obscured by either the excluded groups' lack of meaningful exposure to Medi-Cal-covered ambulatory care, or by inherent difficulties in identifying a denominator that could be used to calculate meaningful rates.

Observed Rates

To calculate the observed rates of ACSCs, DHCS-RASD used the AHRQ standard approach to define the numerator and denominator. The observed rate is calculated by dividing the total number of cases in a specified time frame by the total number of individuals in the population at risk, and expressing it as the number of events per 100,000 population.

The data used as the numerator for calculating ACSC rates in this study were based on the linked 2011 Medi-Cal and OSHPD Patient Discharge Data (PDD) file. DHCS-RASD used AHRQ's algorithm to derive the cases of all PQIs for adults ages 18 and older and PDIs for children ages 1–17 (PDI-17 [Perforated Appendix]); ages 2–17 (PDI-14 [Asthma]); or ages 6–17 (PDI-15 [Diabetes with Short-Term Complications] and PDI-90–PDI-92 [Composites]).

DHCS-RASD restricted the PDI analyses to children ages 1–17 because of difficulties matching data for Medi-Cal children under the age of one year.

Age-Sex Adjustments Using AHRQ's Approach

In order to compare PQI/PDI rates for the California statewide population and the entire Medi-Cal population to the national standard, DHCS-RASD calculated age-sex adjusted rates using the same methodology applied by AHRQ. The age-sex adjusted rates were calculated as O/E * R, or the observed rate of the study population (O) divided by the expected rate of the study population (E), multiplied by the observed rate of the standard population (R).

The observed rate is useful for identifying the magnitude of actual impact. The expected rate is important for predicting the rate that the study population would have if it had experienced the standard population's age- and sex-specific rates given the study population's age-sex demographic structure.

The O/E ratio measures the difference in outcomes between the study population and standard population. A ratio of greater than one indicates that the study population has a higher rate than the standard population. Likewise, a ratio of less than one indicates that the study population has a lower rate than the standard population.

Similarly, a difference of greater than zero between the age-sex adjusted rate of the study population and the observed rate of the standard population indicates that the study population has a higher rate than the standard population. A difference of less than zero indicates that the study population has a lower rate than the standard population.

Standard Population Rates Used for Adjustment

Two sets of standard population rates were used to create age-sex adjusted rates. The standard population rates were chosen based on the specific objective. When evaluating California's and Medi-Cal's overall rates and comparing them to national rates using AHRQ software, the 2008 U.S. population rates were used as the standard population rates (Table PH-14).

Table PH-14: Standard Population Rates Used Throughout This Study

When Comparing	Standard Population Rates Used
California's and Medi-Cal's PQI/PDI rates to national rates	2008 U.S. population rates
Medi-Cal's subpopulations (i.e., aid category and race/ethnicity)	Medi-Cal's overall population rates in 2011

Source: Created by DHCS Research and Analytic Studies Division.

To age-sex adjust the ACSC rates of Medi-Cal study subpopulations by aid category and race/ethnicity, DHCS-RASD adapted the AHRQ approach by using Medi-Cal's total population rates in 2011, rather than U.S. national population rates, as standard population rates.

The adjustments were stratified by sex-specific age groups in a reasonably broad range (ages 6 months to 5 years, 6–12, and 13–17 for children; and ages 18–29, 30–39, 40–49, 50–64, 65–74, and 75 and older for adults), rather than the sex-specific five-year age groups used by AHRQ. This was done to minimize potential problems with the small numerators and/or denominators of Medi-Cal's subpopulations.

Finally, the ratios of observed and expected rates of Medi-Cal's subpopulations were multiplied by the observed rates of the entire Medi-Cal standard population. As a result, this descriptive study was able to, for the first time, provide age-sex adjusted ACSC rates for Medi-Cal's subpopulations, by aid category and racial/ethnic cohort, accounting for the differences in age-sex compositions between the standard and study populations.

Data Source

DHCS-RASD identified ACSC events among the Medi-Cal population using the California Office of Statewide Health Planning and Development (OSHPD) Patient Discharge Data (PDD) set for CY 2011. The dataset included one record for each patient discharge that occurred in California acute-care hospitals throughout CY 2011. In addition, Medi-Cal enrollment data extracted from the Medi-Cal Eligibility Data System (MEDS) and paid claims data were combined with the OSHPD PDD and used to validate Medi-Cal acute-care hospital inpatient discharges and develop meaningful study groups for analysis.

Results

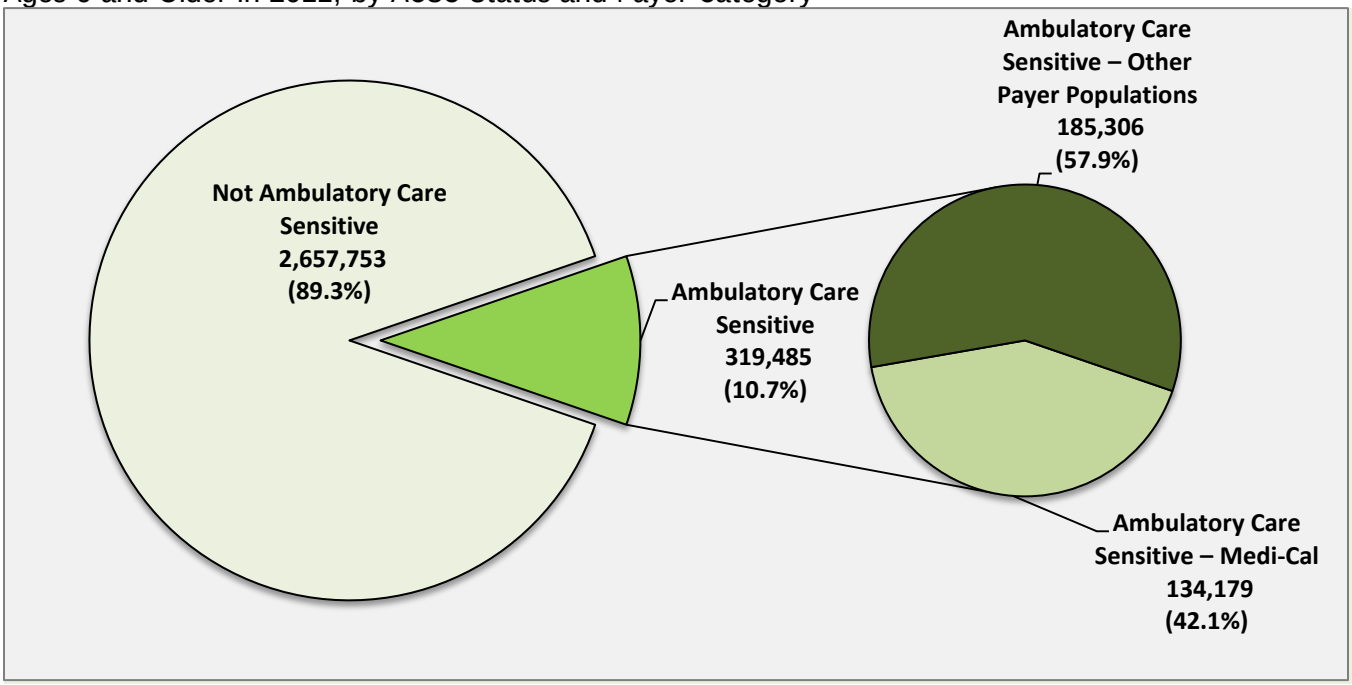
Distribution of ACSC Acute-Care Hospital Inpatient Discharges

Before considering the rates of acute-care hospital inpatient discharges for the selected ACSCs among various segments of the Medi-Cal population, it is useful to begin by first observing them through a wide prism encompassing statewide hospital inpatient discharges. This vantage point enables readers to place Medi-Cal ACSCs into context relative to all acute-care hospital inpatient discharges occurring in California, and among Medi-Cal's overall acute-care hospital inpatient discharges.

In total, there were a combined 2,977,238 acute-care hospital inpatient discharges from California hospitals in 2011 among resident children ages 6–17 and adults ages 18 and older. Because DHCS-RASD's analysis of ACSCs focused on PQI- and PDI-90 (Overall Composites), DHCS-RASD only captured discharges that corresponded to the age groups associated with this measure's defined population. In the case of PDI-90 (Overall Composite) for children, only certified eligibles ages 6–17 were evaluated. Therefore, to be consistent, DHCS-RASD captured only acute-care hospital inpatient discharges for children ages 6–17, both those classified as ACSCs and those not classified as ACSCs.

Of the total acute-care hospital inpatient discharges from California hospitals occurring among individuals ages 6 and older in 2011, 319,485 (10.7%) were associated with the selected ACSCs, and 2,657,753 (89.3%) were not (Figure PH-13).

Figure PH-13: Distribution of Acute-Care Hospital Inpatient Discharges among California Residents Ages 6 and Older in 2011, by ACSC Status and Payer Category

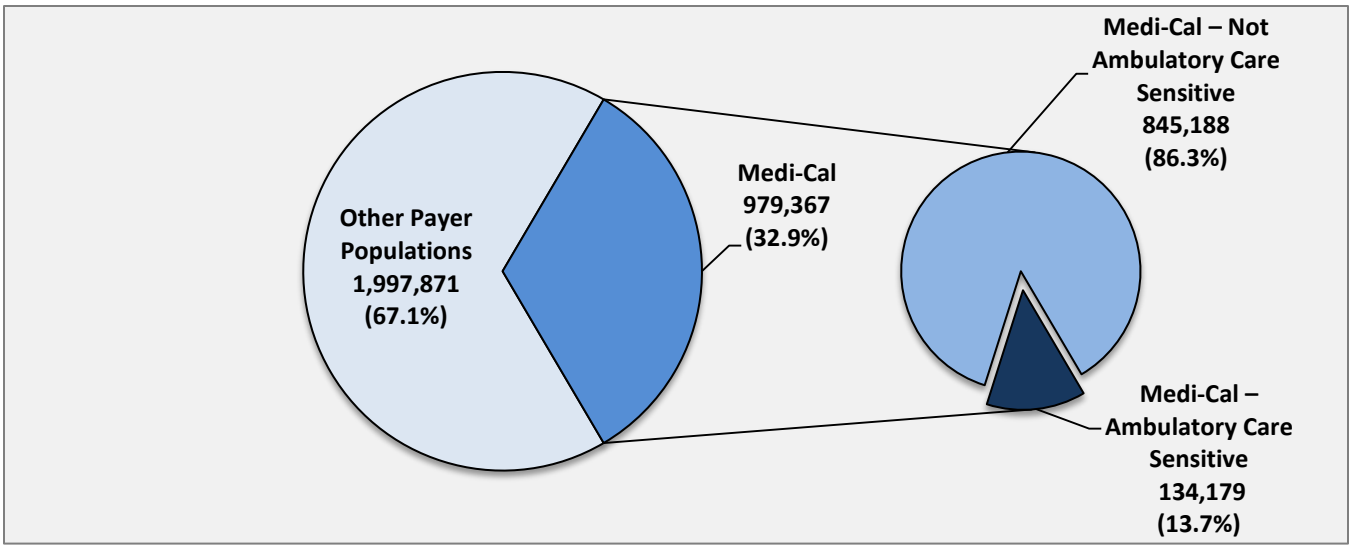


Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file. Ambulatory care sensitive conditions are those identified under PQI- and PDI-90 (Overall Composites). Percentages represent proportions of each pie, and not the entire population.

Of the 2,977,238 total acute-care hospital inpatient discharges, 979,367 (32.9%) were generated by individuals certified eligible for Medi-Cal and 1,997,871 (67.1%) were generated by individuals identified as belonging to a payer population other than Medi-Cal (Figure PH-14).

There were 134,179 acute-care hospital inpatient discharges classified as ACSCs that were generated by Medi-Cal certified eligibles, representing 4.5% of the overall total acute-care hospital inpatient discharges.

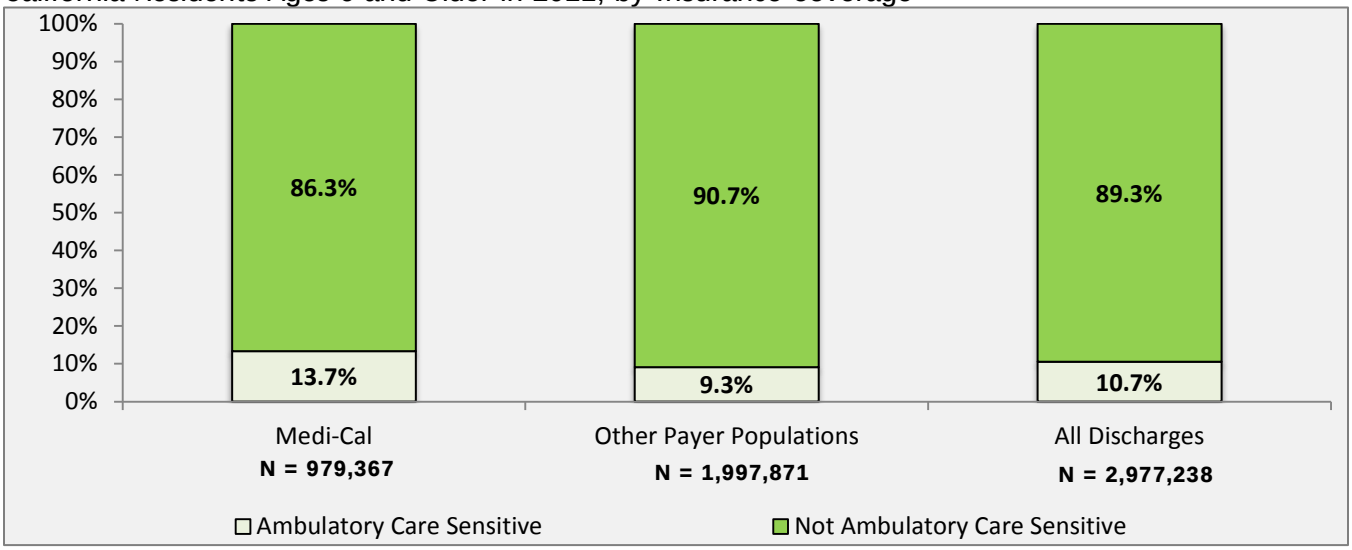
Figure PH-14: Distribution of Acute-Care Hospital Inpatient Discharges among California Residents Ages 6 and Older in 2011, by Payer Category and ACSC Status



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file. Ambulatory care sensitive conditions are those identified under PQI- and PDI-90 (Overall Composites). Percentages represent proportions of each pie, and not the entire population.

The proportion of acute-care inpatient hospital discharges classified as ACSCs was larger among Medi-Cal certified eligibles (13.7%) compared to those covered by other payers (9.3%) (Figure PH-15).

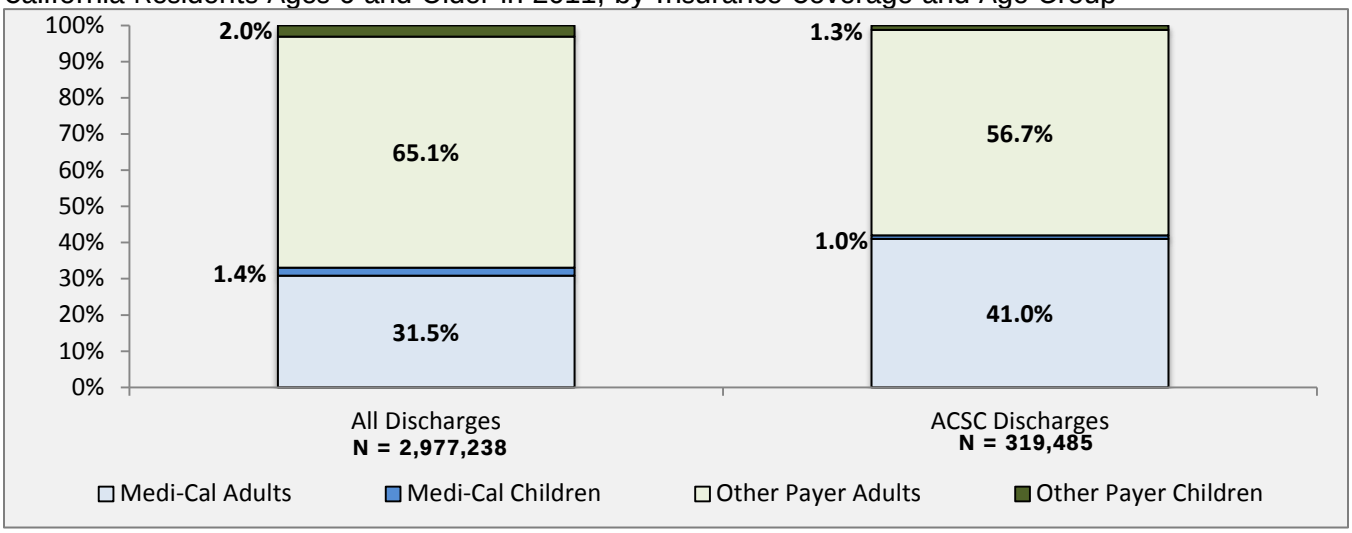
Figure PH-15: Distribution of Acute-Care Hospital Inpatient Discharges Identified as ACSCs among California Residents Ages 6 and Older in 2011, by Insurance Coverage



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file. Ambulatory care sensitive conditions are those identified under PQI- and PDI-90 (Overall Composites).

Medi-Cal adults ages 18 and older generated a disproportionate number of ACSC discharges relative to their total number of acute-care hospital inpatient discharges. Medi-Cal adults generated 31.5% of total acute-care hospital inpatient discharges, but 41.0% of all ACSC discharges. Medi-Cal children generated 1.4% of total acute-care hospital inpatient discharges, but only 1.0% of all ACSC discharges. Overall, adults generated 312,157 (97.7%) ACSC discharges, while children generated 7,328 (2.3%) ACSC discharges (Figure PH-16).

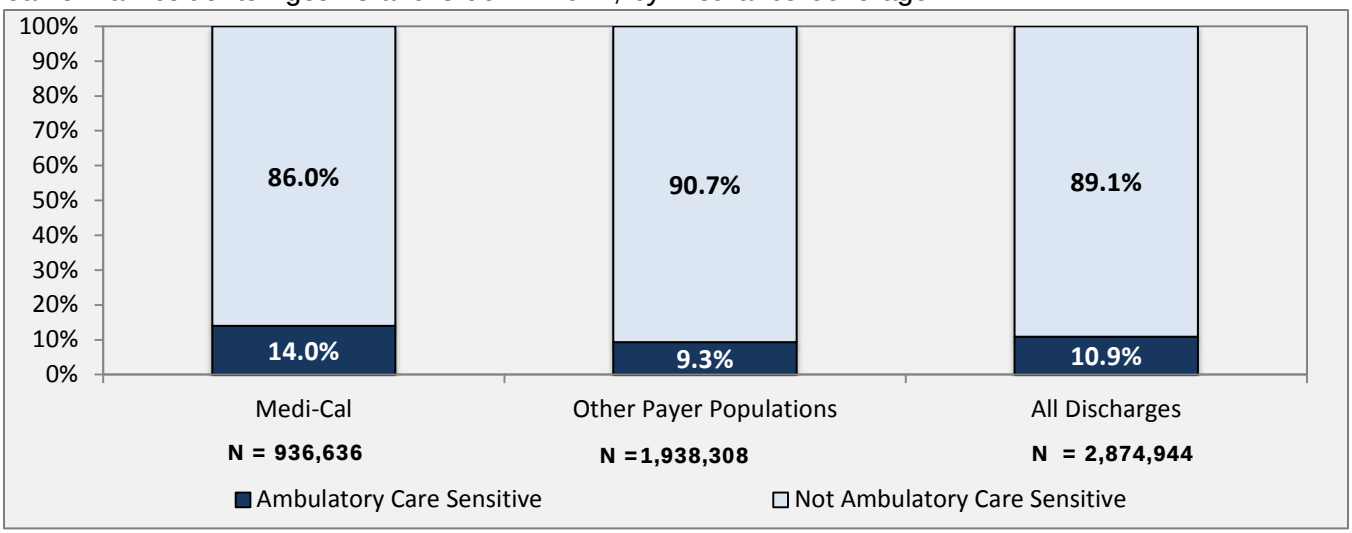
Figure PH-16: Distribution of Total and ACSC Acute-Care Hospital Inpatient Discharges among California Residents Ages 6 and Older in 2011, by Insurance Coverage and Age Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file. Ambulatory care sensitive conditions are those identified under PQI- and PDI-90 (Overall Composites).

Differences in the rates of ACSC discharges between individuals covered by Medi-Cal and individuals covered by other payers were greatest among adults. Among Medi-Cal adults, 14.0% of total acute-care hospital inpatient discharges were associated with an ACSC, compared with only 9.3% among adults with other payers (Figure PH-17).

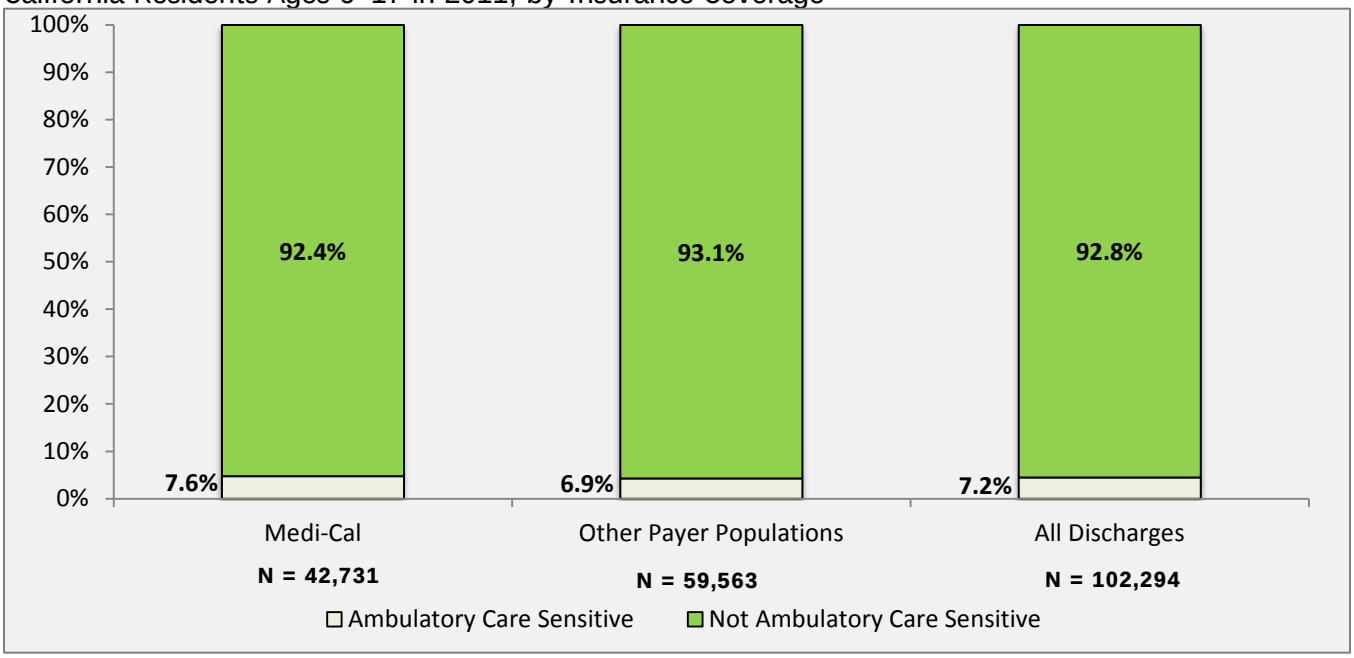
Figure PH-17: Distribution of Acute-Care Hospital Inpatient Discharges Identified as ACSCs among California Residents Ages 18 and Older in 2011, by Insurance Coverage



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file. Ambulatory care sensitive conditions are those identified under PQI- and PDI-90 (Overall Composite).

Among children, differences in rates of ACSC discharges between Medi-Cal certified eligibles and those covered by other payers were much less pronounced. Among Medi-Cal children, 7.6% of total acute-care hospital inpatient discharges were associated with an ACSC, compared to 6.9% among children with other payers (Figure PH-18).

Figure PH-18: Distribution of Acute-Care Hospital Inpatient Discharges Identified as ACSCs among California Residents Ages 6–17 in 2011, by Insurance Coverage



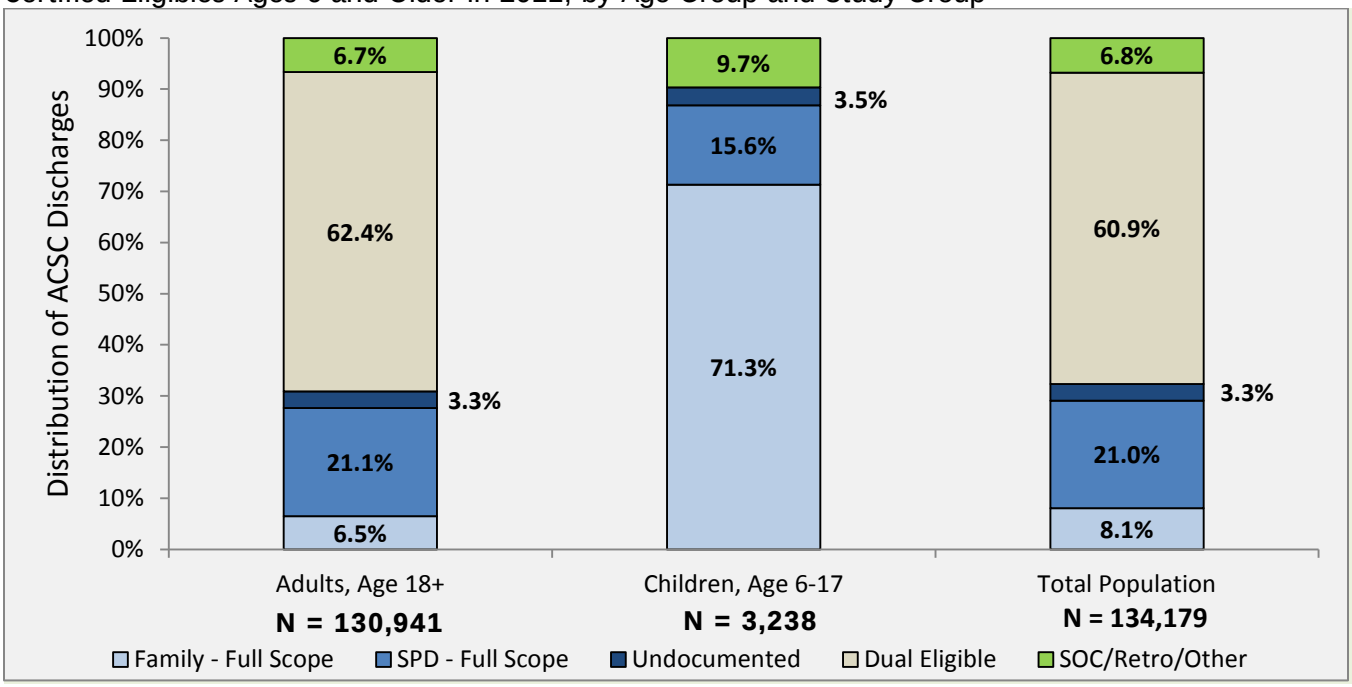
Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file. Ambulatory care sensitive conditions are those identified under PQI- and PDI-90 (Overall Composites).

Distribution of ACSC Acute-Care Hospital Inpatient Discharges among Medi-Cal Study Groups

The 130,941 ACSC acute-care hospital inpatient discharges generated by Medi-Cal-covered adults were concentrated among several study groups. The Dual Eligible study group (81,717, or 62.4%) accounted for the largest proportion of ACSC discharges, followed by the SPD study group (27,656, or 21.1%). The Families (8,513, or 6.5%), SOC/Retro/Other (8,764, or 6.7%), and Undocumented (4,291, or 3.3%) study groups comprised the remainder of ACSC discharges (Figure PH-19).

Among Medi-Cal children ages 6–17, there were 3,238 acute-care hospital inpatient discharges associated with ACSCs. The Families study group (2,308, or 71.3%) generated the largest proportion of ACSC discharges, followed by the SPD study group (504, or 15.6%). The SOC/Retro/Other (314, or 9.7%) and Undocumented (112, or 3.5%) study groups comprised the remainder of ACSC discharges (Figure PH-19).

Figure PH-19: Distribution of ACSC Acute-Care Hospital Inpatient Discharges among Medi-Cal Certified Eligibles Ages 6 and Older in 2011, by Age Group and Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file. Ambulatory care sensitive conditions are those identified under PQI- and PDI-90 (Overall Composites).

Comparison of Medi-Cal ACSC Rates to Statewide and National Populations

Table PH-15 and Table PH-16 display both observed and age-sex adjusted composite PQI rates among the total California and Medi-Cal populations for PQI-90 (Overall Composite), PQI-91 (Acute Composite), and PQI-92 (Chronic Composite). The age-sex adjusted composite PQI rates for the total California population are identical to the rates reported by OSHPD, which utilized the same data and software.[23]

Among Medi-Cal adults, the age-sex adjusted rate for PQI-90 was 3,047 discharges per 100,000 population, compared to 1,877 discharges per 100,000 population observed nationally. Medi-Cal's observed PQI-90 rate was 3,302 per 100,000 population (Table PH-15).

The age-sex adjusted rate for PQI-91 (Acute Composite) among the entire Med-Cal adult population was also higher (1,029 discharges per 100,000 population) than the observed national rate (753 discharges per 100,000 population). Medi-Cal's observed PQI-91 rate was 1,165 per 100,000 population.

The age-sex adjusted rate for PQI-92 among the entire Medi-Cal adult population was significantly higher (2,033 discharges per 100,000 population) than the observed national rate (1,124 discharges per 100,000 population). Medi-Cal's observed PQI-92 rate was 2,137 per 100,000 population.

Table PH-15: Composite PQI Rates for United States, California, and Medi-Cal Adults Ages 18 and Older per 100,000 Population in 2011

Population	Overall (PQI-90)	Acute (PQI-91)	Chronic (PQI-92)
United States' Observed Rate	1,877	753	1,124
California's Age-Sex Adjusted Rate	1,243	479	764
California's Observed Rate	1,104	420	684
Medi-Cal's Age-Sex Adjusted Rate	3,047	1,029	2,033
Medi-Cal's Observed Rate	3,302	1,165	2,137

Source: Created by DHCS Research and Analytic Studies Division.

Among Medi-Cal children ages 6–17, the age-sex adjusted rate for PDI-90 (Overall Composite) was 151 discharges per 100,000 population, lower than the 191 discharges per 100,000 population observed nationally. The California population's age-sex adjusted PDI-90 rate was 117 per 100,000 population (Table PH-16).

Among Medi-Cal children, the age-sex adjusted rate for PDI-91 (Acute Composite) was again lower (50 discharges per 100,000 population) than the observed national rate (65 discharges per 100,000 population). The California population's age-sex adjusted PQI-91 rate (41 discharges per 100,000 population) was also lower than the national observed PQI-91 rate.

Among Medi-Cal children, the age-sex adjusted rate for PDI-92 (Chronic Composite) was also lower (101 discharges per 100,000 population) than the national observed rate (126 discharges per 100,000 population). The California population's age-sex adjusted PQI-92 rate (76 discharges per 100,000 population) was also lower than the observed national PQI-92 rate.

Table PH-16: Composite PDI Rates for United States, California, and Medi-Cal Children Ages 6-17 per 100,000 Population in 2011

Population	Overall (PDI-90)	Acute (PDI-91)	Chronic (PDI-92)
United States' Observed Rate	191	65	126
California's Age-Sex Adjusted Rate	117	41	76
California's Observed Rate	116	41	75
Medi-Cal's Age-Sex Adjusted Rate	151	50	101
Medi-Cal's Observed Rate	148	50	103

Source: Created by DHCS Research and Analytic Studies Division.

Comparison of Rates for the United States, California, and Medi-Cal

Table PH-17 and Table PH-18 display comparisons of PQI/PDI rates for the United States, California, and Medi-Cal for both adults and children. Table PH-17 displays both composite and condition-specific PQI rates for adults. The age-sex adjusted PQI rates of the total Medi-Cal adult population were much higher than the observed national rates, with the exceptions of PQI-2 (Perforated Appendix) and PQI-10 (Dehydration).

Table PH-18 displays both composite and condition-specific PDI rates for children. All age-sex adjusted rates for the Medi-Cal child population were lower than the observed national rates, with the exception of PDI-17 (Perforated Appendix).

Confidence intervals are included for each PQI/PDI rate among the statewide California and Medi-Cal populations. A confidence interval is a range above and below a value of measurement — such as a rate in this study — that conveys how precise the measurement is. Confidence intervals are used to describe the variability and uncertainty around a point estimate. The 95% confidence intervals in this report were calculated using AHRQ software Version 4.4, and have a stated probability that there is a 95% chance that the "true" rate lies within the high and low ends of the interval.

Table PH-17: PQI Rates for U.S., California, and Medi-Cal Adult Certified Eligibles Ages 18 and Older* per 100,000 Population** in 2011

PQI #	Condition	California Observed Rate	95% C.I. Lower Limit	95% C.I. Upper Limit	Medi-Cal Observed Rate	95% C.I. Lower Limit	95% C.I. Upper Limit	California Age-Sex Adjusted Rate	95% C.I. Lower Limit	95% C.I. Upper Limit	Medi-Cal Age-Sex Adjusted Rate	95% C.I. Lower Limit	95% C.I. Upper Limit	U.S. Observed Rate	California Age-Sex Adjusted Rate vs. U.S. Observed Rate	Medi-Cal Age-Sex Adjusted Rate vs. U.S. Observed Rate
1	Diabetes with Short-Term Complications	52.7	51.9	53.6	153.9	150	157.7	51.1	50.2	52.1	151.3	148.9	153.8	64.9	Lower	Higher
2	Perforated Appendix	26.5	26	27	25.3	24.2	26.3	27.2	26.7	27.7	28.4	27.2	29.5	28.8	Lower	Similar
3	Diabetes with Long-Term Complications	106.8	105.6	108	365.2	359.3	371.1	115.3	113.9	116.7	379.8	376.1	383.4	134	Lower	Higher
5	COPD/Asthma	313.7	311	316.4	1170.6	1156	1185	335	331.2	338.8	988.7	979.2	998.1	587.8	Lower	Higher
7	Hypertension	33.7	33	34.4	99	95.9	102.1	36.6	35.7	37.6	99.4	96.9	101.9	64.5	Lower	Higher
8	Heart Failure	256.1	254.2	257.9	726.6	718.2	734.9	300.5	297.9	303	652.6	646.6	658.5	414.2	Lower	Higher
10	Dehydration	74.5	73.5	75.5	184.2	180	188.4	84.1	82.5	85.8	166.2	162.2	170.1	176.5	Lower	Lower
11	Bacterial Pneumonia	204.5	202.8	206.2	554.2	546.9	561.5	233.4	231	235.8	507	501.3	512.6	369.4	Lower	Higher
12	Urinary Tract Infection	140.7	139.3	142.1	426.3	419.9	432.7	161.9	160.1	163.7	349.2	345.2	353.3	207.3	Lower	Higher
13	Angina without Procedure	21.8	21.2	22.3	56	53.7	58.4	23.6	22.9	24.2	59.9	58.2	61.6	27.4	Lower	Higher
14	Uncontrolled Diabetes	11.3	10.9	11.7	44	41.9	46	11.9	11.3	12.4	46.7	45.2	48.2	22.5	Lower	Higher
15	Asthma	29.3	28.3	30.3	89.3	85	93.6	29.7	28.2	31.2	80.8	77.3	84.3	65	Lower	Higher
16	Lower-Extremity Amputation Among Patients with Diabetes	13.9	13.4	14.3	50.7	48.5	52.9	15.3	14.8	15.8	54	52.6	55.4	18.1	Lower	Higher
90	Overall Composite	1104	1100.2	1108	3302	3284	3320	1243.4	1238	1249	3047	3035	3060	1877	Lower	Higher
91	Acute Composite	419.7	417.3	422.1	1164.7	1154	1175	478.9	475.5	482.2	1029	1021	1037	753.2	Lower	Higher
92	Chronic Composite	684.3	681.3	687.4	2137.3	2123	2152	764.1	760	768.2	2033	2023	2043	1124	Lower	Higher

Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Rates are age-sex adjusted to AHRQ Version 4.4 U.S. national rates. *Except PQI-5 for ages 40 and older, and PQI-15 for ages 18-39. **Except PQI-2, per 100 appendicitis cases.

