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Inequalities in hospitalizations for ambulatory care sensitive conditions in New York City before and after the affordable care act

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Abstract

The Patient Protection and Affordable Care Act (ACA) was signed into law by U.S. President Obama in 2010 and fully implemented in 2014. The ACA expanded health insurance by expanding the Medicaid program, creating health insurance exchanges (now called "marketplaces") in which people with incomes between 139% and 400% of the federal poverty level, could purchase subsidized insurance coverage, and by regulating health insurance to eliminate practices such as denying coverage to people with pre-existing conditions, or basing premiums on health status. We investigate the effects of the ACA's implementation on access to ambulatory health services in New York City by comparing rates of hospitalizations for ambulatory care-sensitive conditions (ACSC) before and after the full implementation of the law. Although the ACA was associated with a significant decrease in the rate of ACSC in NYC, we find that there continue to be systemic inequalities by gender, race, ethnicity, income, and insurance status. We argue that the broader social and economic inequalities at the national and state levels, including tax and spending policies that have led to increased income and wealth inequalities, help explain why we see persistent inequalities in hospitalizations for ACSC.

KEYWORDS
Affordable Care Act, inequality, New York City

Key Points

- Advocates hoped that the full implementation of the Affordable Care Act would reduce inequalities in access to health care.
- We find that, after the implementation of the Affordable Care Act in New York City, there are still large

- inequalities in hospitalizations for ambulatory care-sensitive conditions.
- Broader social and economic inequalities at the national and state levels help explain why we see persistent inequalities in hospitalizations for ambulatory care sensitive conditions.

INTRODUCTION

The Patient Protection and Affordable Care Act (ACA) was signed into law by U.S. President Obama in 2010 and fully implemented in 2014. The complex law made extensive changes to the U.S. health care system, but its primary goal was the expansion of health insurance coverage (Marmor & Gusmano, 2018). To do so, the ACA used three primary strategies. The first was to expand the Medicaid program, particularly for childless adults, for individuals with incomes up to 138% of the federal poverty level. Second, the law created health insurance exchanges (now called "marketplaces") in which people could purchase health insurance and receive subsidies if their income is between 139% and 400% of the federal poverty level (FPL). Third, it regulated insurance to eliminate some common practices, for example, denying coverage to people with pre-existing conditions, or basing premiums on health history. The state Medicaid expansions, which were allowed by the Supreme Court's decision in N*ational Federation of Independent Business* (NFIB) v. *Sebelius*, and implementation of the marketplaces and subsidies, were not implemented until 2014. Since that time, the law has led to a significant expansion of insurance coverage among people with lower incomes, especially in states that agreed to expand their Medicaid programs (Courtemanche et al., 2017; Frean et al., 2017; Golberstein et al., 2015; Mazurenko et al., 2018).

THE ACA AND THE GOAL OF REDUCING HEALTH CARE INEQUALITIES

Although critics often highlight the limits of the ACA's incremental approach, the significant increase in health insurance coverage through the expansion of Medicaid, the creation of ACA marketplaces, subsidies for the purchase of insurance, and regulations that made insurance available to those who had been excluded from coverage, were clearly designed to reduce existing inequalities in the health care system. As Jamilia Mitchner argues, a major focus of the law was to "reduce health inequities based on race and ethnicity" (Mitchner, 2020). As she points out, there are multiple references to "discrimination," "non-discrimination," "racial," "race," "ethnicity," and ethnic throughout the text of the law (Mitchner, 2020). The reduction in racial and ethnic inequalities in health insurance coverage was a key goal of the law and it has clearly succeeded in doing so. Several studies have found that the law not only reduced racial and ethnic inequalities insurance coverage, it has reduced inequalities in access to and the use of health care services (Buchmueller et al., 2016; Chen et al., 2016; Gutierrez, 2018; Lipton et al., 2019; McMorrow et al., 2016; Park et al., 2018; Renna et al., 2021).

