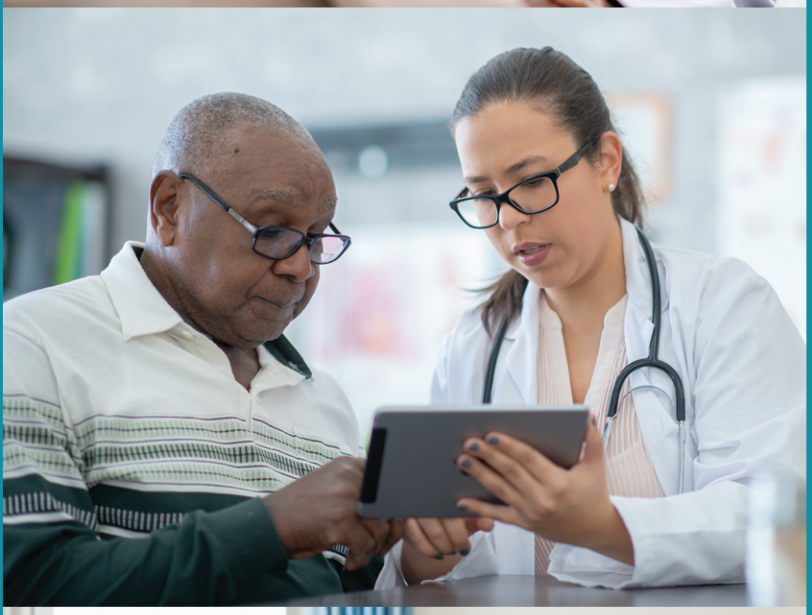
HCQA Health Care Quality Assessment



# Prevention Quality Indicators

## New Jersey 2020

Health Care Quality Assessment
Office of the Commissioner

May 2022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# Prevention Quality Indicators

## New Jersey, 2020


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# Executive Summary

The Office of Health Care Quality Assessment (HCQA) of the New Jersey Department of Health (Department) assesses health care quality using quantitative data reported mainly by hospitals to support performance monitoring related to patient care and safety. Specifically, HCQA produces consumer reports on cardiac surgery, hospital performance, hospital healthcare quality indicators; reviews confidential reports and root-cause analyses of reportable medical errors; and maintains several databases to support licensure requirements. To enrich the information the Department provides to the public on hospital care, HCQA staff routinely evaluate healthcare quality in the State by applying statistical tools developed by the Federal Agency for Healthcare Research and Quality (AHRQ) on the New Jersey hospital Discharge Data Collection System (NJDDCS) commonly known as UB data.

This report presents findings resulting from the application of a statistical tool known as the Prevention Quality Indicators (PQIs) module to the 2020 New Jersey inpatient hospital discharge data (or UB data). The module primarily calculates potentially preventable hospitalizations. Evidence has shown that early intervention to prevent complications and address exacerbations of ambulatory care-sensitive conditions, such as diabetes, chronic obstructive pulmonary disease (COPD), asthma, and congestive heart failure, through good primary care may prevent the need for hospitalization.

PQIs are a set of healthcare quality measures technically specified to identify, using UB data, ambulatory care sensitive conditions (ACSCs) or conditions for which hospitalization could be prevented with good outpatient care or for which early intervention could prevent complications or more severe diseases. PQIs measure outcomes of preventive care for both acute illnesses and chronic conditions, reflecting two important components of the quality of preventive care - effectiveness and timeliness. In short, the indicators identify hospital admissions in geographic areas that research suggests may have been avoided through access to high-quality outpatient care. PQIs are valuable tools that help flag potential health care quality problem areas that need further investigation.

The purpose of this report is to provide hospitals, community leaders, and policy makers with information that would help them identify community-level health care needs to target resources and track the impact of programmatic and policy interventions. The PQIs module facilitates such an effort, and has already been applied at the national level, in the National Healthcare Quality Report and the National Healthcare Disparities Report.

This report presents volume of preventable hospitalizations derived from the 2020 UB data in each of the 21 counties. Observed, expected and risk-adjusted rates along with their 95% confidence intervals for each of the 14 indicators are presented to help assess the quality of preventive health care in each county. Moreover, statewide and national estimates are provided for comparison purposes.

The 2020 PQI statistics show that there are substantial variations in hospitalizations rates by county. Some counties exhibit significantly higher hospitalization rates than others when compared to the statewide rates.

**Some Highlights:**

- Based on AHRQ's specifications of a 'preventable hospitalization', there were about 71,539 potentially preventable hospitalizations for treatment of medical conditions in NJ Hospitals, in 2020.
- Hospitalization cost estimates derived from application of the HCUP cost-to-charge ratio (CCR) estimators indicate that potentially avoidable hospitalizations on these conditions would have saved approximately 1.3 billion dollars ($1, 253,167,263) in 2020 if the 71,539 hospitalizations were avoided through better health care management (Table 14).
- The 2020 New Jersey data shows a substantial variation in preventable hospital admissions by county. The variations appear to markedly reflect the socio-economic disparities of the county populations, with more affluent counties having significantly lower rates than the statewide average, and the less affluent counties having significantly higher admission rates than the statewide rate (Figures 1 to 5).
- In 2020, there were 4,560 hospital admissions for diabetes with short-term complications in New Jersey for a statewide risk-adjusted rate of 66.5 per 100,000 population ages 18 and over. Hospital admission rates for diabetes with short-term complications in Atlantic, Camden, Cape May, Cumberland, Essex, Mercer, and Salem were statistically significantly higher than the statewide average. By comparison, hospitalization rates for Bergen, Gloucester, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Ocean, Somerset, and Sussex were statistically significantly lower than the statewide average (Table 1).
- Statewide, there were 9,869 preventable hospital admissions for Chronic Obstructive Pulmonary Disease (COPD) in 2020, for a risk-adjusted rate of 218.7 per 100,000 population ages 18 and over. Admission rates for COPD ranged from 83.8 per 100,000 in Morris County to 744.8 per 100,000 in Cumberland County (Table 3).
- Statewide, there were 3,719 preventable hospital admissions for hypertension treatment in 2020, for a risk-adjusted rate of 51.1 per 100,000 population ages 18 and older. Rates of hospital admission for hypertension ranged from a low of 21.5 per 100,000 in Bergen County to a high of 123.1 per 100,000 in Cumberland County (Table 4).

- Statewide, there were 25,316 preventable Heart Failure (HF) hospital admissions for a risk-adjusted average rate of 339.7 per 100,000 adults ages 18 or older. Six counties (Atlantic, Burlington, Camden, Cumberland, Essex, and Mercer) had significantly higher HF admission rates than the statewide rate. By comparison, nine counties (Bergen, Gloucester, Hunterdon, Middlesex, Monmouth, Morris, Somerset, Sussex, and Union) had rates that were significantly lower than the statewide HF admission rate (Table 5).

- Similar variations are observed on other PQIs among the 21 counties, which suggest that these indicators may be used as important baseline indicators to help examine determinants that led to variations in preventable hospital admissions.

- Table 13 displays New Jersey's hospitalization rates in comparison to the national benchmark data for the years 2018. Note that hospitalizations in 2020 are lower than previous years not necessarily due to healthcare improvements but possibly due to COVID-19. For most of 2020, hospitals were overwhelmed with COVID-19 patients making it difficult for other patients to get space in hospitals. By the same token, customers were reluctant in taking their loved ones to hospitals due to fear from COVID-19 infections as well as the strict lockdown environment at the time.

# Introduction

The Office of Health Care Quality Assessment (HCQA) of the New Jersey Department of Health (Department) assesses health care quality using quantitative data reported mainly by hospitals to support performance monitoring related to patient care and safety. Specifically, HCQA produces consumer reports on cardiac surgery, hospital performance, hospital quality indicators; reviews confidential reports and root-cause analyses of reportable medical errors; and maintains several databases to support licensure requirements. In an effort to enhance the information that the Department provides to the public on hospital care, HCQA staff routinely apply statistical tools developed by the Federal Agency for Healthcare Research and Quality (AHRQ) on the New Jersey hospital discharge data commonly known as Uniform Billing (UB) data.

The AHRQ Quality Indicators (QIs) are a set of quality indicators organized into four modules, each of which measures quality associated, by and large, with patient care in an outpatient or inpatient settings. These four modules are: Prevention Quality Indicators (PQIs); Inpatient Quality Indicators (IQIs); Patient Safety Indicators (PSIs); and Pediatric Quality Indicators (PDIs). Background information on the development of these modules and the primary purpose they are designed to serve can be found at: http://qualityindicators.ahrq.gov/. It is important to note that the modules are regularly updated with new and enhanced information in order to improve the reliability of the quality indicators.

This report presents findings from the application of the latest Prevention Quality Indicator (PQI) module (Version 2021) to the 2020 New Jersey UB data. The report is organized into sections. The description of the Prevention Quality Indicators Module, Interpretation of the PQI Measures including definitions of individual indicators presented in subsequent sections are, for the most part, excerpted from AHRQ's Guide and Software Documentation to Prevention Quality Indicators. These sources are provided in the reference section. The PQI report also serves as a supplement to the Department's (i.e., HCQA) other quality indicator reports such as the Inpatient Quality Indicators Report, Patient Safety Indicators Report, the Hospital Performance Report, the Cardiac Surgery Report, and the Patient Safety Reporting System Summary Report.

The 2020 New Jersey data shows that there are substantial variations in potentially preventable hospital admission rates by county. Some counties exhibit significantly higher rates (i.e., hospital admission rates) than the corresponding statewide rates while others have significantly lower rates.

# The Prevention Quality Indicators (PQIs) Module

The Prevention Quality Indicators (PQIs) are a set of measures that can be used with hospital inpatient discharge data to identify "ambulatory care sensitive conditions"

(ACSCs). ACSCs are conditions for which good outpatient-care can potentially prevent the need for hospitalization, or for which early intervention can prevent complications or more severe diseases. The PQIs are of most interest to comprehensive health care delivery systems, such as health maintenance organizations (HMOs), or public health agencies.

Although other factors outside the direct control of the health care system, such as poor environmental conditions or lack of patient adherence to treatment recommendations can result in hospitalization, PQIs provide a good starting point for assessing quality of health services in the community. Because PQIs are calculated using readily available hospital administrative data, they provide an easy-to-use and inexpensive regional screening tool. They can be used to provide a window into the community - to identify unmet community healthcare needs, to monitor how well complications from some common diseases are being avoided in the outpatient setting, and to compare performance of local healthcare systems across communities.

These indicators measure outcomes of preventive care for both acute illnesses and chronic conditions, reflecting two important components of the quality of preventive care - effectiveness and timeliness. For example, with effective drug therapy in the outpatient setting, hospital admissions for hypertension can be prevented. Likewise, accurate diagnosis and timely access to asthma treatment will help reduce the incidence of COPD hospitalizations. Thus, the PQI module, which focuses on preventive care services, represents the current state of the art in assessing quality of health services in local communities using inpatient discharge data. It is a valuable tool for identifying potential health care quality problems in outpatient care so that they get timely attention for a more in-depth investigation.

PQIs are used to assess the quality of a health care system as a whole, and especially the quality of ambulatory care, in preventing medical complications. That is why these measures are of greater value when reported at the population level. Such information is valuable for public health groups, state data organizations, and others concerned with community-wide health problems. Most importantly, policy makers and health care providers can use PQIs to answer questions such as: Does the admission rate for diabetes complications in my community suggest a problem in the provision of appropriate outpatient care to this population? How does the admission rate for heart failure vary over time and from one county to another?

Both researchers and policy makers agree that UB data offer useful information on the quality of preventive care in the community. The goal is for hospitals, community leaders, and policy makers to use such readily available data to identify community-level health care needs, target resources, and track the impact of programmatic and policy interventions. The PQI module is intended to facilitate such an effort, and has already been applied, at the national level, in the National Healthcare Quality Report and National Healthcare Disparities Report.

The PQIs consist of the following 14 indicators that measure hospital admissions for ambulatory care sensitive conditions (ACSC) across geographic areas. AHRQ developed

these indicators after a comprehensive literature review, analysis of the International Classification of Diseases, 9th Revision, Clinical Modification, (ICD-09-CM) codes, review by a clinician panel, implementation of risk adjustment, and empirical analyses. It should be noted at this juncture that the latest PQIs module (Version 2021) is based on the latest International Classification of Diseases Codes (i.e., ICD-10-CM Diagnosis & Procedure Codes). Here are the 14 PQIs included in latest version of the module.

- Diabetes Short-term Complications Admission Rate (PQI.01)
- Diabetes Long-term Complications Admission Rate (PQI.03)
- Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults (PQI.05)
- Hypertension Admission Rate (PQI.07)
- Heart Failure (HF) Admission Rate (PQI.08)
- Community Acquired Pneumonia Admission Rate (PQI.11)
- Urinary Tract Infection Admission Rate (PQI.12)
- Uncontrolled Diabetes Admission Rate (PQI.14)
- Asthma in Younger Adults Admission Rate (PQI.15)
- Lower-extremity Amputation Among Patients with Diabetes Rate (PQI.16)
- Composite - Overall PQIs (PQI.90)
- Composite - Acute PQIs (PQI.91)
- Composite - Chronic PQIs (PQI.92)
- Composite - Diabetes PQIs (PQI.93)

The PQIs Software produces county-level volume of admissions, observed, expected, and risk-adjusted rates for each of the 14 indicators. This report presents the volume of hospital admissions in a county along with the observed, expected, and risk-adjusted rates generated by Version 2021 of the AHRQ's SAS Software program. Interpretations and guidelines on when to use the observed, expected, and risk adjusted rates as well as composite scores are discussed below. At the outset, however, it should be clear that there are no "right or perfect hospital admission rates" for these conditions. 'Very low' rates could signal inappropriate underutilization of health care resources while 'Very high' rates could indicate potential overuse of hospital care. Therefore, hospital admission for ACSCs is not a measure of hospital quality but a potential indicator of outpatient and community health care needs at the county level. For example, if an area has a relatively high hospital admission rate for diabetes complications, local health care providers should work with the community to identify reasons and strategies to address the problem.

## *Observed and expected rates*

The *observed rate, which is defined as* the number of events of interest (numerator) divided by the population at risk (denominator), is the raw rate generated by the Software from the data under analysis. In other words, observed rates are the number of hospitalizations for the condition of interest divided by the number of individuals who live in that area who are at risk for the condition. The population at risk (the denominator for calculating a PQI rate) is derived from census population figures defined by county. The

***observed rate*** is primarily used to help identify cases for further follow-up and quality improvement. Counties or communities needing improvement can be identified by the magnitude of the observed rate by comparing the rate to available benchmarks and/or by the number of patients impacted. In this case, the national and statewide rates would be benchmarks for comparison.

Another approach to identify areas that need more attention for focus is to compare the *observed and expected rates*. The ***expected rate*** is the rate the county would have if it had the same patient case-mix (i.e., by age, gender, DRG, and comorbidity categories) as the reference population. It is the rate that would be predicted if the expected level of care observed in the reference population (national database) and estimated with risk-adjustment regression models were applied to the mix of patients with demographic and comorbidity distributions observed in the Statewide dataset. The expected rate answers the question, "What rate of hospitalization for a given indicator would we expect to see if this area/county has provided the average level of care observed in the reference population?". In short, expected rates are predicted for each area using risk-adjustment model coefficients that summarize the age and sex distribution of the area's population and optionally, the poverty decile within which the area's poverty rate falls.

When the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than expected for that specific indicator. And when the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population.

## *Risk-adjusted rates*

Risk-adjusted rates are derived from applying to the observed rates, the average case-mix of a baseline data called State Inpatient Data (SID) that represents national average patient mix for that year. Healthcare Cost & Utilization Project (HCUP) compiles and provides the SID dataset to users at no cost. the County-level risk-adjusted admission rates reflect the age, sex, DRG, and comorbidity distribution of the data in the baseline file rather than the distributions of patients in the user's data. The risk-adjusted rate is the rate the county would have if it had the same patient case-mix as the reference population. Alternatively, a risk-adjusted rate is defined as the estimated performance of a county on the PQI assuming that the county has the case-mix of the reference population.