Table PH-18: PDI Rates for U.S., California, and Medi-Cal Child Certified Eligibles Ages 6-17* per 100,000 population** in 2011

PDI #	Condition	California Observed Rate	95% C.I. Lower Limit	95% C.I. Upper Limit	Medi-Cal Observed Rate	95% C.I. Lower Limit	95% C.I. Upper Limit	California Age-Sex Adjusted Rate	95% C.I. Lower Limit	95% C.I. Upper Limit	Medi-Cal Age-Sex Adjusted Rate	95% C.I. Lower Limit	95% C.I. Upper Limit	U.S. Observed Rate	California Age-Sex Adjusted Rate vs. U.S. Observed Rate	Medi-Cal Age-Sex Adjusted Rate vs. U.S. Observed Rate
14	Asthma	89.4	87.4	91.4	97.3	93.8	100.8	91	88.4	93.5	88.7	84.7	92.6	135.8	Lower	Lower
15	Diabetes with Short-Term Complications	21.7	20.6	22.9	31.5	29.1	33.9	21.4	20	22.8	32.7	30.1	35.2	34	Lower	Similar
17	Perforated Appendix	307.8	300	315.5	324.2	310.7	337.8	296.9	289.6	304.1	313.4	300.7	326	302.1	Similar	Similar
90	Overall Composite	116.1	113.5	118.8	153.2	147.9	158.5	117.2	113.8	120.7	150.8	144.9	156.6	191	Lower	Lower
91	Acute Composite	40.7	39.2	42.3	50.3	47.3	53.3	41.2	39.2	43.2	50.1	46.6	53.5	65	Lower	Lower
92	Chronic Composite	75.4	73.3	77.5	102.9	98.6	107.2	76	73.3	78.8	100.7	96.0	105.4	126	Lower	Lower

Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Rates are age-sex adjusted to AHRQ Version 4.4 U.S. national rates. *Except PDI-14 for ages 2-17, and PDI-17 for ages 1-17. **Except PDI-17, per 1,000 population.

Differences among the Medi-Cal Study Groups

As previously noted, the Medi-Cal population is both demographically and clinically heterogeneous, which influences rates of preventable hospitalization among these diverse groups. In addition, there are administrative differences in the scope and timing of coverage and benefits that may influence the ability of Medi-Cal certified eligibles to access ambulatory care prior to hospitalization. Additionally, as in the case of the SOC/Retro/Other study group, these administrative differences sometimes make it difficult to identify the denominator required to calculate appropriate rates. For these reasons, the Medi-Cal certified eligibles in this study were divided into two age cohorts and five study groups related to eligibility pathway. As expected, wide differences in PQI/PDI rates were observed among these five study groups.

Adults

All rates presented in Figures PH-20–PH-22 were age-sex adjusted to the observed rates of the entire Medi-Cal adult population. Because an indirect standardization method was utilized to construct age-sex adjusted rates, readers should note that age-sex adjusted rates should be interpreted relative to the observed rate for the standard population.

Among adults, compared to Medi-Cal's overall observed rates, age-sex adjusted rates of preventable hospitalization were highest among the SOC/Retro/Other study group for all three composite measures. When compared to Medi-Cal's overall observed rates for each PQI/PDI measure, certified eligibles in this study group generated the highest age-sex adjusted rates for 11 of the 13 condition-specific PQIs evaluated for adults.

However, an important caveat that must be considered when interpreting the SOC/Retro/Other study group's age-sex adjusted rates is that they are based on only those individuals who were deemed certified eligible for Medi-Cal. Therefore, no adjustment was made to account for individuals who did not meet their monthly SOC obligation, or who were eligible for Medi-Cal but not enrolled. These adjustments would have increased the denominator for this study group.

In addition, events that may have occurred outside Medi-Cal's financial responsibility may not be captured in the numerator reflected here. Readers should also note that in many cases, the PQI rate's relationship to Medi-Cal's ambulatory care system may not be relevant. For example, individuals who incurred an ACSC during retroactive months of eligibility may not have received any Medi-Cal-covered ambulatory care prior to the event. Therefore, the rate does not necessarily reflect how well Medi-Cal's ambulatory care system is performing. (See the section titled, "Identifying the Potential Denominator," for a more complete discussion of this topic.)

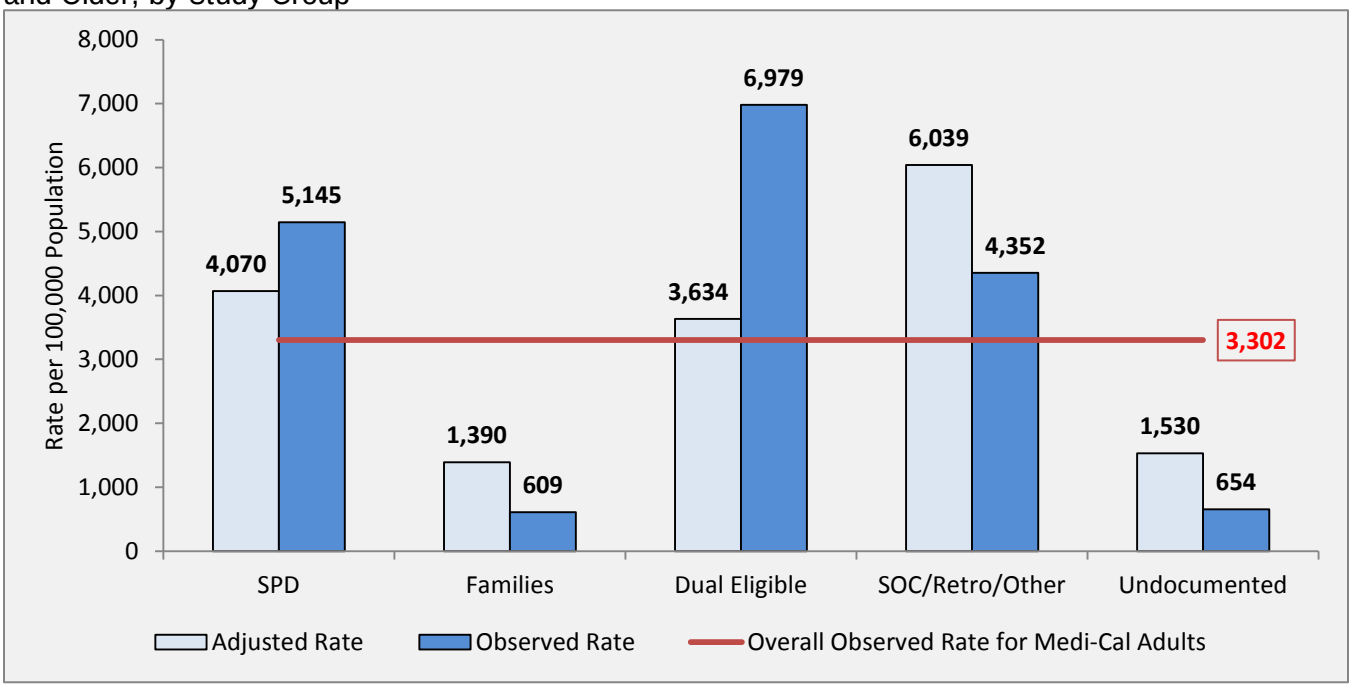
PQI-90 (Overall Composite)

Compared to the observed rate for the total Medi-Cal adult population (3,302 discharges per 100,000 population), adults in the SOC/Retro/Other study group generated a higher age-sex adjusted rate for PQI-90 (Overall Composite) at 6,039 (Figure PH-20).

The SPD and Dual Eligible study groups also generated age-sex adjusted PQI-90 rates that were higher than the observed PQI-90 rate for the overall Medi-Cal adult population.

The Families and Undocumented study groups generated age-sex adjusted PQI-90 rates that were lower than Medi-Cal's overall observed PQI-90. These findings reflect the preponderance of a relatively younger and healthier adult population in both study groups.

Figure PH-20: PQI-90 (Overall Composite) Rates among Medi-Cal Adult Certified Eligibles Ages 18 and Older, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

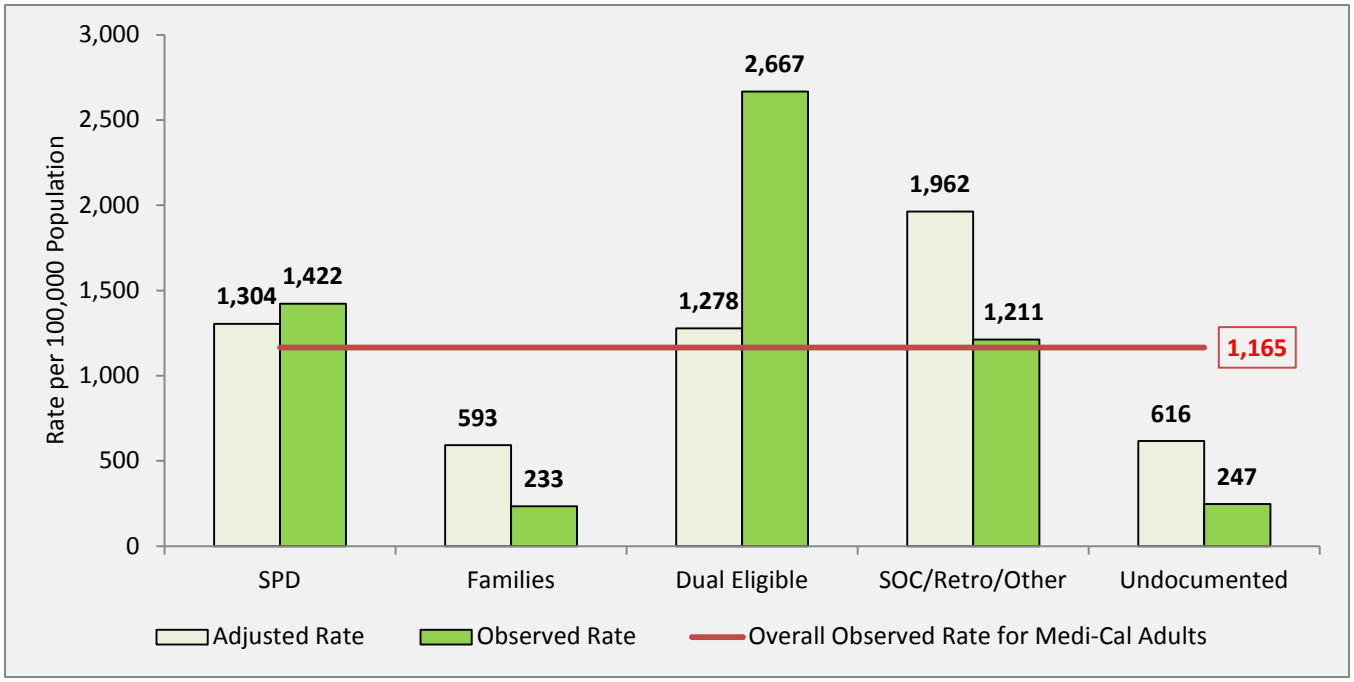
PQI-91 (Acute Composite)

Compared to the observed rate for the total Medi-Cal adult population (1,165 discharges per 100,000 population), adults in the SOC/Retro/Other study group generated a higher age-sex adjusted rate for PQI-91 (Acute Composite) at 1,962 (Figure PH-21).

The SPD and Dual Eligible study groups also generated age-sex adjusted PQI-91 rates that were higher than the observed PQI-91 rate for the overall Medi-Cal adult population. The Families and Undocumented study groups both produced age-sex adjusted PQI-91 rates that were lower than the observed PQI-91 rate for all Medi-Cal adults.

These findings are consistent with the demographic profile of each study group. Both the SPD and Dual Eligible study groups include individuals with multiple complex chronic conditions. Members of these study groups are disabled or aged, and in many cases were determined eligible for Medi-Cal based on a disabling or complex health condition.

Figure PH-21: PQI-91 (Acute Composite) Rates among Medi-Cal Adult Certified Eligibles Ages 18 and Older, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

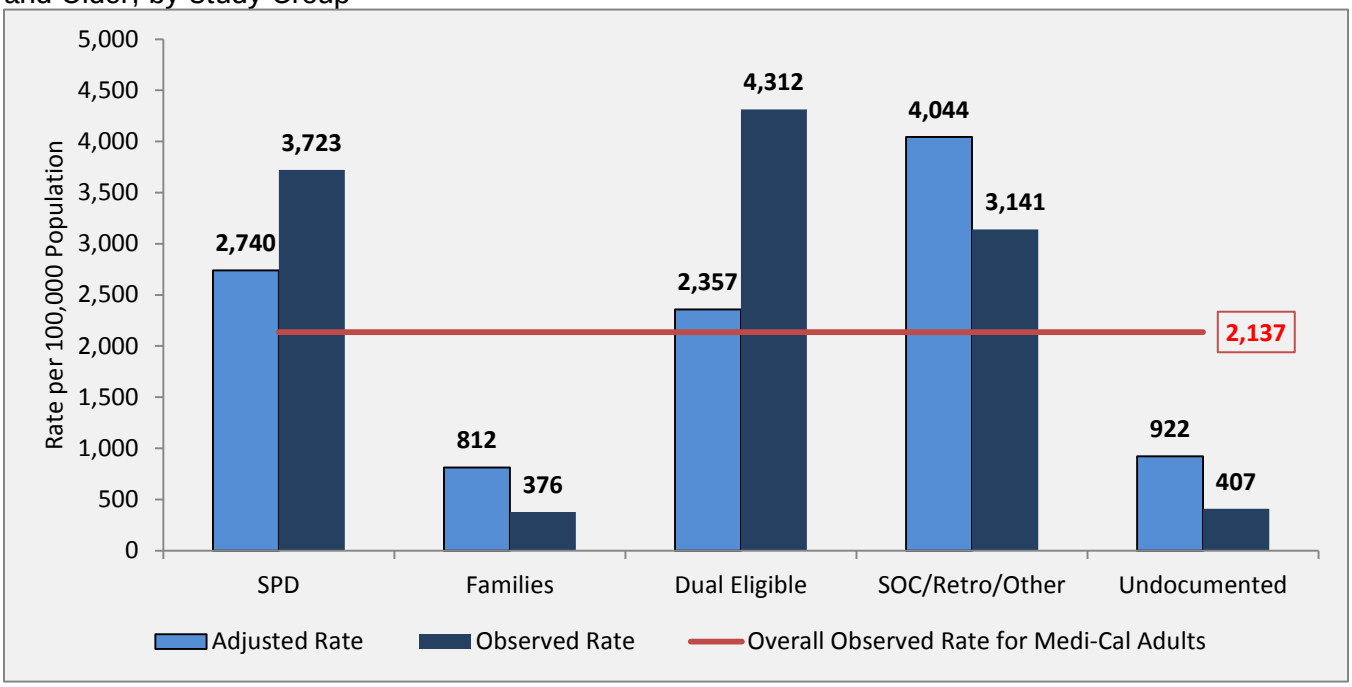
PQI-92 (Chronic Composite)

Compared to the observed rate for the overall Medi-Cal adult population (2,137 discharges per 100,000 population), adults in the SOC/Retro/Other study group generated a higher age-sex adjusted rate for PQI-92 (Chronic Composite) at 4,044 (Figure PH-22).

The SPD and Dual Eligible study groups also generated age-sex adjusted PQI-92 rates that were higher than the observed PQI-92 rate for the total Medi-Cal adult population. It was expected that both of these study groups would generate high age-sex adjusted PQI-92 rates because they include individuals with multiple chronic conditions, and may include individuals who are homeless, suffering from co-occurring complex mental health conditions, and whose low income and SES contribute to the high rates reflected here.

The Families and Undocumented study groups both generated age-sex adjusted PQI-92 rates that were lower than Medi-Cal's overall observed PQI-92 rate. These study groups consisted of individuals with a fairly low prevalence of chronic health conditions when compared to the SPD and Dual Eligible study groups. The Families and Undocumented study groups primarily consisted of parents/caretakers and working-age adults.

Figure PH-22: PQI-92 (Chronic Composite) Rates among Medi-Cal Adult Certified Eligibles Ages 18 and Older, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

Children

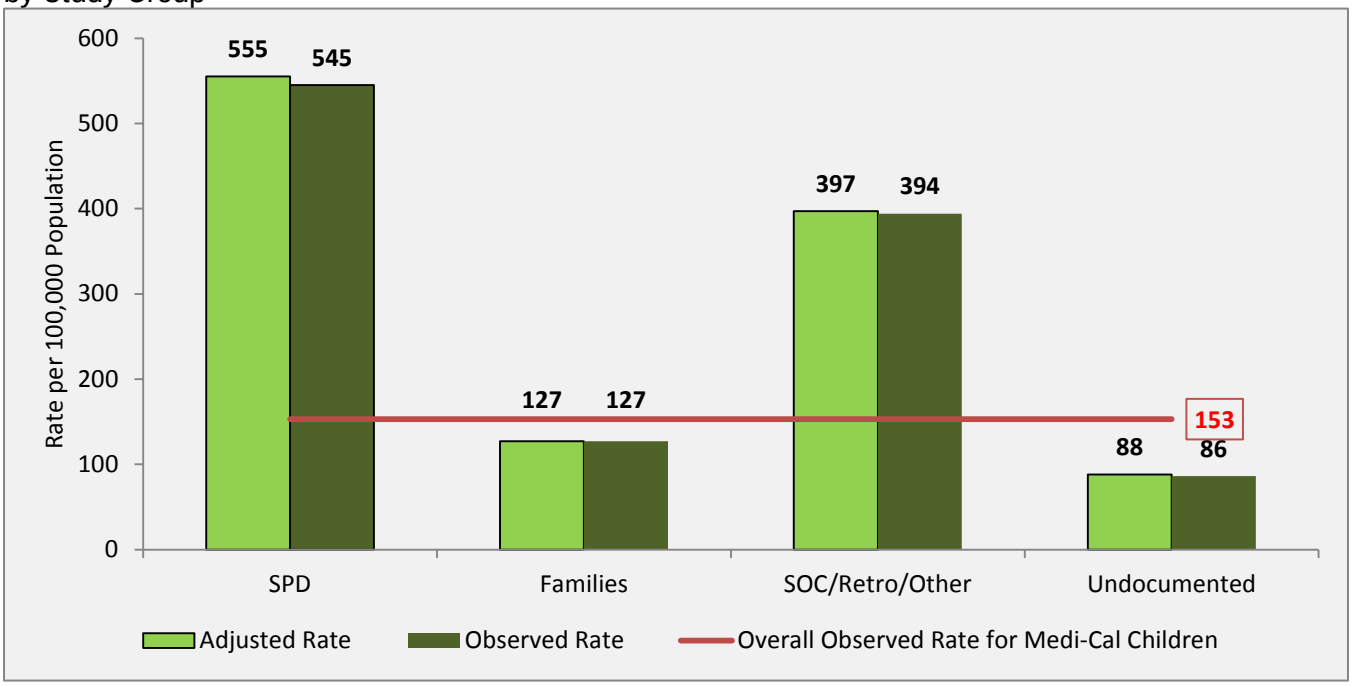
Compared to Medi-Cal's overall observed rates, the highest age-sex adjusted composite rates were generated by children in the SPD study group. Similarly, the SOC/Retro/Other study group also produced age-sex adjusted rates that were higher than Medi-Cal's overall observed rates for children.

PDI-90 (Overall Composite)

Compared to the observed rate for the overall Medi-Cal child population ages 6–17 (153 discharges per 100,000 population), children in the SPD study group generated a higher age-sex adjusted rate for PDI-90 (Overall Composite) at 555 (Figure PH-23). As discussed previously, enrollment in Medi-Cal through SPD eligibility criteria generally includes individuals who are economically disadvantaged and have a disabling condition. Such conditions predispose SPD children to a much higher incidence of hospital inpatient admissions compared to their peers.

The SOC/Retro/Other study group also produced an age-sex adjusted PDI-90 rate that was higher than Medi-Cal's overall observed PDI-90 rate. The Families and Undocumented study groups both generated age-sex adjusted PDI-90 rates that were lower than Medi-Cal's overall observed PDI-90 rate for children.

Figure PH-23: PDI-90 (Overall Composite) Rates among Medi-Cal Child Certified Eligibles Ages 6–17, by Study Group



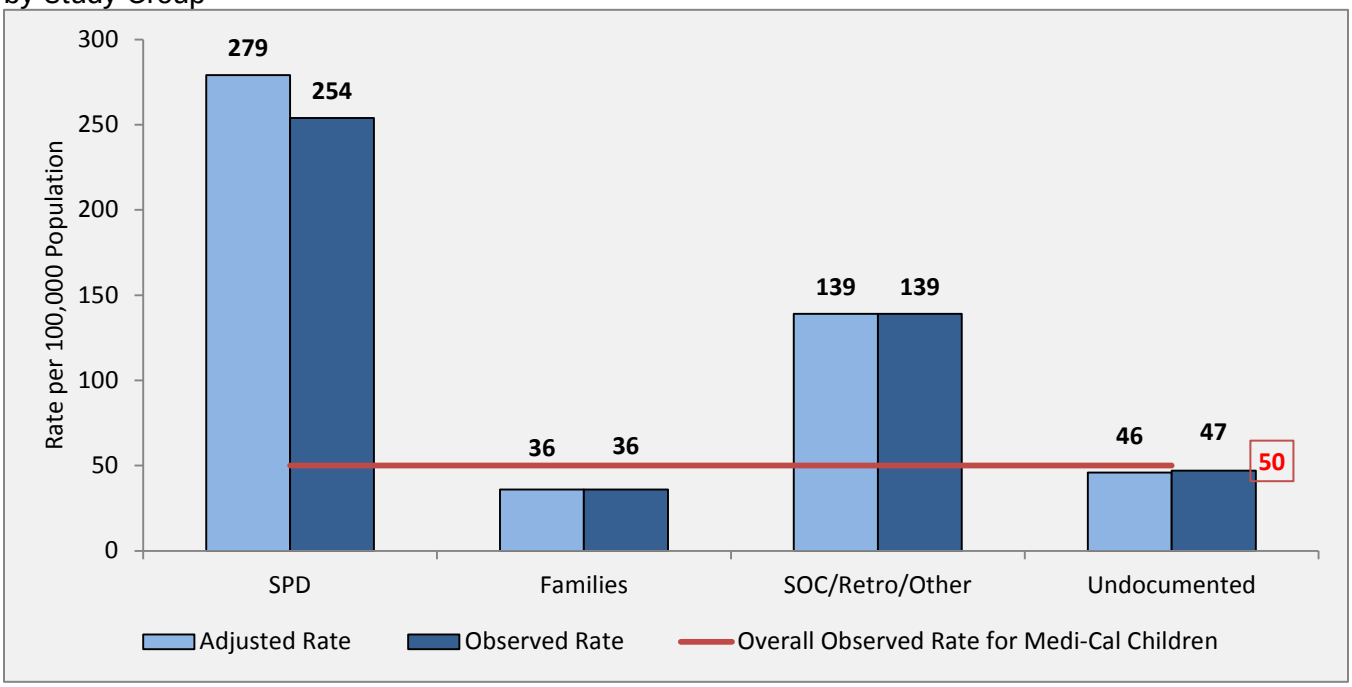
Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6-17.

PDI-91 (Acute Composite)

Compared to the observed rate for the overall Medi-Cal child population ages 6–17 (50 discharges per 100,000 population), the SPD study group generated a higher age-sex adjusted rate for PDI-91 (Acute Composite) at 279 (Figure PH-24).

The SOC/Retro/Other study group also produced an age-sex adjusted PDI-91 rate that was higher than Medi-Cal's overall observed PDI-91 rate. The Families and Undocumented study groups generated age-sex adjusted PDI-91 rates that were lower than Medi-Cal's overall observed PDI-91 rate.

Figure PH-24: PDI-91 (Acute Composite) Rates among Medi-Cal Child Certified Eligibles Ages 6–17, by Study Group



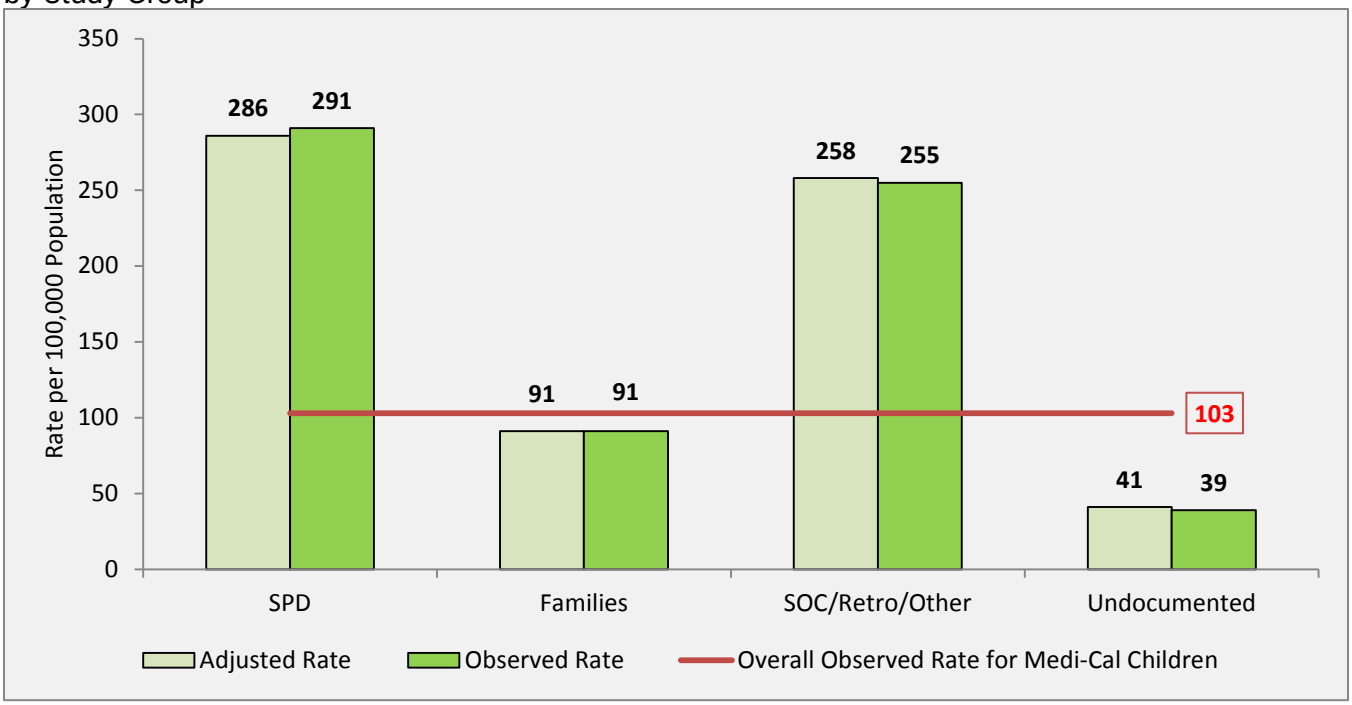
Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6-17.

PDI-92 (Chronic Composite)

Compared to the observed rate for the overall Medi-Cal child population ages 6–17 (103 discharges per 100,000 population), the SPD study group generated an age-sex adjusted rate for PDI-92 (Chronic Composite) that was much higher at 286 (Figure PH-25). As noted previously, this outcome was expected. Children's enrollment in Medi-Cal through SPD eligibility criteria requires the presence of a disabling medical condition. Such conditions predispose SPD children to a much higher incidence of hospital inpatient admission compared to their peers.

The SOC/Retro/Other study group also produced an age-sex adjusted PDI-92 rate that was higher than Medi-Cal's overall observed PDI-92 rate. The Families and Undocumented study groups generated age-sex adjusted PDI-92 rates that were lower than Medi-Cal's overall observed PDI-92 rate.

Figure PH-25: PDI-92 (Chronic Composite) Rates among Medi-Cal Child Certified Eligibles Ages 6–17, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6-17.

Differences among Adult Study Groups, by Race/Ethnicity

DHCS-RASD evaluated disparities in PQI rates among adults in four broad racial/ethnic groups. The differences in rates were compared within three of the five study groups: the SPD study group, the Families study group, and the Dual Eligible study group. DHCS-RASD evaluated racial/ethnic differences for only three of the five study groups in order to limit comparisons to those groups where the results were not obscured by either the excluded groups' lack of meaningful exposure to Medi-Cal-covered ambulatory care, or by inherent difficulties in identifying a denominator that could be used to calculate meaningful rates.

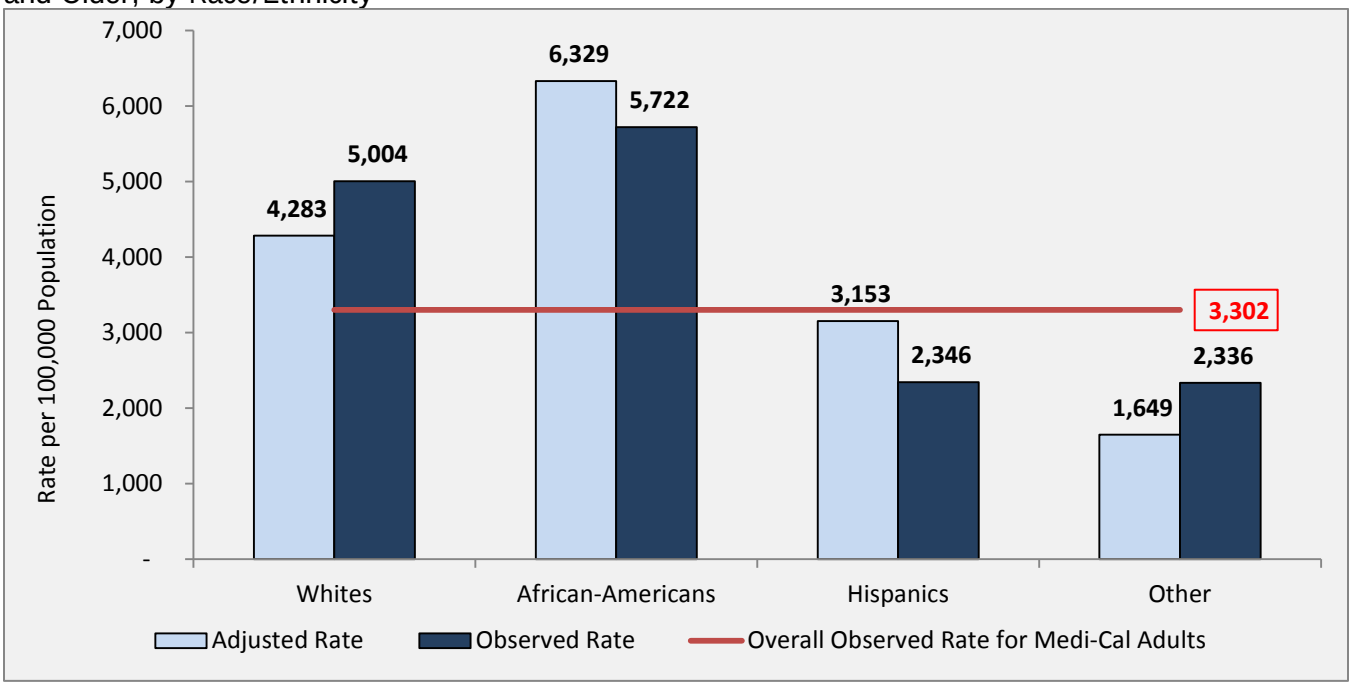
As noted previously, because the indirect standardization method was utilized to construct age-sex adjusted rates, readers should note that age-sex adjusted rates by race/ethnicity should be interpreted relative to the observed rate for the standard population. When evaluating differences in PQI rates among Medi-Cal's racial/ethnic groups, the standard population represents Medi-Cal's overall adult population.

PQI-90 (Overall Composite)

Figure PH-26 displays differences in adults' age-sex adjusted rates, by race/ethnicity, for PQI-90 (Overall Composite) relative to Medi-Cal's overall observed rate among adults.

This comparison reveals that, relative to Medi-Cal's overall observed PQI-90 rate, African-Americans (6,329) generated the highest age-sex adjusted PQI-90 rate among adults. Relative to Medi-Cal's overall observed PQI-90 rate, the Other racial/ethnic cohort generated the lowest age-sex adjusted PQI-90 rate. Hispanics produced an age-sex adjusted PQI-90 rate that was comparable to Medi-Cal's overall observed PQI-90 rate.

Figure PH-26: PQI #90 (Overall Composite) Rates among Medi-Cal Adult Certified Eligibles Ages 18 and Older, by Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

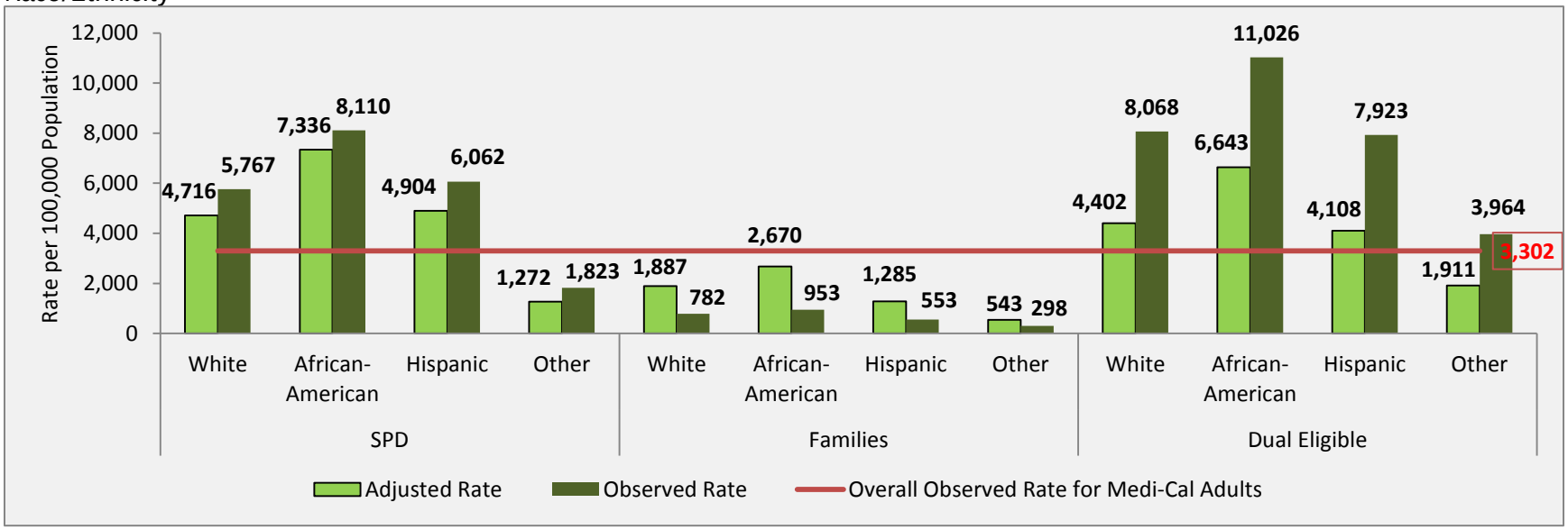
Figure PH-27 presents Medi-Cal adults' age-sex adjusted PQI-90 rates, by race/ethnicity, among three study groups. The age-sex adjusted PQI-90 rates for each racial/ethnic cohort within each study group are compared to Medi-Cal's overall observed PQI-90 rate of 3,302.

Among the SPD study group, African-Americans (7,336) produced an age-sex adjusted PQI-90 rate that was significantly higher than Medi-Cal's overall observed PQI-90 rate. Both Whites and Hispanics also produced age-sex adjusted PQI-90 rates that were higher than Medi-Cal's overall observed PQI-90 rate. The Other racial/ethnic cohort produced an age-sex adjusted PQI-90 rate that was lower than Medi-Cal's overall observed PQI-90 rate.

None of the racial/ethnic cohorts within the Families study group produced an age-sex adjusted PQI-90 rate that was higher than Medi-Cal's overall observed PQI-90 rate. African-Americans (2,670) in the Families study group produced the highest age-sex adjusted PQI-90 rate relative to Medi-Cal's overall observed PQI-90 rate.