Because the Supreme Court's decision *NFIB v. Sebelius* made Medicaid expansion optional for the states, numerous studies have compared expansion and non-expansion states to better understand the effect of the ACA on a variety of outcomes. Nearly all published studies indicate that the law improved insurance coverage and access to health care services for people with lower socioeconomic status. Several studies have found that

the differences in insurance coverage by income fell much more in Medicaid expansion states than in nonexpansion states (Griffith et al., 2017; Sommers et al., 2015).

Beyond insurance coverage, Medicaid expansion has also led to improvements in other self-reported measures of access, including access to a personal physician and the ability to access prescription drugs (Sommers et al., 2015). In addition to these self-reported measures of access to care, other studies relying on mortality and other sources of data have found that the ACA helped reduce inequalities in health outcomes. A systematic review of the literature through the end of 2017 found that Medicaid expansion "was associated with increases in coverage, service use, quality of care, and Medicaid spending" (Mazurenko et al., 2018). One study found that the law's expansion of access to health care contributed to a reduction in infant health inequality (Rauscher & Rangel, 2020). Another found that, by the end of 2018, states that had expanded Medicaid experienced significantly fewer premature cancer deaths than states that had not expanded Medicaid. The authors concluded that, by providing more affordable coverage to lower-income people, the ACA has helped reduce the cancer mortality gap "between those of higher and lower SES" (Song et al., 2021). Supporting this conclusion, another study found that insurance expansion under the ACA has improved access to cancer surgery across the United States (Eguia et al., 2018).

The ACA and hospitalizations for ambulatory care-sensitive conditions (ACSC)

While there is significant evidence that the ACA has improved access to health care services, relatively few studies have examined the law's effect on hospitalizations for ACSC. These are hospitalizations for which access to timely and appropriate outpatient care (primary care services as well as specialty services for the management of chronic disease), should decrease or avoid the need for hospital admission. Examples of such diagnoses include congestive heart failure, asthma, and diabetes. High rates of hospitalization for ACSC, among residents of an area, often reflect barriers to health care (Pappas et al., 1997). ACSC is broadly recognized as a valid indicator of access to ambulatory care, an important dimension of health system performance (Ansari et al., 2012; Casanova & Starfield, 1995; Gusmano et al., 2017; Mercier et al., 2015; Sanderson & Dixon, 2000; Thygesen et al., 2015). One study comparing expansion and nonexpansion states found that Medicaid expansion results in significant reductions in ACSC hospitalizations (Wen et al., 2019). Another found that Medicaid expansion reduced hospitalizations for diabetes with short-term complications, which is one of the ACSC conditions (Mondesir et al., 2019).

Overall, the finding that the ACA expanded insurance and improved access to health care is well established in the literature. Fewer studies, however, have examined the impact of the ACA within particular states or cities. A study that examined the impact of Medicaid expansion in Nevada found that Medicaid expansion had little impact on hospital admissions for ACSC and that additional efforts would be needed to reduce these admissions (Mazurenko et al., 2018). Our primary focus in this article is on whether the ACA helped improve access to outpatient care and reduced inequalities in the use of outpatient care (as reflected in hospitalizations for ACSC) *within* a city, in a state that fully implemented the ACA and expressed a clear policy commitment to reduce healthcare inequalities. An analysis of ACSC in New York City before the implementation of the ACA, found that, despite efforts at the city and state level to expand access and reduce inequalities, racial, ethnic, gender, and income inequalities in hospitalization rates for ACSC remained unchanged between 1999 and 2013. In light of these persistent inequalities, is it plausible to think that the ACA would reduce inequalities in ASCS within New York City?

Even before the adoption of the ACA, New York State had one of the most generous Medicaid programs in the country (Fossett, 1993), so the expansion of Medicaid was not as dramatic within the state as in states with more limited Medicaid eligibility criteria. Nevertheless, the combination of Medicaid expansion and creation of the state marketplace with federal subsidies for insurance did increase health insurance coverage within the state. Since the adoption of the ACA, almost 400,000 people have gained Medicaid coverage in New York and nearly 200,000 people have enrolled in Marketplace coverage. Between 2013 and 2019, the percent of New Yorkers without insurance fell from 10.7% to 5.2% (U.S. Department of Health and Human Services, 2021). In NYC, these gains in insurance appear to have increased access to clinical services. In 2013, year before the full implementation of the ACA, about 81% of NYC residents reported that they had one or more personal care providers, but by 2017, that increased to nearly 85%. Similarly, in 2013, just over 11% of NYC residents reported needed medical care, but did not get it, but by 2017, that fell to just over 10% (calculated by the authors using the NYC Community Health Survey 2013 and 2017).