Thus, risk-adjusted rate is a comparative rate that incorporates information about the observed rate, expected rate, and a reference population that is not part of the input dataset. The risk adjusted rate is the ratio of the observed rate and expected rate multiplied by the reference population observed rate. Therefore, it answers the same question as the ratio of the observed and expected: "How does the rate of hospitalization for this area or county compare with the rate we would expect to see if it has provided the average level of care observed in the reference population?" If a county's risk-adjusted rate for a given indicator is significantly higher than the reference rate (i.e., statewide

average rate), then the county is performing worse than the statewide average in its community level achievement of preventable hospitalizations. In short, readers may use the statewide risk-adjusted rate as a benchmark to compare county-level risk-adjusted admission rates. The PQI module contains an option to incorporate a poverty variable, defined as the percent of the population under the federal poverty line for each area. County level poverty data is obtained from the U.S. Census Small Area Income and Poverty Estimates. According to AHRQ, all U.S. counties are assigned to a poverty decile (POVCAT) based on these data (i.e., Census income and poverty data); and if the option is applied, then risk model coefficients are calculated for each poverty decile implying that, for all area-level QI indicators, the risk factors used in risk adjustment are age, sex, and poverty.

### *Composite scores*

The composite QI scores combine information from multiple component QIs into a single summary index. There are two different methods used to construct composites in the AHRQ QI software. **Area-level** QI composites include PQIs 90, 91, 92, and 93 and PDIs 90, 91, and 92. The numerator of the composites is the sum (unweighted) of all hospital stays for the composite conditions of interest. A consistent denominator is used (e.g., population of adults 18 years and older) in calculating PQIs rates.

## Interpretation of PQI Measures

- Prevention Quality Indicators are not intended to be used as definitive quality measures. But they are useful, low-cost measures that can potentially illuminate differences across geographic areas that hospitals serve by assessing hospital admission rates for ambulatory care sensitive conditions (ACSC).

- Performance on a single PQI often cannot reliably show actual quality differences. For this reason, some indicators have been developed as **measure sets**. For instance, four indicators are related to diabetes – *uncontrolled diabetes, diabetes short-term complications, diabetes long-term complications, and lower-extremity amputation among patients with diabetes*. Examining these indicators together is likely to produce a more complete picture of overall quality of care for this condition. It is in realization of this fact that AHRQ developed a new indicator named Diabetes Composite (PQI.93) in the later versions.

- Since there are no "*right or perfect admission rates"* established for most indicators, it is often better to compare county-level rates with other similar areas. These "peer groups" would ideally be as similar as possible in potentially important factors, such as socioeconomic status of the population, and urban or rural location. However, the most commonly applied approach, is to compare a county's risk-adjusted rate with the statewide risk-adjusted rate.

- A county's performance is measured by comparing its confidence interval to the statewide risk-adjusted rate to see if the 95% confidence interval for its risk-adjusted estimate contains within its lower and upper limits, the statewide risk-adjusted estimate for a given indicator.

    - If a county's confidence interval for its rate contains the statewide risk-adjusted rate, then the county's risk-adjusted rate is not statistically significantly different from the statewide rate.

    - If a county's confidence interval for its rate falls entirely below the statewide risk-adjusted rate, then the county's risk-adjusted rate is significantly lower than the statewide rate. In the tables, these rates are marked by single asterisk (*). Note that lower rates imply better performance.

    - If a county's confidence interval falls entirely above the statewide risk-adjusted rate, then the county's risk-adjusted rate is significantly higher than the statewide rate. In the tables, these rates are marked by double asterisks (**).

- This report is only a guide for consumers and should not be used by itself to draw a conclusion about a county's overall performance in population health.

- Readers can also compare a county's *risk-adjusted rate* with its own *observed and expected rates*. The difference will indicate the impact of risk-adjustment or the impact of differences in case-mix on the indicator.

- It should be noted that lower rates (*) imply better performance while higher rates (**) imply worse performance – rates being measures of avoidable hospitalizations by keeping good community level healthcare quality.

## Strengths and Limitations of PQIs

- Even though these indicators are based on hospital inpatient data, they provide insight into the quality of the health care system *outside* the hospital setting. Patients with diabetes may be hospitalized for diabetic complications if their conditions are not adequately monitored or if they do not receive the patient education needed for appropriate self-management. Patients may be hospitalized for asthma if primary care providers fail to adhere to practice guidelines or to prescribe appropriate treatments. Patients with long-term diabetes and poor foot care who do not have proper and continued treatment and glucose control may end up having to go for lower-extremity amputation. Thus, the PQIs are measures of the impact of preventive care for both acute illnesses and chronic conditions, reflecting two important components of the quality of preventive care - effectiveness and timeliness. In short, the PQI module is a valuable tool to help

flag potential health care quality problem areas that need further investigation. Moreover, the indicators can provide a quick check on access to health care or outpatient services in a community by using patient data found in a typical hospital discharge abstract.

- Despite the strengths, however, there are several issues that should be considered when using these indicators. For some PQIs, differences in socioeconomic status have been shown to explain a substantial part of the variation in rates across counties. The complexity of the relationship between socioeconomic status and PQI rates makes it difficult to delineate how much of the observed relationships are due to true access to care in potentially underserved populations, or due to other patient characteristics, unrelated to quality of care. In addition, environmental conditions that are not under the direct control of the health care system can substantially influence some of the PQIs. For example, COPD and asthma admission rates are likely to be higher in areas with poorer air quality.

- The other issue is that not many studies have directly addressed the question of whether effective treatments in outpatient settings would reduce the overall incidence of hospitalizations. Moreover, the extent to which the reporting of admission rates for ambulatory care sensitive conditions (ACSC) may lead to changes in ambulatory care practices and admission rates is still unknown. Providers may admit patients who do not clinically require inpatient care, or they may do the opposite - fail to hospitalize patients who would benefit from inpatient care.

# PQI Measures for New Jersey

This section presents county-level PQI estimates for New Jersey in 2020. First, the definition of the indicator is provided. Then a summary table showing the number of hospital admissions among residents of the county, the corresponding observed and expected admission rates, and the risk-adjusted rates with their respective 95% confidence intervals is presented. In this section, county-level performance assessments will be made using risk-adjusted rates.

The national rates for all 14 PQIs presented here as benchmarks for comparison purposes, are based on the 2018 HCUP - State Inpatient Data (SID) reported in the AHRQ PQI documentation - see Benchmark Data Tables via this link:
Version_2021_Benchmark_Tables_PQI.pdf.

Comparison of a specific county-level PQI rate to the statewide average for the same indicator is one appropriate way to see how well a county does among its peers. Following the recommendation of AHRQ, we have compared county rates against statewide rates. However, one may equally compare the county rates against the national

rates since the risk-adjustment was based on national parameters. However, it should be noted that the 2018 national data comes from pre-COVID-19 pandemic year, while the 2020 NJ data is gathered during the peak days of the pandemic. Thus, the significantly lower NJ rates compared to national rates could be attributed, not only to the time difference, but also to the impacts of the pandemic.

## 1. Diabetes with Short-term Complications (PQI.01)

Diabetes with short-term complications (PQI.01) is an indicator of an avoidable hospitalization or ambulatory care sensitive condition (ACSC). This indicator is not a measure of hospital quality, but rather a measure of outpatient care and other healthcare not related to hospitalizations. Short-term complications of diabetes mellitus include diabetic ketoacidosis, hyperosmolarity, and coma. These life-threatening emergencies arise when a patient experiences an excess of glucose (hyperglycemia) or insulin (hypoglycemia). Hospital admission for diabetes short-term complications is a PQI that would be of most interest to comprehensive health care delivery systems. The assumption is that proper outpatient treatment and adherence to care may reduce the incidence of diabetic short-term complications resulting in lower admission rates, which implies better quality of care. The rate is defined as admissions for diabetic short-term complications per 100,000 (18 years and older) county population. The indicator includes all non-maternal/non-neonatal discharges of age 18 years and older with ICD-10-CM (International Classification of Diseases, 10$^{th}$ Revision, Clinical Modification) diagnosis codes for diabetes short-term complications (ketoacidosis, hyperosmolarity, coma); excluding transfers from another institution, Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium) and MDC 15 (newborn and other neonates).

**Table 1** shows the number of hospital admissions for *diabetes short-term complications* by county along with *observed, expected* and *risk-adjusted rates,* while Tables 16, 17 and 18 show the same numbers distributed by patient's age, sex, and race/ethnicity.

- Statewide, there were 4,560 hospital admissions for diabetes with short-term complications in 2020 for a risk-adjusted rate of 66.5 per 100,000 adult population. The national hospital admission rate for diabetes with short-term complications was 82.2 per 100,000 in 2018.

- County-level risk-adjusted rates can be conveniently compared to the statewide risk-adjusted rate to see if there is statistical significance in the difference. For example, the risk-adjusted hospital admission rate for *diabetes with short-term complications* among the adult population of Atlantic County is 123.3 per 100,000 with a 95% confidence interval of 110.8 to 135.8. The statewide risk-adjusted rate of 66.5 per 100,000 is far below the lower limit of the confidence interval - implying that the hospital admission rate for *diabetes with short-term complications* in Atlantic County, which is 123.3 is statistically significantly higher than that of the statewide average. This can be used as a signal for policy makers to do further investigation into the health care provisions for diabetic patients in the county. In

another example, the risk-adjusted rate of 28.0 per 100,000 in Morris County is statistically significantly lower than the statewide average (i.e., the statewide rate of 66.5 is higher than the upper limit of the 95% confidence interval of Morris's rate) – suggesting that Morris County performed better on this indicator compared to the statewide average. See Tables 16, 17 and 18 for variations by patient's demographic characteristics.

**Table 1. Hospital Admissions for Diabetes Short-term Complications (per 100,000 county population, age 18+)**

| County | Hospital admissions | Observed rate | Expected rate^ | Risk-adjusted rate | 95% Confidence Interval |
|---|---|---|---|---|---|
| **Statewide** | **4,560** | **65.6** | **81.2** | **66.5** | **64.3 - 68.6** |
| Atlantic | 250 | 120.2 | 80.2 | 123.3 ** | 110.8 - 135.8 |
| Bergen | 205 | 27.9 | 80.3 | 28.5 * | 21.9 - 35.2 |
| Burlington | 252 | 71.0 | 80.6 | 72.5 | 62.9 - 82.0 |
| Camden | 492 | 125.4 | 81.3 | 126.8 ** | 117.8 - 135.8 |
| Cape May | 70 | 92.5 | 75.8 | 100.4 ** | 79.1 - 121.6 |
| Cumberland | 195 | 175.0 | 82.0 | 175.5 ** | 158.7 - 192.4 |
| Essex | 685 | 112.1 | 82.5 | 111.8 ** | 104.6 - 119.0 |
| Gloucester | 110 | 47.7 | 81.2 | 48.3 * | 36.5 - 60.1 |
| Hudson | 281 | 52.5 | 84.0 | 51.4 * | 43.8 - 58.9 |
| Hunterdon | 39 | 38.5 | 79.3 | 39.9 * | 21.9 - 57.9 |
| Mercer | 257 | 88.8 | 82.7 | 88.3 ** | 77.9 - 98.7 |
| Middlesex | 313 | 48.5 | 82.1 | 48.6 * | 41.6 - 55.6 |
| Monmouth | 270 | 55.1 | 79.9 | 56.7 * | 48.6 - 64.9 |
| Morris | 107 | 27.4 | 80.5 | 28.0 * | 18.9 - 37.1 |
| Ocean | 240 | 51.7 | 77.7 | 54.7 * | 46.2 - 63.2 |
| Passaic | 281 | 73.6 | 82.4 | 73.4 | 64.3 - 82.4 |
| Salem | 64 | 130.4 | 79.7 | 134.5 ** | 108.7 - 160.2 |
| Somerset | 81 | 31.3 | 80.8 | 31.8 * | 20.7 - 43.0 |
| Sussex | 48 | 42.4 | 80.1 | 43.5 * | 26.6 - 60.5 |
| Union | 275 | 64.6 | 81.9 | 64.9 | 56.2 - 73.5 |
| Warren | 45 | 52.7 | 79.9 | 54.3 | 34.8 - 73.8 |

Source: **New Jersey 2020 UB Data**.

* = Statistically significantly below state average (i.e. better than average).

** = Statistically significantly above state average (i.e. worse than average).

^ Expected rate = (Observed rate/Risk-adjusted rate) * Standard deviation. It is the rate the county would have if it performed the same as the statewide average (reference population) given the county's actual case-mix (e.g., age, gender, DRG, and comorbidity categories). If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than the reference population for that particular indicator. If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population (the reference population being the total NJ Poulation during the year).

## 2. Diabetes with Long-term Complications (PQI.03)

Area-level hospital admission rate for diabetes with long-term complications is a good indicator of an avoidable hospitalization or ambulatory care sensitive condition (ACSC). This indicator is not a measure of hospital quality, but rather a measure of outpatient care and other healthcare issues not related to hospitalizations. Long-term complications of diabetes mellitus include renal, eye, neurological, and circulatory disorders. Hospital admission for diabetes with long-term complications is a PQI that would be of most interest to comprehensive health care delivery systems. Long-term diabetes complications are thought to arise from sustained long-term poor control of diabetes. Intensive treatment programs have been shown to decrease the incidence of long-term complications in both Type 1 and Type 2 diabetes. The indicator relates to quality because research shows that proper outpatient treatment and adherence to care reduces the incidence of diabetic long-term complications, and that lower rates suggest better quality of care. The rate is defined as hospital admissions for diabetic long-term complications per 100,000 adult county population (i.e., all persons, age 18 years and older). The indicator includes all discharges age 18 years and older with ICD-10-CM principal diagnosis codes for long-term complications of diabetes (renal, eye, neurological, circulatory, or complications not otherwise specified), but excludes cases transferred from another institution, MDC 14 (pregnancy, childbirth, and puerperium), and MDC 15 (newborn and other neonates).

**Table 2** shows the number of hospital admissions in New Jersey hospitals in 2020 for diabetes with long-term complications by county along with observed, expected and risk-adjusted rates.

- Statewide, there were 7,603 hospital admissions in 2020 for diabetes with long-term complications. The statewide average risk-adjusted hospital admission rate for diabetes with long-term complications is 105.5 per 100,000. Table 13 shows New Jersey rates in comparisons National rates.

- Readers may compare their counties' performances against the statewide as well as the national averages to assess the extent of the problem among their populations.

## Table 2. Hospital Admissions for Diabetes Long-term Complications (per 100,000 county population, age 18+)

| County | Hospital admissions | Observed rate | Expected rate^ | Risk-adjusted rate | 95% Confidence Interval |
|---|---|---|---|---|---|
| **Statewide** | **7,603** | **109.4** | **113.0** | **105.5** | **103.1 - 107.9** |
| Atlantic | 339 | 163.0 | 118.1 | 150.3 ** | 136.7 - 163.9 |
| Bergen | 479 | 65.2 | 116.8 | 60.8 * | 53.5 - 68.1 |
| Burlington | 443 | 124.9 | 115.9 | 117.4 | 105.4 - 127.9 |
| Camden | 679 | 173.0 | 110.3 | 170.9 ** | 160.6 - 181.1 |
| Cape May | 81 | 107.1 | 133.7 | 87.2 | 66.0 - 108.5 |
| Cumberland | 326 | 292.6 | 110.2 | 289.1 ** | 269.8 - 308.3 |
| Essex | 816 | 133.6 | 105.8 | 137.5 ** | 129.1 - 145.9 |
| Gloucester | 208 | 90.3 | 113.7 | 86.5 * | 73.3 - 99.7 |
| Hudson | 619 | 115.6 | 94.6 | 133.1 ** | 123.7 - 142.6 |
| Hunterdon | 80 | 79.0 | 126.5 | 68.0 * | 49.2 - 86.9 |
| Mercer | 379 | 131.0 | 108.5 | 131.5 ** | 119.5 - 143.6 |
| Middlesex | 599 | 92.9 | 109.8 | 92.1 * | 84.1 - 100.1 |
| Monmouth | 549 | 112.1 | 120.8 | 101.1 | 92.3 - 109.9 |
| Morris | 222 | 56.9 | 118.3 | 52.4 * | 42.5 - 62.3 |
| Ocean | 539 | 116.1 | 123.9 | 102.1 | 93.2 - 111.0 |
| Passaic | 466 | 122.0 | 108.1 | 122.9 * | 112.4 - 133.4 |
| Salem | 39 | 79.5 | 119.2 | 72.7 * | 44.8 - 100.6 |
| Somerset | 143 | 55.2 | 116.9 | 51.5 * | 39.2 - 63.7 |
| Sussex | 111 | 98.1 | 123.1 | 86.8 | 68.7 - 105.9 |
| Union | 399 | 93.8 | 110.4 | 92.5 * | 82.6 - 102.3 |
| Warren | 87 | 101.9 | 121.6 | 91.3 | 70.4 - 112.3 |

Source: **New Jersey 2020 UB Data**.

* = Statistically significantly below state average (i.e. better than average).