Among the Dual Eligible study group, African-Americans (6,643) produced an age-sex adjusted PQI-90 rate that was significantly higher than Medi-Cal's overall observed PQI-90 rate. Both Whites and Hispanics also produced age-sex adjusted PQI-90 rates that were higher than Medi-Cal's overall observed PQI-90 rate. The Other racial/ethnic cohort produced an age-sex adjusted PQI-90 rate that was lower than Medi-Cal's overall observed PQI-90 rate.

Figure PH-27: PQI-90 (Overall Composite) Rates among Medi-Cal Adult Certified Eligibles Ages 18 and Older, by Study Group and Race/Ethnicity



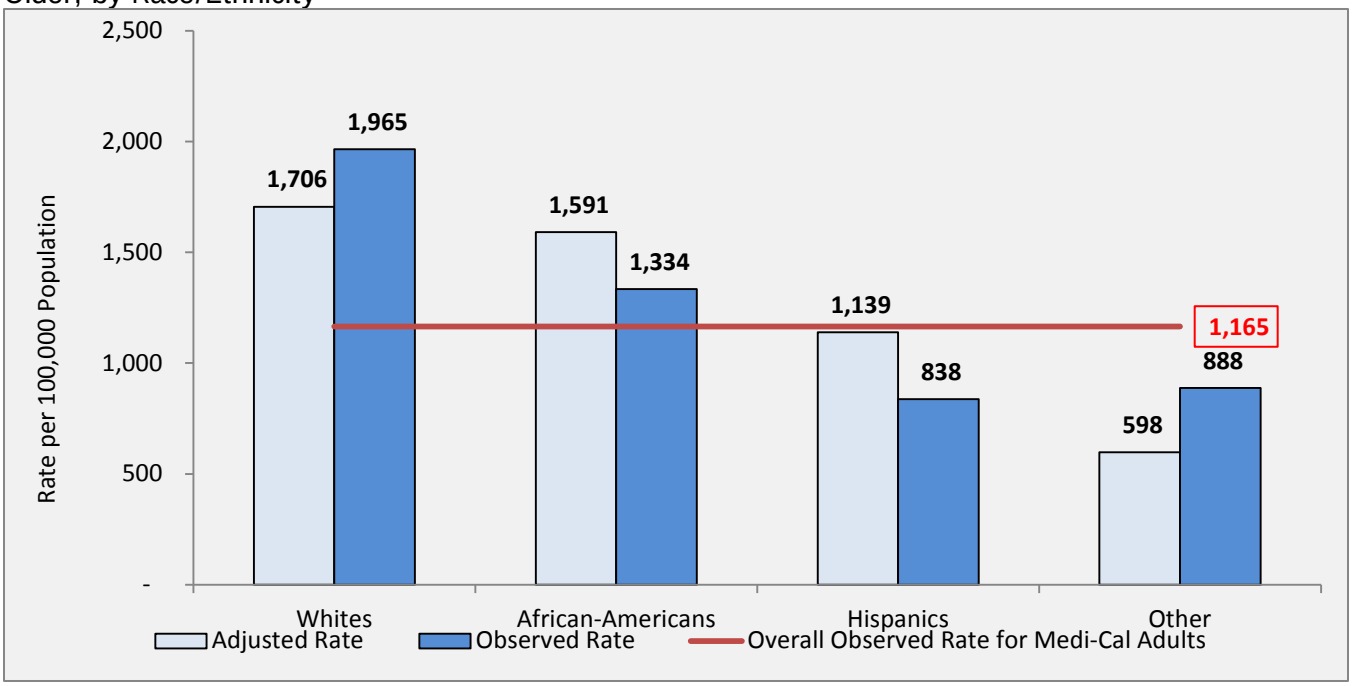
Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

PQI-91 (Acute Composite)

Acute conditions include dehydration, bacterial pneumonia, and urinary tract infections. Among Medi-Cal adults, the observed rate for PQI-91 (Acute Composite) was 1,165 discharges per 100,000 population.

As displayed in Figure PH-28, Whites (1,706) generated an age-sex adjusted PQI-91 rate that was 1.5 times higher than Medi-Cal's overall observed PQI-91 rate. African-Americans also generated an age-sex adjusted PQI-91 rate that was higher than Medi-Cal's overall observed PQI-91 rate. Hispanics generated an age-sex adjusted PQI-91 rate that was slightly lower than Medi-Cal's overall observed PQI-91 rate, and the Other racial/ethnic cohort generated an age-sex adjusted PQI-91 rate that was approximately half of Medi-Cal's overall observed PQI-91 rate.

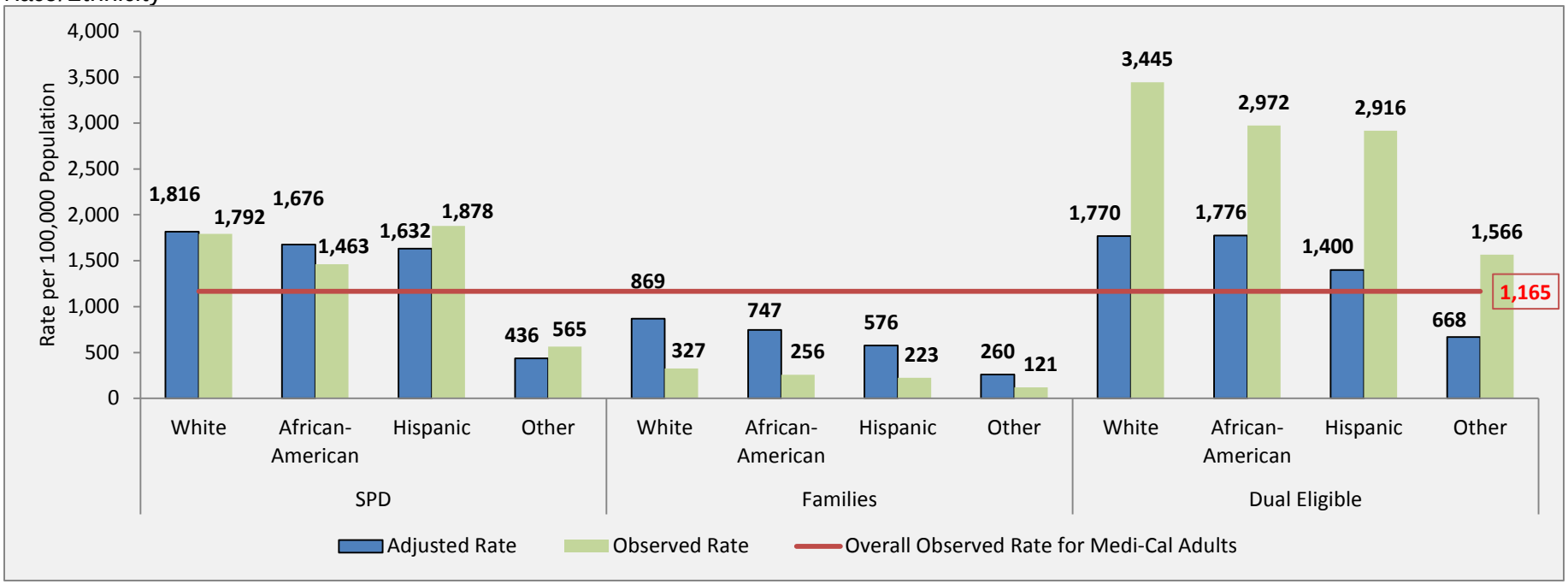
Figure PH-28: PQI-91 (Acute Composite) Rates among Medi-Cal Adult Certified Eligibles Ages 18 and Older, by Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

As displayed in Figure PH-29, within the SPD and Families study groups, Whites generated the highest age-sex adjusted PQI-91 rates relative to Medi-Cal's overall observed PQI-91 rate. Within the Dual Eligible study group, African-Americans generated the highest age-sex adjusted PQI-91 rate relative to Medi-Cal's overall observed PQI-91 rate.

Figure PH-29: PQI-91 (Acute Composite) Rates among Medi-Cal Adult Certified Eligibles Ages 18 and Older, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

Table PH-19: Summary of Disease-Specific Comparisons for Acute Conditions among Medi-Cal Adult Certified Eligibles Ages 18 and Older

Measure	Results (from Table 21)
PQI-10 (Dehydration)	Among Medi-Cal adults, age-sex adjusted rates for African-Americans and Whites were higher than the observed rate for the Medi-Cal adult population as a whole.
PQI-11 (Bacterial Pneumonia)	Among Medi-Cal adults, Whites experienced preventable hospitalizations for bacterial pneumonia at an age-sex adjusted rate nearly 1.5 times the observed rate for the Medi-Cal adult population as a whole.
PQI-12 (Urinary Tract Infection)	White and African-American Medi-Cal adults experienced urinary tract infections at age-sex adjusted rates nearly 1.5 times that of the observed rate for the Medi-Cal adult population as a whole.

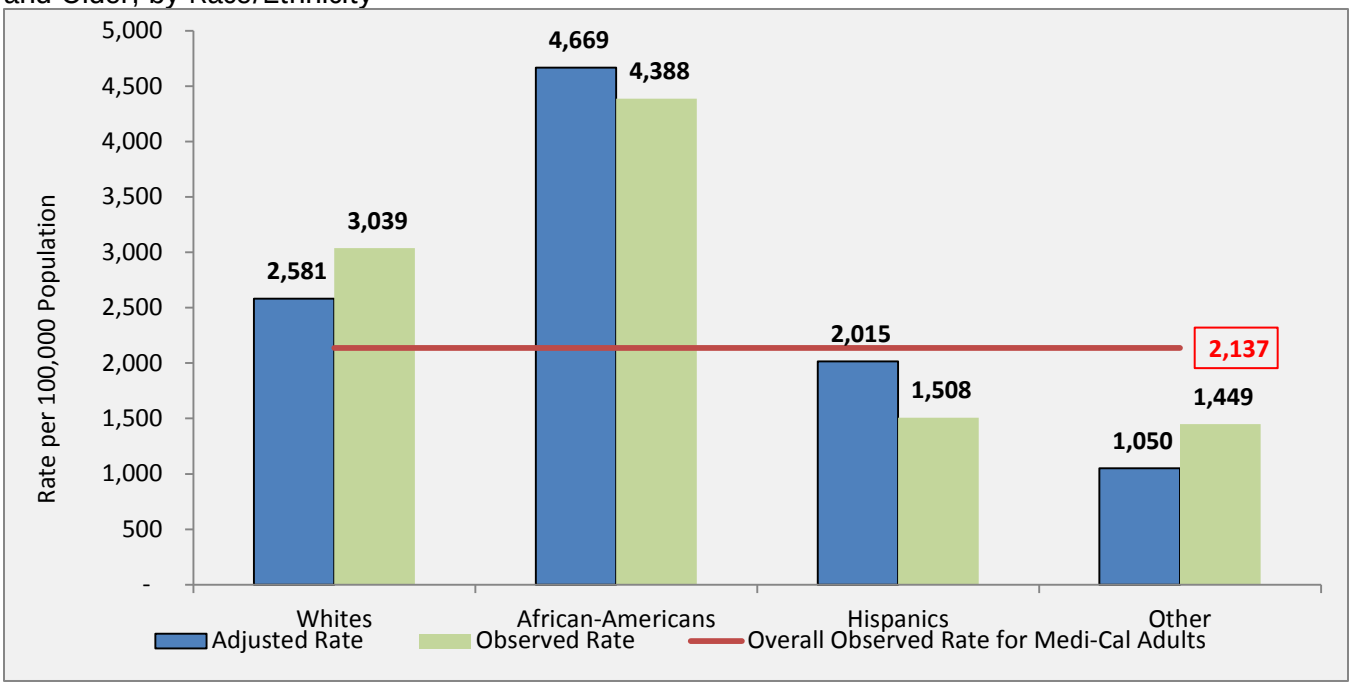
Source: Created by DHCS Research and Analytic Studies Division.

PQI-92 (Chronic Composite)

Chronic conditions include diabetes with short-term complications, diabetes with long-term complications, COPD/ asthma, hypertension, heart failure, angina without procedure, uncontrolled diabetes, and lower-extremity amputation among patients with diabetes. Among Medi-Cal adults, the observed rate for PQI-92 (Chronic Composite) was 2,137 discharges per 100,000 population.

As displayed in Figure PH-30, African-Americans (4,669) generated an age-sex adjusted PQI-92 rate that was more than twice Medi-Cal's overall observed PQI-92 rate. Whites also generated an age-sex adjusted PQI-92 rate that was higher than Medi-Cal's overall observed PQI-92 rate. Hispanics and the Other racial/ethnic cohort generated age-sex adjusted PQI-92 rates that were lower than Medi-Cal's overall observed PQI-92 rate.

Figure PH-30: PQI-92 (Chronic Composite) Rates among Medi-Cal Adult Certified Eligibles Ages 18 and Older, by Race/Ethnicity

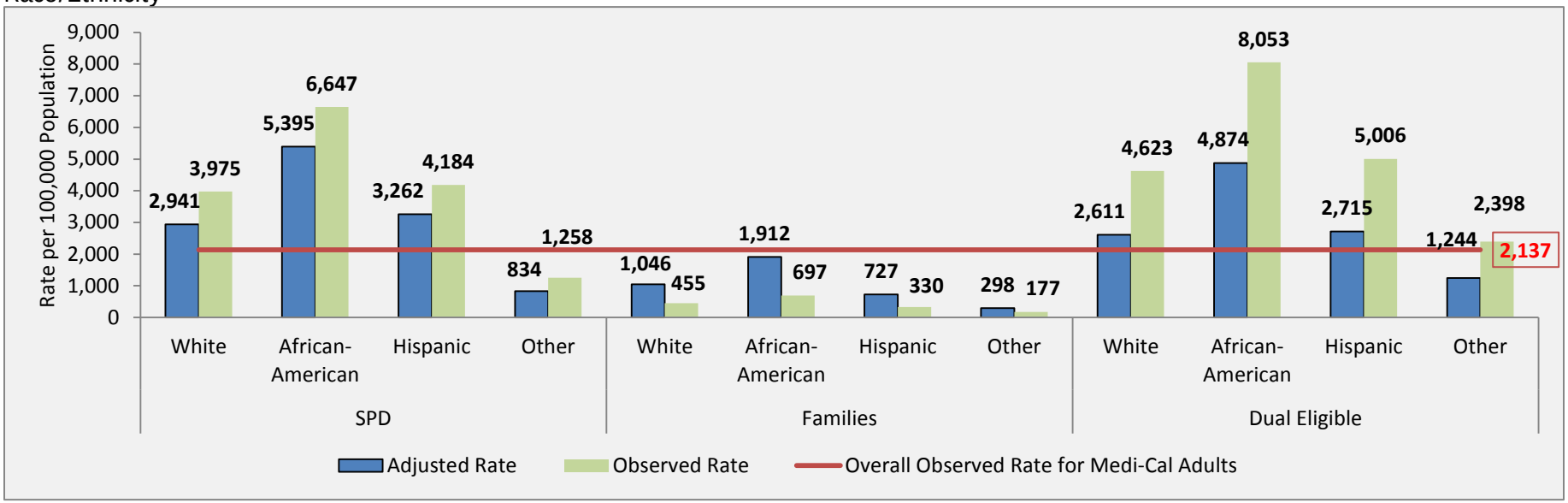


Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

As displayed in Figure PH-31, African-Americans generated the highest age-sex adjusted PQI-92 rates relative to Medi-Cal's overall observed PQI-92 rate in all three study groups evaluated. The Other racial/ethnic cohort generated age-sex adjusted PQI-92 rates that were lower than Medi-Cal's overall observed PQI-92 rate in all three study groups evaluated.

Relative to Medi-Cal's overall observed PQI-92 rate, Hispanics and Whites in the SPD and Dual Eligible study groups generated slightly higher age-sex adjusted PQI-92 rates. Whites and Hispanics in the Families study group generated lower age-sex adjusted PQI-92 rates relative to Medi-Cal's overall observed PQI-92 rate.

Figure PH-31: PQI-92 (Chronic Composite) Rates among Medi-Cal Adult Certified Eligibles Ages 18 and Older, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

Table PH-20: Summary of Disease-Specific Comparisons for Chronic Conditions among Medi-Cal Adult Certified Eligibles Ages 18 and Older

Measure	Results (from Table 21)
PQI-1 (Diabetes with Short-Term Complications)	African-American Medi-Cal adults experienced diabetes with short-term complications at an age-sex adjusted rate that was more than twice that of the observed rate for the Medi-Cal adult population as a whole. White Medi-Cal adults experienced an age-sex adjusted rate that was more than 1.5 times that of the observed rate for the total Medi-Cal adult population.
PQI-3 (Diabetes with Long-Term Complications)	African-American Medi-Cal adults experienced diabetes with long-term complications at an age-sex adjusted rate more than 1.5 times that of the observed rate for the Medi-Cal adult population as a whole. Hispanic Medi-Cal adults also saw an age-sex adjusted rate above that of the observed rate for the total Medi-Cal adult population.
PQI-5 (COPD/Asthma among Older Adults)	African-American Medi-Cal adults experienced COPD/asthma among older adults at an age-sex adjusted rate more than twice that of the observed rate for the Medi-Cal adult population as a whole. White Medi-Cal adults experienced an age-sex adjusted rate more than 1.5 times that of the observed rate for the total Medi-Cal adult population.
PQI-7 (Hypertension)	African-American Medi-Cal adults experienced an age-sex adjusted rate for hypertension that was more than three times that of the observed rate for the Medi-Cal adult population as a whole.
PQI-8 (Heart Failure)	African-American Medi-Cal adults experienced heart failure at an age-sex adjusted rate that was nearly 2.5 times that of the observed rate for the Medi-Cal adult population as a whole.
PQI-13 (Angina without Procedure)	African-American Medi-Cal adults experienced angina without procedure at an age-sex adjusted rate that was more than twice that of the observed rate for the Medi-Cal adult population as a whole.
PQI-14 (Uncontrolled Diabetes)	African-American Medi-Cal adults experienced uncontrolled diabetes at an age-sex adjusted rate that was nearly twice that of the observed rate for the Medi-Cal adult population as a whole.
PQI-15 (Asthma among Younger Adults)	African-American Medi-Cal adults experienced asthma at an age-sex adjusted rate that was nearly three times that of the observed rate for the Medi-Cal population as a whole. White Medi-Cal adults generated an age-sex adjusted rate that was more than 1.5 times that of the observed rate for the total Medi-Cal adult population.
PQI-16 (Low-Extremity Amputation among Patients with Diabetes)	African-American Medi-Cal adults saw an age-sex adjusted rate that was nearly twice that of the observed rate for the Medi-Cal adult population as a whole. Hispanic Medi-Cal adults saw an age-sex adjusted rate that was nearly 1.5 times that of the observed rate for the total Medi-Cal adult population.

Table PH-21: Age-Sex Adjusted PQI Rates* among Medi-Cal Adult Certified Eligibles Ages 18 and Older** per 100,000 Population*** in 2011, by Race/Ethnicity

PQI #	Condition	Rate for Whites	95% C.I. Lower Limit	95% C.I. Upper Limit	Rate for African-Americans	95% C.I. Lower Limit	95% C.I. Upper Limit	Rate for Hispanics	95% C.I. Lower Limit	95% C.I. Upper Limit	Rate for Other	95% C.I. Lower Limit	95% C.I. Upper Limit	Observed Rate for All Medi-Cal Adults
1	Diabetes with Short-Term Complications	244	236	251	316	304	328	110	104	116	54	45	63	154
2	Perforated Appendix	24	22	27	25	20	29	26	25	27	24	22	27	25
3	Diabetes with Long-Term Complications	345	333	356	609	590	628	463	453	473	165	154	177	365
5	COPD/Asthma	1,799	1,772	1,826	2,602	2,554	2,650	768	742	793	557	531	584	1,171
7	Hypertension	79	74	85	303	293	313	98	93	104	55	50	61	99
8	Heart Failure	774	759	790	1,712	1,683	1,741	761	746	776	394	379	408	727
10	Dehydration	281	273	289	294	280	309	163	156	170	89	82	97	184
11	Bacterial Pneumonia	829	815	843	689	664	715	524	511	536	310	297	323	554
12	Urinary Tract Infection	596	584	608	605	582	628	451	440	461	198	187	210	426
13	Angina without Procedure	57	52	61	117	109	124	64	60	68	24	20	28	56
14	Uncontrolled Diabetes	36	32	40	86	80	93	56	53	59	17	13	21	44
15	Asthma	142	132	152	243	230	257	56	50	61	45	33	57	89
16	Lower-Extremity Amputation Among Patients with Diabetes	52	48	56	90	83	97	68	65	72	17	13	21	51
90	Overall Composite	4,283	4,250	4,316	6,329	6,270	6,388	3,153	3,123	3,183	1,649	1,618	1,681	3,302
91	Acute Composite	1,706	1,686	1,726	1,591	1,554	1,628	1,139	1,121	1,157	598	580	617	1,165
92	Chronic Composite	2,581	2,555	2,608	4,669	4,622	4,716	2,015	1,991	2,039	1,050	1,023	1,076	2,137

Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

*Rates have been rounded to the nearest whole number.

**Except PQI -5 for ages 40 and older, and PQI-15 for ages 18–39.

***Except PQI-2, per 100 appendicitis cases.

Note: C.I. = Confidence Interval

Differences among Child Study Groups, by Race/Ethnicity

This section presents age-sex adjusted rates of preventable hospitalization among children in the SPD and Families study groups, relative to observed rates among the overall Medi-Cal child population ages 6–17.

As expected, children in the SPD study group generated age-sex adjusted rates that were higher than Medi-Cal's overall observed rates, while the Families study group generated age-sex adjusted rates that were lower. Children enrolled in SPD aid codes, while representing a small proportion of the Medi-Cal child population, were more likely to incur these types of hospitalization events due to their clinical characteristics. Their eligibility pathway incorporates disability, and consequently these children experience a much higher incidence of chronic illness.

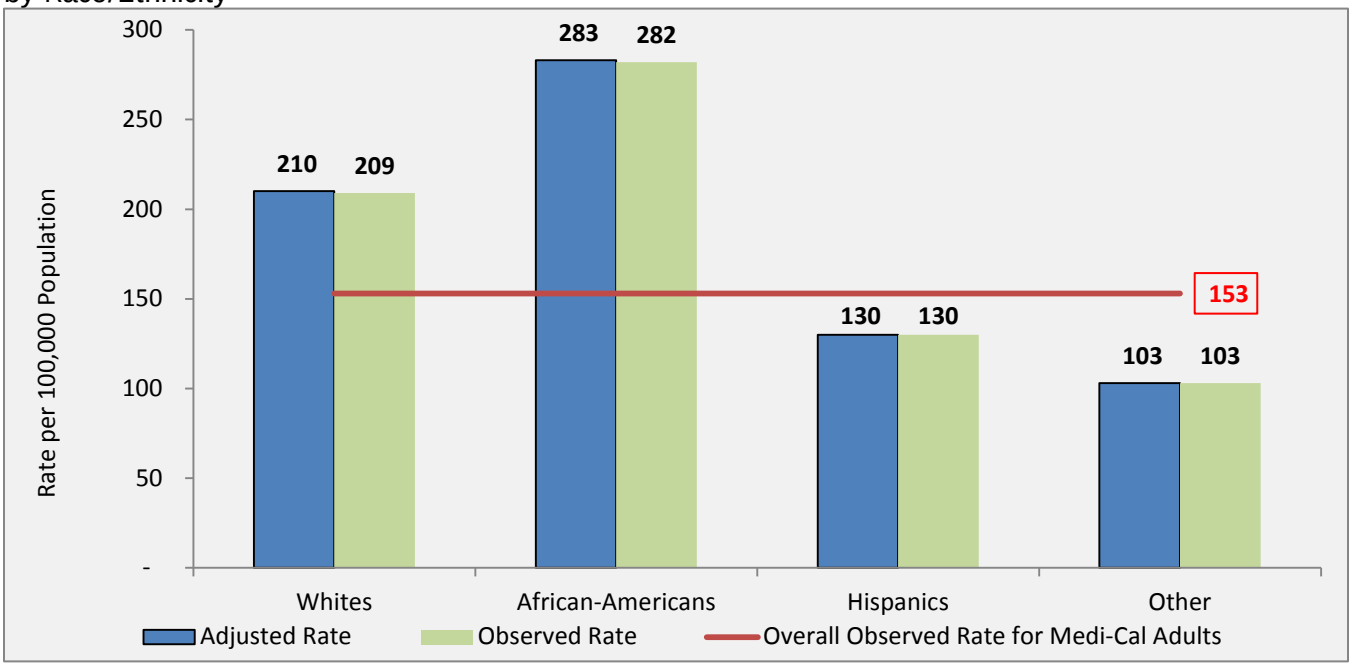
Relative to Medi-Cal's overall observed rate, African-Americans generated significantly higher age-sex adjusted rates for chronic conditions. Relative to Medi-Cal's overall observed rate, Hispanics and Whites generated the highest age-sex adjusted rates for acute conditions. The Other racial/ethnic cohort produced age-sex adjusted rates that were lower than Medi-Cal's overall observed rates.

PDI-90 (Overall Composite)

Among Medi-Cal children, the observed rate for PDI-90 (Overall Composite) was 153 discharges per 100,000 population.

As displayed in Figure PH-32, African-Americans (283) generated an age-sex adjusted rate for PDI-90 that was 1.85 times Medi-Cal's overall observed PDI-90 rate. Whites also generated an age-sex adjusted PDI-90 rate that was higher than Medi-Cal's overall observed PDI-90 rate. Hispanics and the Other racial/ethnic cohort both generated age-sex adjusted PDI-90 rates that were lower than Medi-Cal's overall observed PDI-90 rate.

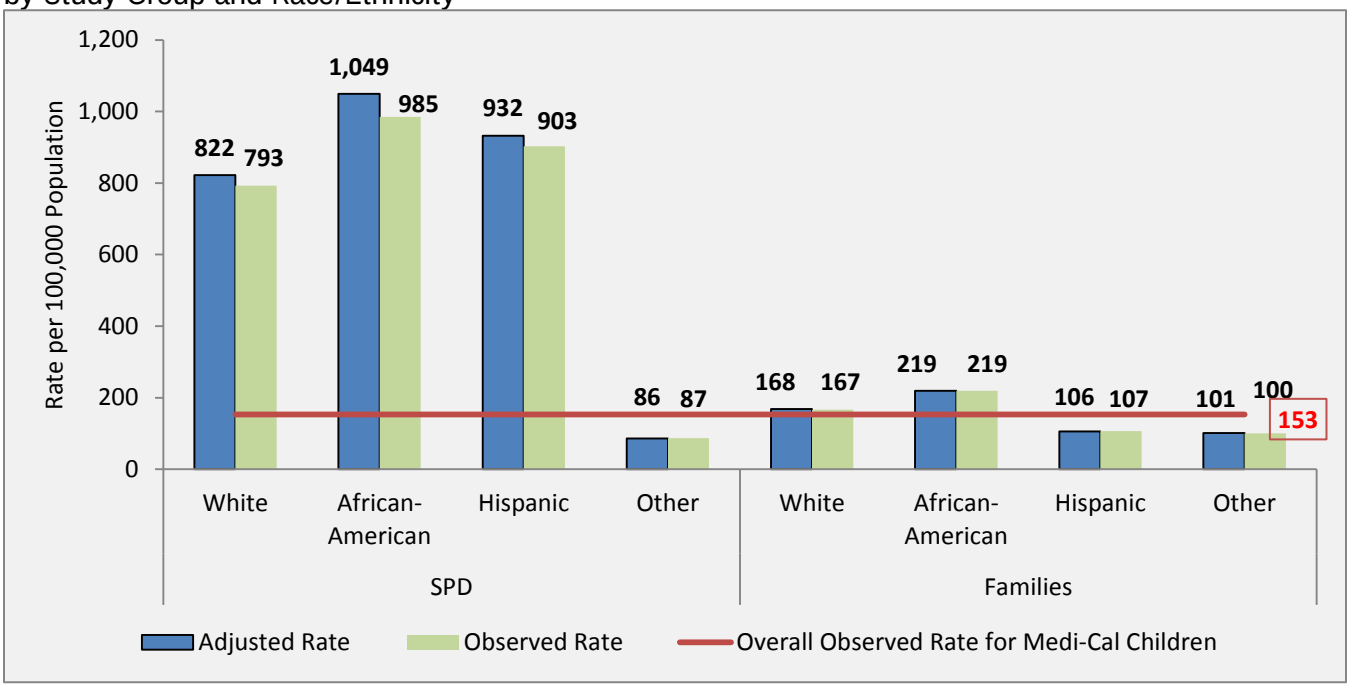
Figure PH-32: PDI-90 (Overall Composite) Rates among Medi-Cal Child Certified Eligibles Ages 6–17, by Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6-17.

Relative to Medi-Cal's overall observed PDI-90 rate, African-Americans generated the highest age-sex adjusted PDI-90 rates in both the SPD and Families study groups (Figure PH-33).

Figure PH-33: PDI-90 (Overall Composite) Rates among Medi-Cal Child Certified Eligibles Ages 6–17, by Study Group and Race/Ethnicity



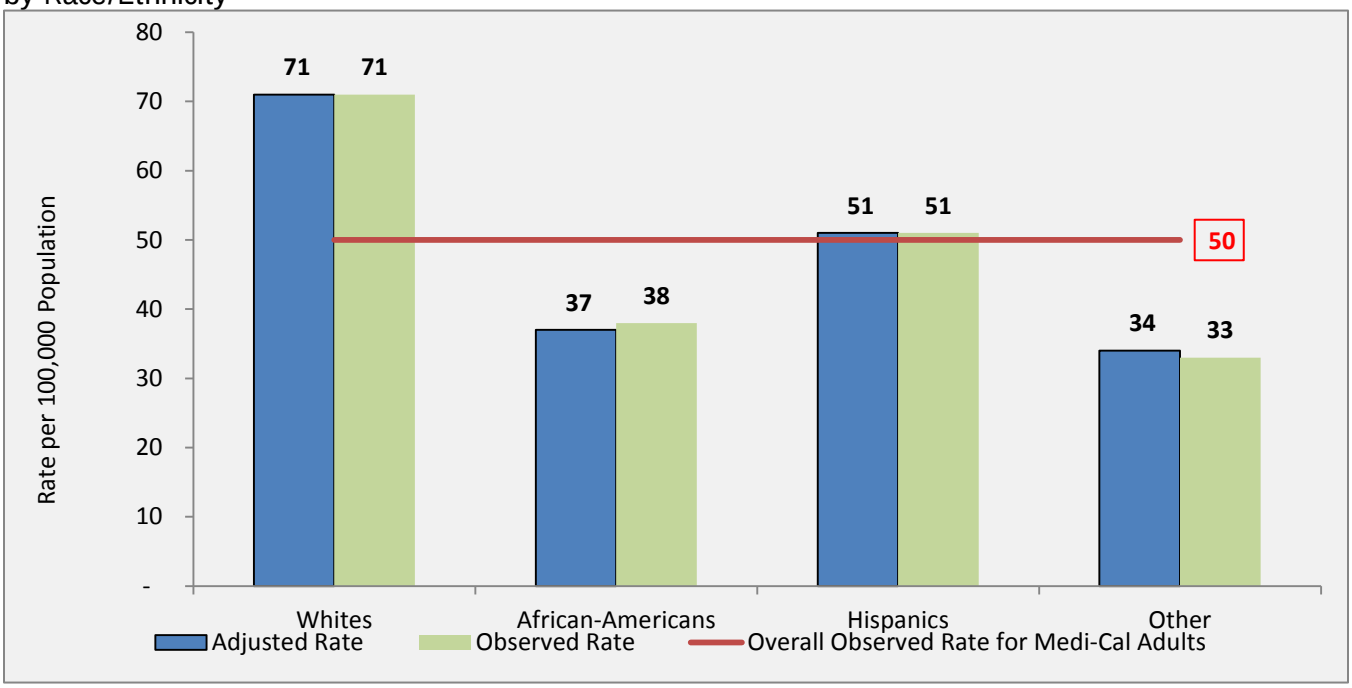
Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6-17.

PDI-91 (Acute Composite)

Acute conditions include gastroenteritis and urinary tract infection. Among Medi-Cal children ages 6–17, the observed rate for PDI-91 (Acute Composite) was 50 discharges per 100,000 population.

As displayed in Figure PH-34, Whites (71) generated an age-sex adjusted PDI-91 rate that was 1.4 times Medi-Cal's overall observed PDI-91 rate. Hispanics generated an age-sex adjusted PDI-91 rate that was slightly higher than Medi-Cal's overall observed PDI-91 rate. African-Americans and the Other racial/ethnic cohort both generated age-sex adjusted PDI-91 rates that were lower than Medi-Cal's overall observed PDI-91 rate.

Figure PH-34: PDI-91 (Acute Composite) Rates among Medi-Cal Child Certified Eligibles Ages 6–17, by Race/Ethnicity

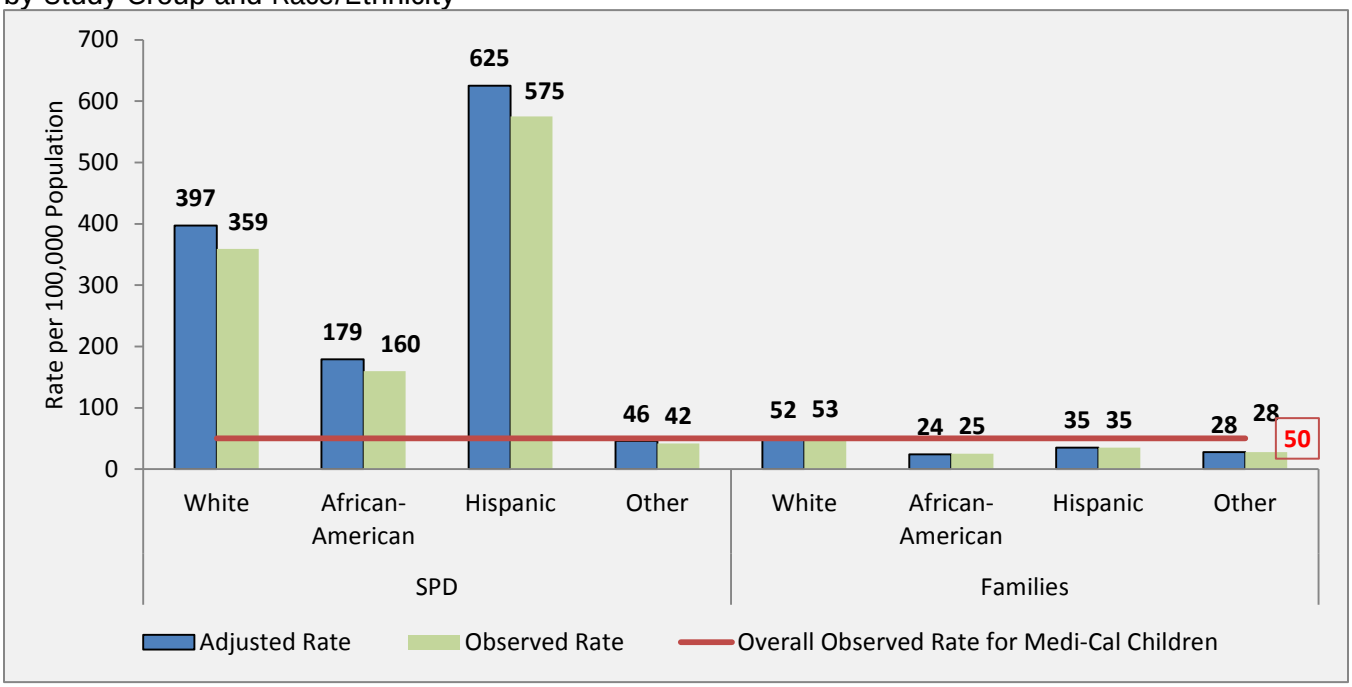


Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6-17.

Medi-Cal's low overall observed rate of 50 for PDI-91 reflects the much greater proportion of relatively healthy members of the Families study group among Medi-Cal children ages 6–17, and the much smaller proportion of less healthy members of the SPD study group.

As displayed in Figure PH-35, within the SPD study group Hispanics (625) generated the highest age-sex adjusted PDI-91 rate relative to Medi-Cal's overall observed PDI-91 rate, while Whites (52) generated the highest age-sex adjusted PDI-91 rate within the Families study group.