Along with the expansion of insurance, there is preliminary evidence that the ACA was making changes that could be expected to lead to reductions in inequalities in hospitalizations for ACSC. Specifically, the full implementation of the ACA after 2014 was associated with a "significant reduction in the asthma EMS dispatch rate" (Peters et al., 2020). The reduction in the use of emergency services for asthma led the authors of this study to conclude that the ACA's insurance expansion in New York may have helped reduce emergency services for ambulatory care–sensitive conditions in New York City (Peters et al., 2020). In terms of racial and ethnic inequalities, however, the situation is less clear. There were gains in Medicaid and ACA private insurance coverage by non-Hispanic Whites, Hispanics, and non-Hispanic Blacks in New York (Garrett & Gangopadhyaya, 2016), but insurance gains were significant among Whites (Denham & Veazie, 2019). There is also some evidence that insurance expansion was strongest among those with at least a high school education versus those without (Denham & Veazie, 2019). So while it is possible that the ACA may have reduced hospitalizations for ACSC, it is also plausible that, despite the goals of the ACA, racial and ethnic disparities in these hospitalizations did not decrease.

This article builds on an analysis of hospitalizations for ACSC in New York City that was published before the implementation of the ACA (Gusmano et al., 2017). This study found large and persistent inequalities in these hospitalizations within New York City. Although one might have expected that implementation of the ACA in New York City would reduce these inequalities, we find that whether they are analyzed by gender, race and ethnicity, income or insurance status, they are as large as they were before the law's implementation.

MATERIALS AND METHODS

Measuring access to ambulatory care

To compare rates of hospitalization for ACSC within New York City before and after the implementation of the ACA, we use the definition of the indicator developed by Weissman et al. (1992), which has been validated by previous studies (Backus et al., 2002; Gusmano et al., 2017; Pappas et al., 1997; Parchman & Culler, 1994). The Weissman definition includes pneumonia, congestive heart failure, asthma, cellulitis, perforated or bleeding ulcer, pyelonephritis, diabetes with ketoacidosis or coma, ruptured appendix, malignant hypertension, hypokalemia, five immunizable conditions, and gangrene.

Age adjustment and data sources

We calculated hospital discharge rates of AHC for age-adjusted cohorts, employing the direct standardization method using the 2000 U.S. population to calculate adjustment weights (Klein & Schoenborn, 2001). We restricted the analysis to the population 18 years and over. Hospital data are from the Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project's State Inpatient Database for New York State. This database includes individual-level data for all patients discharged from nonfederal hospitals in New York State, excluding the population cared for in Veterans Administration hospitals. The HCUP data includes approximately 97% of the hospital discharges in New York City. To calculate the population denominators for the descriptive statistics, we rely on U.S. census estimates.

Regression model

To identify the factors that explain differences across and within New York City, we rely, for both the 2011–2013 and 2014–2017 periods, on multiple logistic regression models, to estimate effects of selected variables on the odds of hospitalization for ASCS. In both models, the independent variables are age, sex, race/ethnicity, primary payers, and number of diagnoses on the record (as a measure of morbidity). The model also controls for a number of neighborhood variables at the ZIP code level: income quartile, and dummy variables for ZIP codes in which more than 15% of the households are linguistically isolated and more than 40% of the adult population does not have a high school degree.