** = Statistically significantly above state average (i.e. worse than average).

^ Expected rate = (Observed rate/Risk-adjusted rate) * Standard deviation. It is the rate the county would have if it performed the same as the statewide average (reference population) given the county's actual case-mix (e.g., age, gender, DRG, and comorbidity categories). If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than the reference population for that particular indicator. If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population (the reference population being the total NJ Poulation during the year).

## 3. Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults (PQI.05)

Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults includes three primary diseases that cause respiratory dysfunction - asthma, emphysema, and chronic bronchitis - each with distinct etiologies, treatments, and outcomes. This indicator examines emphysema, bronchitis and asthma in older adults. Asthma in younger adults and children is discussed separately. COPD or Asthma in older adults can often be controlled in an outpatient setting. Admissions for COPD include exacerbations of COPD, respiratory failure, and (rarely) lung volume reduction surgery or lung transplantation.

With appropriate outpatient treatment and compliance, hospitalizations for exacerbations of COPD and decline in lung function should be minimized. Counties may wish to use chart reviews to understand more clearly whether admissions are a result of poor healthcare quality or other problems. Counties may also wish to identify hospitals that contribute the most to the overall area rate for this indicator. Proper outpatient treatment may reduce admissions for COPD, and lower rates suggest better quality of care. Evidence has shown that hospital admission rate for COPD is a good indicator of avoidable hospitalization or ambulatory care sensitive condition (ACSC). The rate is defined as admissions for COPD per 100,000 county population (i.e., all persons, age 18 and older in a county). In other words, all non-maternal discharges age 18 and older with ICD-10-CM principal diagnosis codes for COPD except for MDC 14 (pregnancy, childbirth, and puerperium) and MDC 15 (newborn and other neonates), are included in the rate calculation.

**Table 3** shows the number of hospital admissions for c*hronic obstructive pulmonary disease (COPD)* or asthma in older adults by county along with their *observed, expected* and *risk-adjusted rates*.

- In New Jersey, there were 9,869 hospital admissions for *COPD* or asthma in older adults in 2020. The statewide risk-adjusted hospital admissions rate for *COPD* or asthma in older adults was 218.7 per 100,000 with a 95% confidence interval of 213.0 to 224.4. County-level rates range from a low of 83.8 to 744.8 per 100,000 population ages 18 and older. National vs New Jersey *COPD* or asthma admission rates are shown in Table 13.

- Readers may assess county performance on COPD admissions by comparing the county rate against the statewide rate. Tables 16, 17 and 18 show COPD or adult asthma patients by demographic characteristics.

**Table 3. Hospital Admissions for Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults (per 100,000 county population, age 40+)**

| County | Hospital admissions | Observed rate | Expected rate^ | Risk-adjusted rate | 95% Confidence Interval |
|---|---|---|---|---|---|
| **Statewide** | **9,869** | **220.8** | **384.8** | **218.7** | **213.0 - 224.4** |
| Atlantic | 365 | 264.0 | 403.1 | 249.6 | 218.0 - 281.2 |
| Bergen | 532 | 108.0 | 386.2 | 106.6 * | 89.5 - 123.6 |
| Burlington | 743 | 318.2 | 389.7 | 311.2 ** | 286.5 - 335.9 |
| Camden | 1,035 | 419.9 | 383.6 | 417.3 ** | 393.0 - 441.5 |
| Cape May | 193 | 349.0 | 455.2 | 292.2 ** | 245.3 - 339.2 |
| Cumberland | 516 | 743.5 | 380.5 | 744.8 ** | 699.0 - 790.7 |
| Essex | 991 | 263.2 | 362.3 | 276.9 ** | 256.7 - 297.0 |
| Gloucester | 261 | 174.5 | 380.3 | 174.9 ** | 143.6 - 206.1 |
| Hudson | 735 | 261.0 | 355.1 | 280.1 ** | 256.6 - 303.7 |
| Hunterdon | 95 | 131.4 | 396.5 | 126.3 * | 82.3 - 170.3 |
| Mercer | 424 | 235.5 | 377.6 | 237.7 | 209.2 - 266.3 |
| Middlesex | 748 | 185.2 | 373.2 | 189.1 * | 169.9 - 208.3 |
| Monmouth | 764 | 226.9 | 393.4 | 219.8 | 199.4 - 240.3 |
| Morris | 224 | 85.1 | 387.0 | 83.8 * | 60.4 - 107.1 |
| Ocean | 986 | 308.1 | 441.8 | 265.7 ** | 245.9 - 285.6 |
| Passaic | 301 | 128.2 | 378.1 | 129.3 * | 104.3 - 154.3 |
| Salem | 91 | 276.6 | 402.2 | 262.1 | 197.4 - 326.9 |
| Somerset | 174 | 99.6 | 375.7 | 101.0 * | 71.9 - 130.1 |
| Sussex | 138 | 176.6 | 387.7 | 173.6 * | 130.8 - 216.4 |
| Union | 441 | 162.5 | 366.4 | 169.1 * | 145.4 - 192.7 |
| Warren | 112 | 191.5 | 396.7 | 184.0 | 135.1 - 232.9 |

Source: **New Jersey 2020 UB Data**.

* = Statistically significantly below state average (i.e. better than average).

** = Statistically significantly above state average (i.e. worse than average).

^ Expected rate = (Observed rate/Risk-adjusted rate) * Standard deviation. It is the rate the county would have if it performed the same as the statewide average (reference population) given the county's actual case-mix (e.g., age, gender, DRG, and comorbidity categories). If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than the reference population for that particular indicator. If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population (the reference population being the total NJ Poulation during the year).

## 4. Hypertension (PQI.07)

Hypertension or high blood pressure is a chronic cardiac medical condition in which systemic arterial blood pressure is elevated. Hypertension is a good indicator of avoidable hospitalizations. Hypertension is a chronic condition that is often controllable in an outpatient setting with appropriate use of drug therapy. Hospital admission for hypertension is a PQI that would be of most interest to comprehensive health care delivery systems. Counties may wish to identify hospitals that contribute the most to the overall county rate for this indicator. As a PQI, hypertension is not a measure of hospital quality per se, but rather one measure of outpatient health care. Providers may reduce admission rates without necessarily improving quality by shifting care to an outpatient setting. Proper outpatient treatment may reduce admissions for hypertension, and lower admission rates represent better quality of community healthcare. The rate is defined as admissions for hypertension per 100,000 adult county population (i.e., all persons in the county age 18 and older). The indicator includes all non-maternal discharges age 18 or older with ICD-10-CM principal diagnosis codes for hypertension, but excludes transfers from another institution, MDC 14 (pregnancy, childbirth, and puerperium), MDC 15 (newborn and other neonates) and cases with cardiac procedure codes in any field.

**Table 4** shows the number of hospital admissions for hypertension by county along with their observed, expected and risk-adjusted rates, while Tables 16, 17 and 18 show distribution of hypertension patients by demographic characteristics.

- Statewide, there were 3,719 potentially preventable hospital admissions for hypertension treatment in 2020, for a risk-adjusted rate of 51.1 per 100,000 adults of age 18 or older. Rates of hospital admission for hypertension ranged from 21.5 per 100,000 in Bergen County to 123.1 in Cumberland.

- Five counties (Atlantic, Camden, Cumberland, Essex, and Mercer) have statistically significantly higher admission rates for hypertension compared to the statewide average.

## Table 4. Hospital Admissions for Hypertension (per 100,000 population, age 18+)

| County | Hospital admissions | Observed rate | Expected rate^ | Risk-adjusted rate | 95% Confidence Interval |
|---|---|---|---|---|---|
| **Statewide** | **3,719** | **53.5** | **63.6** | **51.1** | **49.4 - 52.9** |
| Atlantic | 234 | 112.5 | 65.5 | 104.4 ** | 94.2 - 114.6 |
| Bergen | 172 | 23.4 | 66.1 | 21.5 * | 16.1 - 26.9 |
| Burlington | 211 | 59.5 | 64.8 | 55.8 | 47.9 - 63.6 |
| Camden | 359 | 91.5 | 62.3 | 89.2 ** | 81.6 - 96.9 |
| Cape May | 36 | 47.6 | 75.4 | 38.3 | 22.6 - 54.1 |
| Cumberland | 139 | 124.8 | 61.6 | 123.1 ** | 108.7 - 137.4 |
| Essex | 527 | 86.3 | 60.2 | 87.0 ** | 80.8 - 93.2 |
| Gloucester | 100 | 43.4 | 62.7 | 42.1 | 32.2 - 52.0 |
| Hudson | 224 | 41.8 | 54.2 | 46.9 | 39.9 - 53.9 |
| Hunterdon | 36 | 35.5 | 68.1 | 31.7 * | 17.4 - 46.0 |
| Mercer | 211 | 72.9 | 61.3 | 72.3 ** | 63.4 - 81.3 |
| Middlesex | 264 | 40.9 | 61.3 | 40.5 * | 34.6 - 46.5 |
| Monmouth | 263 | 53.7 | 67.0 | 48.7 | 42.1 - 55.3 |
| Morris | 129 | 33.1 | 66.1 | 30.4 * | 23.0 - 37.8 |
| Ocean | 256 | 55.1 | 72.5 | 46.2 | 39.7 - 52.7 |
| Passaic | 193 | 50.5 | 60.7 | 50.6 | 42.8 - 58.4 |
| Salem | 14 | 28.5 | 67.1 | 25.8 | 5.1 - 46.6 |
| Somerset | 70 | 27.0 | 65.4 | 25.1 * | 16.0 - 34.3 |
| Sussex | 47 | 41.5 | 65.5 | 38.6 | 24.7 - 52.4 |
| Union | 193 | 45.4 | 62.0 | 44.4 | 37.1 - 51.8 |
| Warren | 41 | 48.1 | 67.2 | 43.4 | 27.7 - 59.1 |

Source: **New Jersey 2020 UB Data**.

* = Statistically significantly below state average (i.e. better than average).

** = Statistically significantly above state average (i.e. worse than average).

^ Expected rate = (Observed rate/Risk-adjusted rate) * Standard deviation. It is the rate the county would have if it performed the same as the statewide average (reference population) given the county's actual case-mix (e.g., age, gender, DRG, and comorbidity categories). If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than the reference population for that particular indicator. If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population (the reference population being the total NJ Poulation during the year).

## 5. Heart Failure (PQI.08)

About 610,000 people die of heart disease in the United States every year–that's 1 in every 4 deaths. Heart disease is the leading cause of death for both men and women. Coronary heart disease (CHD) is the most common type of heart disease, killing over 370,000 people annually. Heart Failure (PQI,08) leads to about 1 million annual hospital admissions and is the most common reason for admission for patients 65 and older. It is estimated that about half of the people who developed heart failure die within 5 years of diagnosis. It is also estimated that heart disease costs more than $30.0 billion a year at a national level, which includes the cost of health care services, medicines to treat heart failure, and missed days of work. The most common causes of HF are coronary artery disease (CAD), high blood pressure, and diabetes (AHRQ)[1].

Usually heart failure (HF) can be controlled in an outpatient setting. However, the disease is a chronic progressive disorder for which some hospitalizations are appropriate. Congestive heart failure relates to quality because research shows that proper outpatient treatment reduces admissions for HF, which in turn lowers admission rates, suggesting a better quality of care. Congestive heart failure is a PQI that would be of most interest to comprehensive health care delivery systems. As the causes for HF admissions may include poor quality of care, lack of patient compliance, or problems of access to care, counties may wish to review HF patient records to identify precipitating causes and potential targets for intervention. As a prevention quality indicator, HF is not a measure of hospital quality, but rather a measure of outpatient care and other community level health conditions. The rate is defined as admissions with a principal diagnosis of heart failure per 100,000 population ages 18 years and older. The measure excludes cardiac procedure admissions, obstetric admissions, and transfers from other institutions.

**Table 5** shows the number of hospital admissions for heart failure by county along with their observed, expected and risk-adjusted rates, while Tables 16, 17 and 18 show the distribution of these patients by age, sex and race/ethnicity.

- Statewide, there were 25,316 hospital admissions for *heart failure* in 2020. The risk-adjusted hospital admissions rate for *heart failure* was 339.7 per 100,000.

- Admission rates for HF ranged from a low of 207.5 per 100,000 in Hunterdon to a high of 1,040.8 per 100,000 in Cumberland.

[1] http://www.qualitymeasures.ahrq.gov/search/search.aspx?term=prevention+quality+indicators.

## Table 5. Hospital Admissions for Heart Failure (per 100,000 population, age 18+)

| County | Hospital admissions | Observed rate | Expected rate^ | Risk-adjusted rate | 95% Confidence Interval |
|---|---|---|---|---|---|
| **Statewide** | **25,316** | **363.8** | **460.1** | **339.7** | 335.0 - 344.4 |
| Atlantic | 1,035 | 496.9 | 489.7 | 435.8 ** | 409.7 - 462.0 |
| Bergen | 1,827 | 248.3 | 488.4 | 218.4 * | 204.4 - 232.3 |
| Burlington | 1,483 | 417.2 | 473.6 | 378.4 ** | 358.1 - 398.8 |
| Camden | 2,014 | 512.0 | 443.2 | 496.2 ** | 476.2 - 516.2 |
| Cape May | 402 | 530.1 | 631.3 | 360.7 | 322.6 - 398.9 |
| Cumberland | 1,204 | 1074.5 | 443.5 | 1040.8 ** | 1003.3 - 1078.2 |
| Essex | 2,599 | 424.9 | 409.2 | 446.0 ** | 429.3 - 462.7 |
| Gloucester | 710 | 307.7 | 441.4 | 299.5 * | 273.3 - 325.6 |
| Hudson | 1,505 | 280.8 | 347.7 | 346.9 | 327.6 - 366.3 |
| Hunterdon | 251 | 247.4 | 512.2 | 207.5 * | 170.8 - 244.1 |
| Mercer | 1,239 | 427.6 | 438.9 | 418.6 ** | 395.1 - 442.0 |
| Middlesex | 2,031 | 314.4 | 431.7 | 312.8 * | 297.0 - 328.7 |
| Monmouth | 1,815 | 369.9 | 497.6 | 319.3 * | 302.4 - 336.2 |
| Morris | 958 | 245.4 | 489.6 | 215.3 * | 196.2 - 234.4 |
| Ocean | 2,214 | 475.4 | 596.7 | 342.3 | 326.4 - 358.1 |
| Passaic | 1,241 | 324.5 | 427.9 | 325.8 | 305.2 - 346.5 |
| Salem | 185 | 376.6 | 506.1 | 319.6 | 266.7 - 372.6 |
| Somerset | 598 | 230.7 | 469.5 | 211.1 * | 187.1 - 235.0 |
| Sussex | 329 | 290.3 | 470.9 | 264.8 * | 228.6 - 301.0 |
| Union | 1,290 | 302.8 | 430.6 | 302.1 * | 282.6 - 321.6 |
| Warren | 386 | 451.3 | 503.4 | 385.2 ** | 344.9 - 425.4 |

**Source: New Jersey 2020 UB Data.**

* = Statistically significantly below the state average.

** = Statistically significantly above the state average.

^ Expected rate = (Observed rate/Risk-adjusted rate) * Standard deviation. It is the rate the county would have if it performed the same as the statewide average (reference population) given the county's actual case-mix (e.g., age, gender, DRG, and comorbidity categories). If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than the reference population for that particular indicator. If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population (the reference population being the total NJ Poulation during the year).

## 6. Community Acquired Pneumonia (PQI.11)

Community Acquired or Bacterial pneumonia is a relatively common acute condition, treatable for the most part with antibiotics. If left untreated in susceptible individuals - such as the elderly - pneumonia can lead to death. Proper outpatient treatment may reduce admissions for bacterial pneumonia in non-susceptible individuals, and lower admission rates represent better quality of care at the community level. Specifically, bacterial pneumonia is a good indicator of an avoidable hospitalization or ambulatory care sensitive condition (ACSC). High admission rates are often a reflection of large number of inappropriate admissions or low-quality treatment with antibiotics. As a PQI, admission for bacterial pneumonia is not a measure of hospital quality, but rather a measure of outpatient care and other community-level health care issues.

The elderly population is particularly susceptible to pneumonia, and in this population, a vaccine is suggested to prevent pneumonia. Areas may wish to examine the outpatient care for pneumonia and pneumococcal vaccination rates to identify potential processes of care that may reduce admission rates. Appropriateness of admissions appears to be a problem for this indicator. High rates may reflect large number of inappropriate admissions and/or poor outpatient care, among other things.