Figure PH-35: PDI-91 (Acute Composite) Rates among Medi-Cal Child Certified Eligibles Ages 6–17, by Study Group and Race/Ethnicity



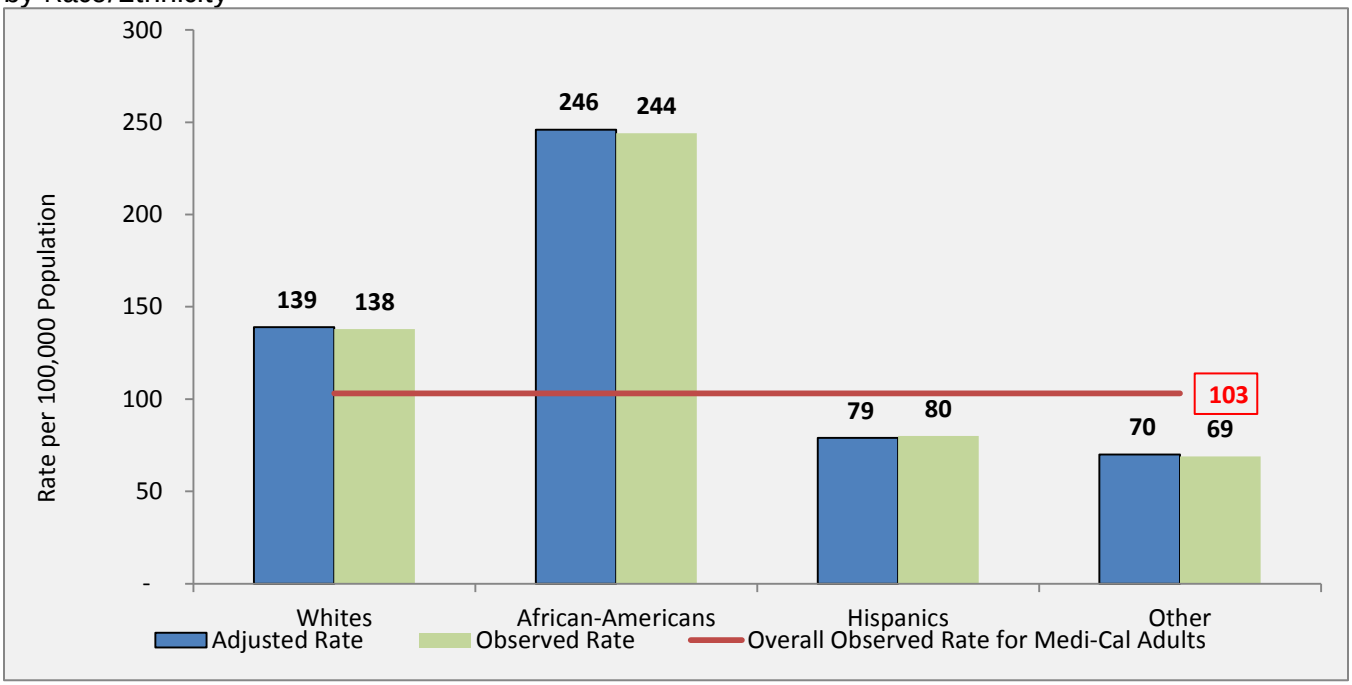
Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6-17.

PDI-92 (Chronic Composite)

Chronic conditions include asthma and diabetes with short-term complications. Among Medi-Cal children ages 6–17, the observed rate for PDI-92 (Chronic Composite) was 103 discharges per 100,000 population.

As displayed in Figure PH-36, African-Americans (246) generated an age-sex adjusted PDI-92 rate that was 2.4 times Medi-Cal's overall observed PDI-92 rate. Whites (139) also generated an age-sex adjusted PDI-92 rate that was higher than Medi-Cal's overall observed PDI-92 rate. Hispanics and the Other racial/ethnic cohort both generated age-sex PDI-92 adjusted rates that were lower than Medi-Cal's overall observed PDI-92 rate.

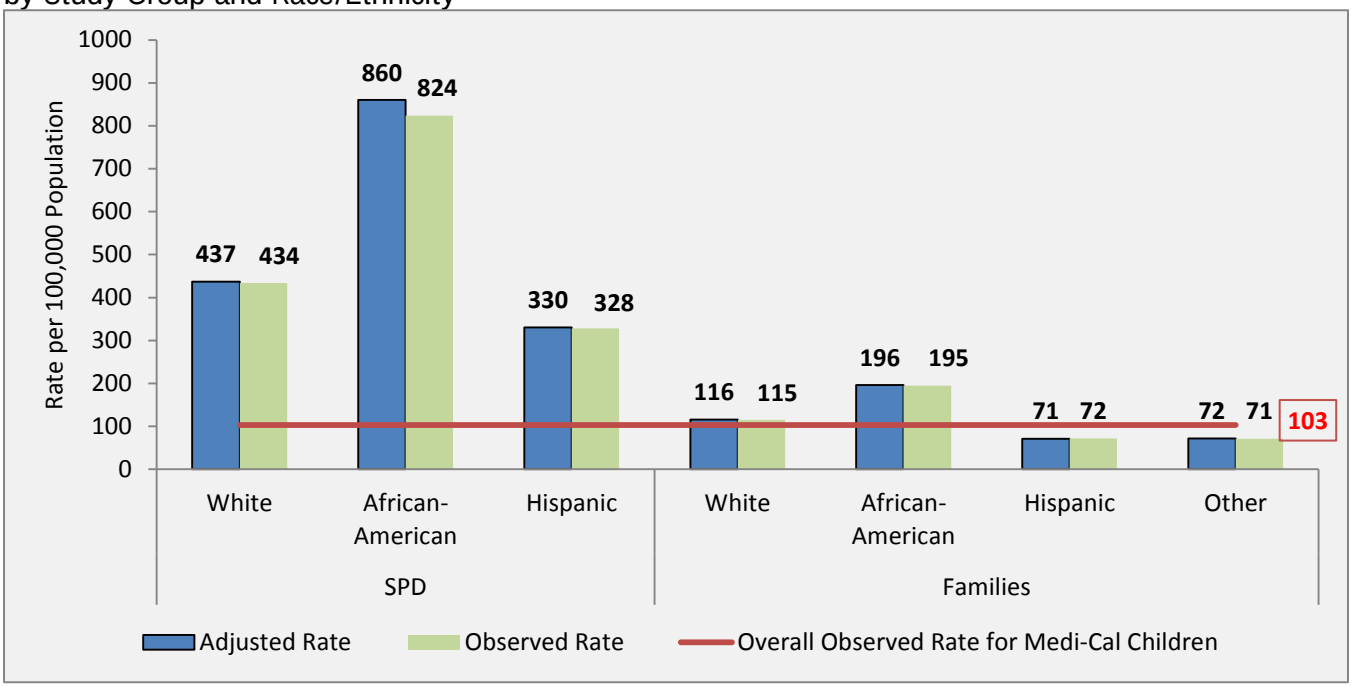
Figure PH-36: PDI-92 (Chronic Composite) Rates among Medi-Cal Child Certified Eligibles Ages 6–17, by Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6-17.

Relative to Medi-Cal's overall observed PDI-92 rate, African-Americans generated the highest age-sex adjusted PDI-92 rates in both the SPD (860) and Families (196) study groups (Figure PH-37).

Figure PH-37: PDI-92 (Chronic Composite) Rates among Medi-Cal Child Certified Eligibles Ages 6–17, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6-17. The rate of the Other racial cohort in the SPD study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

Table PH-22: Age-Sex Adjusted PDI Rates* among Medi-Cal Child Certified Eligibles Ages 6-17** per 100,000 Population*** in 2011, by Race/Ethnicity

PDI #	Condition	Rate for Whites	95 C.I. Lower Limit	95% C.I. Upper Limit	Rate for African-Americans	95% C.I. Lower Limit	95% C.I. Upper Limit	Rate for Hispanics	95% C.I. Lower Limit	95% C.I. Upper Limit	Rate for Other	95% C.I. Lower Limit	95% C.I. Upper Limit	Observed Rate for All Medi-Cal Children
14	Asthma	100	91	110	254	242	265	78	73	82	83	73	93	97
15	Diabetes with Short-Term Complications	64	58	70	55	48	63	23	20	26	16	9	23	32
17	Perforated Appendix	292	259	326	321	237	404	329	314	344	351	299	403	324
90	Overall Composite	210	197	224	283	266	300	130	123	136	103	88	118	153
91	Acute Composite	71	63	79	37	28	47	51	47	54	34	25	42	50
92	Chronic Composite	139	128	150	246	232	261	79	74	85	70	58	82	103

Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6-17.

*Rates have been rounded to the nearest whole number.

**Except PDI-14 for ages 2-17, and PDI-17 for ages 1-17.

***Except PDI-17, per 1,000 population.

Note: C.I. = Confidence Interval

Condition-Specific PQI/PDI Results

PQI-1 (Diabetes with Short-Term Complications among Adults Ages 18 and Older)

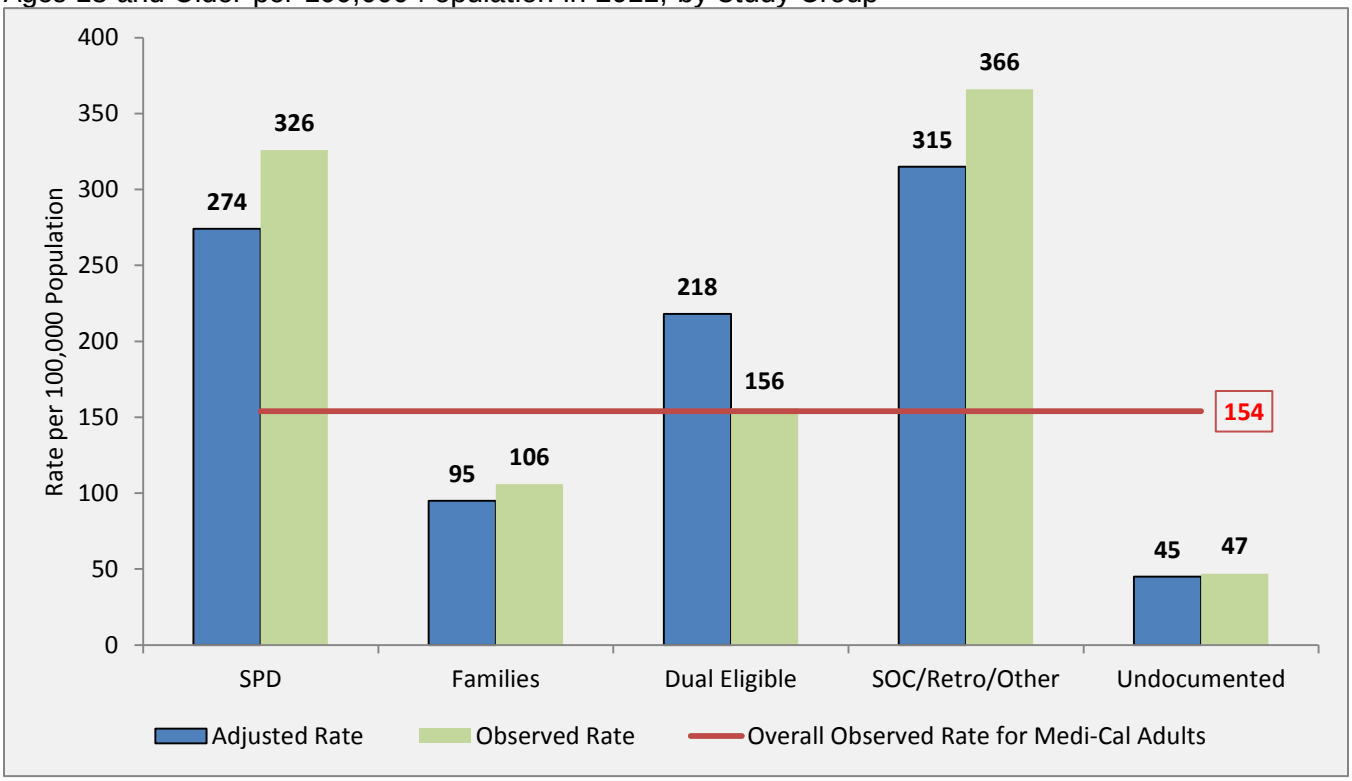
The overall observed rate of diabetes with short-term complications among all individuals ages 18 and older certified eligible for Medi-Cal was 154 discharges per 100,000 population (Figure PH-38).

The SOC/Retro/Other study group (315) generated an age-sex adjusted PQI-1 rate that was more than twice Medi-Cal's overall observed PQI-1 rate. As discussed previously, the evaluation of rates for this group is complicated by interpretive issues related to a lack of prior exposure to ambulatory care, as well as difficulties identifying a denominator population with which to calculate rates. Readers should keep these complexities in mind when reviewing these rates.

The SPD (274) and Dual Eligible (218) study groups also generated age-sex adjusted PQI-1 rates that were higher than Medi-Cal's overall observed PQI-1 rate.

The Families (95) and Undocumented (45) study groups both generated age-sex adjusted PQI-1 rates that were lower than Medi-Cal's overall observed PQI-1 rate.

Figure PH-38: PQI-1 (Diabetes with Short-Term Complications) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Rates are age-sex adjusted to the rates of the total Medi-Cal adult population.

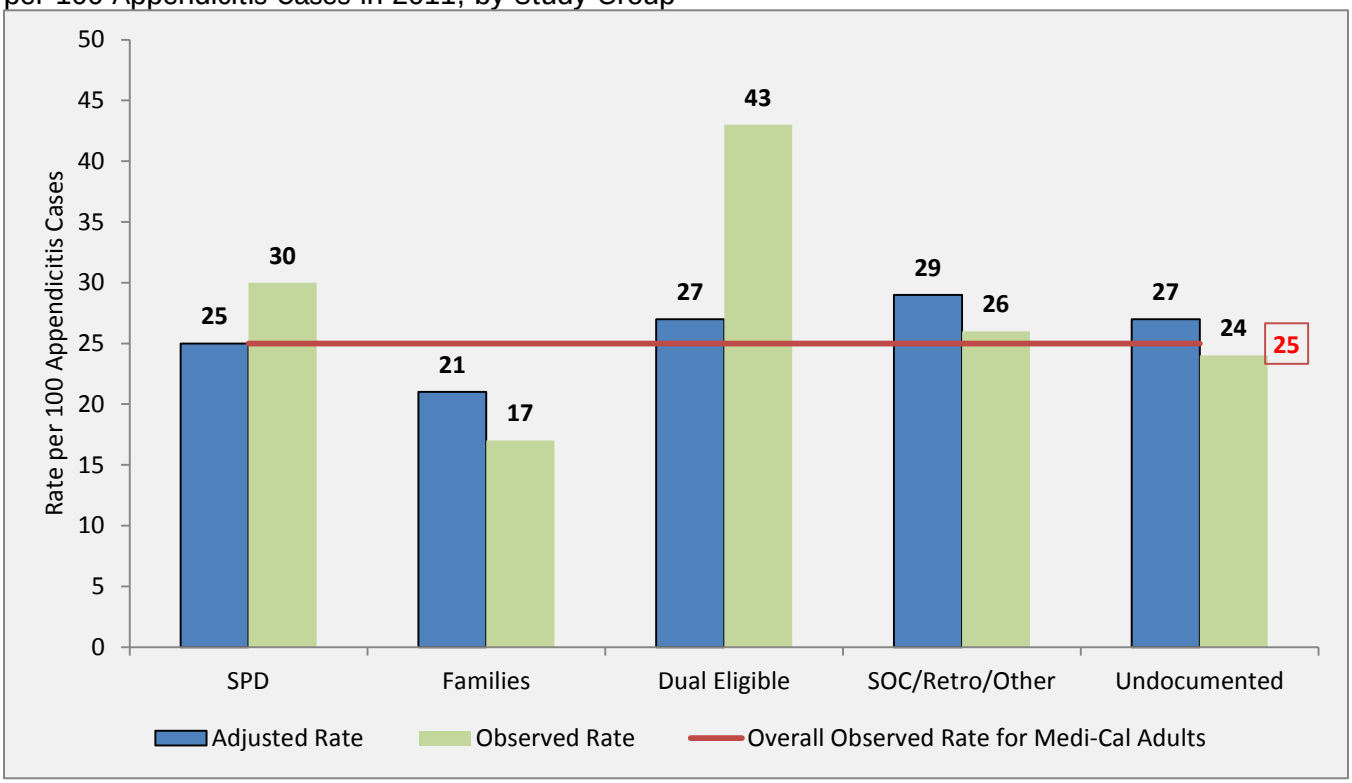
PQI-2 (Perforated Appendix among Adults Ages 18 and Older)

The overall observed rate of perforated appendix among all individuals ages 18 and older certified eligible for Medi-Cal was 25 discharges per 100 appendicitis cases (Figure PH-39).

The SOC/Retro/Other study group (29) generated an age-sex adjusted PQI-2 rate that was roughly 1.2 times Medi-Cal's overall observed PQI-2 rate. The Dual Eligible and Undocumented study groups (both 27) also generated age-sex adjusted PQI-2 rates that were higher than Medi-Cal's overall observed PQI-2 rate.

The SPD (25) and Families (21) study groups both produced age-sex adjusted PQI-2 rates that were equal to or lower than Medi-Cal's overall observed PQI-2 rate.

Figure PH-39: PQI-2 (Perforated Appendix) Rates among Adult Certified Eligibles Ages 18 and Older per 100 Appendicitis Cases in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

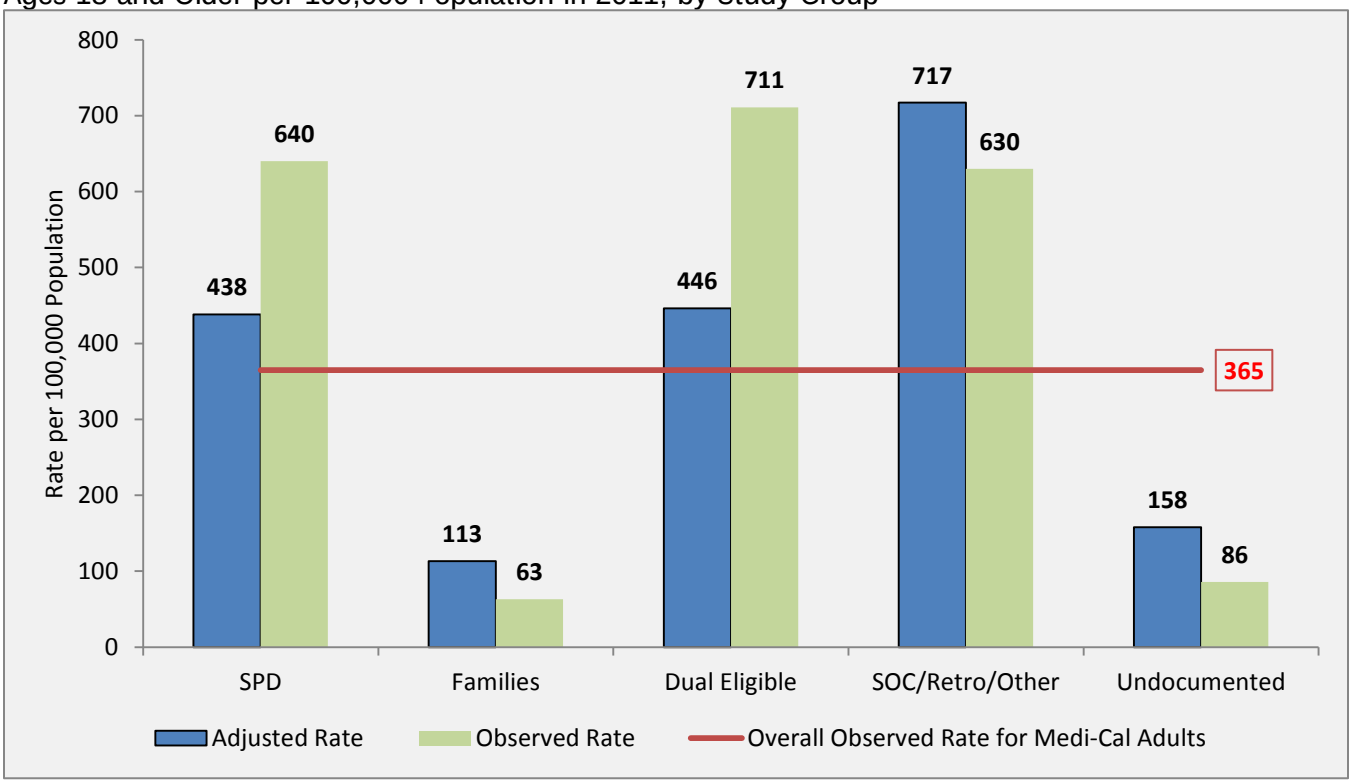
PQI-3 (Diabetes with Long-Term Complications among Adults Ages 18 and Older)

The overall observed rate of diabetes with long-term complications among all individuals ages 18 and older certified eligible for Medi-Cal was 365 discharges per 100,000 population (Figure PH-40).

The SOC/Retro/Other study group (717) generated an age-sex adjusted PQI-3 rate that was roughly 1.9 times Medi-Cal's overall observed PQI-3 rate. The Dual Eligible (446) and SPD (438) study groups also generated age-sex adjusted PQI-3 rates that were higher than Medi-Cal's overall observed PQI-3 rate.

The Undocumented (158) and Families (113) study groups both produced age-sex adjusted PQI-3 rates that were lower than Medi-Cal's overall observed PQI-3 rate.

Figure PH-40: PQI-3 (Diabetes with Long-Term Complications) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

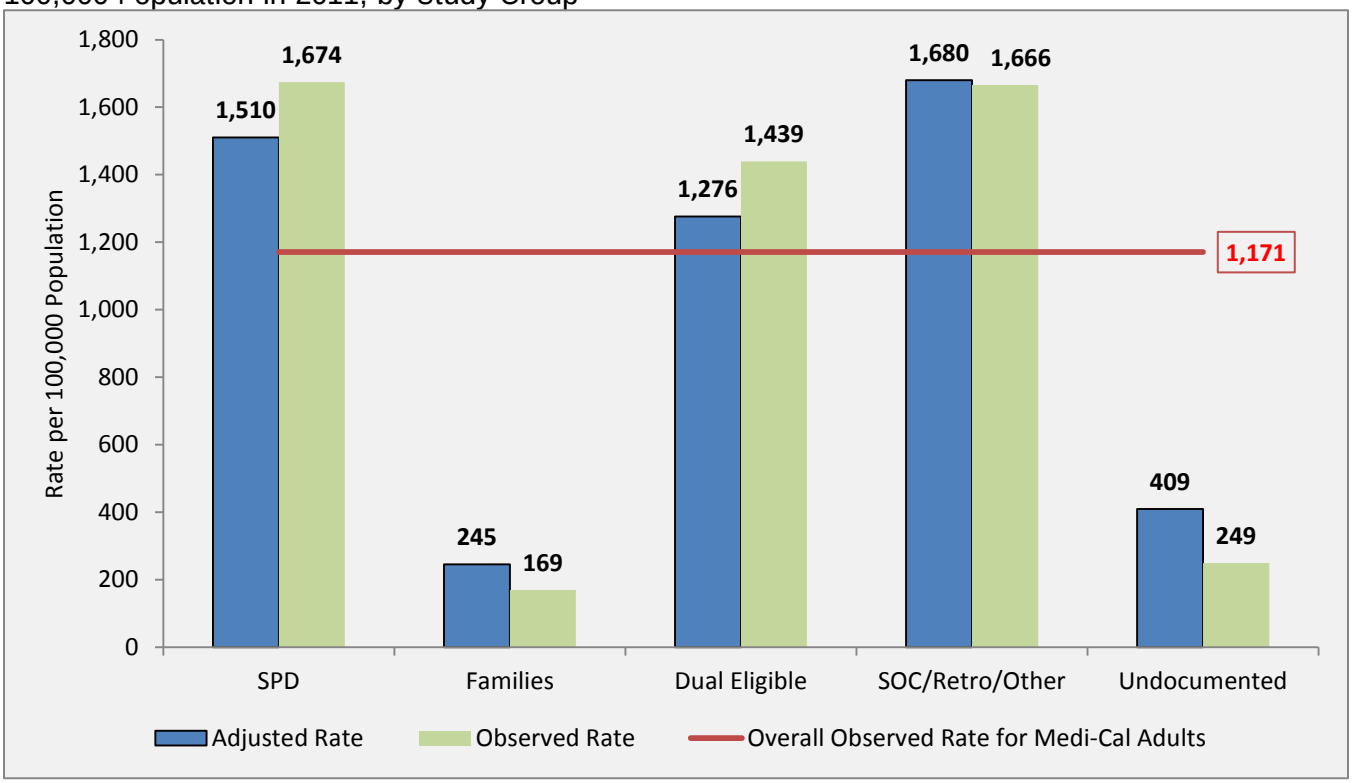
PQI-5 (COPD/Asthma among Adults Ages 40 and Older)

The overall observed rate of COPD/asthma among all individuals ages 40 and older certified eligible for Medi-Cal was 1,171 discharges per 100,000 population (Figure PH-41).

The SOC/Retro/Other study group (1,680) generated an age-sex adjusted PQI-5 rate that was roughly 1.4 times Medi-Cal's overall observed PQI-5 rate. The SPD (1,510) and Dual Eligible (1,276) study groups both generated age-sex adjusted PQI-5 rates that were also higher than Medi-Cal's overall PQI-5 observed rate.

The Undocumented (409) and Families (245) study groups both produced age-sex adjusted PQI-5 rates that were lower than Medi-Cal's overall observed PQI-5 rate.

Figure PH-41: PQI-5 (COPD/Asthma) Rates among Adult Certified Eligibles Ages 40 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

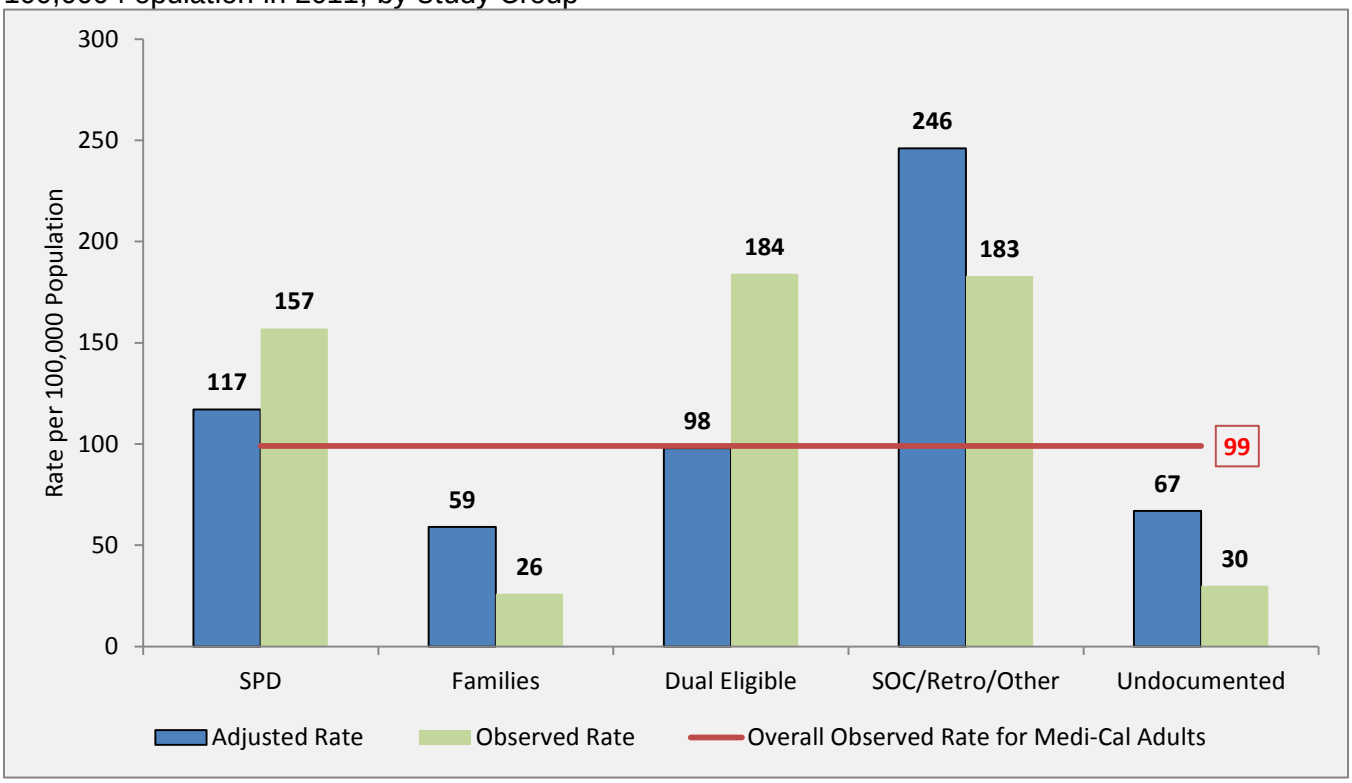
PQI-7 (Hypertension among Adults Ages 18 and Older)

The overall observed rate of hypertension among all individuals ages 18 and older certified eligible for Medi-Cal was 99 discharges per 100,000 population (Figure PH-42).

The SOC/Retro/Other study group (246) generated an age-sex adjusted PQI-7 rate that was roughly 2.4 times Medi-Cal's overall observed PQI-7 rate. The SPD study group (117) also produced an age-sex adjusted PQI-7 rate that was higher than Medi-Cal's overall observed PQI-7 rate.

The Dual Eligible (98), Undocumented (67), and Families (59) study groups all produced age-sex adjusted PQI-7 rates that were lower than Medi-Cal's overall observed PQI-7 rate.

Figure PH-42: PQI-7 (Hypertension) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

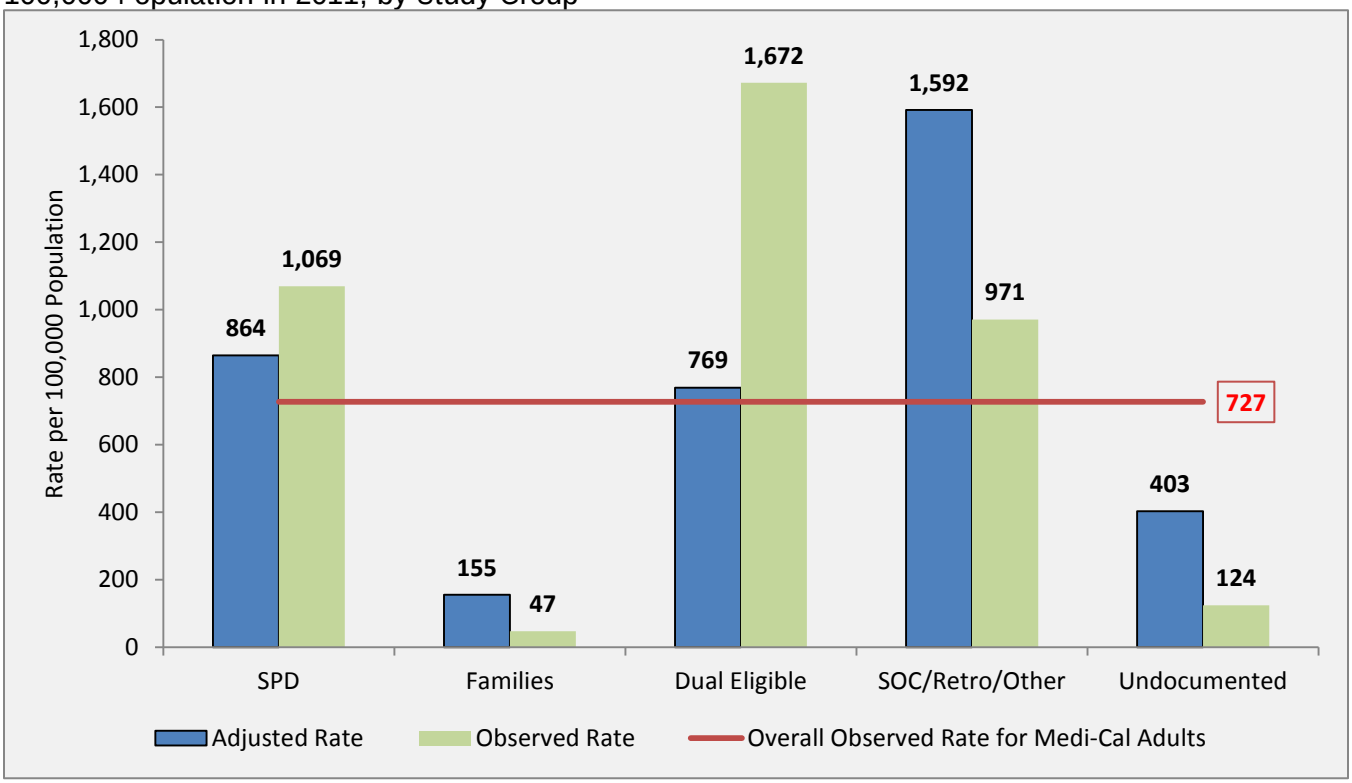
PQI-8 (Heart Failure among Adults Ages 18 and Older)

The overall observed rate of heart failure among all individuals ages 18 and older certified eligible for Medi-Cal was 727 discharges per 100,000 population (Figure PH-43).

The SOC/Retro/Other study group (1,592) generated an age-sex adjusted PQI-8 rate that was more than twice Medi-Cal's overall observed PQI-8 rate. The SPD (864) and Dual Eligible (769) study groups also generated age-sex adjusted PQI-8 rates that were higher than Medi-Cal's overall observed PQI-8 rate.

The Undocumented (403) and Families (155) study groups both produced age-sex adjusted PQI-8 rates that were lower than Medi-Cal's overall observed PQI-8 rate.

Figure PH-43: PQI-8 (Heart Failure) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

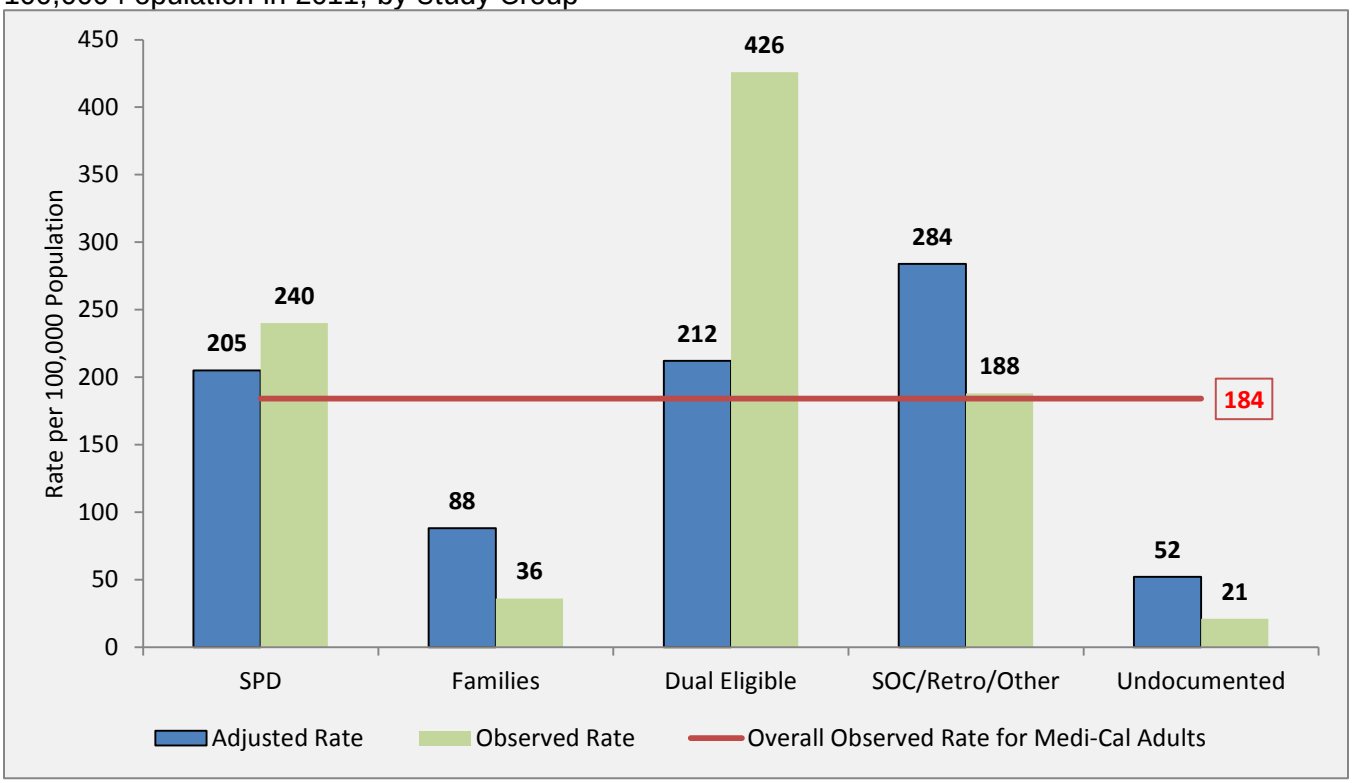
PQI-10 (Dehydration among Adults Ages 18 and Older)

The overall observed rate of dehydration among all individuals ages 18 and older certified eligible for Medi-Cal was 184 discharges per 100,000 population (Figure PH-44).