The rate is defined as admissions for bacterial pneumonia per 100,000 county population. The indicator includes all non-maternal discharges age 18 and older with the ICD-10-CM principal diagnosis code for bacterial pneumonia. It excludes transfer cases, MDC 14 (pregnancy, childbirth, and puerperium), MDC 15 (newborn and other neonates), and those with diagnosis code for sickle cell anemia or HB-S disease.

**Table 6** shows the number of hospital admissions for bacterial pneumonia by county along with the observed, expected and risk-adjusted rates, while Tables 16, 17 and 18 present hospital admission rates of bacterial pneumonia patients by age, sex, and race/ethnicity.

- The national average admission rate for bacterial pneumonia in 2018 was 183.6 per 100,000 population, age 18+.

- In New Jersey, there were 8,247 hospital admissions for bacterial pneumonia in 2020. With a risk-adjusted rate of 112.1 per 100,000, New Jersey had a significantly lower rate than the 2018 national benchmark rate of 183.6.

- Readers are advised to assess individual county performance by comparing them against the statewide rate; and the national average bacterial pneumonia admission rate shown in Table 13.

**Table 6. Hospital Admissions for Community-Acquired Pneumonia (per 100,000 population, age 18+)**

| County | Hospital admissions | Observed rate | Expected rate^ | Risk-adjusted rate | 95% Confidence Interval |
|---|---|---|---|---|---|
| **Statewide** | **8,247** | **118.7** | **194.4** | **112.1** | **109.0 - 115.2** |
| Atlantic | 389 | 187.1 | 206.0 | 166.8 ** | 149.4 - 184.1 |
| Bergen | 520 | 70.7 | 205.7 | 63.2 * | 53.9 - 72.4 |
| Burlington | 582 | 164.0 | 199.5 | 151.0 ** | 137.5 - 164.5 |
| Camden | 571 | 145.5 | 187.8 | 142.2 ** | 129.0 - 155.5 |
| Cape May | 169 | 223.4 | 261.1 | 157.1 ** | 131.6 - 182.6 |
| Cumberland | 393 | 352.5 | 185.4 | 349.1 ** | 324.1 - 374.0 |
| Essex | 574 | 94.0 | 175.2 | 98.5 * | 87.5 - 109.5 |
| Gloucester | 172 | 74.6 | 187.3 | 73.2 * | 55.9 - 90.5 |
| Hudson | 542 | 101.2 | 151.2 | 122.9 | 110.3 - 135.5 |
| Hunterdon | 114 | 112.5 | 214.2 | 96.4 | 72.1 - 120.8 |
| Mercer | 367 | 126.9 | 185.9 | 125.3 | 109.8 - 140.8 |
| Middlesex | 692 | 107.3 | 183.1 | 107.6 | 97.1 - 118.0 |
| Monmouth | 719 | 146.8 | 208.7 | 129.1 ** | 117.9 - 140.4 |
| Morris | 264 | 67.7 | 205.7 | 60.4 * | 47.8 - 73.1 |
| Ocean | 923 | 198.7 | 247.9 | 147.2 ** | 136.6 - 157.7 |
| Passaic | 359 | 94.0 | 182.1 | 94.8 * | 81.2 - 108.4 |
| Salem | 95 | 193.6 | 212.6 | 167.2 ** | 132.1 - 202.3 |
| Somerset | 153 | 59.1 | 198.0 | 54.8 * | 39.0 - 70.6 |
| Sussex | 133 | 117.5 | 197.9 | 109.0 | 85.0 - 133.0 |
| Union | 416 | 97.7 | 183.0 | 98.1 * | 85.2 - 111.0 |
| Warren | 100 | 117.2 | 210.4 | 102.3 | 75.5 - 129.1 |

Source: **New Jersey 2020 UB Data**.

* = Statistically significantly below the state average.

** = Statistically significantly above the state average.

PQI 11 - Community-Acquired Pneumonia was formerly called Bacterial Pneumonia.

^ Expected rate = (Observed rate/Risk-adjusted rate) * Standard deviation. It is the rate the county would have if it performed the same as the statewide average (reference population) given the county's actual case-mix (e.g., age, gender, DRG, and comorbidity categories). If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than the reference population for that particular indicator. If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population.

## 7. Urinary Tract Infection (PQI.12)

Urinary tract infection (UTI) is a common acute condition that can, for the most part, be treated with antibiotics in an outpatient setting. However, this condition can progress to more clinically significant infections, such as pyelonephritis, in vulnerable individuals with inadequate treatment. Proper outpatient treatment is believed to reduce admissions for urinary tract infection, and lower admission rates represent better quality of care at a community level. Hospital admission for urinary tract infection is a PQI that would be of most interest to comprehensive health care delivery systems. As a PQI, admission for urinary tract infection is not a measure of hospital quality, but rather one measure of outpatient care and other health care issues.

The rate is defined as admissions for urinary tract infection per 100,000 adult county population. The indicator includes all non-maternal discharges age 18 and older with ICD-10-CM principal diagnosis code for urinary tract infection. It excludes transfer cases, MDC 14 (pregnancy, childbirth, and puerperium), MDC 15 (newborn and other neonates), patients with diagnosis code of kidney/urinary tract disorder, patients with diagnosis code of immunocompromised state, and those with immunocompromised state procedure code.

**Table 7** shows the number of hospital admissions for urinary tract infection by county along with the observed, expected and risk-adjusted rates.

- In New Jersey, there were 7,930 hospital admissions for urinary tract infection in 2020. The risk-adjusted hospital admissions rate for urinary tract infection is 106.7 per 100,000.

- The national average admission rate for urinary tract infection in 2018 was 134.8 per 100,000 population, age 18+.

- County-level urinary tract infection rates can be compared to the statewide average as well as the national average to see where specific counties stand on this specific indicator. Hospital admission rate variations by age, sex and race/ethnicity are shown in Tables 16, 17 and 18.

**Table 7. Hospital Admissions for Urinary Tract Infection (per 100,000 population, age 18+)**

| County | Hospital admissions | Observed rate | Expected rate^ | Risk-adjusted rate | 95% Confidence Interval |
|---|---|---|---|---|---|
| **Statewide** | **7,930** | **114.1** | **144.2** | **106.7** | **104.0 - 109.3** |
| Atlantic | 331 | 159.1 | 151.2 | 141.8 ** | 127.0 - 156.7 |
| Bergen | 541 | 73.6 | 153.3 | 64.7 * | 56.9 - 72.6 |
| Burlington | 607 | 171.0 | 147.0 | 156.8 ** | 145.3 - 168.3 |
| Camden | 750 | 191.0 | 140.1 | 183.8 ** | 172.6 - 195.0 |
| Cape May | 92 | 121.6 | 193.5 | 84.7 | 63.0 - 106.5 |
| Cumberland | 341 | 305.8 | 135.6 | 304.0 ** | 282.6 - 325.4 |
| Essex | 530 | 86.8 | 131.2 | 89.1 * | 79.8 - 98.4 |
| Gloucester | 226 | 98.1 | 136.3 | 97.0 | 82.2 - 111.9 |
| Hudson | 428 | 79.9 | 112.7 | 95.6 | 84.9 - 106.3 |
| Hunterdon | 150 | 148.0 | 153.5 | 129.9 ** | 108.8 - 151.1 |
| Mercer | 305 | 105.4 | 139.1 | 102.1 | 89.0 - 115.3 |
| Middlesex | 608 | 94.2 | 134.5 | 94.4 * | 85.5 - 103.4 |
| Monmouth | 687 | 140.2 | 153.7 | 122.9 ** | 113.3 - 132.5 |
| Morris | 372 | 95.4 | 151.8 | 84.7 * | 73.9 - 95.5 |
| Ocean | 741 | 159.5 | 189.5 | 113.5 | 104.6 - 122.3 |
| Passaic | 369 | 96.6 | 135.1 | 96.4 | 84.8 - 108.0 |
| Salem | 86 | 175.2 | 158.8 | 148.8 ** | 118.9 - 178.6 |
| Somerset | 194 | 74.9 | 146.9 | 68.7 * | 55.3 - 82.2 |
| Sussex | 117 | 103.4 | 139.3 | 100.0 | 79.0 - 121.0 |
| Union | 355 | 83.4 | 135.3 | 83.1 * | 72.1 - 94.1 |
| Warren | 100 | 117.2 | 154.7 | 102.1 | 79.2 - 125.0 |

Source: **New Jersey 2020 UB Data.**

* = Statistically significantly below the state average.

** = Statistically significantly above the state average.

^ Expected rate = (Observed rate/Risk-adjusted rate) * Standard deviation. It is the rate the county would have if it performed the same as the statewide average (reference population) given the county's actual case-mix (e.g., age, gender, DRG, and comorbidity categories). If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than the reference population for that particular indicator. If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population.

## 8. Uncontrolled Diabetes (PQI.14)

Uncontrolled diabetes indicates an excess of glucose in a patient's bloodstream. In diabetics, glucose levels are stabilized by proper administration of insulin, and may involve other activities such as home blood-glucose monitoring, that contribute to the overall problems with glycemic control. However, it is unclear whether poor glycemic control arises from poor quality medical care, non-compliance of patients, lack of education, or problems of access to care. Areas with high rates may wish to examine these factors when interpreting this indicator. Proper outpatient treatment and adherence to care may reduce the incidence of uncontrolled diabetes, and lower admission rates represent better quality of care.

Uncontrolled diabetes is an avoidable hospitalization/ambulatory care sensitive condition (ACSC) indicator. The indicator is not a measure of hospital quality, but rather a measure of outpatient care and other healthcare issues not related to hospitalizations. Hospital admission for uncontrolled diabetes is a PQI that would be of most interest to comprehensive health care delivery systems, such as some health maintenance organizations (HMOs), or public health agencies. Uncontrolled diabetes as a measure of potentially avoidable hospitalizations should be used in conjunction with short-term complications of diabetes (PQI.01).

The rate is defined as admissions for uncontrolled diabetes per 100,000 adult county population. The indicator includes all non-maternal discharges age 18 and older with ICD-10-CM principal diagnosis codes for uncontrolled diabetes, without mention of a short-term or long-term complication. It excludes transfer cases, MDC 14 (pregnancy, childbirth, and puerperium), and MDC 15 (newborn and other neonates).

**Table 8** shows the number of hospital admissions for uncontrolled diabetes by county along with the observed, expected and risk-adjusted rates

- In New Jersey, there were 2,787 hospital admissions for uncontrolled diabetes in 2020. The risk-adjusted rate is 38.6 per 100,000. By comparison, the national admission rate for uncontrolled diabetes in 2018 was 42.1 per 100,000.

- Hospital admission rates for uncontrolled diabetes in Atlantic, Burlington, Camden, Cumberland, and Essex counties were statistically significantly higher compared to the statewide average.

**Table 8. Hospital Admissions for Uncontrolled Diabetes (per 100,000 population, age 18+)**

| County | Hospital admissions | Observed rate | Expected rate^ | Risk-adjusted rate | 95% Confidence Interval |
|---|---|---|---|---|---|
| **Statewide** | **2,787** | **40.1** | **43.8** | **38.6** | **37.1 - 40.1** |
| Atlantic | 144 | 69.3 | 45.8 | 63.6 ** | 55.2 - 72.1 |
| Bergen | 130 | 17.7 | 45.3 | 16.4 * | 11.9 - 21.0 |
| Burlington | 173 | 48.8 | 44.8 | 45.9 ** | 39.3 - 52.4 |
| Camden | 286 | 72.9 | 42.8 | 71.7 ** | 65.3 - 78.1 |
| Cape May | 31 | 41.0 | 53.7 | 32.2 | 19.2 - 45.1 |
| Cumberland | 139 | 124.7 | 42.7 | 123.2 ** | 111.2 - 135.2 |
| Essex | 368 | 60.2 | 40.9 | 62.1 ** | 56.9 - 67.3 |
| Gloucester | 66 | 28.6 | 43.4 | 27.8 * | 19.6 - 36.1 |
| Hudson | 179 | 33.4 | 36.9 | 38.2 | 32.3 - 44.0 |
| Hunterdon | 29 | 28.6 | 47.7 | 25.3 * | 13.4 - 37.2 |
| Mercer | 99 | 34.2 | 42.1 | 34.2 | 26.8 - 41.7 |
| Middlesex | 220 | 34.1 | 42.2 | 34.0 | 29.0 - 39.0 |
| Monmouth | 185 | 37.8 | 46.3 | 34.4 | 28.9 - 39.9 |
| Morris | 110 | 28.2 | 45.5 | 26.1 * | 19.9 - 32.3 |
| Ocean | 202 | 43.5 | 50.6 | 36.2 | 30.8 - 41.6 |
| Passaic | 161 | 42.2 | 41.8 | 42.4 | 35.9 - 49.0 |
| Salem | 23 | 46.9 | 46.4 | 42.6 | 25.3 - 59.9 |
| Somerset | 43 | 16.6 | 44.6 | 15.7 * | 8.0 - 23.4 |
| Sussex | 31 | 27.4 | 45.9 | 25.1 * | 13.7 - 36.6 |
| Union | 133 | 31.3 | 42.3 | 31.2 * | 25.0 - 37.3 |
| Warren | 35 | 41.0 | 46.6 | 37.1 | 24.0 - 50.2 |

Source: **New Jersey 2020 UB Data**.

* = Statistically significantly below the state average.

** = Statistically significantly above the state average.

^ Expected rate = (Observed rate/Risk-adjusted rate) * Standard deviation. It is the rate the county would have if it performed the same as the statewide average (reference population) given the county's actual case-mix (e.g., age, gender, DRG, and comorbidity categories). If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than the reference population for that particular indicator. If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population.

## 9. Asthma in Younger Adults (PQI.15)

Asthma is one of the most common reasons for hospital admission and emergency room care. Most cases of asthma can be managed with proper ongoing therapy on an outpatient basis. The assumption is that proper outpatient treatment may reduce the incidence or exacerbation of asthma requiring hospitalization, and that lower admission rates suggest better quality of care at community level. Environmental factors such as air pollution, occupational exposure to irritants, or other exposure to allergens have been shown to increase hospitalization rates or exacerbate asthma symptoms. Counties may wish to identify hospitals that contribute the most to the overall county rate for this indicator. The patient populations served by these hospitals may be a starting point for interventions.

As a PQI, asthma in young adults is not a measure of hospital quality, but rather one measure of overall outpatient care in a community. The rate is defined as admissions for asthma per 100,000 population age 18 to 40. The measure includes all non-maternal discharges age 18 to 40 with ICD-10-CM principal diagnosis codes for asthma, but excludes transfer cases, MDC 14 (pregnancy, childbirth, and puerperium)**,** MDC 15 (newborn and other neonates), and those with any diagnosis code of cystic fibrosis and anomalies of the respiratory system.

**Table 9** shows the number of hospital admissions for asthma in younger adults by county along with their observed, expected and risk-adjusted rates (Disparities in admissions for asthma in younger adults by sex and race/ethnicity is shown in Tables 17 and 18).

- In New Jersey, there were 675 hospital admissions for asthma in young adults (ages 18 to 40) in 2020 for a risk-adjusted rate of 27.0 per 100,000 (it should be noted that hospitalizations were lower in 2020 compared to previous years due to COVID-19). The 2018 NJ rate (Table 13) shows that asthma is still a significant problem in New Jersey as evidenced by the significantly higher statewide admission rate compared to the national young adult asthma admission rate.

- Burlington, Camden, Cumberland, and Essex counties have young adult asthma admission rates that are statistically significantly higher than the statewide average.

**Table 9. Hospital Admissions for Asthma in Younger Adults (per 100,000 population, age 18-39)**

| County | Hospital admissions | Observed rate | Expected rate^ | Risk-adjusted rate | 95% Confidence Interval |
|---|---|---|---|---|---|
| **Statewide** | **675** | **27.2** | **29.4** | **27.0** | **24.9 - 29.2** |
| Atlantic | 25 | 35.9 | 29.1 | 36.0 | 23.3 - 48.7 |
| Bergen | 25 | 10.3 | 29.7 | 10.2 * | 3.4 - 16.9 |
| Burlington | 55 | 45.3 | 29.2 | 45.4 ** | 35.8 - 55.0 |
| Camden | 88 | 60.3 | 29.8 | 59.2 ** | 50.5 - 67.8 |
| Cape May | 4 | 19.7 | 28.8 | 19.9 | 0.0 - 43.6 |
| Cumberland | 32 | 76.0 | 28.6 | 77.7 ** | 61.2 - 94.2 |
| Essex | 129 | 55.1 | 29.8 | 54.0 ** | 47.1 - 60.8 |
| Gloucester | 21 | 26.0 | 29.4 | 25.8 | 14.1 - 37.6 |
| Hudson | 46 | 18.1 | 29.9 | 17.7 * | 11.2 - 24.3 |
| Hunterdon | 2 | 6.9 | 28.8 | 7.0 * | 0.0 - 26.8 |
| Mercer | 18 | 16.5 | 28.8 | 16.7 | 6.5 - 26.9 |
| Middlesex | 44 | 18.3 | 29.4 | 18.2 * | 11.4 - 25.0 |
| Monmouth | 52 | 34.0 | 29.2 | 34.0 | 25.4 - 42.5 |
| Morris | 10 | 7.9 | 29.3 | 7.9 * | 0.0 - 17.3 |
| Ocean | 31 | 21.5 | 29.2 | 21.5 | 12.7 - 30.3 |
| Passaic | 30 | 20.4 | 29.2 | 20.4 | 11.6 - 29.1 |
| Salem | 4 | 24.7 | 29.3 | 24.7 | 0.0 - 51.0 |
| Somerset | 9 | 10.7 | 29.5 | 10.6 * | 0.0 - 22.1 |
| Sussex | 5 | 14.3 | 29.1 | 14.4 | 0.0 - 32.3 |
| Union | 41 | 26.6 | 29.7 | 26.2 | 17.7 - 34.7 |
| Warren | 4 | 14.9 | 29.2 | 14.9 | 0.0 - 35.4 |

Source: **New Jersey 2020 UB Data**.

* = Statistically significantly below the state average.

** = Statistically significantly above the state average.

^ Expected rate = (Observed rate/Risk-adjusted rate) * Standard deviation. It is the rate the county would have if it performed the same as the statewide average (reference population) given the county's actual case-mix (e.g., age, gender, DRG, and comorbidity categories). If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than the reference population for that particular indicator. If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population.

## 10. Lower-extremity Amputation among Patients with Diabetes (PQI.16)

Diabetes is a major risk factor for lower-extremity amputation, which can be caused by infection, neuropathy, and microvascular disease. Proper long-term glucose control, diabetes education, and foot care are some of the interventions that can reduce the incidence of infection, neuropathy, and microvascular diseases. As a PQI, lower-extremity amputations among patients with diabetes, is not a measure of hospital quality but rather one measure of outpatient care and other health care problems in a community. Proper and continued treatment and glucose control may reduce the incidence of lower-extremity amputation; and lower hospitalization rates represent better quality of care. Areas may wish to identify hospitals that contribute the most to the overall area rate for this indicator. The patient populations served by these hospitals may be a starting point for interventions.

The rate is defined as admissions for lower-extremity amputation in patients with diabetes per 100,000 county population age 18 years and older. The indicator includes all non-maternal discharges age 18 and older with ICD-10-CM procedure codes for lower-extremity amputation and diagnosis code for diabetes and excludes transfer cases, MDC 14 (pregnancy, childbirth, and puerperium), MDC 15 (newborn and other neonates), and those with trauma diagnosis code.

**Table 10** shows the number of hospital admissions for lower-extremity amputation by county along with their observed, expected and risk-adjusted rates.

- In New Jersey, there were 2,084 admissions for lower-extremity amputation in 2020. The risk-adjusted hospital admissions rate for lower-extremity amputation was 28.8 per 100,000. The national rate for 2018 (see Table 13) was 32.3 per 100,000.

- Burlington, Camden, Cumberland, Essex, Hudson and Passaic counties have rates that are statistically significantly higher than the statewide average.

- Disparities in hospitalizations for lower-extremity amputation in patients with diabetes by age, sex and race/ethnicity are shown in Tables 16, 17 and 18.

**Table 10. Hospital Admissions for Lower-Extremity Amputation among Patients with Diabetes (per 100,000 population, age 18+)**

| County | Hospital admissions | Observed rate | Expected rate^ | Risk-adjusted rate | 95% Confidence Interval |
|---|---|---|---|---|---|
| **Statewide** | **2,084** | **30.0** | **33.6** | **28.8** | **27.5 - 30.1** |
| Atlantic | 79 | 38.0 | 35.6 | 34.4 | 27.1 - 41.8 |
| Bergen | 131 | 17.8 | 34.9 | 16.5 * | 12.6 - 20.5 |
| Burlington | 134 | 37.8 | 34.7 | 35.2 ** | 29.5 - 40.9 |
| Camden | 174 | 44.3 | 32.6 | 43.9 ** | 38.3 - 49.5 |
| Cape May | 14 | 18.5 | 41.4 | 14.5 * | 3.1 - 25.8 |
| Cumberland | 118 | 105.9 | 32.7 | 104.5 ** | 94.0 - 115.0 |
| Essex | 237 | 38.8 | 30.9 | 40.6 ** | 36.0 - 45.2 |
| Gloucester | 58 | 25.2 | 33.9 | 24.0 | 16.8 - 31.1 |
| Hudson | 158 | 29.5 | 26.9 | 35.4 ** | 30.1 - 40.7 |
| Hunterdon | 20 | 19.7 | 38.7 | 16.5 * | 6.4 - 26.6 |
| Mercer | 67 | 23.2 | 32.2 | 23.3 | 16.7 - 29.8 |
| Middlesex | 211 | 32.7 | 32.6 | 32.5 | 28.1 - 36.8 |
| Monmouth | 118 | 24.1 | 36.5 | 21.3 * | 16.6 - 26.1 |
| Morris | 53 | 13.6 | 35.5 | 12.4 * | 7.0 - 17.7 |
| Ocean | 150 | 32.3 | 37.6 | 27.8 | 23.0 - 32.5 |
| Passaic | 159 | 41.6 | 32.0 | 42.1 ** | 36.3 - 47.8 |
| Salem | 16 | 32.6 | 35.9 | 29.3 | 14.2 - 44.4 |
| Somerset | 43 | 16.6 | 34.9 | 15.4 * | 8.7 - 22.0 |
| Sussex | 16 | 14.1 | 37.5 | 12.2 * | 2.5 - 21.9 |
| Union | 114 | 26.8 | 32.6 | 26.5 | 21.2 - 31.9 |
| Warren | 14 | 16.4 | 36.8 | 14.4 * | 3.1 - 25.7 |

Source: **New Jersey 2020 UB Data**.

* = Statistically significantly below the state average.

** = Statistically significantly above the state average.

^ Expected rate = (Observed rate/Risk-adjusted rate) * Standard deviation. It is the rate the county would have if it performed the same as the statewide average (reference population) given the county's actual case-mix (e.g., age, gender, DRG, and comorbidity categories). If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than the reference population for that particular indicator. If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population.

## 11. Composite PQIs (Overall-PQI.90, Acute-PQI.91, and Chronic-PQI.92)

As mentioned earlier, the PQIs are currently implemented at the county level based on the location of the patient's residence, not on the location of the hospital. In other words, the PQI are hospitalization rates for residents of the county, regardless of whether the hospital is located inside or outside the county (or state). The PQI composites are intended to improve the statistical precision of the individual PQI, allowing for greater discrimination in performance among areas, and improved ability to identify potentially determining factors in performance.

An overall composite captures the general concept of potentially avoidable hospitalization connecting the individual PQI measures, which are all rates at the area level. The composite measures - acute and chronic – are created to investigate different factors influencing hospitalization rates for acute and chronic conditions. Table 11 shows composite PQI measures for New Jersey for 2020.

The PQI composites are designed to help provide quick information on issues such as assessment of quality and disparity, baselines to track progress, and identify information gaps, and emphasize interdependence of quality and disparities. They are also intended to provide national, state and county level estimates that can be tracked over time.

**Table 11** shows the number of hospital admissions for overall, acute and chronic conditions by county along with their risk-adjusted rates (observed and expected rates are excluded for reasons of brevity).

- The national overall, acute and chronic composite rates, respectively, in 2018, were 1,301.4, 318.4 and 983.1 per 100,000 age 18.

- Readers can compare the corresponding composite rates for New Jersey for 2018 and 2020 with the 2018 national rates presented in Table 13.

## Table 11. Composite PQIs (per 100,000 population, age 18+)

| County | Overall (PQI.90) | | Acute (PQI.91) | | Chronic (PQI.92) | |
|---|---|---|---|---|---|---|
| | Volume | Rate | Volume | Rate | Volume | Rate |
| **Statewide** | **71,539** | **960.5** | **16,177** | **218.2** | **55,362** | **751.1** |
| Atlantic | 3,136 | 1,328.2 ** | 720 | 307.5 ** | 2,416 | 1,035.1 ** |
| Bergen | 4,492 | 547.0 * | 1,061 | 127.8 * | 3,431 | 422.6 * |
| Burlington | 4,591 | 1,172.2 ** | 1,189 | 306.4 ** | 3,402 | 879.8 ** |
| Camden | 6,334 | 1,534.9 ** | 1,321 | 325.2 ** | 5,013 | 1,230.1 ** |
| Cape May | 1,083 | 1,025.9 | 261 | 241.0 | 822 | 795.9 |
| Cumberland | 3,338 | 2,803.3 ** | 734 | 646.2 ** | 2,604 | 2,229.7 ** |
| Essex | 7,316 | 1,224.1 ** | 1,104 | 187.5 * | 6,212 | 1,045.6 ** |
| Gloucester | 1,901 | 792.3 * | 398 | 169.5 * | 1,503 | 628.1 * |
| Hudson | 4,628 | 1,012.8 ** | 970 | 218.0 | 3,658 | 802.4 |
| Hunterdon | 805 | 675.6 * | 264 | 224.6 | 541 | 457.0 * |
| Mercer | 3,333 | 1,118.3 ** | 672 | 226.8 | 2,661 | 902.3 ** |
| Middlesex | 5,596 | 853.8 * | 1,300 | 201.5 * | 4,296 | 659.2 * |
| Monmouth | 5,341 | 948.7 | 1,406 | 251.1 ** | 3,935 | 707.2 * |
| Morris | 2,419 | 553.0 * | 636 | 144.9 * | 1,783 | 411.8 * |
| Ocean | 6,192 | 1,005.7 ** | 1,664 | 259.5 ** | 4,528 | 757.5 |
| Passaic | 3,473 | 901.0 * | 728 | 190.8 * | 2,745 | 717.1 * |
| Salem | 609 | 1,071.3 ** | 181 | 315.0 ** | 428 | 765.6 |
| Somerset | 1,481 | 526.8 * | 347 | 123.5 * | 1,134 | 406.3 * |
| Sussex | 965 | 773.1 * | 250 | 207.9 | 715 | 571.9 * |
| Union | 3,591 | 831.4 * | 771 | 180.8 * | 2,820 | 656.7 * |
| Warren | 915 | 926.7 | 200 | 203.8 | 715 | 731.5 |

Source: **New Jersey 2020 UBJ Data**.

* = Statistically significantly below the state average.

** = Statistically significantly above the state average.

OVERALL - includes all 10 PQIs (i.e., PQI.1, PQI.3, PQI.5, PQI.7, PQI.8, PQI.11, PQI.12, PQI.14, PQI.15, and PQI.16)

ACUTE - includes PQI.11 and PQI.12 only

CHRONIC - includes all 8 of the non-acute PQIs included under the composite - OVERALL.

## 12. Diabetes Composite (PQI.93)

As stated earlier, the PQIs are area-level indicators that enable tracking of potentially preventable hospitalizations, including diabetes, in a community or region. PQIs are proved to be key tool for community health needs assessments. To enhance this objective, AHRQ in its latest module versions has added a fourth PQI composite measure - PQI.93 (i.e., Prevention Quality Diabetes Composite).

Diabetes Composite (PQI.93) is composed of Diabetes Short-Term Complications (PQI.01), Diabetes Long-Term Complications (PQI.03), Uncontrolled Diabetes (PQI.14), and Lower-Extremity Amputation (PQI.16). The Diabetes Composite (PQI.93) rate represents hospital admissions per 100,000 population, ages 18 years and older; and it includes admissions for any one or more of the following conditions: diabetes with short-term complications, diabetes with long-term complications, uncontrolled diabetes without complications, diabetes with lower-extremity amputation.

**Table 12** shows the number of hospital admissions for Diabetes Composite conditions by county along with their observed, expected and risk-adjusted rates including their corresponding 95% Confidence Intervals. As stated earlier, the PQI composites are intended to be used to provide national estimates that can be tracked over time and to provide State and county level estimates that can be compared with the national estimate and to each other.

- In New Jersey, there were 15,788 admissions for Diabetes Composite (i.e., diabetes with short-term complications, diabetes with long-term complications, uncontrolled diabetes without complications, and diabetes with lower-extremity amputation) in 2020, with a risk-adjusted rate of 222.5 per 100,000 (Table 12).

- Atlantic, Burlington, Camden, Cumberland, Essex, Mercer and Passaic counties have rates that are statistically significantly higher than the statewide average.

- Readers can compare Diabetes Composite hospitalization rates for New Jersey for 2018 and 2020 with the 2018 national rate presented in Table 13.

- Disparities in hospitalizations for Diabetes Composite by age, sex and race/ethnicity are shown in Tables 16, 17 and 18.

## Table 12. Prevention Quality Diabetes Composite (per 100,000 population, age 18+)

| County | Hospital admissions | Observed rate | Expected rate^ | Risk-adjusted rate | 95% Confidence Interval |
|---|---|---|---|---|---|
| **Statewide** | **15,788** | **227.2** | **252.8** | **222.5** | **218.8 - 226.1** |
| Atlantic | 757 | 364.1 | 259.9 | 346.8 ** | 325.9 - 367.6 |
| Bergen | 875 | 119.0 | 257.8 | 114.3 * | 103.2 - 125.4 |
| Burlington | 910 | 256.5 | 256.5 | 247.5 ** | 231.4 - 263.5 |
| Camden | 1,517 | 386.4 | 248.9 | 384.2 ** | 368.7 - 399.7 |
| Cape May | 187 | 247.2 | 281.3 | 217.5 | 184.3 - 250.7 |
| Cumberland | 714 | 640.5 | 249.4 | 635.7 ** | 606.7 - 664.8 |
| Essex | 1,966 | 321.8 | 242.9 | 328.0 ** | 315.4 - 340.6 |
| Gloucester | 411 | 178.4 | 253.4 | 174.3 * | 154.2 - 194.3 |
| Hudson | 1,148 | 214.4 | 227.5 | 233.3 | 219.4 - 247.2 |
| Hunterdon | 157 | 154.9 | 270.5 | 141.8 * | 112.5 - 171.0 |
| Mercer | 771 | 266.5 | 247.6 | 266.5 ** | 248.4 - 284.6 |
| Middlesex | 1,209 | 187.4 | 248.6 | 186.6 * | 174.5 - 198.7 |
| Monmouth | 1,041 | 212.5 | 263.0 | 200.0 * | 186.5 - 213.5 |
| Morris | 462 | 118.5 | 260.0 | 112.8 * | 97.6 - 128.0 |
| Ocean | 1,042 | 224.4 | 268.8 | 206.6 * | 192.9 - 220.4 |
| Passaic | 980 | 256.6 | 246.5 | 257.6 ** | 241.8 - 273.4 |
| Salem | 134 | 273.1 | 261.1 | 258.9 | 216.1 - 301.7 |
| Somerset | 283 | 109.3 | 257.6 | 105.0 * | 86.2 - 123.7 |
| Sussex | 196 | 173.2 | 265.7 | 161.4 | 133.4 - 189.3 |
| Union | 856 | 201.1 | 249.0 | 199.9 * | 185.0 - 214.8 |
| Warren | 172 | 201.5 | 264.3 | 188.7 * | 156.5 - 221.0 |

Source: **New Jersey 2020 UB Data**.

* = Statistically significantly below the state average.

** = Statistically significantly above the state average.

Diabetes Composite - Includes PQI.1, PQI.3, PQI.14, and PQI.16)

^ Expected rate = (Observed rate/Risk-adjusted rate) * Standard deviation. It is the rate the county would have if it performed the same as the statewide average (reference population) given the county's actual case-mix (e.g., age, gender, DRG, and comorbidity categories). If the observed rate is higher than the expected rate (i.e., the ratio of observed/expected is greater than 1.0), then the implication is that the county performed worse than the reference population for that particular indicator. If the observed rate is lower than the expected rate (i.e., the ratio of observed/expected is less than 1.0), then the implication is that the county performed better than the reference population.

# Prevention Quality Indicator Patterns by County

Prevention quality indicators are best understood by grouping indicators that potentially describe similar health problems. As an example, all risk-adjusted diabetes related admission rates by county are presented on a map side-by-side to assess patterns (Figure 2). In some instances, (e.g, Figures 3 and 4) the maps may not necessarily suggest similarities of health indicators. In Figures 3 and 4, the maps include indicators that we found easier to show on the same page for presentation purposes only.