The SOC/Retro/Other study group (284) generated an age-sex adjusted PQI-10 rate that was roughly 1.5 times Medi-Cal's overall observed PQI-10 rate. The Dual Eligible (212) and SPD (205) study groups both generated age-sex adjusted PQI-10 rates that were also higher than Medi-Cal's overall observed PQI-10 rate.

The Families (88) and Undocumented (52) study groups both produced age-sex adjusted PQI-10 rates that were lower than Medi-Cal's overall observed PQI-10 rate.

Figure PH-44: PQI-10 (Dehydration) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

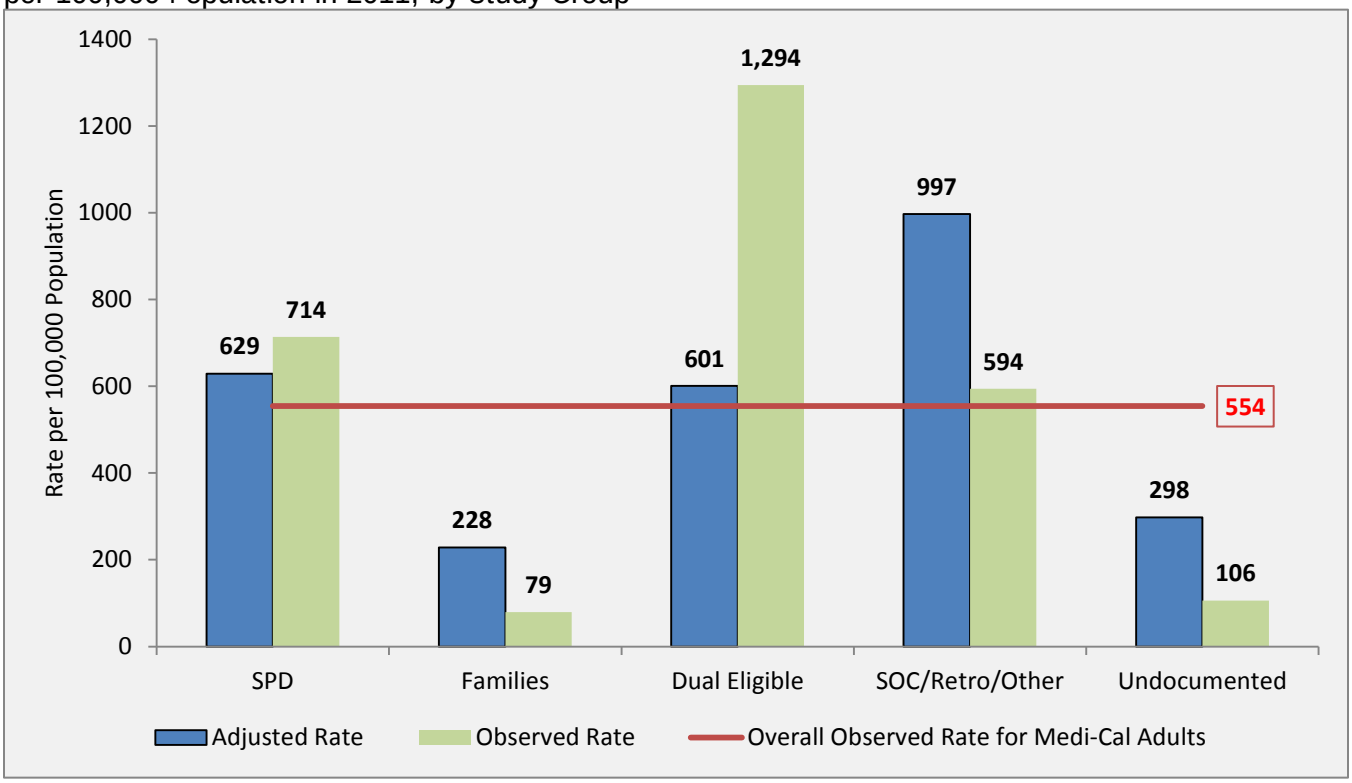
PQI-11 (Bacterial Pneumonia among Adults Ages 18 and Older)

The overall observed rate of bacterial pneumonia among all individuals ages 18 and older certified eligible for Medi-Cal was 554 discharges per 100,000 population (Figure PH-45).

The SOC/Retro/Other study group (997) generated an age-sex adjusted PQI-11 rate that was roughly 1.8 times Medi-Cal's overall observed PQI-11 rate. The SPD (629) and Dual Eligible (601) study groups both generated age-sex adjusted PQI-11 rates that were also higher than Medi-Cal's overall observed PQI-11 rate.

The Undocumented (298) and Families (228) study groups both produced age-sex adjusted PQI-11 rates that were lower than Medi-Cal's overall observed PQI-11 rate.

Figure PH-45: PQI-11 (Bacterial Pneumonia) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

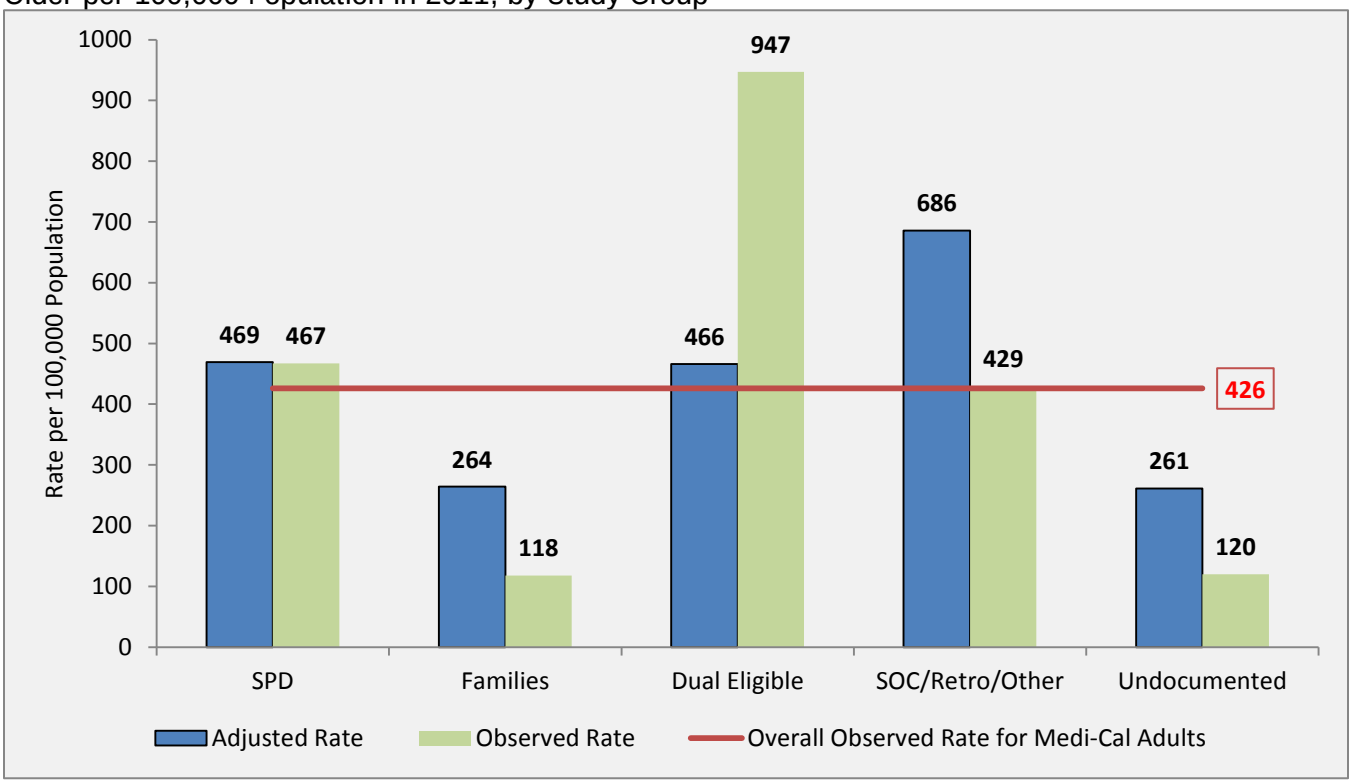
PQI-12 (Urinary Tract Infection among Adults Ages 18 and Older)

The overall observed rate of urinary tract infection among all individuals ages 18 and older certified eligible for Medi-Cal was 426 discharges per 100,000 population (Figure PH-46).

The SOC/Retro/Other study group (686) generated an age-sex adjusted PQI-12 rate that was roughly 1.6 times Medi-Cal's overall observed PQI-12 rate. The SPD (469) and Dual Eligible (466) study groups both generated age-sex adjusted PQI-12 rates that were also higher than Medi-Cal's overall observed PQI-12 rate.

The Families (264) and Undocumented (261) study groups both produced age-sex adjusted PQI-12 rates that were lower than Medi-Cal's overall observed PQI-12 rate.

Figure PH-46: PQI-12 (Urinary Tract Infection) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

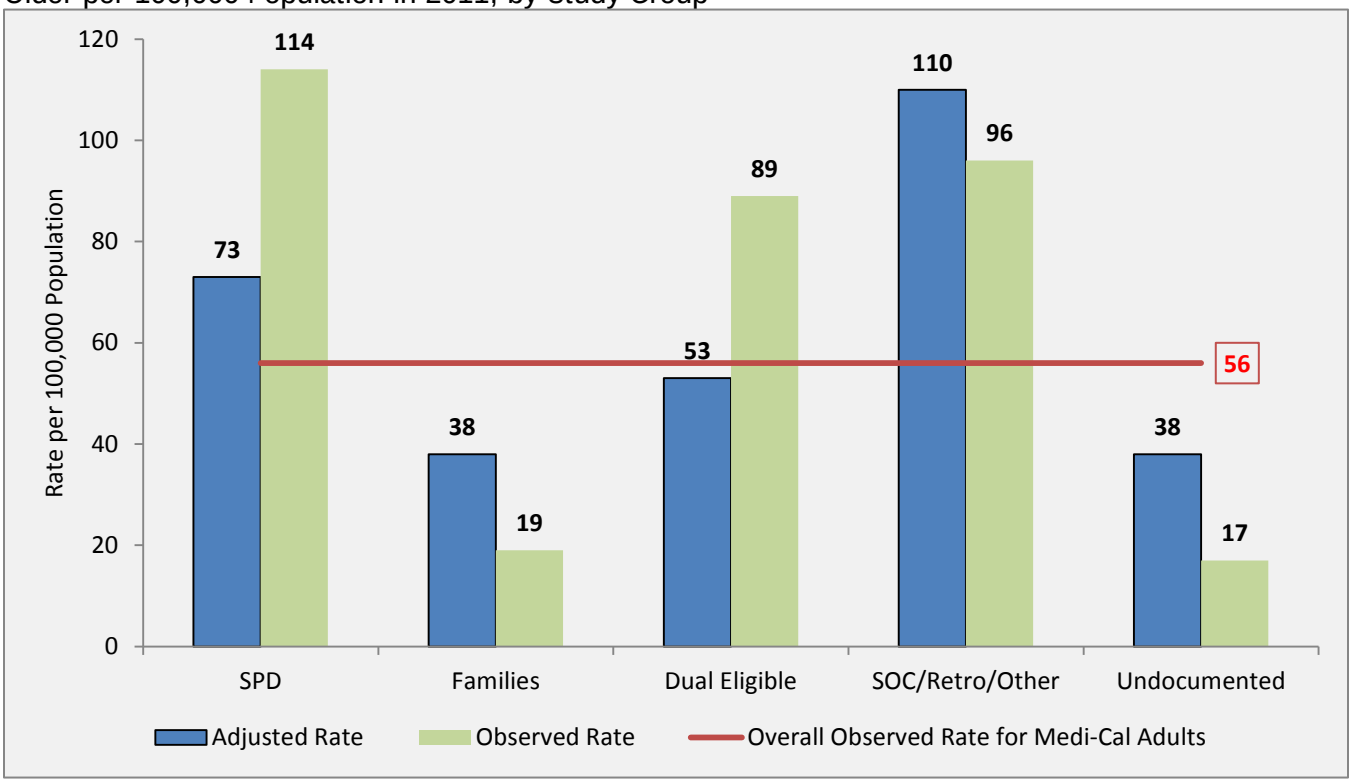
PQI-13 (Angina without Procedure among Adults Ages 18 and Older)

The overall observed rate of angina without procedure among all individuals eligible for Medi-Cal ages 18 and older was 56 discharges per 100,000 population (Figure PH-47).

The SOC/Retro/Other study group (110) generated an age-sex adjusted PQI-13 rate that was nearly twice Medi-Cal's overall observed PQI-13 rate. The SPD study group (73) also generated an age-sex adjusted PQI-13 rate that was higher than Medi-Cal's overall observed PQI-13 rate.

The Dual Eligible (53), Families, and Undocumented (both 38) study groups all produced age-sex adjusted PQI-13 rates that were lower than Medi-Cal's overall observed PQI-13 rate.

Figure PH-47: PQI-13 (Angina without Procedure) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

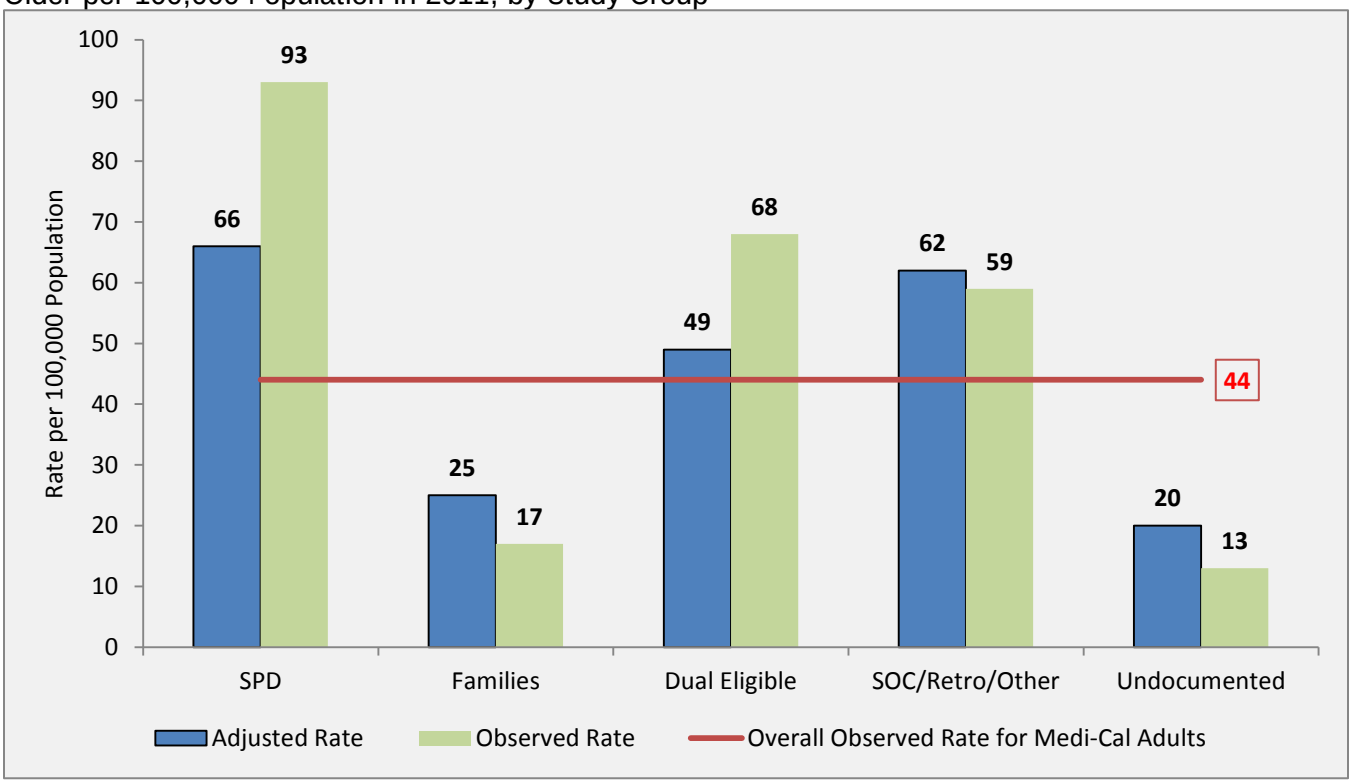
PQI-14 (Uncontrolled Diabetes among Adults Ages 18 and Older)

The overall observed rate of uncontrolled diabetes among all individuals ages 18 and older certified eligible for Medi-Cal was 44 discharges per 100,000 population (Figure PH-48).

The SPD study group (66) generated an age-sex adjusted PQI-14 rate that was 1.5 times Medi-Cal's overall observed PQI-14 rate. The SOC/Retro/Other (62) and Dual Eligible (49) study groups both generated age-sex adjusted PQI-14 rates that were also higher than Medi-Cal's overall observed PQI-14 rate.

The Families (25) and Undocumented (20) study groups both produced age-sex adjusted PQI-14 rates that were lower than Medi-Cal's overall observed PQI-14 rate.

Figure PH-48: PQI-14 (Uncontrolled Diabetes) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

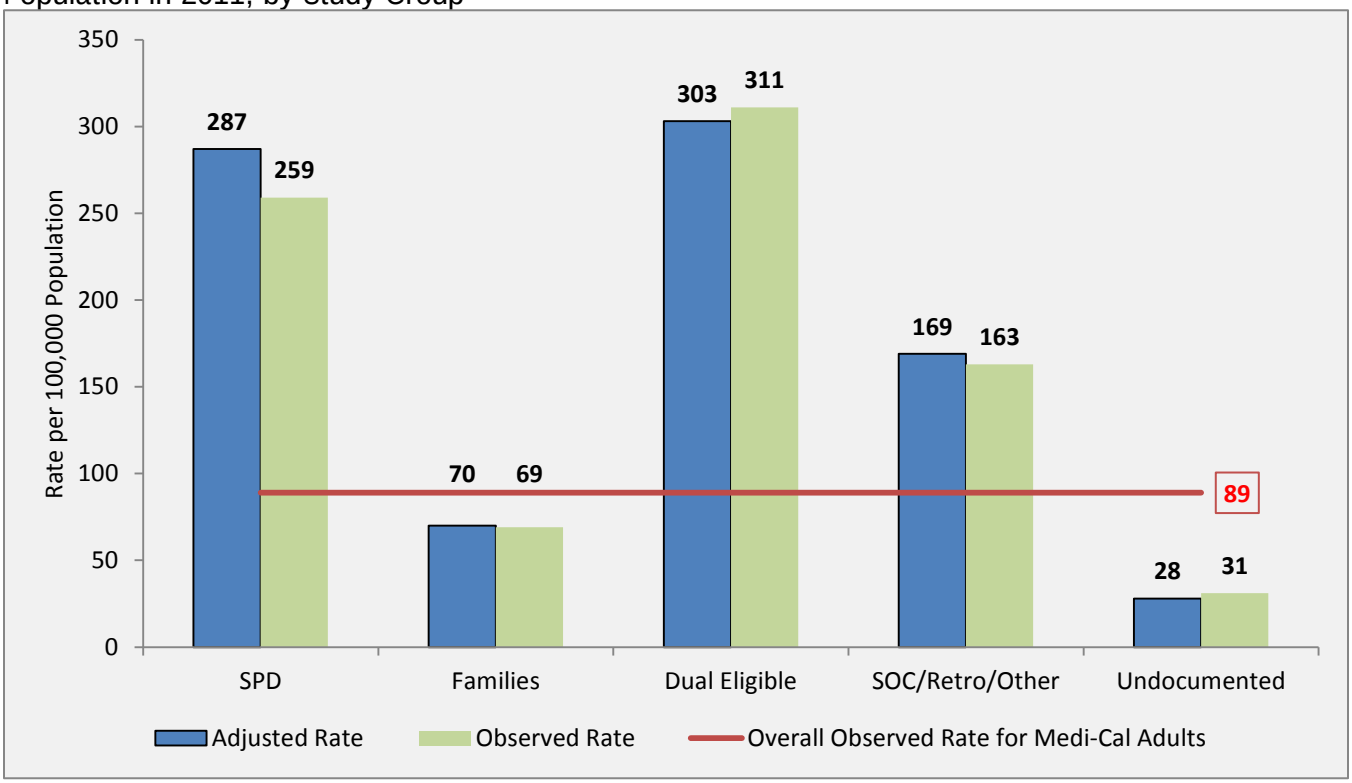
PQI-15 (Asthma among Adults Ages 18-39)

The overall observed rate of asthma among all individuals ages 18–39 certified eligible for Medi-Cal was 89 discharges per 100,000 population (Figure PH-49).

Both the Dual Eligible (303) and SPD (287) study groups generated age-sex adjusted PQI-15 rates that were more than three times Medi-Cal's overall observed PQI-15 rate. The SOC/Retro/Other (169) study group also generated an age-sex adjusted PQI-15 rate that was higher than Medi-Cal's overall observed PQI-15 rate.

The Families (70) and Undocumented (28) study groups both produced age-sex adjusted PQI-15 rates that were lower than Medi-Cal's overall observed PQI-15 rate.

Figure PH-49: PQI-15 (Asthma) Rates among Adult Certified Eligibles Ages 18–39 per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

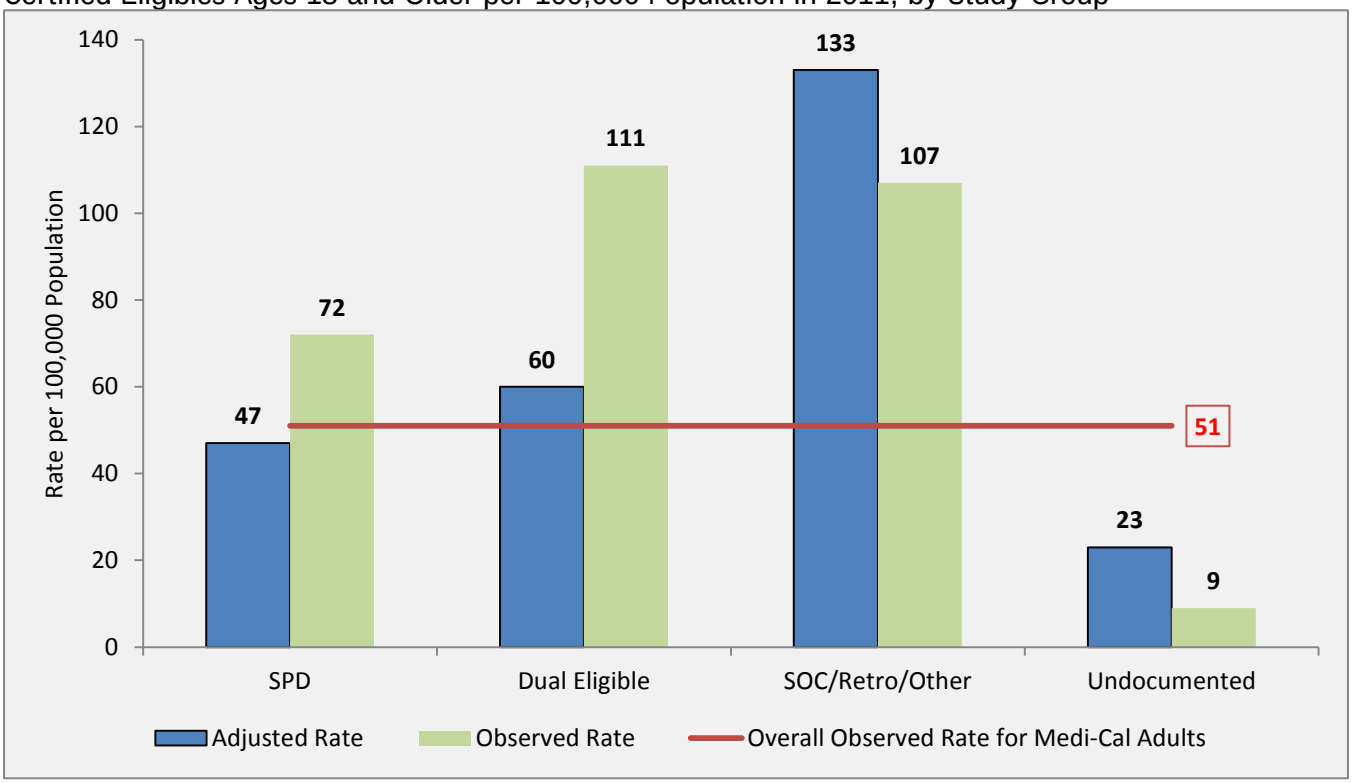
PQI-16 (Low-Extremity Amputation in Patients with Diabetes among Adults Ages 18 and Older)

The overall observed rate of low-extremity amputation in patients with diabetes among all individuals ages 18 and older certified eligible for Medi-Cal was 51 discharges per 100,000 population (Figure PH-50).

The SOC/Retro/Other study group (133) generated an age-sex adjusted PQI-16 rate that was roughly 2.6 times Medi-Cal's overall observed PQI-16 rate. The Dual Eligible study group (60) also generated an age-sex adjusted PQI-16 rate that was higher than Medi-Cal's overall observed PQI-16 rate.

The SPD (47) and Undocumented (23) study groups both produced age-sex adjusted PQI-16 rates that were lower than Medi-Cal's overall observed PQI-16 rate.

Figure PH-50: PQI-16 (Low-Extremity Amputation in Patients with Diabetes) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population. The rate of the Families study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

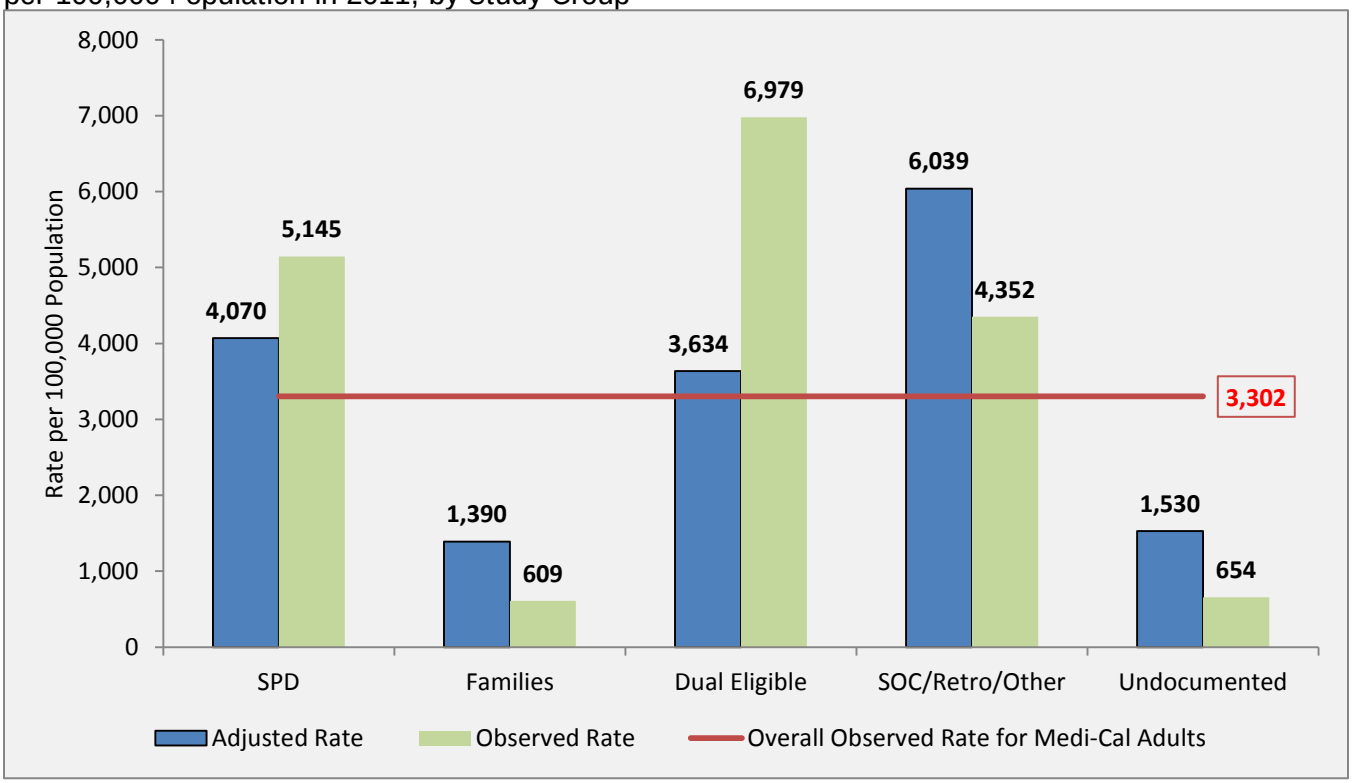
PQI-90 (Overall Composite among Adults Ages 18 and Older)

The overall observed Overall Composite rate among all individuals ages 18 and older certified eligible for Medi-Cal was 3,302 discharges per 100,000 population (Figure PH-51).

The SOC/Retro/Other study group (6,039) generated an age-sex adjusted PQI-90 rate that was roughly 1.8 times Medi-Cal's overall observed PQI-90 rate. The SPD (4,070) and Dual Eligible (3,634) study groups both produced age-sex adjusted PQI-90 rates that were also higher than Medi-Cal's overall observed PQI-90 rate.

The Undocumented (1,530) and Families (1,390) study groups both produced age-sex adjusted PQI-90 rates that were lower than Medi-Cal's overall observed PQI-90 rate.

Figure PH-51: PQI-90 (Overall Composite) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

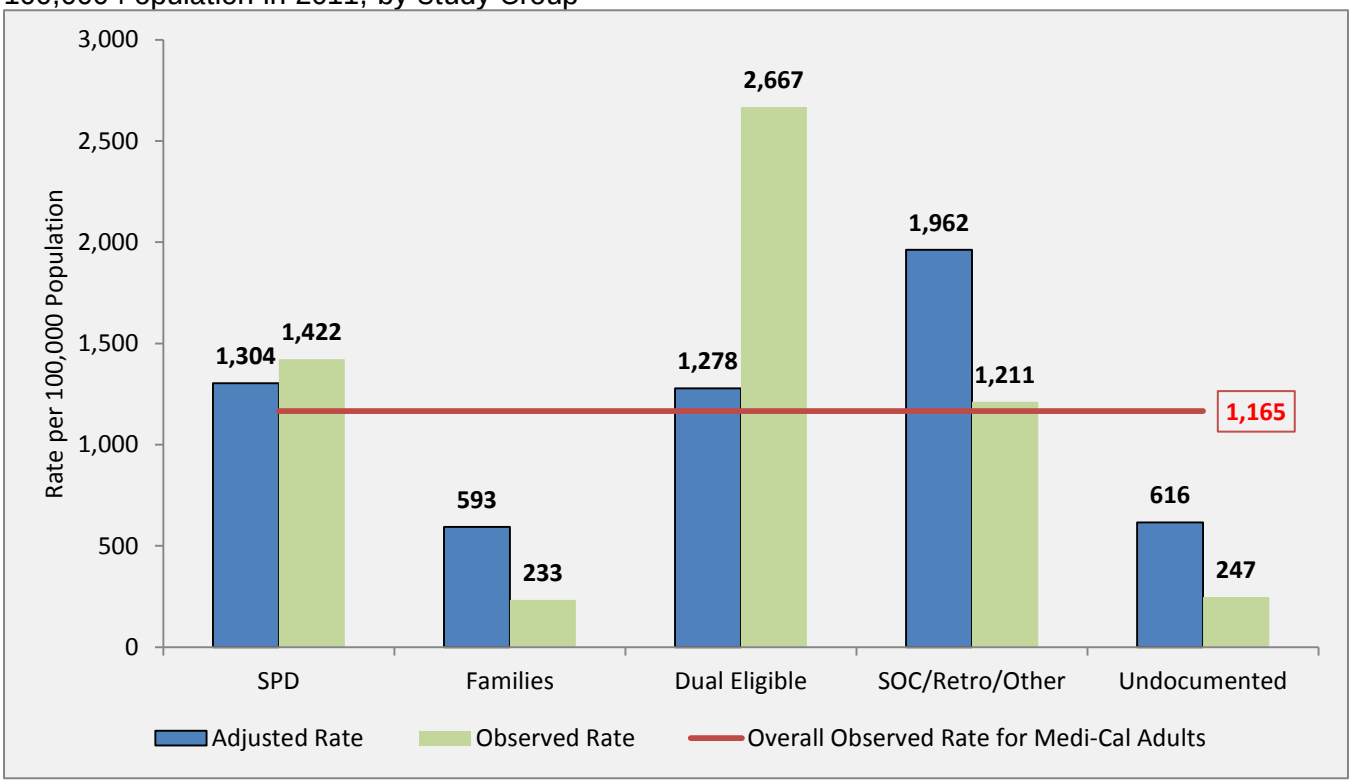
PQI-91 (Acute Composite among Adults Ages 18 and Older)

The overall observed Acute Composite rate among all individuals ages 18 and older certified eligible for Medi-Cal was 1,165 discharges per 100,000 population (Figure PH-52).

The SOC/Retro/Other study group (1,962) generated an age-sex adjusted PQI-91 rate that was roughly 1.7 times Medi-Cal's overall observed PQI-91 rate. The SPD (1,304) and Dual Eligible (1,278) study groups both generated age-sex adjusted PQI-91 rates that were also higher than Medi-Cal's overall observed PQI-91 rate.

The Undocumented (616) and Families (593) study groups both produced age-sex adjusted PQI-91 rates that were lower than Medi-Cal's overall observed PQI-91 rate.

Figure PH-52: PQI-91 (Acute Composite) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

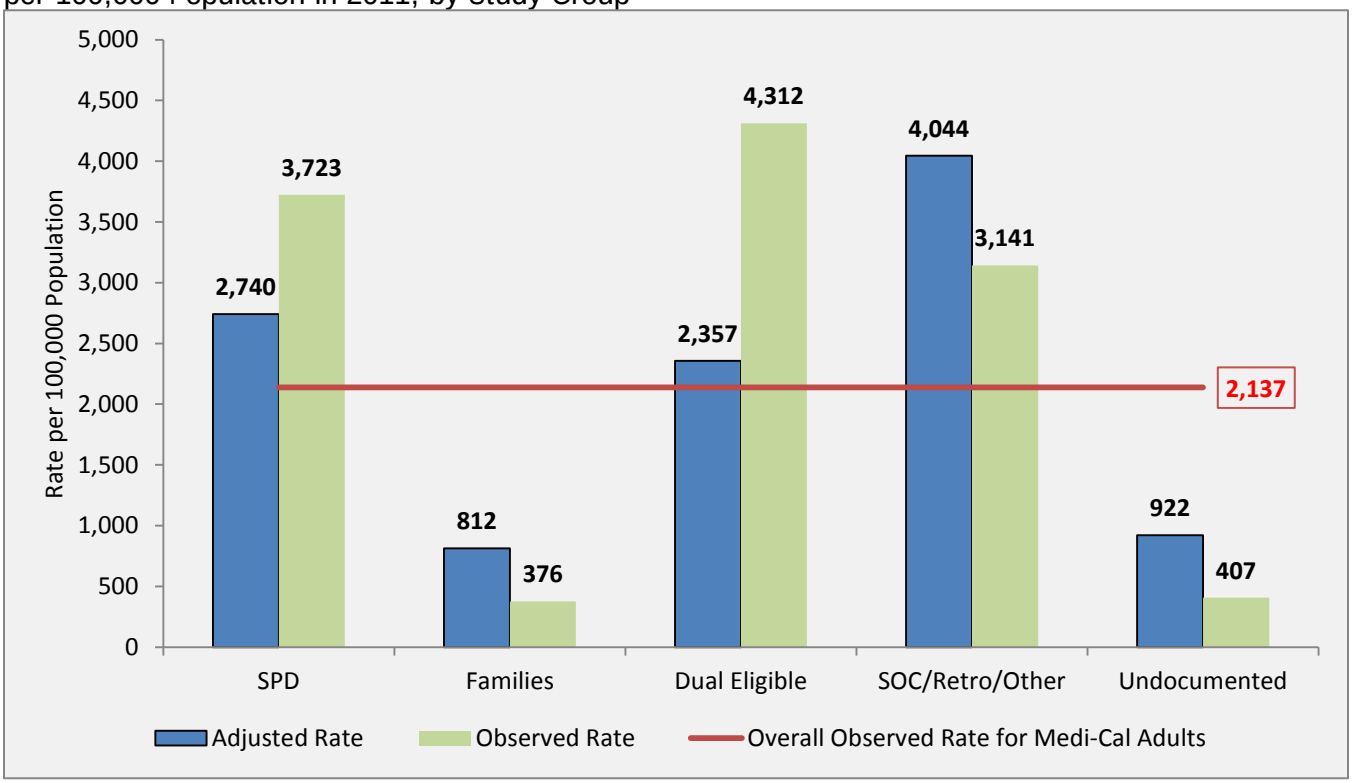
PQI-92 (Chronic Composite among Adults Ages 18 and Older)

The overall observed Chronic Composite rate among all individuals ages 18 and older certified eligible for Medi-Cal was 2,137 discharges per 100,000 population (Figure PH-53).

The SOC/Retro/Other study group (4,044) generated an age-sex adjusted PQI-92 rate that was roughly 1.9 times Medi-Cal's overall observed PQI-92 rate. The SPD (2,740) and Dual Eligible (2,357) study groups both generated age-sex adjusted PQI-92 rates that were also higher than Medi-Cal's overall observed PQI-92 rate.

The Undocumented (922) and Families (812) study groups both produced age-sex adjusted PQI-92 rates that were lower than Medi-Cal's overall observed PQI-92 rate.

Figure PH-53: PQI-92 (Chronic Composite) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

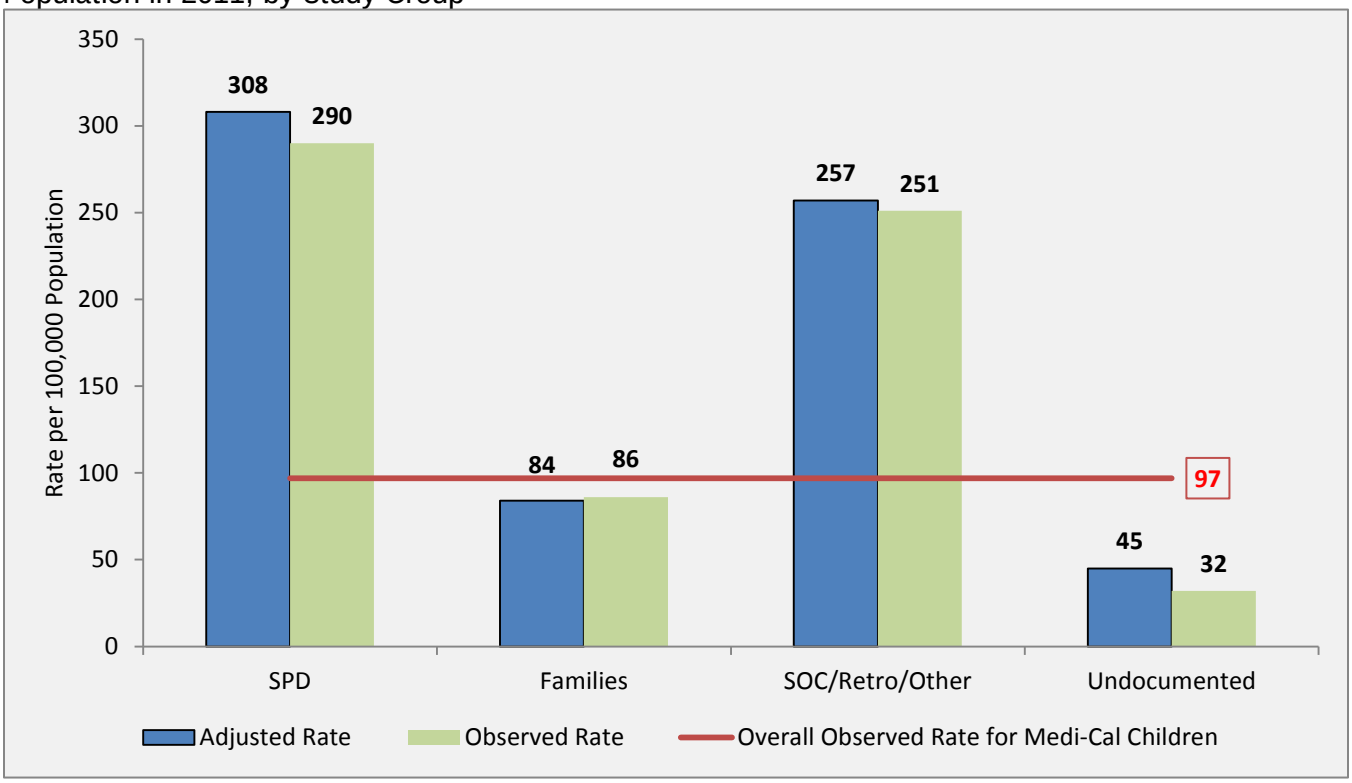
PDI-14 (Asthma among Children Ages 2–17)

The overall observed rate of asthma among all individuals ages 2–17 certified eligible for Medi-Cal was 97 discharges per 100,000 population (Figure PH-54).

The SPD study group (308) generated an age-sex adjusted PDI-14 rate that was roughly 3.2 times Medi-Cal's overall observed PDI-14 rate. The SOC/Retro/Other study group (257) also generated an age-sex adjusted PDI-14 rate that was higher than Medi-Cal's overall observed PDI-14 rate.

The Families (84) and Undocumented (45) study groups both produced age-sex adjusted PDI-14 rates that were lower than Medi-Cal's overall observed PDI-14 rate.

Figure PH-54: PDI-14 (Asthma) Rates among Child Certified Eligibles Ages 2–17 per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 2–17.

PDI-15 (Diabetes with Short-Term Complications among Children Ages 6–17)

The overall observed rate of diabetes with short-term complications among all individuals ages 6–17 certified eligible for Medi-Cal was 32 discharges per 100,000 population (Figure PH-55).

The SPD study group (73) generated an age-sex adjusted PDI-15 rate that was roughly 2.3 times Medi-Cal's overall observed PDI-15 rate. The SOC/Retro/Other study group (72) also generated an age-sex adjusted PDI-15 rate that was higher than Medi-Cal's overall observed PDI-15 rate.

The Families study group (29) produced an age-sex adjusted PDI-15 rate that was lower than Medi-Cal's overall observed PDI-15 rate.

Figure PH-55: PDI-15 (Diabetes with Short-Term Complications) Rates among Child Certified Eligibles Ages 6–17 per 100,000 Population in 2011, by Study Group

Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17. The rate of the Undocumented study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

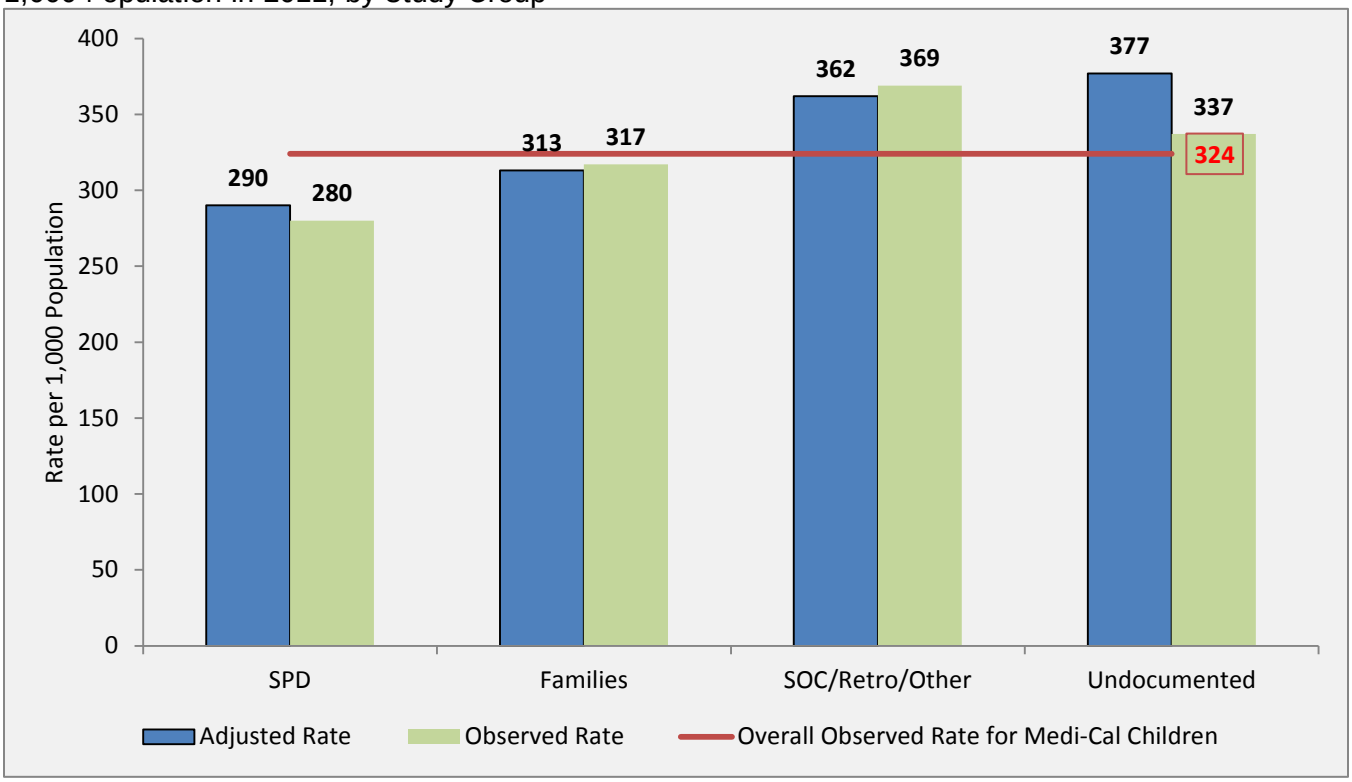
PDI-17 (Perforated Appendix among Children Ages 1–17)

The overall observed rate of perforated appendix among all individuals ages 1–17 certified eligible for Medi-Cal was 324 discharges per 1,000 population (Figure PH-56).

The Undocumented (377) and SOC/Retro/Other (362) study groups both generated age-sex adjusted PDI-17 rates that were higher than Medi-Cal's overall observed PDI-17 rate.

The Families (313) and SPD (290) study groups both produced age-sex adjusted PDI-17 rates that were lower than Medi-Cal's overall observed PDI-17 rate.

Figure PH-56: PDI-17 (Perforated Appendix) Rates among Child Certified Eligibles Ages 1–17 per 1,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 1–17.

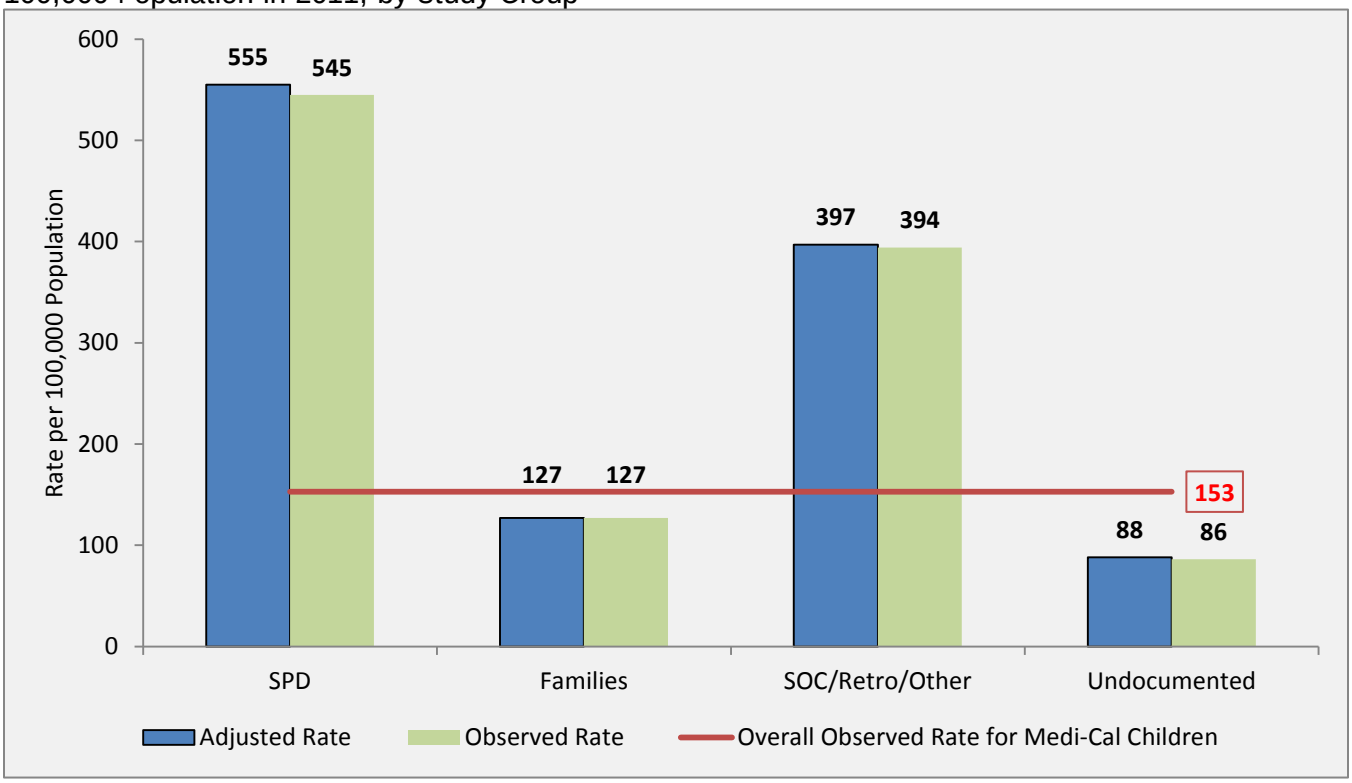
PDI-90 (Overall Composite among Children Ages 6–17)

The overall observed Overall Composite rate among all individuals ages 6–17 certified eligible for Medi-Cal was 153 discharges per 100,000 population (Figure PH-57).

The SPD study group (555) generated an age-sex adjusted PDI-90 rate that was roughly 3.6 times Medi-Cal's overall observed PDI-90 rate. The SOC/Retro/Other study group (397) also generated an age-sex adjusted PDI-90 rate that was higher than Medi-Cal's overall observed PDI-90 rate.

The Families (127) and Undocumented (88) study groups both produced age-sex adjusted PDI-90 rates that were lower than Medi-Cal's overall observed PDI-90 rate.

Figure PH-57: PDI-90 (Overall Composite) Rates among Child Certified Eligibles Ages 6–17 per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17.

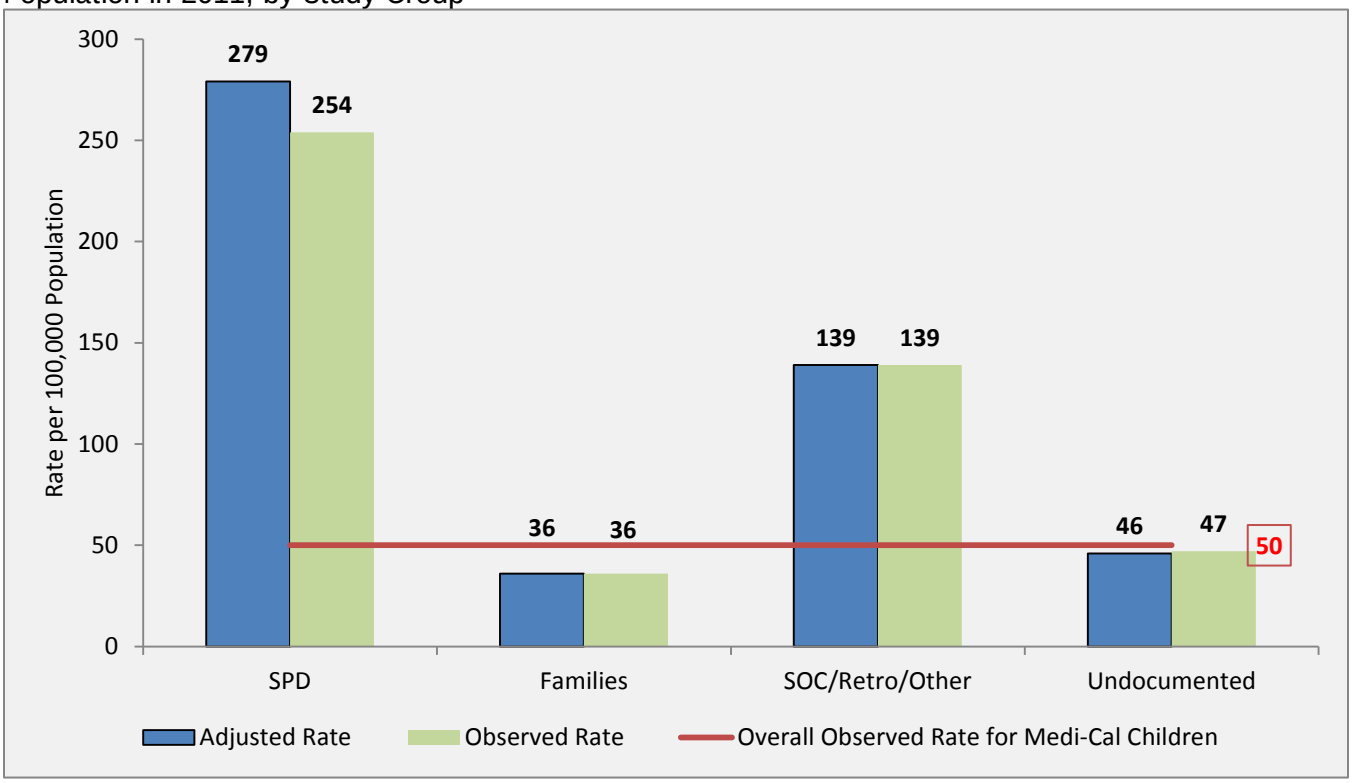
PDI-91 (Acute Composite among Children Ages 6–17)

The overall observed Acute Composite rate among all individuals ages 6–17 certified eligible for Medi-Cal was 50 discharges per 100,000 population (Figure PH-58).

The SPD study group (279) generated an age-sex adjusted PDI-91 rate that was roughly 5.6 times Medi-Cal's overall observed PDI-91 rate. The SOC/Retro/Other study group (139) also generated an age-sex adjusted PDI-91 rate that was higher than Medi-Cal's overall observed PDI-91 rate.

The Undocumented (46) and Families (36) study groups both produced age-sex adjusted PDI-91 rates that were lower than Medi-Cal's overall observed PDI-91 rate.

Figure PH-58: PDI-91 (Acute Composite) Rates among Child Certified Eligibles Ages 6–17 per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17.

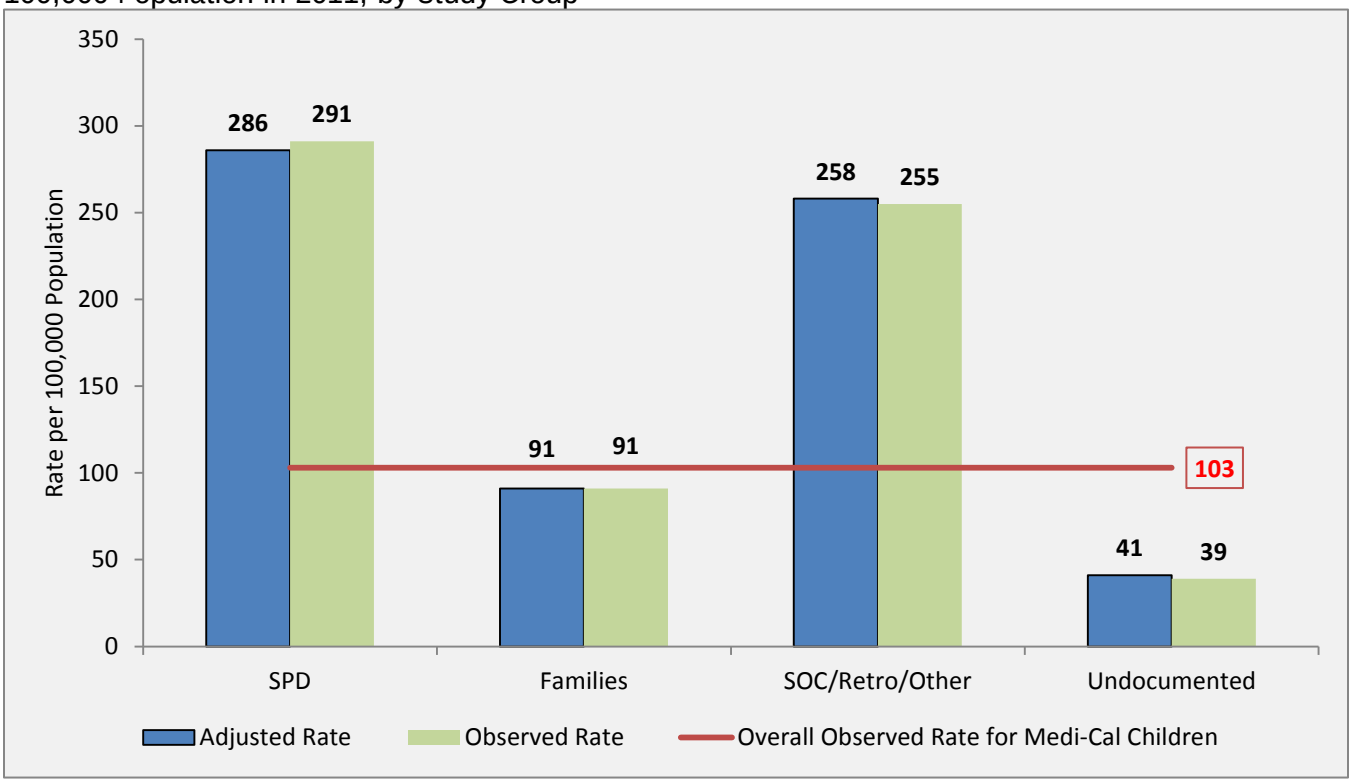
PDI-92 (Chronic Composite among Children Ages 6–17)

The overall observed Chronic Composite rate among all individuals ages 6–17 certified eligible for Medi-Cal was 103 discharges per 100,000 population (Figure PH-59).

The SPD study group (286) generated an age-sex adjusted PDI-92 rate that was roughly 2.8 times Medi-Cal's overall observed PDI-92 rate. The SOC/Retro/Other study group (258) also generated an age-sex adjusted PDI-92 rate that was higher than Medi-Cal's overall observed PDI-92 rate.

The Families (91) and Undocumented (41) study groups both produced age-sex adjusted PDI-92 rates that were lower than Medi-Cal's overall observed PDI-92 rate.

Figure PH-59: PDI-92 (Chronic Composite) Rates among Child Certified Eligibles Ages 6–17 per 100,000 Population in 2011, by Study Group



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17.

Differences by Race/Ethnicity

Figures PH-20–PH-31, which appeared earlier in this report, compared composite rates of preventable hospitalization by eligibility-based study group and race/ethnicity. The figures that follow here present those comparisons for the condition-specific indicators as well. Only three of the five study groups were evaluated: the SPD, Families, and Dual Eligible study groups. The age-sex adjusted rates for each of the study groups and races/ethnicities were compared to the observed rate for the overall Medi-Cal adult (for PQIs) or child (for PDIs) population.

As seen in the earlier comparisons, the age-sex adjusted rates generated by the SPD and Dual Eligible study groups tended to be higher than Medi-Cal's overall observed rates, while age-sex adjusted rates generated by the Families study group tended to be lower. This reflects the greater clinical complexity of the SPD and Dual Eligible subpopulations, resulting in their need for more frequent care and a higher probability of hospitalization.

Relative to Medi-Cal's overall observed rates, African-American adults and children generated the highest age-sex adjusted rates among all three study groups for the Chronic Composite measures (PQI-92 and PDI-92), and most of the chronic condition-specific measures. Relative to Medi-Cal's overall observed rates, White adults and children generated the highest age-sex adjusted rates among the SPD and Families study groups for the Acute Composite measures (PQI-91 and PDI-91).

PQI-1 (Diabetes with Short-Term Complications among Adults Ages 18 and Older)

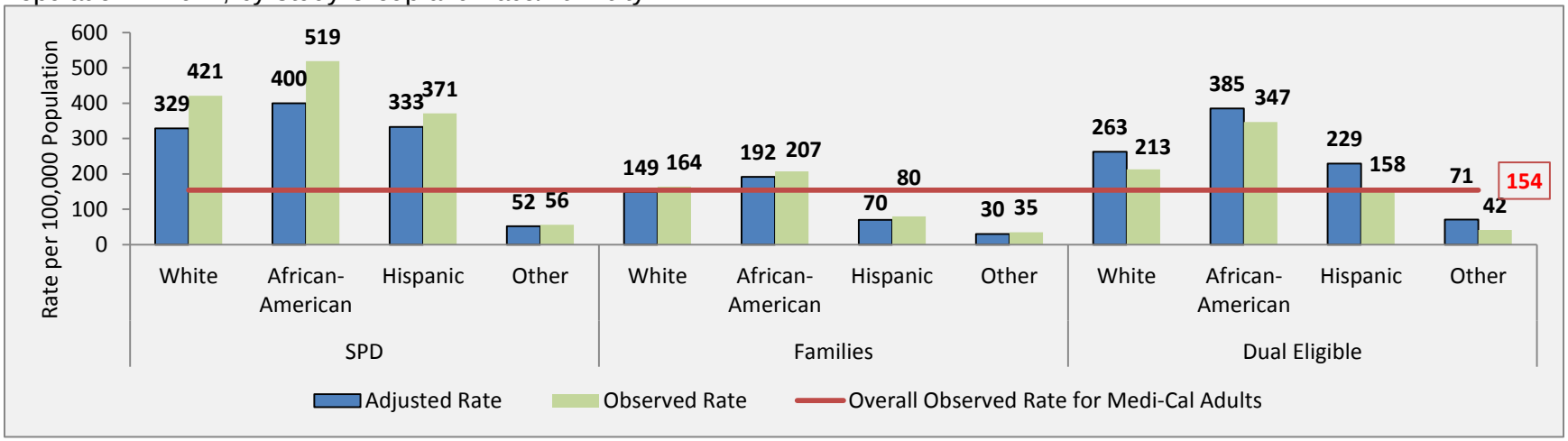
The overall observed rate of diabetes with short-term complications among all individuals ages 18 and older certified eligible for Medi-Cal was 154 discharges per 100,000 population (Figure PH-60).

Among the SPD study group, African-Americans (400), Hispanics, and Whites (329) produced age-sex adjusted PQI-1 rates that were higher than Medi-Cal's overall observed PQI-1 rate. The Other racial/ethnic cohort (52) produced an age-sex adjusted PQI-1 rate that was lower than Medi-Cal's overall observed PQI-1 rate.

Among the Families study group, African-Americans (192) generated an age-sex adjusted PQI-1 rate that was higher than Medi-Cal's overall observed PQI-1 rate. Whites (149), Hispanics (70), and the Other racial/ethnic cohort (30) produced age-sex adjusted PQI-1 rates that were lower than Medi-Cal's overall observed PQI-1 rate.

Among the Dual Eligible study group, African-Americans (385), Whites (263), and Hispanics (229) generated age-sex adjusted PQI-1 rates that were higher than Medi-Cal's overall observed PQI-1 rate. The Other racial/ethnic cohort (71) produced an age-sex adjusted PQI-1 rate that was lower than Medi-Cal's overall observed PQI-1 rate.

Figure PH-60: PQI-1 (Diabetes with Short-Term Complications) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

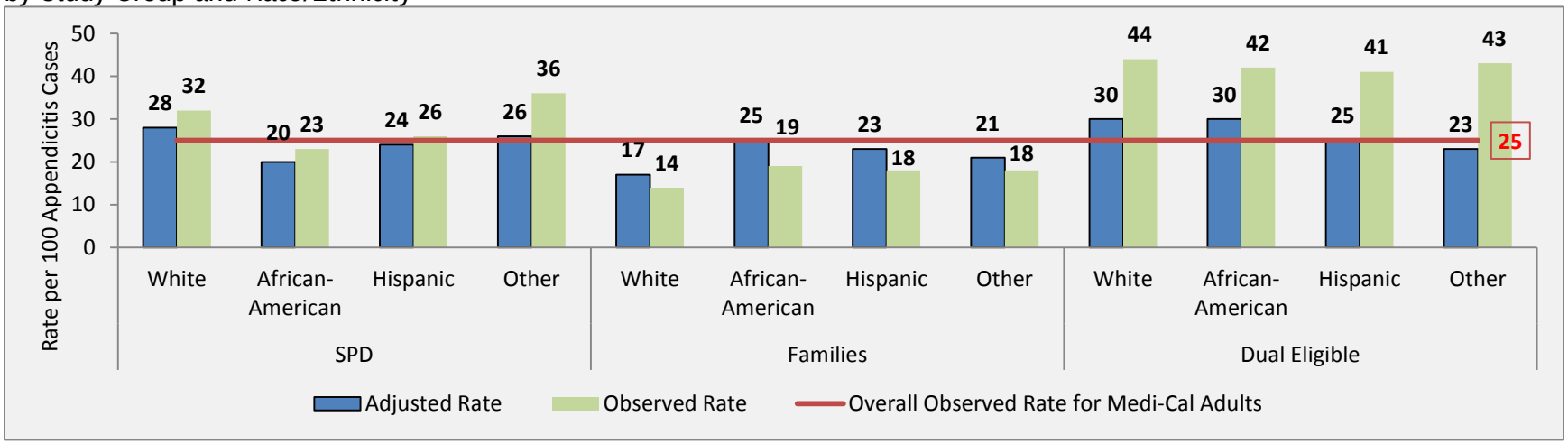
PQI-2 (Perforated Appendix among Adults Ages 18 and Older)

The overall observed rate of perforated appendix among all individuals ages 18 and older certified eligible for Medi-Cal was 25 discharges per 100 appendicitis cases (Figure PH-61).

Among the SPD study group, Whites (28) produced an age-sex adjusted PQI-2 rate that was higher than Medi-Cal's overall observed PQI-2 rate. The Other racial/ethnic cohort (26), Hispanics (24), and African-Americans (20) produced age-sex adjusted PQI-2 rates that were lower than Medi-Cal's overall observed PQI-2 rate. Among the Families study group, African-Americans (25) generated an age-sex adjusted PQI-2 rate that was equal to Medi-Cal's overall observed PQI-2 rate. Hispanics (23), Whites (17), and the Other racial/ethnic cohort (21) produced age-sex adjusted PQI-2 rates that were lower than Medi-Cal's overall observed PQI-2 rate.

Among members of the Dual Eligible study group, African-Americans (30) and Whites (30) generated age-sex adjusted PQI-2 rates that were higher than Medi-Cal's overall observed PQI-2 rate. Hispanics produced an age-sex adjusted PQI-2 rate that was equal to Medi-Cal's overall observed PQI-2 rate, while the Other racial/ethnic cohort (23) produced an age-sex adjusted PQI-2 rate that was lower than Medi-Cal's overall observed PQI-2 rate.

Figure PH-61: PQI-2 (Perforated Appendix) Rates among Adult Certified Eligibles Ages 18 and Older per 100 Appendicitis Cases in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

PQI-3 (Diabetes with Long-Term Complications among Adults Ages 18 and Older)

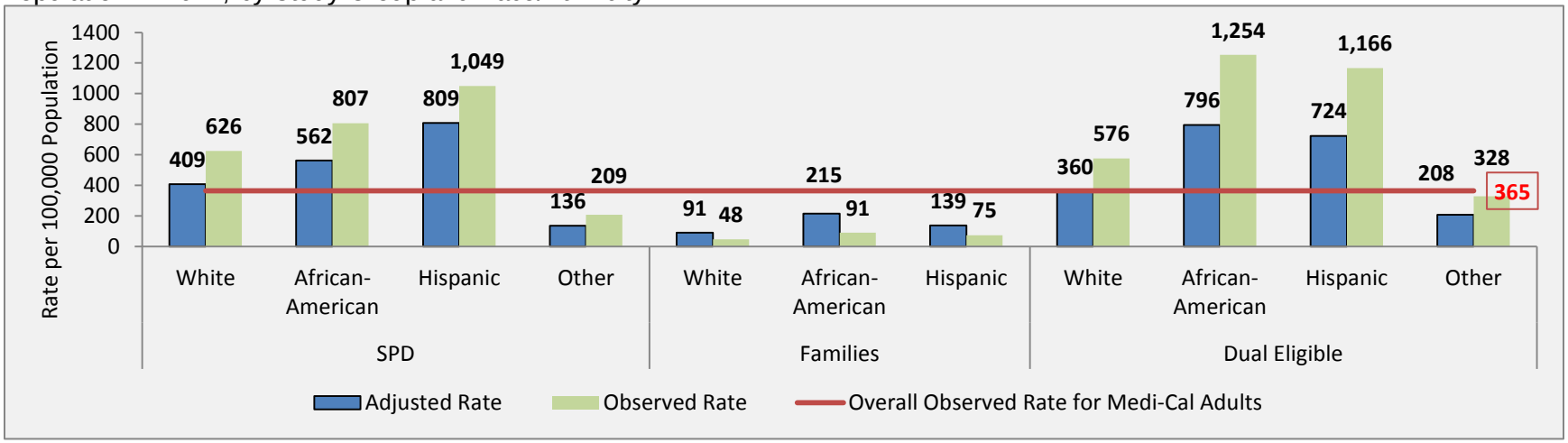
The overall observed rate of diabetes with long-term complications among all individuals ages 18 and older certified eligible for Medi-Cal was 365 discharges per 100,000 population (Figure PH-62).

Among the SPD study group, Hispanics (809) produced an age-sex adjusted PQI-3 rate that was 2.2 times Medi-Cal's overall observed PQI-3 rate. African-Americans (562) and Whites (409) also produced age-sex adjusted PQI-3 rates that were higher than Medi-Cal's overall observed PQI-3 rate. The Other racial/ethnic cohort (136) produced an age-sex adjusted PQI-3 rate that was lower than Medi-Cal's overall observed PQI-3 rate.

Among the Families study group, African-Americans (215), Hispanics (139), and Whites (91) all produced age-sex adjusted PQI-3 rates that were lower than Medi-Cal's overall observed PQI-3 rate.

Among the Dual Eligible study group, African-Americans (796) and Hispanics (724) generated age-sex adjusted PQI-3 rates that were higher than Medi-Cal's overall observed PQI-3 rate. Whites (360) and the Other racial/ethnic cohort (208) generated age-sex adjusted PQI-3 rates that were lower than Medi-Cal's overall observed PQI-3 rate.