The 2020 New Jersey data show a substantial variation in preventable hospital admissions by county. Not surprisingly, the variations appear to reflect the socio-economic disparities of the county populations, with more affluent counties having significantly lower rates than the statewide average, and the less affluent counties having significantly higher admission rates than the statewide rate. Figure 1 shows county-level median household income in New Jersey in 2020.

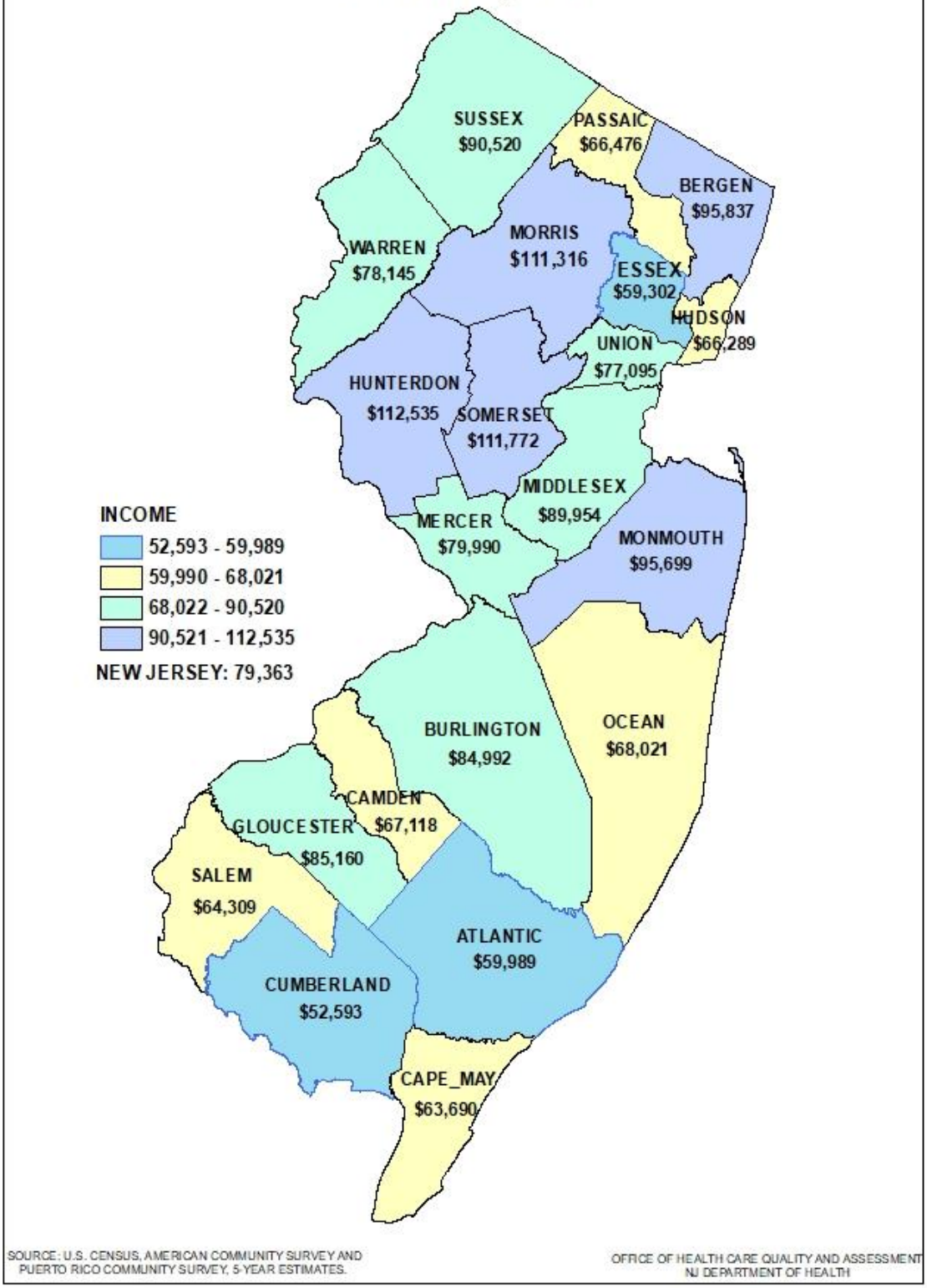
We observe a remarkable consistency in levels of admission rates by county for diabetes with short term complications, diabetes with long term complications, uncontrolled diabetes, and lower-extremity amputation among patients with diabetes (See Figure 2). Note that on the map, they are denoted as Diab_St, Diab_Lt, Diab_Uncon, and Amputation, respectively.

Figure 3 presents hospital admission rates for hypertension, heart failure (HF) and urinary tract infection (UTI) by county. These three indicators (i.e., Hypertension, HF and UTI) point to potentially associated health problems. We observe that counties have similar patterns in admission rates, with Warren, Hunterdon and Sussex showing stronger similarities in patterns of admission for hypertension, and HF (i.e., CHF).

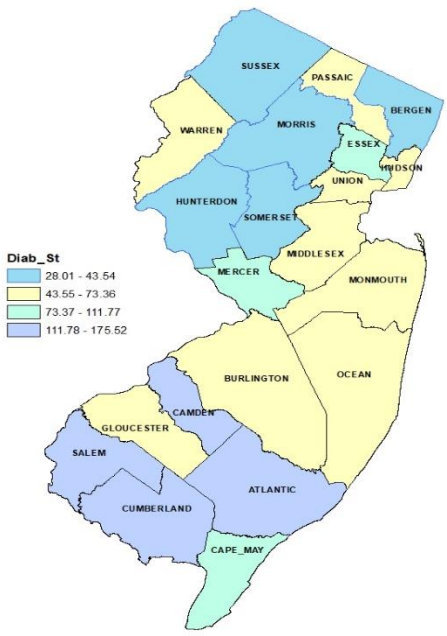
The top panel of Figure 4 presents asthma and chronic obstructive pulmonary disease (COPD) admission rates by county. Not surprisingly, asthma and COPD admission rates show similar patterns by county. Figure 4 also presents community-acquired or bacterial pneumonia (represented on the map by Pneumonia) admission rates by county and shows that the patterns are remarkably consistent.

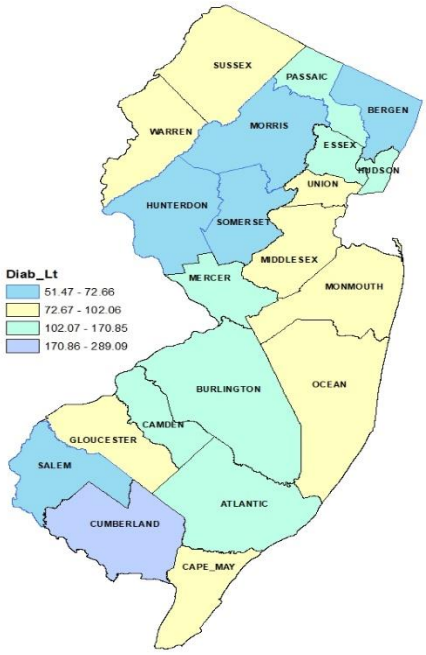
Figure 5 shows composite PQIs by county. Note that the following two questions were examined while creating the composite measures: 1) Does disease prevalence impact variability? As anticipated, areas with higher rates of diabetes and hypertension show higher hospitalizations, particularly in the chronic composite. However, for asthma the contrary relation is true suggesting other confounding factors; 2) Is variability driven by poverty status? Areas with low levels of poverty also show lower hospitalization rates for each of the PQI composites, which is independent of access to care.

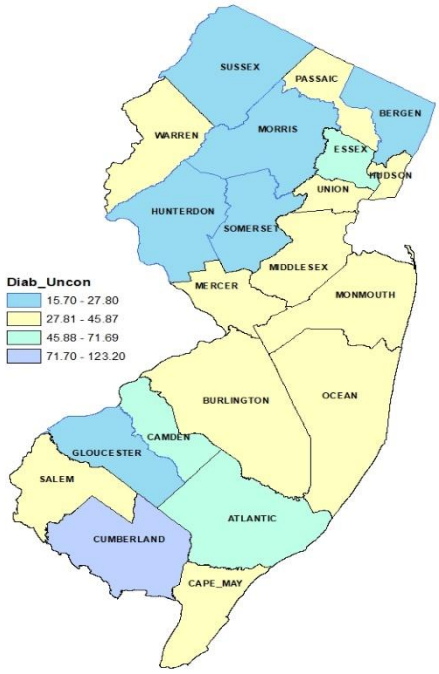
**FIGURE 1. NEW JERSEY HOUSEHOLD MEDIAN INCOME BY COUNTY**
**NEW JERSEY, 2020**

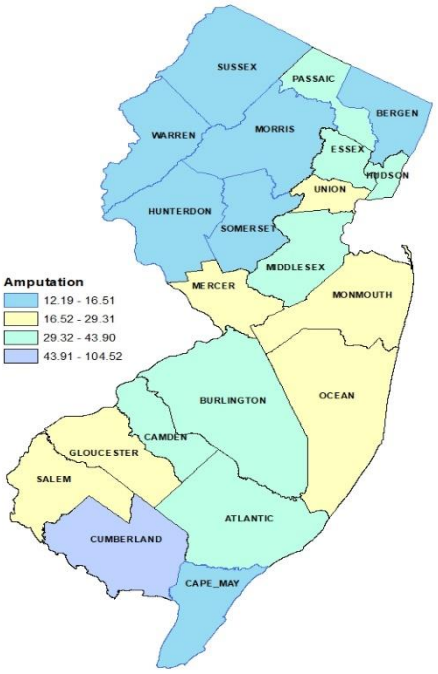


## FIGURE 2. DIABETES-RELATED HOSPITAL ADMISSION RATES (PER 100,000 POPULATION) BY COUNTY, NEW JERSEY 2020

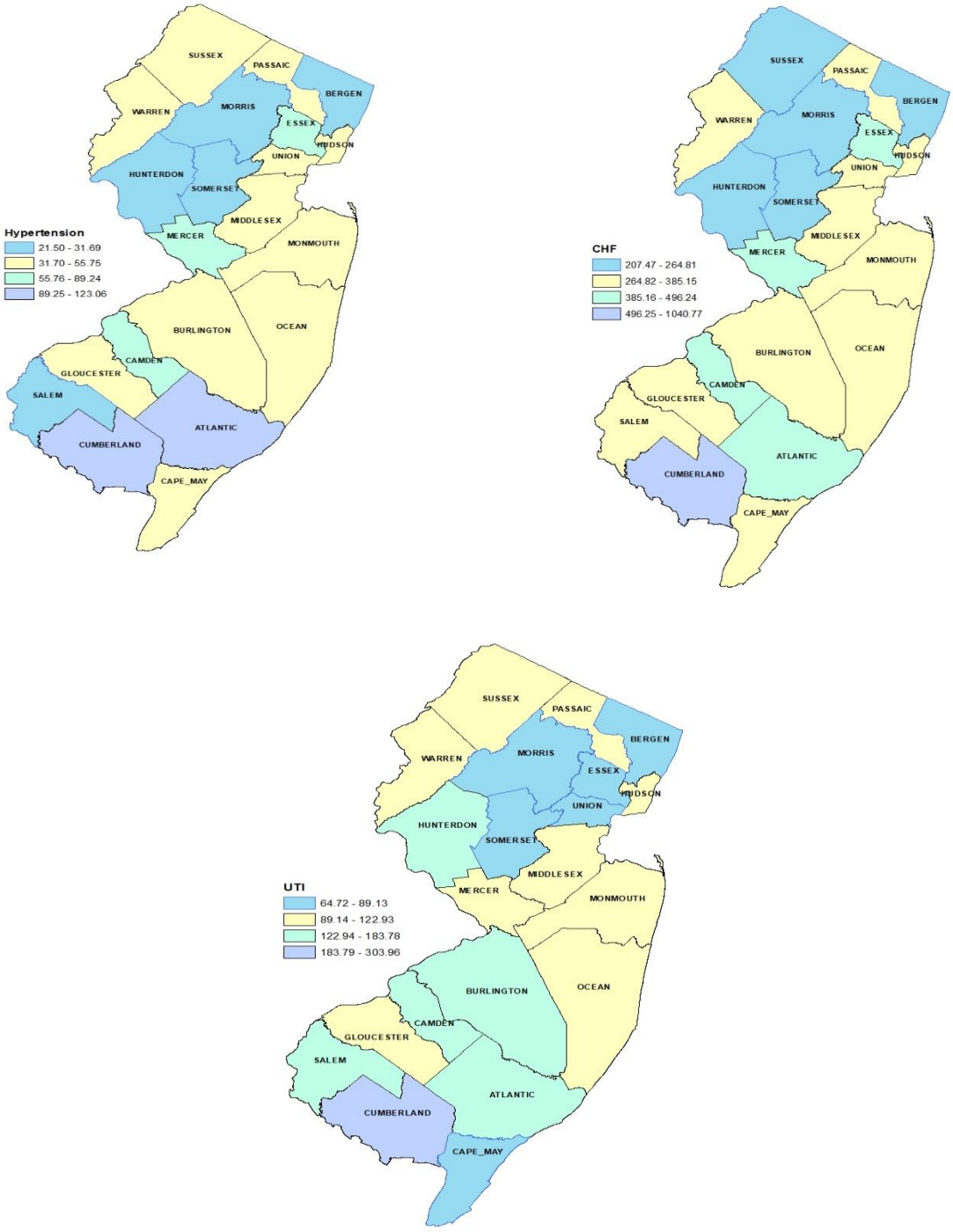


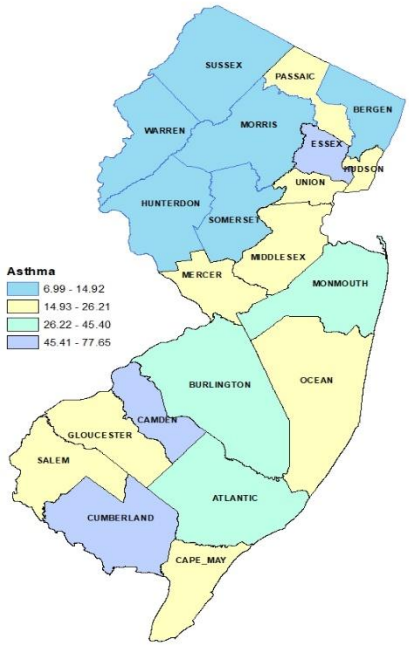



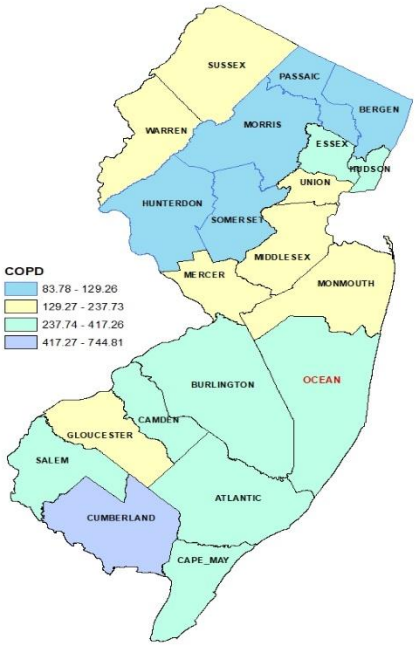



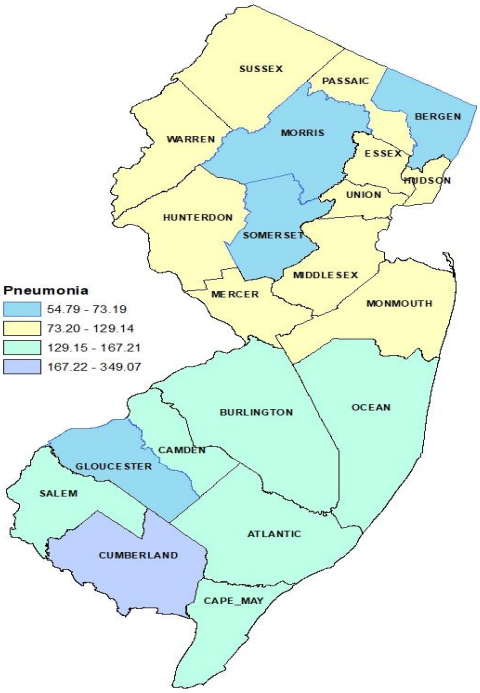
## FIGURE 3. HOSPITAL ADMISSION RATES (PER 100,000 POPULATION) FOR HYPERTENSION, CONGESTIVE HEART FAILURE, AND URINATRY TRACT INFECTION BY COUNTY, NEW JERSEY 2020