Figure PH-62: PQI-3 (Diabetes with Long-Term Complications) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population. The rate of the Other racial cohort in the Families study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

PQI-5 (COPD/Asthma among Adults Ages 40 and Older)

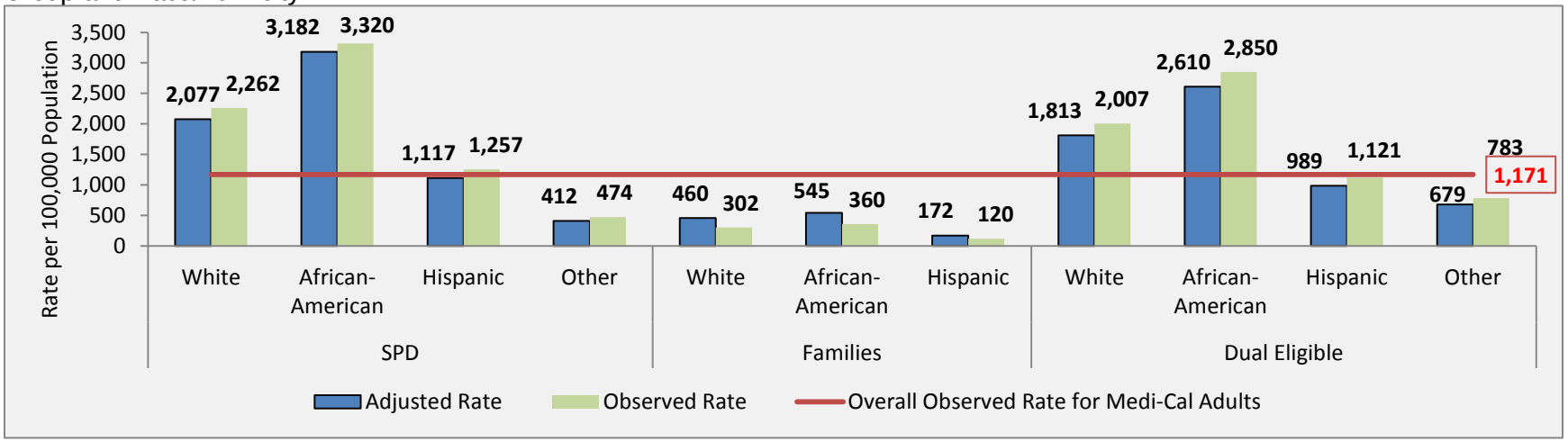
The overall observed rate of COPD/asthma among all individuals ages 40 and older certified eligible for Medi-Cal was 1,171 discharges per 100,000 population (Figure PH-63).

Among the SPD study group, African-Americans (3,182) produced an age-sex adjusted PQI-5 rate that was 2.7 times greater than Medi-Cal's overall observed PQI-5 rate. Whites (2,077) also generated an age-sex adjusted PQI-5 rate that was higher than Medi-Cal's overall observed PQI-5 rate. Hispanics (1,117) and the Other racial/ethnic cohort (412) produced age-sex adjusted PQI-5 rates that were lower than Medi-Cal's overall observed PQI-5 rate.

Among the Families study group, African-Americans (545), Whites (460), and Hispanics (172) all produced age-sex adjusted PQI-5 rates that were lower than Medi-Cal's overall observed PQI-5 rate.

Among the Dual Eligible study group, African-Americans (2,610) and Whites (1,813) produced age-adjusted PQI-5 rates that were higher than Medi-Cal's overall observed PQI-5 rate. Hispanics (989) and the Other racial/ethnic cohort (679) produced age-sex adjusted PQI-5 rates that were lower than Medi-Cal's overall observed PQI-5 rate.

Figure PH-63: PQI-5 (COPD/Asthma) Rates among Adult Certified Eligibles Ages 40 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population. The rate of the Other racial cohort in the Families study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

PQI-7 (Hypertension among Adults Ages 18 and Older)

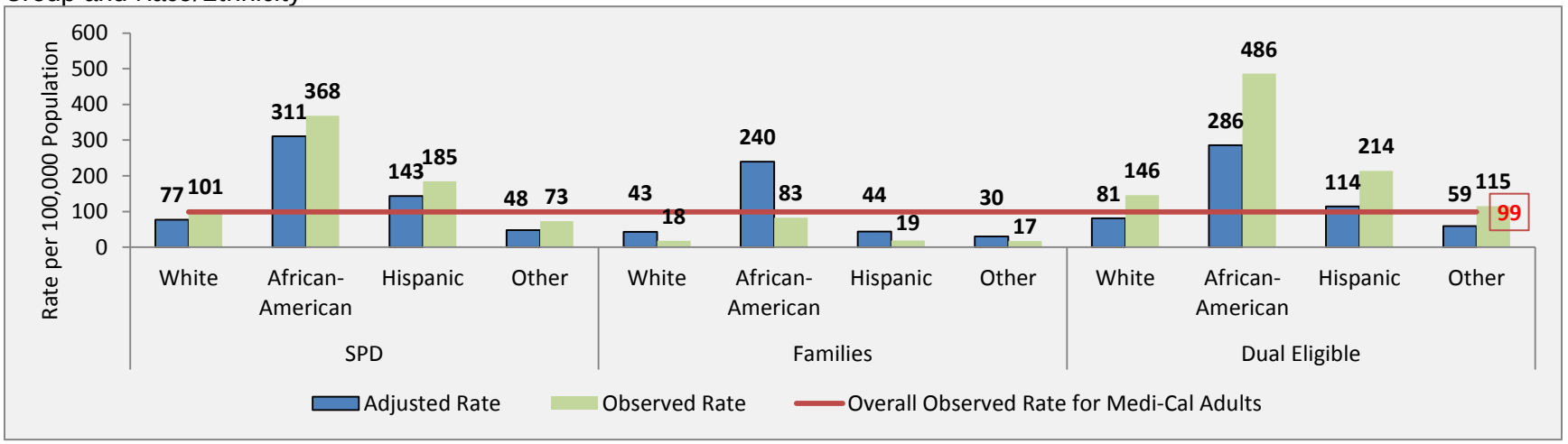
The overall observed rate of hypertension among all individuals ages 18 and older certified eligible for Medi-Cal was 99 discharges per 100,000 population (Figure PH-64).

Among the SPD study group, African-Americans (311) produced an age-sex adjusted PQI-7 rate that was roughly 3 times Medi-Cal's overall observed PQI-7 rate. Hispanics (143) also generated an age-sex adjusted PQI-7 rate that was higher than Medi-Cal's overall observed PQI-7 rate. Whites (77) and the Other racial/ethnic cohort (48) produced age-sex adjusted PQI-7 rates that were lower than Medi-Cal's overall observed PQI-7 rate.

Among the Families study group African-Americans (240) produced an age-sex adjusted PQI-7 rate that was higher than Medi-Cal's overall observed PQI-7 rate. Hispanics (44), Whites (43), and the Other racial/ethnic cohort (30) produced age-sex adjusted PQI-7 rates that were lower than Medi-Cal's overall observed PQI-7 rate.

Among the Dual Eligible study group, African-Americans (286) and Hispanics (114) generated age-sex adjusted PQI-7 rates that were higher than Medi-Cal's overall observed PQI-7 rate. Whites (81) and the Other racial/ethnic cohort (59) produced age-sex adjusted PQI-7 rates that were lower than Medi-Cal's overall observed PQI-7 rate.

Figure PH-64: PQI-7 (Hypertension) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

PQI-8 (Heart Failure among Adults Ages 18 and Older)

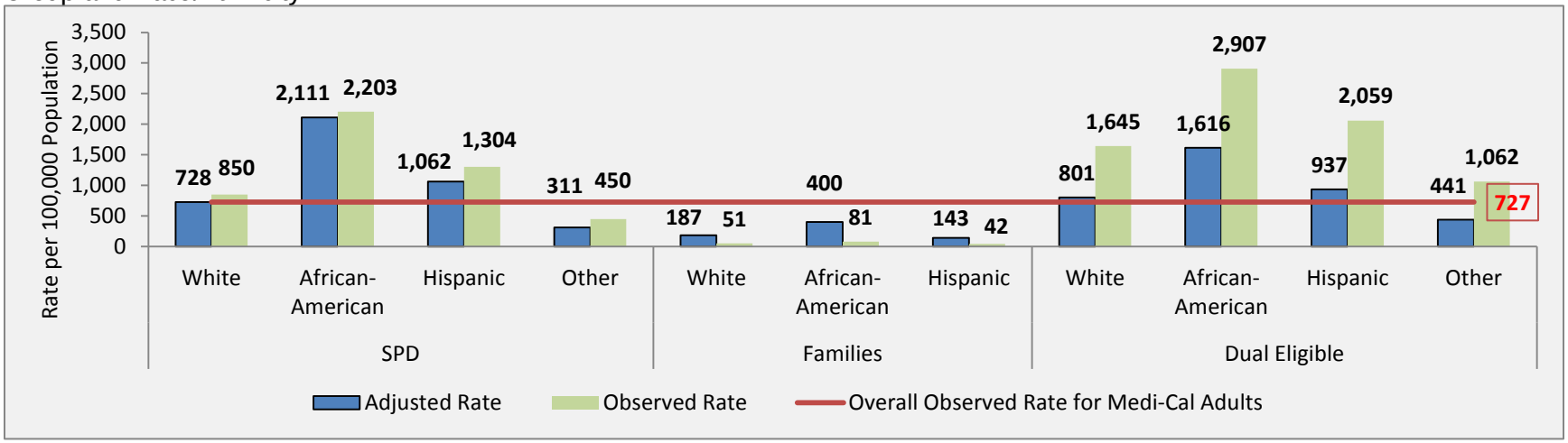
The overall observed rate of heart failure among all individuals ages 18 and older certified eligible for Medi-Cal was 727 discharges per 100,000 population (Figure PH-65).

Among the SPD study group, African-Americans (2,111) produced an age-sex adjusted PQI-8 rate that was roughly 2.9 times Medi-Cal's overall observed PQI-8 rate. Hispanics (1,062) and Whites (728) also generated age-sex adjusted PQI-8 rates that were higher than Medi-Cal's overall observed PQI-8 rate. The Other racial/ethnic cohort (311) produced an age-sex adjusted PQI-8 rate that was lower than Medi-Cal's overall observed PQI-8 rate.

Among the Families study group, African-Americans (400), Whites (187), and Hispanics (143) all produced age-sex adjusted PQI-8 rates that were lower than Medi-Cal's overall observed PQI-8 rate.

Among the Dual Eligible study group, African-Americans (1,616), Hispanics (937), and Whites (801) generated age-sex adjusted PQI-8 rates that were higher than Medi-Cal's overall observed PQI-8 rate. The Other racial/ethnic cohort (441) produced an age-sex adjusted PQI-8 rate that was lower than Medi-Cal's overall observed PQI-8 rate.

Figure PH-65: PQI-8 (Heart Failure) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population. The rate of the Other racial cohort in the Families study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

PQI-10 (Dehydration among Adults Ages 18 and Older)

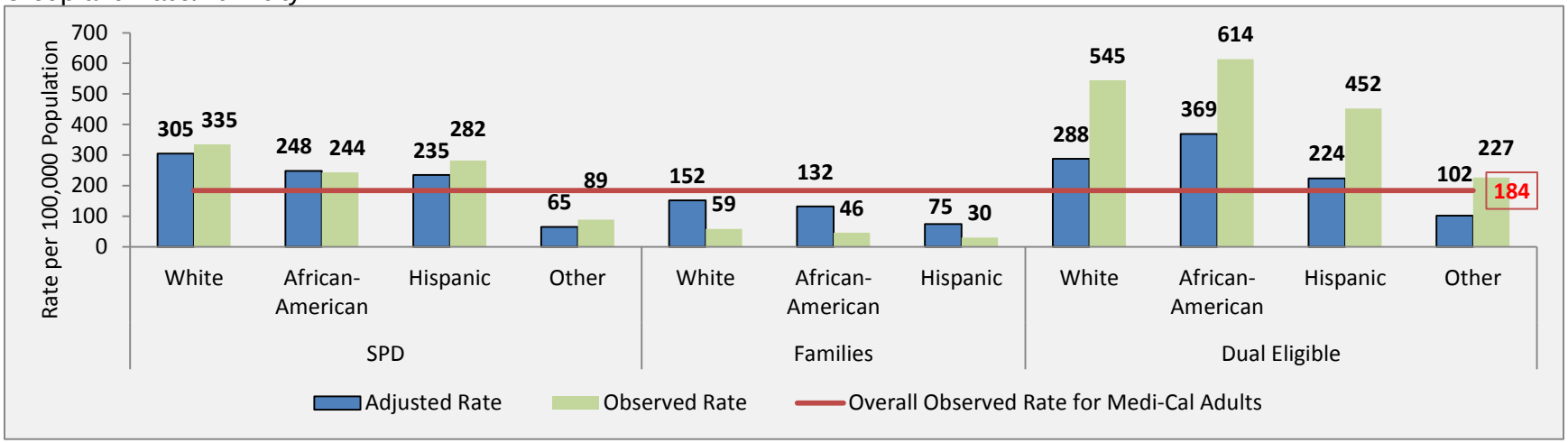
The overall observed rate of dehydration among all individuals ages 18 and older certified eligible for Medi-Cal was 184 discharges per 100,000 population (Figure PH-66).

Among the SPD study group, Whites (305), African-Americans (248), and Hispanics (235) produced age-sex adjusted PQI-10 rates that were higher than Medi-Cal's overall observed PQI-10 rate. The Other racial/ethnic cohort (65) produced an age-sex adjusted PQI-10 rate that was lower than Medi-Cal's overall observed PQI-10 rate.

Among the Families study group, Whites (152), African-Americans (132), and Hispanics (75) all produced age-sex adjusted PQI-10 rates that were lower than Medi-Cal's overall observed PQI-10 rate.

Among the Dual Eligible study group, African-Americans (369), Whites (228), and Hispanics (224) produced age-sex adjusted PQI-10 rates that were higher than Medi-Cal's overall PQI-10 observed rate. The Other racial/ethnic cohort (102) produced an age-sex adjusted PQI-10 rate that was lower than Medi-Cal's overall observed PQI-10 rate.

Figure PH-66: PQI-10 (Dehydration) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population. The rate of the Other racial cohort in the Families study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

PQI-11 (Bacterial Pneumonia among Adults Ages 18 and Older)

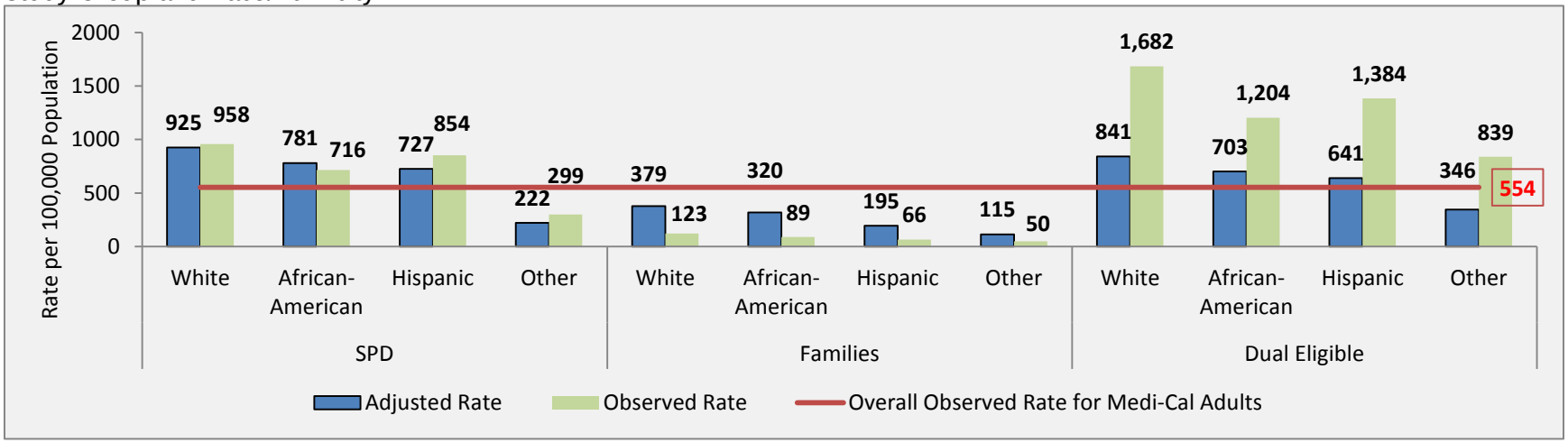
The overall observed rate of bacterial pneumonia among all individuals ages 18 and older certified eligible for Medi-Cal was 554 discharges per 100,000 population (Figure PH-67).

Among the SPD study group, Whites (925) produced an age-sex adjusted PQI-11 rate that was roughly 1.7 times Medi-Cal's overall observed PQI-11 rate. African-Americans (781) and Hispanics (727) also produced age-sex adjusted PQI-11 rates that were higher than Medi-Cal's overall observed PQI-11 rate. The Other racial/ethnic cohort (222) produced an age-sex adjusted PQI-11 rate that was lower than Medi-Cal's overall observed PQI-11 rate.

Among the Families study group, Whites (379), African-Americans (320), Hispanics (195), and the Other racial/ethnic cohort (115) all produced age-sex adjusted PQI-11 rates that were lower than Medi-Cal's overall observed PQI-11 rate.

Among the Dual Eligible study group, Whites (841), African-Americans (703), and Hispanics (641) produced age-sex adjusted PQI-11 rates that were higher than Medi-Cal's overall observed PQI-11 rate. The Other racial/ethnic cohort (346) produced an age-sex adjusted PQI-11 rate that was lower than Medi-Cal's overall observed PQI-11 rate.

Figure PH-67: PQI-11 (Bacterial Pneumonia) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

PQI-12 (Urinary Tract Infection among Adults Ages 18 and Older)

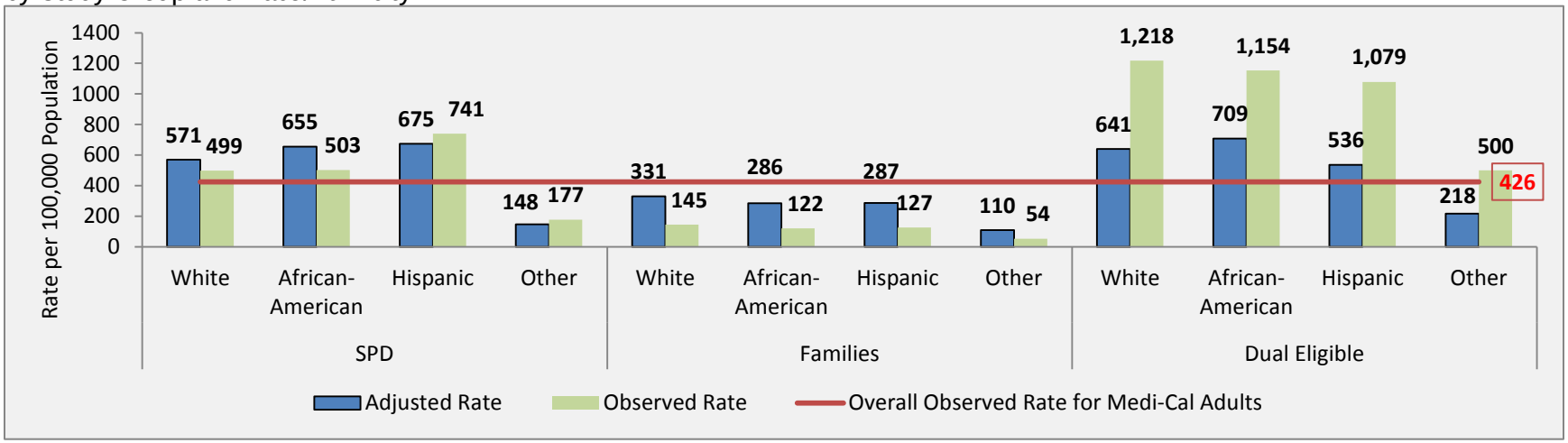
The overall observed rate of urinary tract infection among all individuals ages 18 and older certified eligible for Medi-Cal was 426 discharges per 100,000 population (Figure PH-68).

Among the SPD study group, Hispanics (675), African-Americans (655), and Whites (571) produced age-sex adjusted PQI-12 rates that were higher than Medi-Cal's overall observed PQI-12 rate. The Other racial/ethnic cohort (148) produced an age-sex adjusted PQI-12 rate that was lower than Medi-Cal's overall observed PQI-12 rate.

Among the Families study group, Whites (331), Hispanics (287), African-Americans (286), the Other racial/ethnic cohort (110) all produced age-sex adjusted PQI-12 rates that were lower than Medi-Cal's overall observed PQI-12 rate.

Among the Dual Eligible study group, African-Americans (709), Whites (641), and Hispanics (536) produced age-sex adjusted PQI-12 rates that were higher than Medi-Cal's overall observed PQI-12 rate. The Other racial/ethnic cohort (218) produced an age-sex adjusted PQI-12 rate that was lower than Medi-Cal's overall observed PQI-12 rate.

Figure PH-68: PQI-12 (Urinary Tract Infection) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

PQI-13 (Angina without Procedure among Adults Ages 18 and Older)

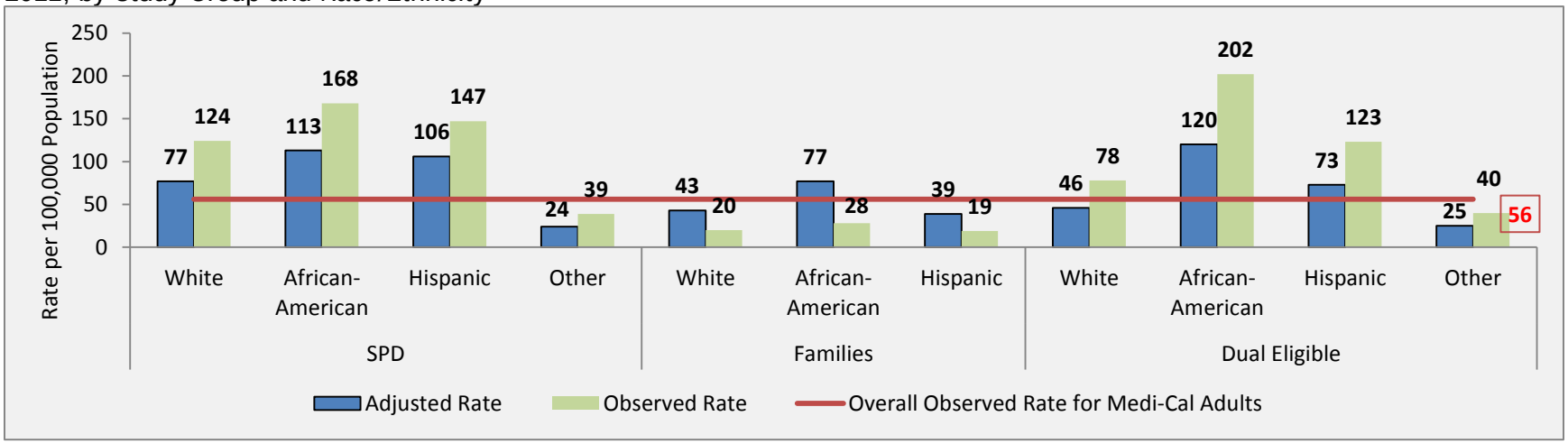
The overall observed rate of angina without procedure among all individuals ages 18 and older certified eligible for Medi-Cal was 56 discharges per 100,000 population (Figure PH-69).

Among the SPD study group, African-Americans (113) produced an age-sex adjusted PQI-13 rate that was twice Medi-Cal's overall observed PQI-13 rate. Hispanics (103) and Whites (77) also generated age-sex adjusted PQI-13 rates that were higher than Medi-Cal's overall observed PQI-13 rate. The Other racial/ethnic cohort (24) produced an age-sex adjusted PQI-13 rate that was lower than Medi-Cal's overall observed PQI-13 rate.

Among the Families study group, African-Americans (77) produced an age-sex adjusted PQI-13 rate that was higher than Medi-Cal's overall observed PQI-13 rate. Whites (43) and Hispanics (39) produced age-sex adjusted PQI-13 rates that were lower than Medi-Cal's overall observed PQI-13 rate.

Among the Dual Eligible study group, African-Americans (120) and Hispanics (106) generated age-sex adjusted PQI-13 rates that were higher than Medi-Cal's overall observed PQI-13 rate. Whites (46) and the Other racial/ethnic cohort (25) produced age-sex adjusted PQI-13 rates that were lower than Medi-Cal's overall observed PQI-13 rate.

Figure PH-69: PQI-13 (Angina without Procedure) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population. The rate of the Other racial cohort in the Families study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

PQI-14 (Uncontrolled Diabetes among Adults Ages 18 and Older)

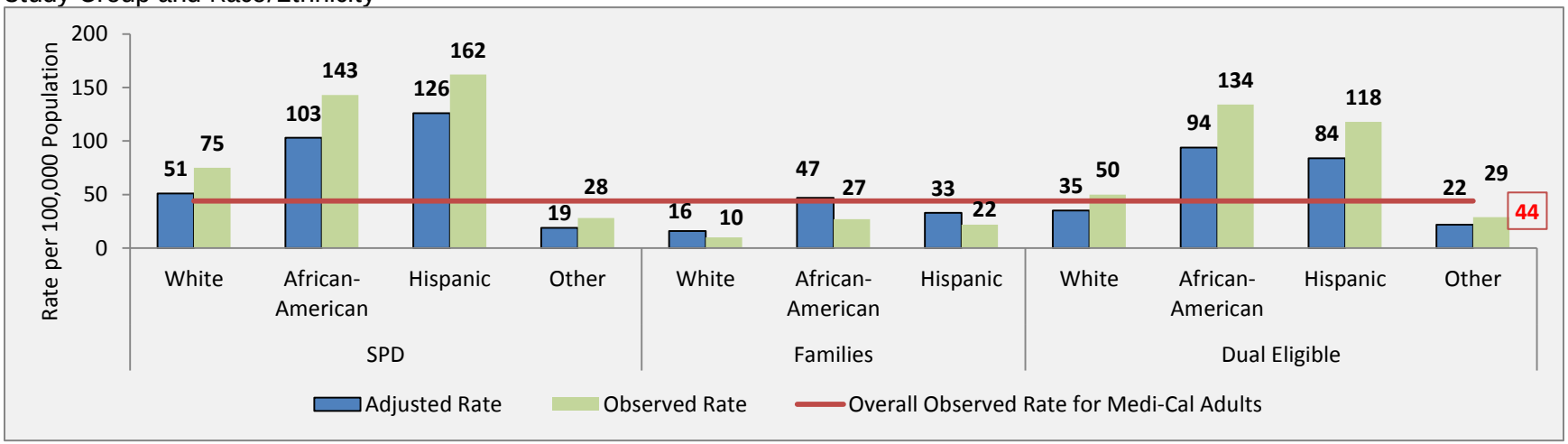
The overall observed rate of uncontrolled diabetes among all individuals ages 18 and older certified eligible for Medi-Cal was 44 discharges per 100,000 population (Figure PH-70).

Among the SPD study group, Hispanics (126) produced an age-sex adjusted PQI-14 rate that was 2.8 times Medi-Cal's overall observed PQI-14 rate. African-Americans (104) and Whites (51) also produced age-sex adjusted PQI-14 rates that were higher than Medi-Cal's overall observed PQI-14 rate. The Other racial/ethnic cohort (19) produced an age-sex adjusted PQI-14 rate that was lower than Medi-Cal's overall observed PQI-14 rate.

Among the Families study group African-Americans (47) generated an age-sex adjusted PQI-14 rate that was higher than Medi-Cal's overall observed PQI-14 rate. Hispanics (33) and Whites (16) generated age-sex adjusted PQI-14 rates that were lower than Medi-Cal's overall observed PQI-14 rate.

Among the Dual Eligible study group, African-Americans (94) and Hispanics (84) generated age-sex adjusted PQI-14 rates that were higher than Medi-Cal's overall observed PQI-14 rate. Whites (35) and the Other racial/ethnic cohort (22) generated age-sex adjusted PQI-14 rates that were lower than Medi-Cal's overall observed PQI-14 rate.

Figure PH-70: PQI-14 (Uncontrolled Diabetes) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population. The rate of the Other racial cohort in the Families study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

PQI-15 (Asthma in Adults Ages 18–39)

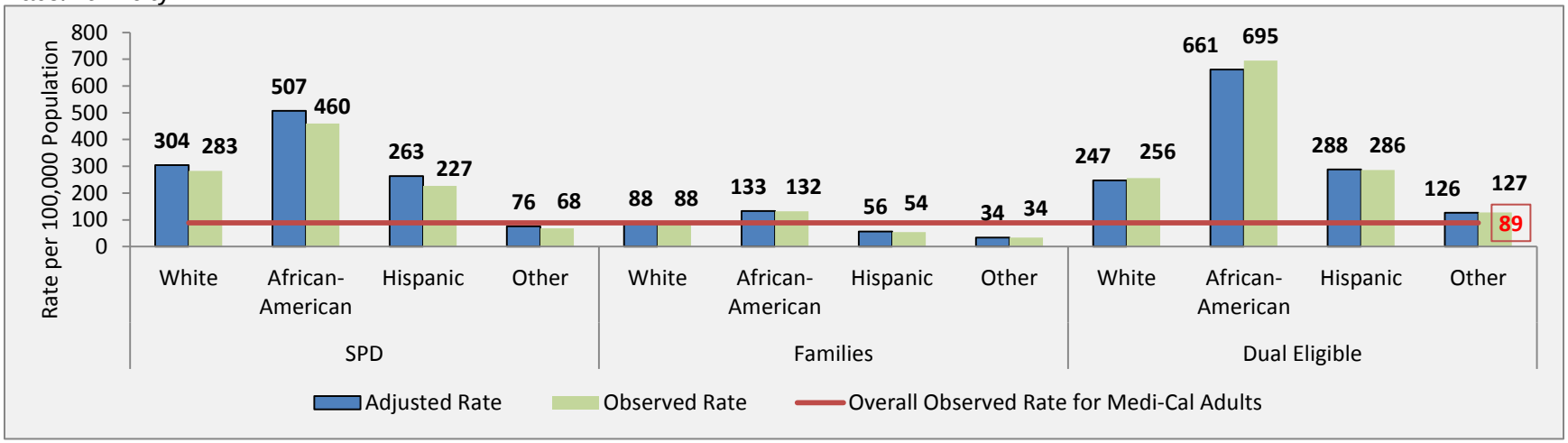
The overall observed rate of asthma among all individuals ages 18–39 certified eligible for Medi-Cal was 89 discharges per 100,000 population (Figure PH-71).

Among the SPD study group, African-Americans (507) produced an age-sex adjusted PQI-15 rate that was 5.7 times Medi-Cal's overall observed PQI-15 rate. Whites (304) and Hispanics (263) also generated age-sex adjusted PQI-15 rates that were higher than Medi-Cal's overall observed PQI-15 rate. The Other racial/ethnic cohort (76) produced an age-sex adjusted PQI-15 rate that was lower than Medi-Cal's overall observed PQI-15 rate.

Among the Families study group African-Americans (113) generated an age-sex adjusted PQI-15 rate that was higher than Medi-Cal's overall observed PQI-15 rate. Whites (88), Hispanics (56), and the Other racial/ethnic cohort (34) generated age-sex adjusted PQI-15 rates that were lower than Medi-Cal's overall observed PQI-15 rate.

Among the Dual Eligible study group, African-Americans (661), Hispanics (288), Whites (247), and the Other racial/ethnic cohort (126) all generated age-sex adjusted PQI-15 rates that were higher than Medi-Cal's overall observed PQI-15 rate.

Figure PH-71: PQI-15 (Asthma) Rates among Adult Certified Eligibles Ages 18–39 per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

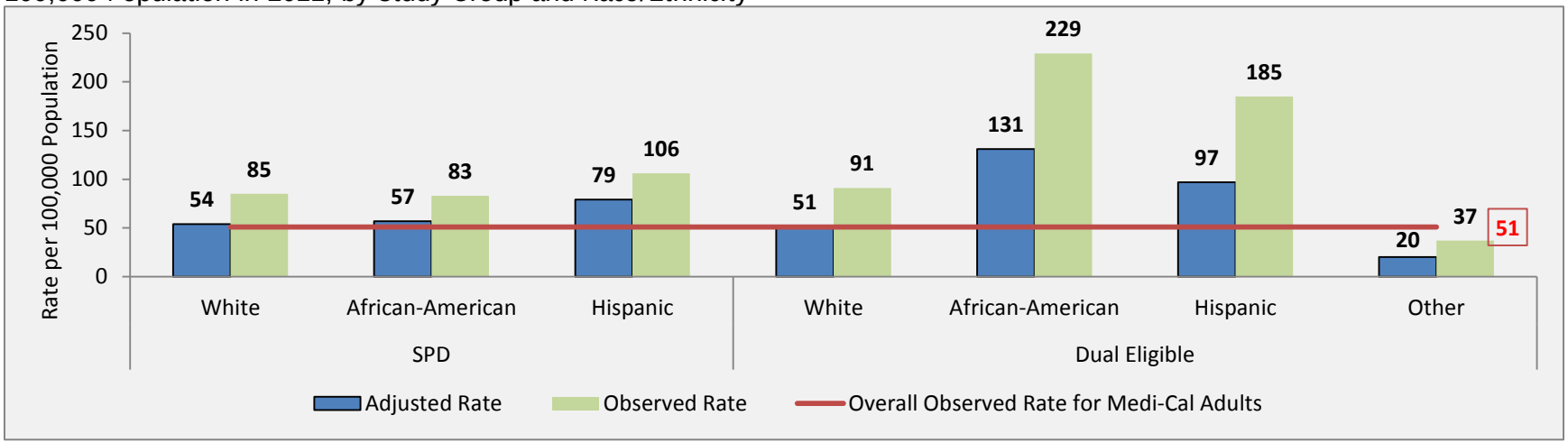
PQI-16 (Low-Extremity Amputation in Patients with Diabetes among Adults Ages 18 and Older)

The overall observed rate of low-extremity amputation in patients with diabetes among all individuals ages 18 and older certified eligible for Medi-Cal was 51 discharges per 100,000 population (Figure PH-72).

Among the SPD study group, Hispanics (79), African-Americans (57), and Whites (54) all produced age-sex adjusted PQI-16 rates that were higher than Medi-Cal's overall observed PQI-16 rate.

Among the Dual Eligible study group, African-Americans (131) and Hispanics (97) generated age-sex adjusted PQI-16 rates that were higher than Medi-Cal's overall observed PQI-16 rate. Whites (51) generated an age-sex adjusted PQI-16 rate that equal to Medi-Cal's overall observed PQI-16 rate. The Other racial/ethnic cohort (20) generated an age-sex adjusted PQI-16 rate that was lower than Medi-Cal's overall observed PQI-16 rate.

Figure PH-72: PQI-16 (Low-Extremity Amputation in Patients with Diabetes) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population. The rates of the Families study group, and the Other racial cohort in the SPD study group, had a relative standard error of greater than 30%, and were suppressed due to their statistical unreliability.

PQI-90 (Overall Composite among Adults Ages 18 and Older)

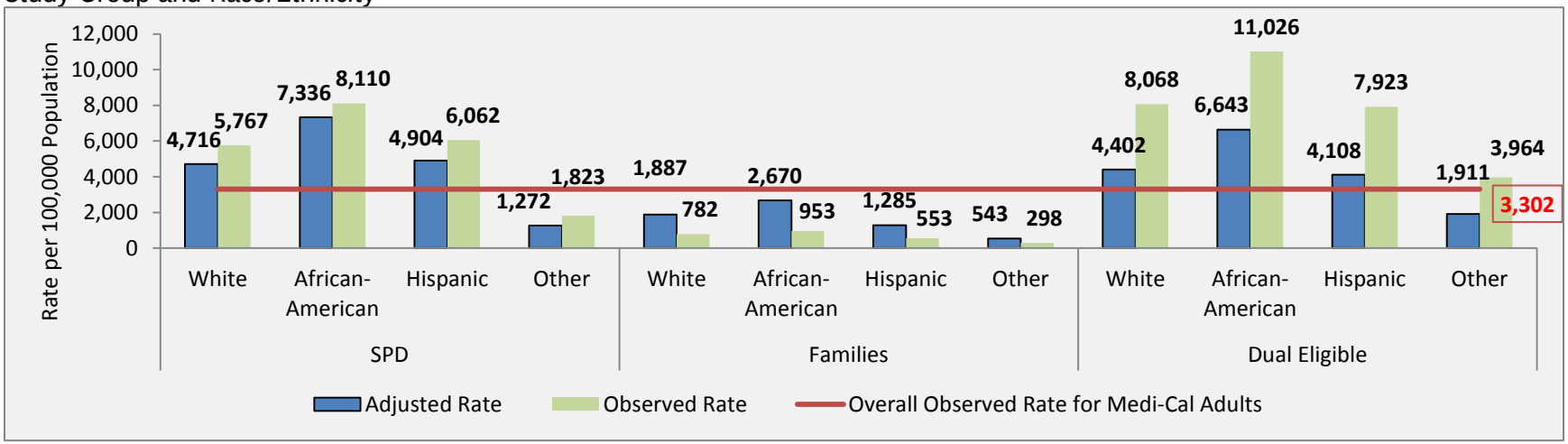
The overall observed Overall Composite rate among all individuals ages 18 and older certified eligible for Medi-Cal was 3,302 discharges per 100,000 population (Figure PH-73).