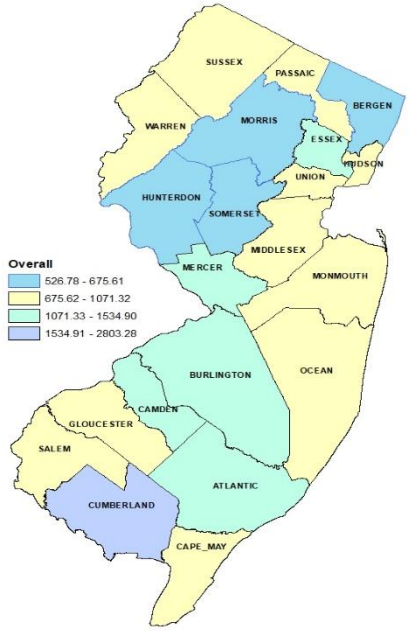
## FIGURE 4. HOSPITAL ADMISSION RATES FOR ASTHMA, COPD, AND LOW PNEUMONIA (PER 1,000 POPULATION ) BY COUNTY, NEW JERSEY 2020

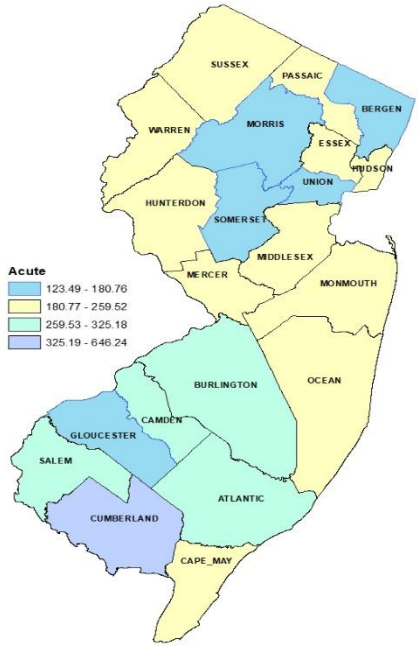


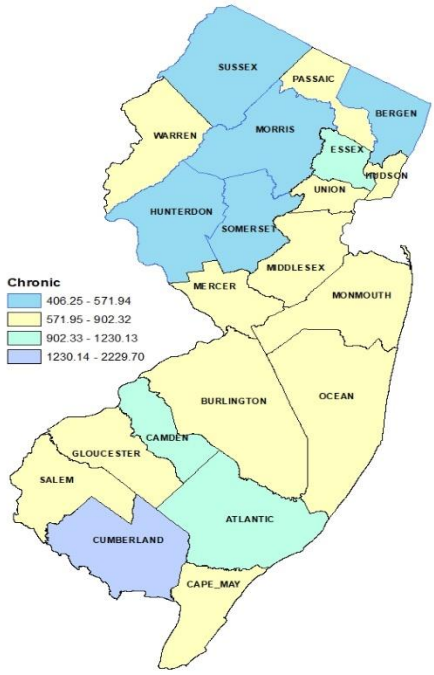



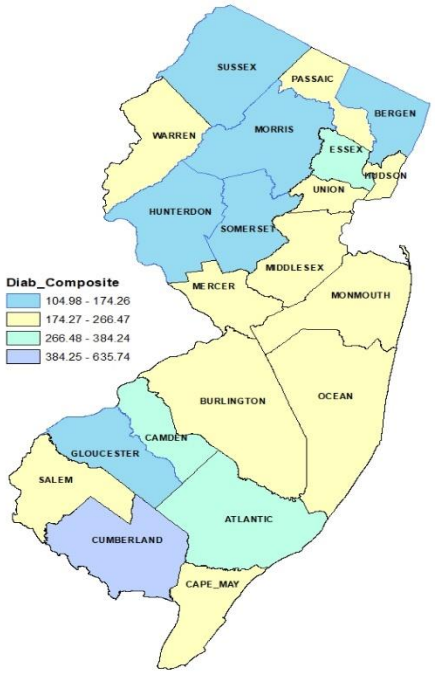



## FIGURE 5. COMPOSITE INDICATORS BY COUNTY, NEW JERSEY 2020



# Statewide PQI Measures Compared to National Estimates

National rates for PQIs are derived from the State Inpatient Data (SID), which is a national dataset dealing with inpatients only. SID is built from UB datasets coming from 49 participating states including the District of Columbia (Alabama and Idaho are not participating, yet). In 2018, the SID database represented more than 97 percent of all annual discharges in the United States. The uniform format of the SID helps facilitate cross-state comparisons because it contains all-payer, encounter-level information on inpatient discharges, including clinical and resource information typically found on a billing record, such as patient demographics, up to 30 ICD-10-CM/PCS diagnoses and procedures, length of stay, expected payer, admission and discharge dates, and discharge disposition.

The transition from ICD-9-CM to ICD-10-CM/PCS represents substantial differences across the two code sets. According to AHRQ, specifications have been carefully reviewed to achieve as much consistency as possible. However, differences are expected to exist between AHRQ QI measures calculated by the ICD-9 based versions such as v5.0 and the previous ones; and those calculated by the ICD-10-CM/PCS based versions such as V2019, V2020 and v2021.

**Table 13** shows National rates and New Jersey's statewide-level prevention quality indicator estimates for the 10 individual PQIs and the 4 Composite PQIs analyzed in this report. New Jersey's statewide estimated rates for 2018 and 2020 are presented along with the 2018 National rates (the latest available) for readers to make comparisons. All rates in the table including the national rates are calculated using the PQIs module (SAS Version 2021). Readers ought to note that Version 2021, which is the latest one, is based on the ICD-10-CM Coding system.

- Data in Table 13 clearly demonstrates that New Jersey's hospitalization rates for almost all the PQIs including the composite measures are considerably higher than the national averages. It ought to be noted, however, that NJ hospitalization rates for 2020 are lower than expected due to the pandemic.

## Table 13. Comparing New Jersey's Statewide PQI Rates with National Rates (per 100,000 population)

| Preventiona Quality Indicators (PQIs) | National | New Jersey | |
|---|---|---|---|
| | 2018 | 2018 | 2020 |
| Diabetes with Short Term Complications (PQI.01) | 82.2 | 78.4 | 66.5 |
| Diabetes with Long Term Complication (PQI.03) | 108.9 | 138.4 | 105.5 |
| COPD or Asthma in Older Adults (PQI.05) | 381.1 | 486.2 | 218.7 |
| Hypertension (PQI.07) | 60.8 | 72.9 | 51.1 |
| Heart Failure (PQI.08) | 429.6 | 463.7 | 339.7 |
| Community-Acquired Pneumonia (PQI.11) | 183.6 | 182.8 | 112.1 |
| Urinary Tract Infection (PQI.12) | 134.8 | 162.3 | 106.7 |
| Uncontrolled Diabetes (PQI.14) | 42.1 | 55.7 | 38.6 |
| Asthma in Younger Adults (PQI.15) | 29.2 | 49.0 | 27.0 |
| Lower Extremity Amputation (PQI.16) | 32.3 | 34.0 | 28.8 |
| Overall PQIs - Composite (PQI.90) | 1,301.4 | 1,444.5 | 960.5 |
| Acute PQIs - Composite (PQI.91) | 318.4 | 344.1 | 218.2 |
| Chronic PQIs - Composite (PQI.92) | 983.1 | 1,123.2 | 751.1 |
| Diabetes PQIs - Composite (PQI.93) | 247.5 | 285.5 | 222.5 |

Note: Both the National and NJ Rates are calculated using the latest Version of AHRQ SAS Software (i.e., Version 2021) - a version based on the ICD-10-CM Diagnosis & Procedure Codes.

# Costs of Potentially Preventable Hospitalizations

This section presents potentially preventable hospitalizations and their associated costs. The terms “preventable hospitalizations” and “unnecessary hospitalizations” are often used interchangeably with “avoidable hospitalizations” to indicate the presence of hospital care for patients whose primary condition or diagnosis is one that, if detected and cared for effectively at an earlier point, may not lead to hospitalization. While not every hospitalization can be prevented through improvement in health care delivery, early detection, care, and education of persons with ambulatory care sensitive conditions is believed to reduce rates of potentially avoidable hospitalizations and save both lives and cost.

**Table 14** shows the amount of money that could be saved by reducing potentially avoidable hospitalizations as estimated by the PQIs module. These statistics would assist health care planners in identifying communities for future interventions to improve preventive and primary care services, improve patient safety as well as in tracking the impacts of such interventions over time. Such information is particularly relevant in assessing the role hospitals and physicians may play in containing health care expenditures arising from potentially avoidable hospitalizations.

As is well known, the UB database contains information on total charges for each patient’s in-hospital stay. This hospital charge information represents the amount that hospitals bill for services they provide but does not reflect how much they realistically cost; or the specific amounts that hospitals received in payment. Often, users are interested in seeing how hospital charges translate into actual costs. And, the HCUP Cost-to-Charge Ratio (CCR) Files enable this conversion.

The HCUP Cost-to-Charge Ratio (CCR) files contains hospital-specific cost-to-charge ratios based on all-payer inpatient cost for nearly every hospital in the corresponding National Inpatient Sample (NIS) or State Inpatient Data (SID) sets. Cost information is obtained from the hospital accounting reports collected by the Centers for Medicare and Medicaid Services (CMS).

Hospitalization costs presented in this report are calculated using the HCUP Cost-to-charge-ratio (CCR) estimators. These estimates are obtained by multiplying total charges reported in the UB by cost-to-charge ratio (CCR) after data elements on the HCUP prepared CCR file for New Jersey were merged with our UB data using the appropriate procedure of merging different data sets. Note that Cost-to-charge ratio (CCR) files for NJ are obtained from HCUP.

In 2020, NJ hospitals reported about 71,539 hospitalizations for treatment of all the medical conditions outlined under the PQIs, which according to AHRQ’s specifications, are considered preventable. Using the cost-to-charge ratio estimators, potentially avoidable hospitalizations on the conditions presented in this report would have saved about 1.3 billion dollars ($1,253,167,263.14) in 2020 alone.

**Table 14. Estimated Costs over Potentially Preventable Hospitalizations (in $)**

| Prevention Quality Indicators (PQIs) | # of Preventable Hospitaliza-tions | Average length of in-hospital stay (days) | Average estimated cost per patient per day ($) | Average estimated cost per patient for all days ($) | Total estimated cost for all the Preventable Hospitaliza-tions ($) |
|---|---|---|---|---|---|
| Diabetes with Short Term Complications | **4,560** | 5.0 | 3,490 | 17,386 | 79,279,157 |
| Diabetes with Long Term Complication | **7,603** | 4.9 | 3,634 | 17,670 | 134,342,425 |
| COPD or Asthma in Older Adults | **9,869** | 4.9 | 3,657 | 18,070 | 178,331,350 |
| Hypertension (PQI.07) | **3,719** | 5.0 | 3,587 | 18,009 | 66,975,917 |
| Heart Failure | **25,316** | 5.0 | 3,509 | 17,721 | 448,616,229 |
| Community-Acquired Pneumonia | **8,247** | 4.7 | 3,546 | 16,553 | 136,515,972 |
| Urinary Tract Infection | **7,930** | 4.8 | 3,577 | 17,338 | 137,489,626 |
| Uncontrolled Diabetes | **2,787** | 4.8 | 3,427 | 16,410 | 45,736,036 |
| Asthma in Younger Adults | **675** | 6.6 | 2,778 | 18,415 | 12,429,848 |
| Lower Extremity Amputation | **2,084** | 5.1 | 3,538 | 17,964 | 37,437,059 |
| Overall PQIs - Composite | **71,539** | 4.9 | 3,544 | 17,517 | 1,253,167,263 |
| Acute PQIs - Composite | **16,177** | 4.7 | 3,559 | 16,877 | 273,022,626 |
| Chronic PQIs - Composite | **55,362** | 5.0 | 3,540 | 17,739 | 982,086,448 |
| Diabetes PQIs - Composite | **15,788** | 4.9 | 3,550 | 17,471 | 275,832,306 |

**Source: NJ UB 2020.**

Cost = TOTCHG * GAPICC.

TOTCHG stands for Total Charges reported in UB data, while GAPICC stands for Group average all-payer inpatient cost/charge ratio (CCR). HCUP constructed the CCR files using all-payer, inpatient cost and charge information that hospitals report to CMS. CCR provides an estimate of all-payer inpatient cost-to-charge ratio for hospitals in states that participate in HCUP.

Note: The HCUP Cost-to-Charge Ratio (CCR) Files enable users to convert total charges reported in UB databases to estimated actual costs. Each file contains hospital-specific cost-to-charge ratios based on all-payer inpatient cost for nearly every hospital in the corresponding National Inpatient Sample (NIS) or State Inpatient Data (SID). Cost information was obtained from the hospital accounting reports collected by the Centers for Medicare and Medicaid Services (CMS). Using the merged data elements from the cost-to-charge ratio files and the total charges reported in the UB data sets, we have converted the hospital total charge data to cost estimates by simply multiplying total charges with the appropriate cost-to-charge ratio, per AHRQ's recommendation.

# Potentially Preventable Hospitalizations by Payer Type

**Table 15** shows the percentage distribution of potentially preventable hospitalizations for each PQI by health insurance payer type as reported in the NJ 2020 UB data.

- Of the 25,316 potentially preventable hospitalizations for heart failure, 36 percent were paid for by Medicare. Similarly, 37 percent of the 9,869 hospitalizations for COPD, and 34 percent of the 3,719 for Hypertension for were paid for by Medicare.

- Not surprisingly, about 30 percent of all the potentially preventable hospitalizations for community-acquired pneumonia and 36% of urinary tract infections were paid for by Medicare.

- Overall, more than 32 percent of the potentially preventable hospitalizations both for acute and chronic conditions were paid for by Medicare. The data also shows that payment by private insurance for acute conditions was more than 38 percent.

- It should also be noted that 34 percent of hospital admissions for asthma in younger adults (ages 18-39) were paid by private insurance, implying significant gain in health insurance coverage among young adults.

- Both HCUP and AHRQ reports have shown that hospital stays paid for by Medicare were over three times more likely to be potentially preventable than were stays paid for by private insurance.

## Table 15. Preventable Hospitalizations by Payer Type

| PQIs | # of Preventable hospitaliza-tions | Paid by (%) | | | | |
|---|---|---|---|---|---|---|
| | | Medicare | Medicaid | Private | Self Pay | Other |
| Diabetes with Short Term Comp | **4,560** | 36.3 | 21.0 | 33.9 | 2.0 | 6.8 |
| Diabetes with Long Term Comp | **7,603** | 35.2 | 19.5 | 35.6 | 2.4 | 7.3 |
| COPD or Asthma in Older Adults | **9,869** | 36.9 | 20.1 | 33.3 | 2.7 | 7.0 |
| Hypertension | **3,719** | 34.4 | 20.8 | 35.0 | 2.5 | 7.2 |
| Heart Failure | **25,316** | 35.9 | 19.0 | 35.6 | 2.4 | 7.1 |
| Community-Acquired Pneumonia | **8,247** | 30.2 | 18.9 | 39.3 | 3.0 | 8.5 |
| Urinary Tract Infection | **7,930** | 35.9 | 18.6 | 36.2 | 2.2 | 7.1 |
| Uncontrolled Diabetes | **2,787** | 35.0 | 21.9 | 33.4 | 2.8 | 7.0 |
| Asthma in Younger Adults | **675** | 33.0 | 21.6 | 33.9 | 3.6 | 7.9 |
| Lower Extremity Amputation | **2,084** | 35.8 | 19.0 | 35.0 | 1.8 | 8.4 |
| Overall PQIs - Composite | **71,539** | 35.0 | 19.5 | 35.7 | 2.5 | 7.3 |
| Acute PQIs - Composite | **16,177** | 32.5 | 18.8 | 38.1 | 2.7 | 7.9 |
| Chronic PQIs - Composite | **55,362** | 35.8 | 19.7 | 34.9 | 2.5 | 7.1 |
| Diabetes PQIs - Composite | **15,788** | 35.5 | 20.3 | 34.6 | 2.3 | 7.3 |

**Source: NJ UB 2020**

OVERALL Composite - includes all 10 PQIs.

ACUTE Composite - includes PQI.11 and PQI.12 only

CHRONIC Composite - includes all 8 of the non-acute PQIs included under the composite - OVERALL.

Diabetes Composite - Includes PQI.1, PQI.3, PQI.14, and PQI.16)

## Selected Preventable Hospitalizations by Age, Sex and Race/Ethnicity

Tables 16.1, 16.2, 17, and 18 show the breakdown by age, sex, and race/ethnicity, respectively, of the total number of potentially preventable hospital admissions along with their corresponding observed rates for all the 10 individual PQIs and for only 2 composite measures (PQI.90 and PQI.93 are excluded for purposes of brevity). The purpose of including these tables is to assess the extent to which hospitalizations vary by socio-demographic characteristics with the hope that such information will shine some light for prevention services planning.

**Table 16.1** presents age distribution of the total hospital admissions for each PQI presented in Tables 1 through 12. As expected, hospitalizations for heart failure, community-acquired pneumonia, urinary tract infection and uncontrolled diabetes are significantly higher among people aged 65 and older.

**Table 16.2** presents hospital admission rates by broad age groups. Among the 18-39 years old, hospitalization rates were higher for Diabetes with Long Term Complication at 70.5 per 100,000 followed by Asthma in Younger Adults at 27.3 per 100,000; compared to other indicators. Among 40-64 years old, heart failure hospitalizations were more distinct at 205.2 per 100,000 followed by COPD at 140.6, and Diabetes with Long Term Complication at 128.2 per 100,000. Among the age group 65-74, the rate of hospitalizations for Heart Failure was the highest at 627.4 per 100,000 followed by COPD at 314.5, and Diabetes with Long Term Complication at 219.2 per 100,000. Among the 75 and older population, the highest hospitalization rate was due to Heart Failure at 2,509.3 per 100,000 followed by Community-Acquired or Bacterial Pneumonia at 737.8, Urinary Tract Infection at 718.4, and COPD at 462.0 per 100,000 population. For all age groups, hospitalizations for chronic conditions were consistently higher compared with hospitalizations for acute conditions.

**Table 17** shows potentially preventable hospitalizations of patients by gender for all 10 PQIs and two composite measures. Among males, Heart Failure (HF) with 336.2 per 100,000 hospitalizations rate was the most noticeable closely followed by COPD at 133.7/100,000. Likewise, Heart Failure at 391.6 and COPD at 150.2 per 100,000 stood out to reflect the highest hospital admission rates among females. Both gender categories reflected higher hospitalization rates for chronic conditions than for acute conditions.

**Table 18** shows variations in potentially preventable hospitalizations of patients by race/ethnicity for all the 10 individual PQIs and two composite measures (i.e., excluding PQI.90 and PQI.93). Diabetes w/short term complication hospitalization rate was much higher for Blacks (79.6) compared to the statewide average of 65.7 per 100,000. Except for Asian NH, COPD hospitalizations were associated with the highest rates followed by Heart Failure for all race/ethnic groups. The highest rate for Asian NH was Heart Failure (102.9/100,000). Avoidable hospitalizations (i.e., rates) for all the measures displayed in this table are markedly higher for blacks (African Americans) compared to other race/ethnic groups. The race/ethnic group ‘Asian NH’ showed consistently, lower rates of hospitalizations, than all the other race/ethnic groups. Preventable hospitalization rates by socio-demographic characteristics clearly show wide variation. Some of these variations may result from lifestyle differences, lack of access to the healthcare system, or other social determinants of health.

## Table 16.1: Age Distribution of Preventable Hospitalizations (%)

| PQIs | # of Preventable hospitaliza-tions | Age Distribution | | | |
|---|---|---|---|---|---|
| | | 18-39 | 40-64 | 65-74 | 75+ |
| Diabetes with Short Term Complications | **4,560** | 38.2 | 43.9 | 10.4 | 7.5 |
| Diabetes with Long Term Complication | **7,603** | 6.6 | 49.9 | 24.8 | 18.8 |
| COPD or Asthma in Older Adults | **9,869** | - | 42.1 | 27.4 | 30.5 |
| Hypertension | **3,719** | 8.8 | 42.7 | 18.7 | 29.7 |
| Heart Failure | **25,316** | 1.8 | 24.0 | 21.3 | 52.9 |
| Community-Acquired Pneumonia | **8,247** | 5.2 | 21.3 | 15.3 | 58.2 |
| Urinary Tract Infection | **7,930** | 7.5 | 16.7 | 16.9 | 58.9 |
| Uncontrolled Diabetes | **2,787** | 9.2 | 35.4 | 23.9 | 31.5 |
| Asthma in Younger Adults | **675** | 100.0 | - | - | - |
| Lower Extremity Amputation | **2,084** | 2.8 | 51.0 | 27.2 | 19.0 |
| Overall PQIs - Composite | **71,539** | 6.9 | 30.5 | 20.2 | 42.3 |
| Acute PQIs - Composite | **16,177** | 6.2 | 19.4 | 15.9 | 58.5 |
| Chronic PQIs - Composite | **55,362** | 7.2 | 34.4 | 21.7 | 36.7 |
| Diabetes PQIs - Composite | **15,788** | 16.0 | 45.7 | 20.6 | 17.7 |

**Source: NJ UB 2020**

COPD or Asthma in Older Adults (PQI.05) - covers population 40 years of age and over. It does not apply to population ages 18-39. Likewise, PQI.15 applies only for younger adults ages 18-39.

OVERALL Composite - includes all 10 PQIs.

ACUTE Composite - includes PQI.11 and PQI.12 only

CHRONIC Composite - includes all 8 of the non-acute PQIs included under the composite - OVERALL.

Diabetes Composite - Includes PQI.1, PQI.3, PQI.14, and PQI.16)

**Table 16.2: Hospitalized Patients for Selected PQIs by Age**

**(Rates are per 100,000 population in the given age group)**

| Selected PQIs | 18 to 39 | | 40 to 64 | | 65 to 74 | | 75+ | | Total (All Ages) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | # of Hospital Admissions | Rate | # of Hospital Admissions | Rate | # of Hospital Admissions | Rate | # of Hospital Admissions | Rate | # of Hospital Admissions | Rate |
| Diabetes with Short Term Complications | 1,742 | 70.5 | 2,002 | 67.7 | 474 | 55.2 | 342 | 52.6 | **4,560** | **65.7** |
| Diabetes with Long Term Complication | 500 | 20.2 | 3,793 | 128.2 | 1,884 | 219.2 | 1,425 | 219.0 | **7,603** | **109.6** |
| COPD or Asthma in Older Adults (age 40+) | - | - | 4,160 | 140.6 | 2,703 | 314.5 | 3,006 | 462.0 | **9,869** | **142.2** |
| Hypertension | 328 | 13.3 | 1,589 | 53.7 | 696 | 81.0 | 1,106 | 170.0 | **3,719** | **53.6** |
| Heart Failure | 457 | 18.5 | 6,069 | 205.2 | 5,392 | 627.4 | 13,398 | 2,059.3 | **25,316** | **364.9** |
| Community-Acquired Pneumonia | 429 | 17.4 | 1,757 | 59.4 | 1,262 | 146.8 | 4,800 | 737.8 | **8,247** | **118.9** |
| Urinary Tract Infection | 594 | 24.0 | 1,324 | 44.8 | 1,338 | 155.7 | 4,674 | 718.4 | **7,930** | **114.3** |
| Uncontrolled Diabetes | 257 | 10.4 | 986 | 33.3 | 665 | 77.4 | 879 | 135.1 | **2,787** | **40.2** |
| Asthma in Younger Adults | 675 | 27.3 | - | - | - | - | - | - | **675** | **9.7** |
| Lower Extremity Amputation | 59 | 2.4 | 1,062 | 35.9 | 567 | 66.0 | 396 | 60.9 | **2,084** | **30.0** |
| Acute PQIs - Composite | 1,003 | 40.6 | 3,138 | 106.1 | 2,572 | 299.3 | 9,464 | 1,454.6 | **16,177** | **233.1** |
| Chronic PQIs - Composite | 3,982 | 161.2 | 19,034 | 643.4 | 12,037 | 1,400.6 | 20,309 | 3,121.5 | **55,362** | **797.9** |
| **NJ 2020 Population Estimate (age 18+)** | **2,470,244** | | **2,958,252** | | **859,409** | | **650,619** | | **6,938,524** | |

**Source: NJ UB 2020.**

COPD or Asthma in Older Adults (PQI.05) - covers population 40 years of age and over. It does not apply to population ages 18-39.

Asthma in Younger Adults (PQI.15) - covers population 18 to 39 years of age only.

Note that rates in this table are not risk adjusted. They are simply observed/row rates obtained by dividing # of hospitalization in the age group by the total population in that same age group.

**Table 17. Hospitalized Patients for Selected PQIs by Sex**

**(Rates are per 100,000 population ages 18 and older)**

| Selected PQIs | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | # of Hospital Admissions | Rate | # of Hospital Admissions | Rate | # of Hospital Admissions | Rate |
| Diabetes with Short Term Comp | 2,082 | 62.2 | 2,478 | 69.0 | **4,560** | **65.7** |
| Diabetes with Long Term Comp | 3,371 | 100.7 | 4,232 | 117.8 | **8,271** | **119.2** |
| COPD or Asthma in Older Adults | 4,475 | 133.7 | 5,394 | 150.2 | **9,869** | **142.2** |
| Hypertension | 1,640 | 49.0 | 2,079 | 57.9 | **3,719** | **53.6** |
| Heart Failure | 11,253 | 336.2 | 14,064 | 391.6 | **25,317** | **364.9** |
| Community-Acquired Pneumonia | 3,587 | 107.2 | 4,660 | 129.8 | **8,247** | **118.9** |
| Urinary Tract Infection | 3,555 | 106.2 | 4,375 | 121.8 | **7,930** | **114.3** |
| Uncontrolled Diabetes | 1,290 | 38.5 | 1,497 | 41.7 | **2,787** | **40.2** |
| Asthma in Younger Adults | 299 | 8.9 | 376 | 10.5 | **675** | **9.7** |
| Lower Extremity Amputation | 892 | 26.6 | 1,192 | 33.2 | **2,084** | **30.0** |
| Acute PQIs - Composite | 7,134 | 213.1 | 9,043 | 251.8 | **16,177** | **233.1** |
| Chronic PQIs - Composite | 24,790 | 740.6 | 30,572 | 851.3 | **55,362** | **797.9** |
| **NJ 2020 Population Estimate (age 18+)** | **3,347,455** | | **3,591,069** | | **6,938,524** | |

**Source: NJ UB 2020.**

COPD or Asthma in Older Adults (PQI.05) - covers population 40 years of age and over. It does not apply to population ages 18-39.

Asthma in Younger Adults (PQI.15) - covers population 18 to 39 years of age only.

Note that rates in this table are not risk adjusted. They are simply observed/row rates obtained by dividing # of hospitalization in the age group by the total population in that same age group.

**Table 18. Hospitalized Patients for Selected PQIs by Race/Ethnicity**

**(Rates are per 100,000 population)**

| Selected PQIs | White NH | | Black NH | | Hispanic | | Asian NH | | Other | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # of Hospital Admissions | Rate | # of Hospital Admissions | Rate | # of Hospital Admissions | Rate | # of Hospital Admissions | Rate | # of Hospital Admissions | Rate | # of Hospital Admissions | Rate |
| Diabetes with Short Term Complications | 2,245 | 45.6 | 978 | 79.6 | 778 | 48.7 | 181 | 18.9 | 378 | 716.5 | **4,560** | **65.7** |
| Diabetes with Long Term Complication | 3,974 | 80.7 | 1,313 | 106.9 | 1,268 | 79.4 | 316 | 33.0 | 732 | 1,387.4 | **7,603** | **109.6** |
| COPD or Asthma in Older Adults | 5,460 | 110.9 | 1,774 | 144.4 | 1,405 | 88.0 | 350 | 36.6 | 880 | 1,668.0 | **9,869** | **142.2** |
| Hypertension | 1,943 | 39.5 | 759 | 61.8 | 580 | 36.3 | 133 | 13.9 | 304 | 576.2 | **3,719** | **53.6** |
| Heart Failure | 13,872 | 281.7 | 4,393 | 357.6 | 3,932 | 246.2 | 984 | 102.9 | 2,135 | 4,046.7 | **25,316** | **364.9** |
| Community-Acquired Pneumonia | 4,472 | 90.8 | 1,232 | 100.3 | 1,359 | 85.1 | 542 | 56.7 | 642 | 1,216.1 | **8,247** | **118.9** |
| Urinary Tract Infection | 4,547 | 92.3 | 1,194 | 97.2 | 1,145 | 71.7 | 330 | 34.5 | 713 | 1,351.4 | **7,930** | **114.3** |
| Uncontrolled Diabetes | 1,462 | 29.7 | 485 | 39.5 | 505 | 31.6 | 118 | 12.3 | 217 | 411.3 | **2,787** | **40.2** |
| Asthma in Younger Adults | 331 | 6.7 | 152 | 12.4 | 107 | 6.7 | 27 | 2.8 | 58 | 109.9 | **675** | **9.7** |
| Lower Extremity Amputation | 1,075 | 21.8 | 364 | 29.6 | 372 | 23.3 | 87 | 9.1 | 186 | 352.5 | **2,084** | **30.0** |
| Acute PQIs - Composite | 8,962 | 182.0 | 2,427 | 197.6 | 2,540 | 159.1 | 906 | 94.7 | 1,343 | 2,545.5 | **16,177** | **233.1** |
| Chronic PQIs - Composite | 29,710 | 603.4 | 10,012 | 815.0 | 8,722 | 546.2 | 2,143 | 224.1 | 4,775 | 9,050.6 | **55,362** | **797.9** |
| **NJ 2018 Population Estimate (age 18+)** | **4,923,832** | | **1,228,438** | | **1,596,962** | | **956,329** | | **52,759** | | **6,938,524** | |

**Source: NJ UB 2020.**

COPD or Asthma in Older Adults (PQI.05) - covers population 40 years of age and over. It does not apply to population ages 18-39.

Asthma in Younger Adults (PQI.15) - covers population 18 to 39 years of age only.

Note that rates in this table are not risk adjusted. They are simply observed/row rates obtained by dividing # of hospitalization in the age group by the total population in that same age group.

# Summary of Findings

Potentially preventable hospitalizations (patient in-hospital stays that might be avoided with the delivery of quality outpatient treatments and disease management) serve as useful indicators of possible unmet community health needs. By measuring the frequency of such hospitalizations among patient subpopulations, policymakers and providers can identify those communities most in need of improvements in outpatient care as well as the conditions for which care is most needed. Rates of potentially preventable hospitalizations are higher for vulnerable populations with limited access to care. Targeting issues related to access to primary care may serve to narrow disparities in health outcomes and improve the quality of care while reducing costs.

This report presents the number of preventable hospital admissions in each of the 21 counties. In addition to volume of hospitalizations, observed, expected and risk-adjusted rates (note that translations of these rates are discussed in the section that presents the Prevention Quality Indicators Module) for all the 10 individual and 4 composite prevention quality indicators are provided to help assess the quality of health care in each county. Statewide and national estimates are also provided to facilitate county to state and county to national comparisons.

According to the 2020 New Jersey data, there are substantial variations in preventable hospital admissions by county. Some counties exhibit significantly higher admission rates than the statewide average while others have significantly lower rates. Not surprisingly, the variations appear to reflect the socio-economic disparities of the county populations, with more affluent counties having significantly lower rates than the state average and the less affluent counties having significantly higher admission rates. For example, hospital admissions rates for diabetes with short-term complications in Morris, Bergen, Somerset, and Hunterdon counties are 28.0, 28.5, 31.8, and 39.9 per 100,000, respectively. By comparison, the rates for Cumberland, Salem, Camden, Atlantic, Essex and Cape May counties are 175.5, 134.5, 126.8, 123.3, 118.8, and 100.4 per 100, 000, respectively (see Table 1).

In another example, the lowest rate of hospital admission for hypertension is recorded in Bergen (21.5 per 100,000) and Somerset (25.1 per 100,000) followed by Morris (30.4 per 100,000) and Hunterdon (31.4 per 100,000). By comparison, the highest rate of hospital admission for hypertension is reported in Cumberland (123.1 per 100,000), followed by Atlantic (104.4 per 100,000), Essex (87.0 per 100,000), and Mercer (72.3 per 100,000).

Other indicators also show similar variations by county, suggesting that PQIs are useful as baseline measures for the study of health disparities in geographic areas. A closer examination of PQI measures may help planners identify the socio-economic determinants of such huge variation in costly and potentially preventable hospitalizations. More importantly, this report can be used in promoting the expansion of primary health care facilities to provide better health care access to those in need. This will lower preventable and costly hospital admissions.

# References

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# Prevention Quality Indicators

## Application of the AHRQ Module to New Jersey Data

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