Among the SPD study group, African-Americans (7,336) produced an age-sex adjusted PQI-90 rate that was 2.2 times Medi-Cal's overall observed PQI-90 rate. Hispanics (4,904) and Whites (4,716) also generated age-sex adjusted PQI-90 rates that were higher than Medi-Cal's overall observed PQI-90 rate. The Other racial/ethnic cohort (1,911) produced an age-sex adjusted PQI-90 rate that was lower than Medi-Cal's overall observed PQI-90 rate.

Among the Families study group, African-Americans (2,670) generated an age-sex adjusted PQI-90 rate that was higher than Medi-Cal's overall observed PQI-90 rate. Whites (1,887), Hispanics (1,285), and the Other racial/ethnic cohort (543) generated age-sex adjusted PQI-90 rates that were lower than Medi-Cal's overall observed PQI-90 rate.

Among the Dual Eligible study group, African-Americans (6,643), Whites (4,402), and Hispanics (4,108) generated age-sex adjusted PQI-90 rates that were higher than Medi-Cal's overall observed PQI-90 rate. The Other racial/ethnic cohort (1,911) generated an age-sex adjusted PQI-90 rate that was lower than Medi-Cal's overall observed PQI-90 rate.

Figure PH-73: PQI-90 (Overall Composite) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

PQI-91 (Acute Composite among Adults Ages 18 and Older)

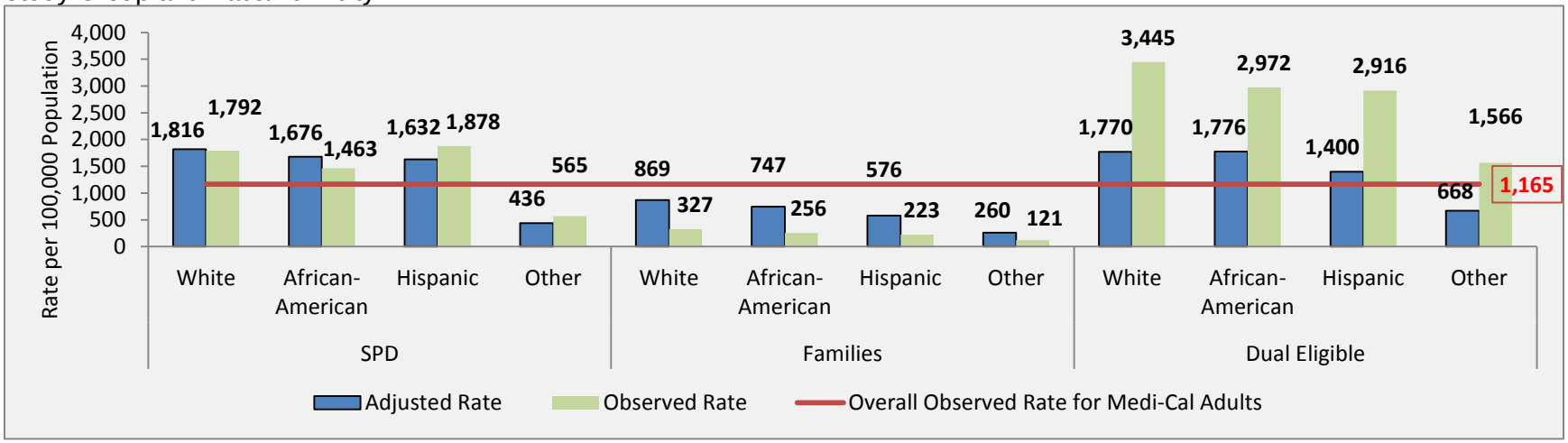
The overall observed Acute Composite rate among all individuals ages 18 and older certified eligible for Medi-Cal was 1,165 discharges per 100,000 population (Figure PH-74).

Among the SPD study group, Whites (1,816) produced an age-sex adjusted PQI-91 rate that was 1.5 times Medi-Cal's overall observed PQI-91 rate. African-Americans (1,676) and Hispanics (1,632) also produced age-sex adjusted PQI-91 rates that were higher than Medi-Cal's overall observed PQI-91 rate. The Other racial/ethnic cohort (436) produced an age-sex adjusted PQI-91 rate that was lower than Medi-Cal's overall observed PQI-91 rate.

Among the Families study group, Whites (869), African-Americans (747), Hispanics (576), and the Other racial/ethnic cohort (260) all generated age-sex adjusted PQI-91 rates that were higher than Medi-Cal's overall observed PQI-91 rate.

Among the Dual Eligible study group, African-Americans (1,776), Whites (1,770), and Hispanics (1,400) produced age-sex adjusted PQI-91 rates that were higher than Medi-Cal's overall observed PQI-91 rate. The Other racial/ethnic cohort (668) produced an age-sex adjusted PQI-91 rate that was lower than Medi-Cal's overall observed PQI-91 rate.

Figure PH-74: PQI-91 (Acute Composite) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

PQI-92 (Chronic Composite among Adults Ages 18 and Older)

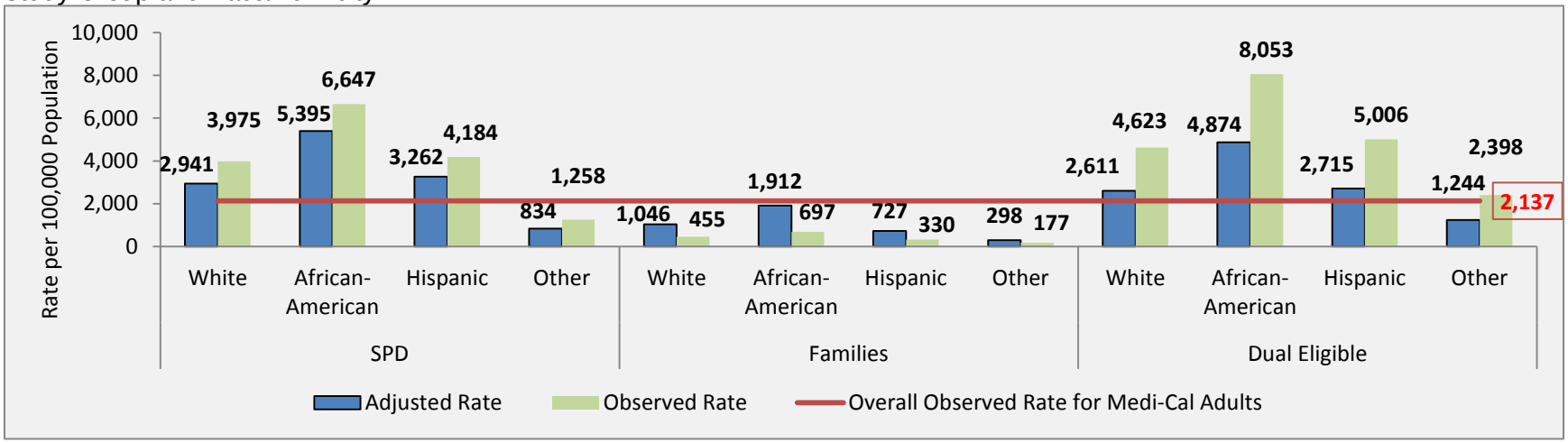
The overall observed Chronic Composite rate among all individuals ages 18 and older certified eligible for Medi-Cal was 2,137 discharges per 100,000 population (Figure PH-75).

Among the SPD study group, African-Americans (5,395) produced an age-sex adjusted PQI-92 rate that was 2.5 times Medi-Cal's overall observed PQI-92 rate. Hispanics (3,262) and Whites (2,941) also generated age-sex adjusted PQI-92 rates that were higher than Medi-Cal's overall observed PQI-92 rate. The Other racial/ethnic cohort (834) produced an age-sex adjusted PQI-92 rate that was lower than Medi-Cal's overall observed PQI-92 rate.

Among the Families study group, African-Americans (1,912), Whites (1,046), Hispanics (727), and the Other racial/ethnic cohort (298) all produced age-sex adjusted PQI-92 rates that were higher than Medi-Cal's overall observed PQI-92 rate.

Among the Dual Eligible study group, African-Americans (4,874), Hispanics (2,715), and Whites (2,611) generated age-sex adjusted PQI-92 rates that were higher than Medi-Cal's overall observed PQI-92 rate. The Other racial/ethnic cohort (1,244) produced an age-sex adjusted PQI-92 rate that was lower than Medi-Cal's overall observed PQI-92 rate.

Figure PH-75: PQI-92 (Chronic Composite) Rates among Adult Certified Eligibles Ages 18 and Older per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal adult population.

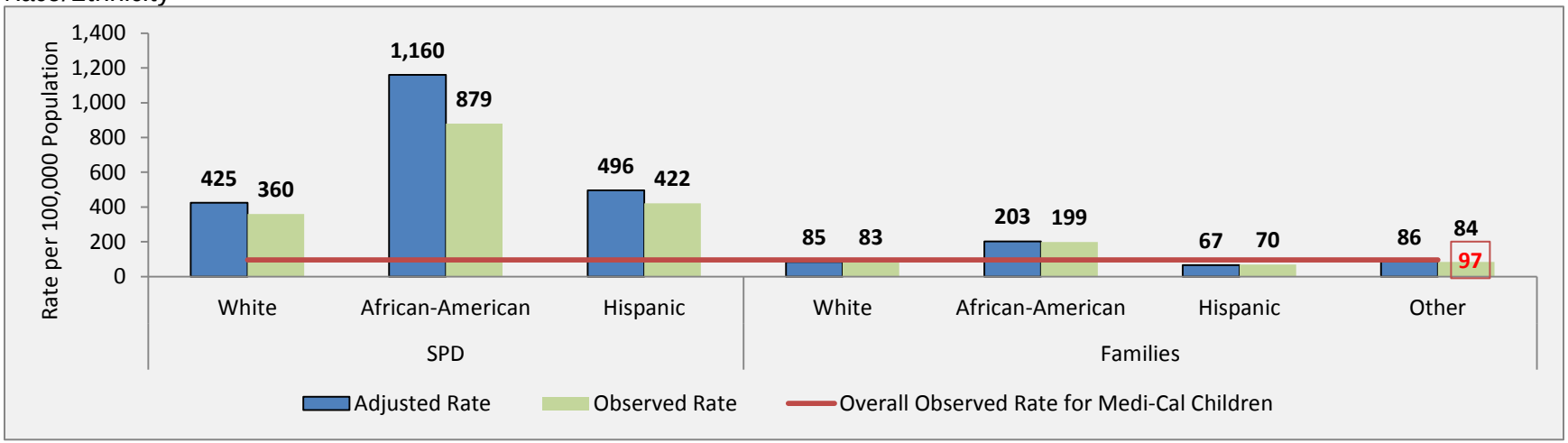
PDI-14 (Asthma among Children Ages 2–17)

The overall observed rate of asthma among all individuals ages 2–17 certified eligible for Medi-Cal was 97 discharges per 100,000 population (Figure PH-76).

Among the SPD study group, African-Americans (1,160) produced an age-sex adjusted PDI-14 rate that was nearly 12 times Medi-Cal's overall observed PDI-14 rate. Hispanics (496) and Whites (425) also generated age-sex adjusted PDI-14 rates that were higher than Medi-Cal's overall observed PDI-14 rate.

Among the Families study group, African-Americans (203) generated an age-sex adjusted PDI-14 rate that was higher than Medi-Cal's overall observed PDI-14 rate. The Other racial/ethnic cohort (86), Whites (85), and Hispanics (67) produced age-sex adjusted PDI-14 rates that were lower than Medi-Cal's overall observed PDI-14 rate.

Figure PH-76: PDI-14 (Asthma) Rates among Child Certified Eligibles Ages 2–17 per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 2–17. The rate of the Other racial cohort in the SPD study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

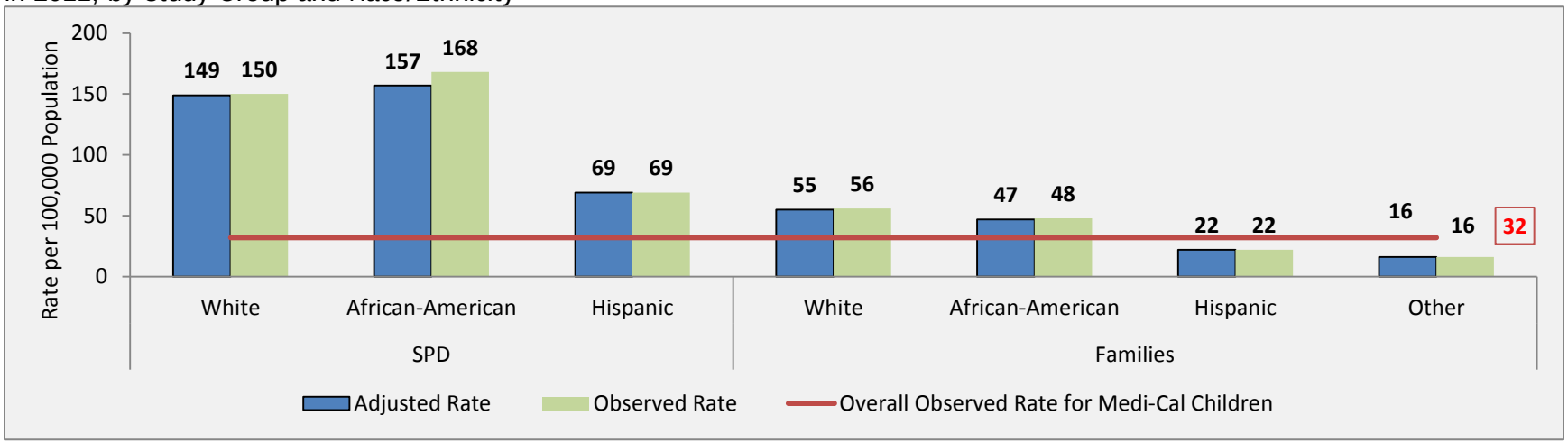
PDI-15 (Diabetes with Short-Term Complications among Children Ages 6–17)

The overall observed rate of diabetes with short-term complications among all individuals ages 6–17 certified eligible for Medi-Cal was 32 discharges per 100,000 population (Figure PH-77).

Among the SPD study group, African-Americans (157) produced an age-sex adjusted PDI-15 rate that was 4.9 times Medi-Cal's overall observed PDI-15 rate. Whites (149) and Hispanics (69) also generated age-sex adjusted PDI-15 rates that were higher than Medi-Cal's overall observed PDI-15 rate.

Among the Families study group, Whites (55) and African-Americans (47) produced age-sex adjusted PDI-15 rates that were higher than Medi-Cal's overall observed PDI-15 rate. Hispanics (22) and the Other racial/ethnic cohort (16) generated age-sex adjusted PDI-15 rates that were lower than Medi-Cal's overall observed PDI-15 rate.

Figure PH-77: PDI-15 (Diabetes with Short-Term Complications) Rates among Child Certified Eligibles Ages 6–17 per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17. The rate of the Other racial cohort in the SPD study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

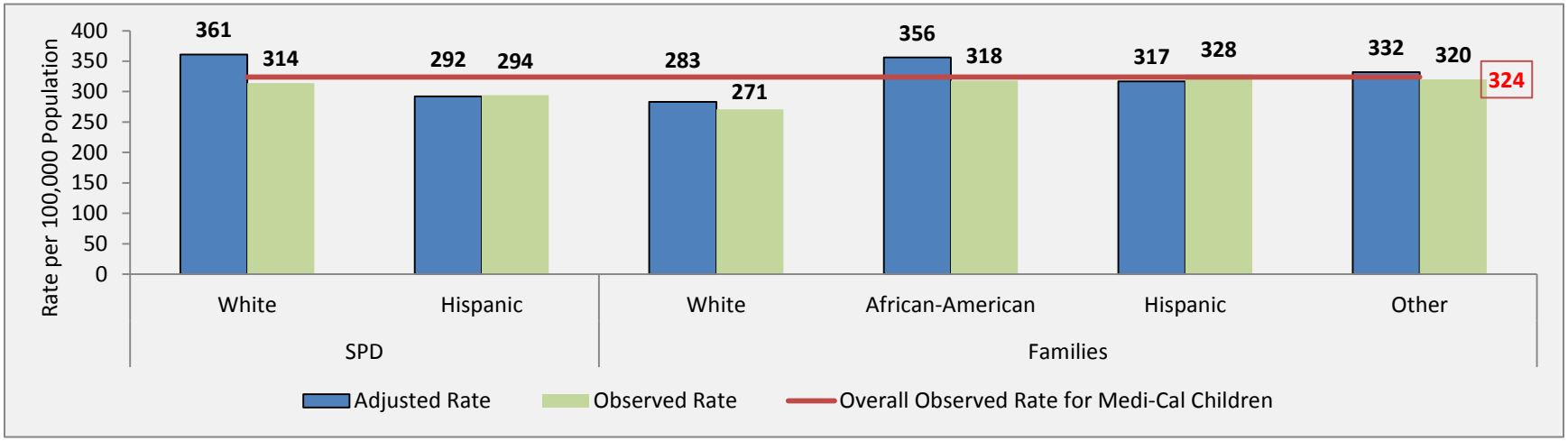
PDI-17 (Perforated Appendix among Children Ages 1–17)

The overall observed rate of perforated appendix among all individuals ages 1–17 certified eligible for Medi-Cal was 324 discharges per 1,000 appendicitis cases (Figure PH-78).

Among the SPD study group, Whites (361) produced an age-sex adjusted PDI-17 rate that was higher than Medi-Cal's overall observed PDI-17 rate. Hispanics (292) generated an age-sex adjusted PDI-17 rate that was lower than Medi-Cal's overall observed PDI-17 rate.

Among the Families study group, African-Americans (356) and the Other racial/ethnic cohort (332) produced age-sex adjusted PDI-17 rates that were higher than Medi-Cal's overall observed PDI-17 rate. Hispanics (317) and Whites (283) generated age-sex adjusted PDI-17 rates that were lower than Medi-Cal's overall observed PDI-17 rate.

Figure PH-78: PDI-17 (Perforated Appendix) Rates among Child Certified Eligibles Ages 1–17 per 1,000 Appendicitis Cases in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 1–17. The rates of the African-American and Other racial cohorts in the SPD study group had a relative standard error of greater than 30%, and were suppressed due to their statistical unreliability.

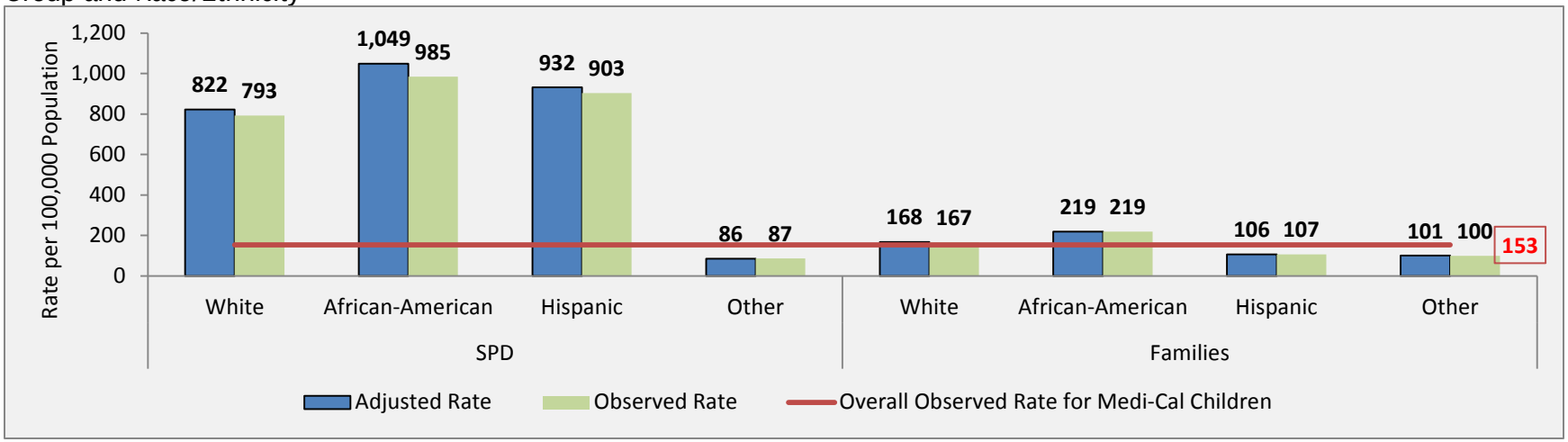
PDI-90 (Overall Composite among Children Ages 6–17)

The overall observed Overall Composite rate among all individuals ages 6–17 certified eligible for Medi-Cal was 153 discharges per 100,000 population (Figure PH-79).

Among the SPD study group, African-Americans (1,049) produced an age-sex adjusted PDI-90 rate that was 6.8 times Medi-Cal's overall observed PDI-90 rate. Hispanics (932) and Whites (822) also generated age-sex adjusted PDI-90 rates that were higher than Medi-Cal's overall observed PDI-15 rate. The Other racial/ethnic cohort (86) generated an age-sex adjusted PDI-90 rate that was lower than Medi-Cal's overall observed PDI-90 rate.

Among the Families study group, African-Americans (219) and Whites (168) produced age-sex adjusted PDI-90 rates that were higher than Medi-Cal's overall observed PDI-90 rate. Hispanics (106) and the Other racial/ethnic cohort (101) generated age-sex adjusted PDI-90 rates that were lower than Medi-Cal's overall observed PDI-90 rate.

Figure PH-79: PDI-90 (Overall Composite) Rates among Child Certified Eligibles Ages 6–17 per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17.

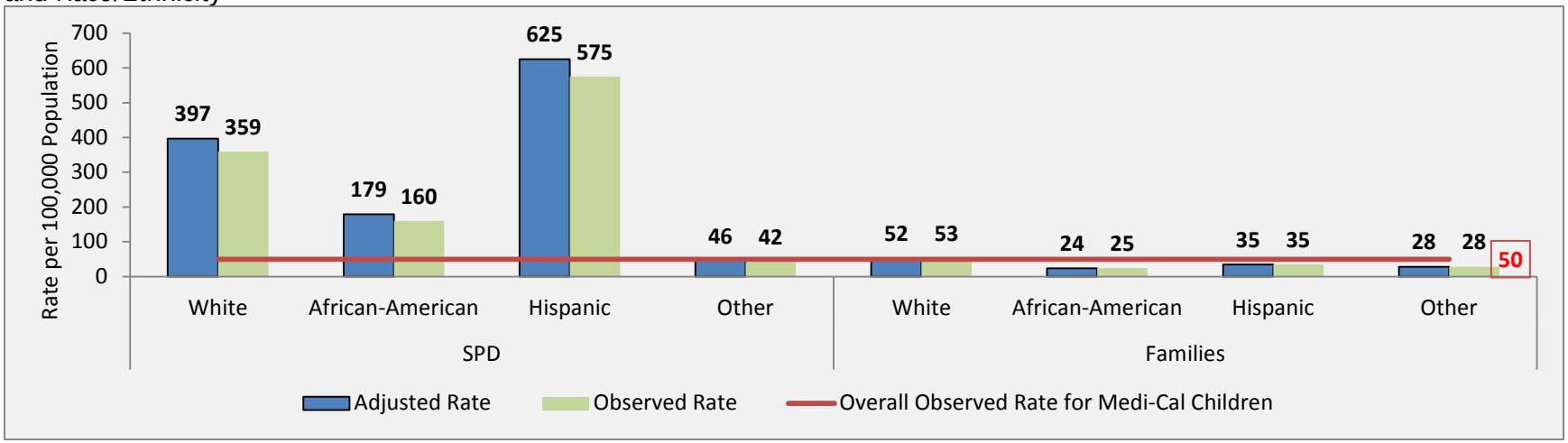
PDI-91 (Acute Composite among Children Ages 6–17)

The observed overall Acute Composite rate among all individuals ages 6–17 certified eligible for Medi-Cal was 50 discharges per 100,000 population (Figure PH-80).

Among the SPD study group, Hispanics (625) produced an age-sex adjusted PDI-91 rate that was 12 times Medi-Cal's overall observed PDI-91 rate. Whites (397) and African-Americans (179) also generated age-sex adjusted PDI-91 rates that were higher than Medi-Cal's overall observed PDI-91 rate. The Other racial/ethnic cohort (46) generated an age-sex adjusted PDI-91 rate that was lower than Medi-Cal's overall observed PDI-91 rate.

Among the Families study group, Whites (52) produced an age-sex adjusted PDI-91 rate that was higher than Medi-Cal's overall observed PDI-91 rate. Hispanics (35), African-Americans (24), and the Other racial/ethnic cohort (28) generated age-sex adjusted PDI-91 rates that were lower than Medi-Cal's overall observed PDI-91 rate.

Figure PH-80: PDI-91 (Acute Composite) Rates among Child Certified Eligibles Ages 6–17 per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17.

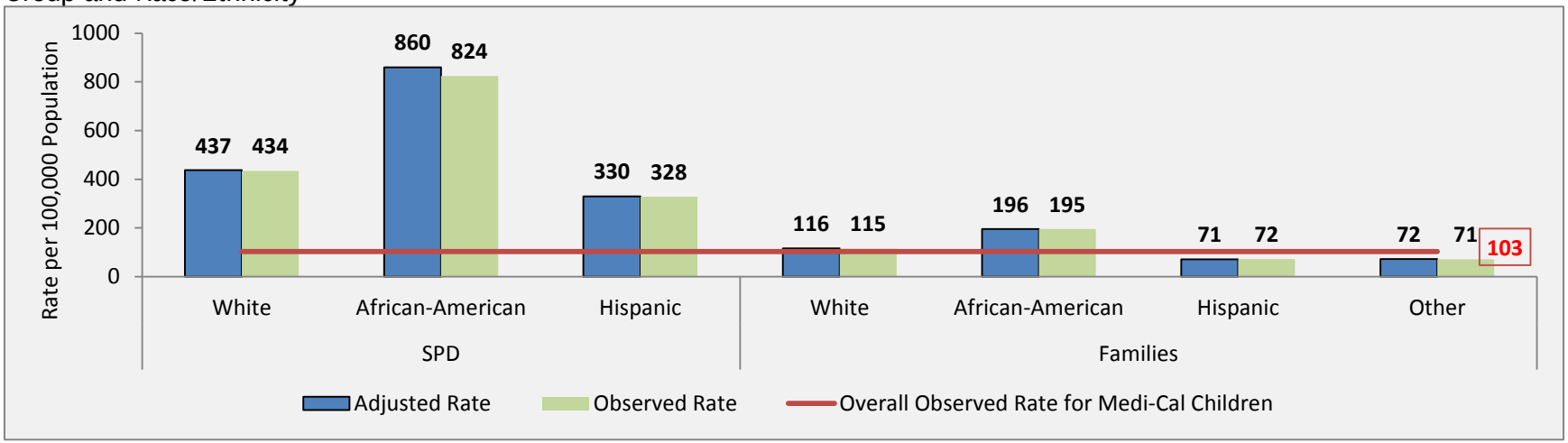
PDI-92 (Chronic Composite among Children Ages 6–17)

The overall observed Chronic Composite rate among all individuals ages 6–17 certified eligible for Medi-Cal was 103 discharges per 100,000 population (Figure PH-81).

Among the SPD study group, African-Americans (860) generated an age-sex adjusted PDI-92 rate that was eight times Medi-Cal's overall observed PDI-92 rate. Whites (437) and Hispanics (330) also generated age-sex adjusted PDI-92 rates that were higher than Medi-Cal's overall observed PDI-92 rate.

Among the Families study group, African-Americans (196) and Whites (116) produced age-sex adjusted PDI-92 rates that were higher than Medi-Cal's overall observed PDI-92 rate. The Other racial/ethnic cohort (72) and Hispanics (71) generated age-sex adjusted PDI-92 rates that were lower than Medi-Cal's overall observed PDI-92 rate.

Figure PH-81: PDI-92 (Chronic Composite) Rates among Child Certified Eligibles Ages 6–17 per 100,000 Population in 2011, by Study Group and Race/Ethnicity



Source: Created by DHCS Research and Analytic Studies Division using the 2011 OSHPD Patient Discharge Data file and information extracted from the Medi-Cal Eligibility Data System and claims/encounter datasets. Study group rates are age-sex adjusted to the total Medi-Cal child population ages 6–17. The rate of the Other racial cohort in the SPD study group had a relative standard error of greater than 30%, and was suppressed due to its statistical unreliability.

Glossary of Terms

Acute conditions – Medical conditions or diseases characterized by sudden onset and/or brief duration. These conditions include dehydration, bacterial pneumonia, and urinary tract infection.

Administrative data – Information collected by an organization for registration, transaction, and record-keeping purposes. Administrative data utilized in this study include Medi-Cal enrollment and paid claims data.

Agency for Healthcare Research and Quality (AHRQ) – U.S. government agency that functions as part of the Department of Health & Human Services to support research to help improve the quality of health care. In this study, AHRQ's Prevention Quality Indicators and Pediatric Quality Indicators were used to identify hospital discharges associated with ambulatory care sensitive conditions among California residents.

Age-sex adjusted rates – Rates that have been adjusted to control for the common confounding variables of age and sex. Age-sex adjustments can be utilized to more effectively compare results from populations with different age-sex demographic compositions. In this study, the observed rates of statewide and Medi-Cal populations were indirectly age-sex adjusted to a standard population.

Aid categories – Administrative groupings of Medi-Cal beneficiaries with similar administrative and clinical characteristics. Categories reflect the aid code(s) and eligibility pathway(s) through which individuals qualify for coverage under the Medi-Cal program. The primary aid categories used in this study are:

- **Dual Eligible** – Includes individuals who are eligible for both Medi-Cal and Medicare benefits on the basis of age and health/disability status, with Medi-Cal acting as secondary payer. Certified eligibles qualify for full-scope Medi-Cal coverage.
- **Families** – Includes primarily children and their adult parents or caretakers. Qualification is based on income and resources that fall below eligibility thresholds. Certified eligibles qualify for full-scope coverage.
- **Seniors and Persons with Disabilities (SPD)** – Includes aged and/or blind/disabled individuals who qualify on the basis of age, health/disability status, and/or a linkage to Supplemental Security Income. Certified eligibles qualify for full-scope coverage.
- **SOC/Retro/Other** – Includes individuals with a share-of-cost (SOC) obligation; retroactive eligibility; or other characteristics that exclude them from placement in another aid category. Individuals in this aid category have varying scopes of coverage.
- **Undocumented** – Includes beneficiaries lacking Satisfactory Immigration Status. Certified eligibles qualify for restricted-scope coverage which entitles them to emergency and pregnancy-related services only.

Ambulatory care – Health care delivered on an outpatient basis with no hospital admission.

Ambulatory care sensitive conditions (ACSCs) – Conditions for which timely and appropriate ambulatory care can potentially prevent the need for hospitalization, or for which early intervention can prevent complications or more severe disease.

California Health Interview Survey (CHIS) – The nation's largest state health survey derived from respondents' answers to standardized questions about their health care experiences. The CHIS covers

a wide range of health topics that give a detailed picture of the health status and health care needs of California's large and diverse population.

Certified eligibles – Individuals who have enrolled in Medi-Cal after being deemed qualified for coverage based on a valid eligibility determination. Enrolled individuals who have not met their monthly share-of-cost obligation are not counted as certified eligibles.

Chronic conditions – Medical conditions or diseases characterized by persistent symptoms that develop over time. These conditions include diabetes, chronic obstructive pulmonary disease (COPD)/asthma, hypertension, and heart failure.

Composites – Summary indicators that capture the general concept of potentially avoidable hospitalizations, and encompass all the individual indicators related to specific diseases and conditions. This study includes separate composite indicators for acute and chronic conditions, as well as overall composites that include both acute and chronic conditions.

Confidence intervals – Ranges above and below a measurement that convey how reliable the measurement is. Used to describe the variability and uncertainty around a point estimate.

Dual Eligible – See "Aid categories."

Eligible but not enrolled – Individuals who are eligible to receive health care coverage under the Medi-Cal program according to current enrollment requirements, but have not enrolled into the program.

Eligibility pathways – Laws, administrative rules, and/or policies which dictate how individuals are able to qualify for Medi-Cal benefits.

Families – See "Aid categories."

Federal Poverty Level (FPL) – Set minimum amount of gross income, according to family size, that a family needs for food, clothing, transportation, shelter, and other necessities. Determined annually by the U.S. Department of Health & Human Services, it is used to determine eligibility for certain programs and benefits.

Fee-for-Service (FFS) – Medi-Cal's "pay as you go" health care delivery system in which providers bill the program directly for individual services rendered to certified eligibles.

Full-scope benefits – Benefits which include all medically necessary services. Medi-Cal covers certain services by federal mandate, while others are optional benefits offered by the state.

Inpatient – Refers to services rendered to a patient at a hospital after they have been admitted overnight or have been transferred to another facility in the same day.

Medi-Cal managed care – Medi-Cal's health care delivery system where the state contracts with organizations that agree to provide all or most medically necessary services on a per-member per-month payment basis.

Medicaid – Joint federal and state means-tested program that helps qualifying low-income individuals and families pay for the costs of health care services.

Medi-Cal – California's version of Medicaid.

Medi-Cal Only – Denotes coverage for Medi-Cal but not Medicare, thus excluding certified eligibles in the Dual Eligible aid category.

Medicare – Federal program which provides health care coverage primarily to individuals ages 65 and older and certain younger individuals with disabilities.

Observed rates – Rates that relate crude/unadjusted data.

Office of Statewide Health Planning and Development (OSHPD) – State government agency whose duties include collecting data and disseminating information about the state's health care infrastructure; promoting an equitably distributed health care workforce; and publishing information about health care outcomes. In this study, patient discharge data from OSHPD was used with the Agency for Healthcare Quality and Research's Prevention Quality Indicators and Pediatric Quality Indicators to identify ambulatory care sensitive conditions among California residents.

Pediatric Quality Indicators (PDIs) – Set of measures that can be used with hospital inpatient discharge data to identify ambulatory care sensitive conditions among children and gauge the quality of ambulatory pediatric care.

Prevention Quality Indicators (PQIs) – Set of measures that can be used with hospital inpatient discharge data to identify ambulatory care sensitive conditions in adult populations and gauge the quality of preventative ambulatory care.

Restricted-scope benefits – Benefits which include a limited scope of services covering emergency and pregnancy-related services only; or services relating to a specific medical condition which qualified an individual for Medi-Cal coverage (e.g., cancer treatment for a beneficiary enrolled as part of the Breast and Cervical Cancer Treatment Program).

Retroactive eligibility – Eligibility granted to an individual which may cover services rendered for a period of up to three months prior to the individual's actual Medi-Cal enrollment.

Satisfactory Immigration Status (SIS) – Requirement for full-scope benefits which may be met by qualifying aliens and individuals who are permanently residing in the U.S. under color of law (PRUCOL).

Scope of benefits – Range of benefits to which individuals enrolled in Medi-Cal are entitled. Benefits may cover all medically necessary services, or may be restricted to include only certain types of health care services.

Seniors and Persons with Disabilities (SPD) – See "Aid categories."

Share of cost (SOC) – Predetermined cost amount that some beneficiaries must pay towards the reimbursement of rendered health care services before the Medi-Cal program covers the cost of any services.

Socioeconomic status (SES) – Combined economic and sociological measure of an individual's or family's economic and social position in relation to others. Metrics include income, occupation, health care coverage, educational attainment, race/ethnicity, and available resources.

SOC/Retro/Other – See "Aid categories."

Standard population – Demographic distributions – such as those relating to age and sex – from a given population that are used as weights to create standardized rates.

Study population – Group of individuals who share a common characteristic, such as age, sex, or health status. In this study, study populations' observed rates may be compared to one another. However, the indirectly age-sex adjusted rates presented in this study should be compared only to the observed rate of the standard population to which they were adjusted.

Supplemental Security Income (SSI) – Federal government program that provides stipends to low-income individuals who are either ages 65 and older, blind, or disabled.

Undocumented – See "Aid Categories."

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