We ran a model with secondary payers and interactive terms relating race and ZIP code, income and race, and the percent of population with health insurance. Since the inclusion of these additional variables did not change the results, we relied on our original model. Because observations on individuals from the same neighborhood might be correlated, we tested for bias attributable to unobserved neighborhood-level heterogeneity by estimating the models with a dummy variable for each ZIP code as a replacement for neighborhood-level variables. The parameter estimates for the individual characteristics were not appreciably different from those generated by these models (Figure 1).
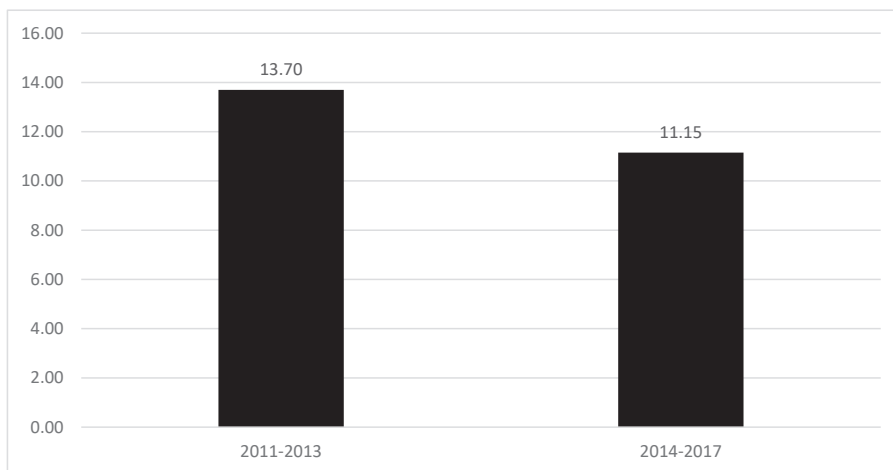

FIGURE 1 Age-adjusted rate hospital discharge of AHC per 1000 in New York City, 2011–13 and 2014–2017. *Sources*: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, State Inpatient Database for New York State; 2011–13 and 2014–2017; U.S. Census.

FIGURE 2 Age-specific and age-adjusted rate hospital discharge of AHC by race/ethnicity per 1000 in New York City, 2011–13 and 2014–2017.
Sources: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, State Inpatient Database for New York State; 2011–13 and 2014–2017; U.S. Census.
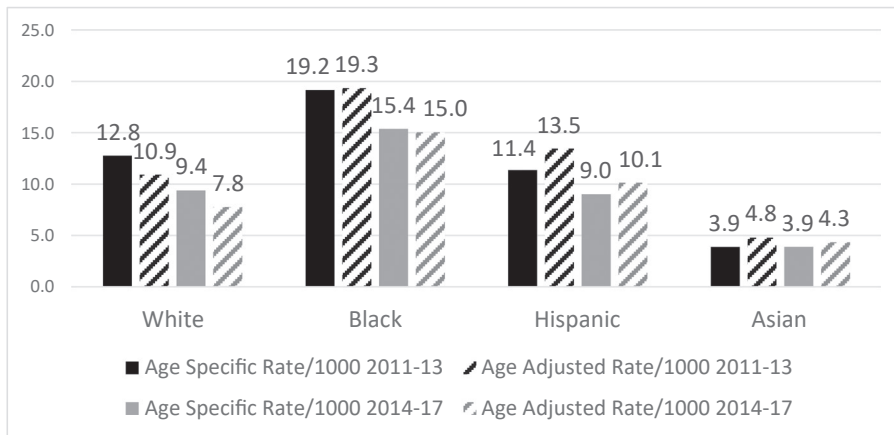
RESULTS

When we compare the age-adjusted rates of hospitalization for ACSC in New York City during the 2011–2013 and 2014–2017 periods, we find that the age-adjusted rates fell from 13.7 to 11.15 per 1000 following the full implementation of the ACA. This is a decrease of over 18%. When we compare the age-specific and age-adjusted rates of hospitalization for ACSC in New York City during the two time periods by race and ethnicity, we find that there were decreases among those who identify as White, Black, Hispanic, and Asian (Figure 2). The largest decrease in age-adjusted rates, however, was experienced by White patients, for whom the rate fell by about 28%. In contrast, the age-adjusted rate decreased by about 22% among Black patients, about 25% among Hispanic patients, and about 10% among Asian patients.

We found that, in both time periods, age, insurance status, race, ethnicity, gender, number of diagnoses, and zip code residence are all associated with statistically significant odds ratios for ACSC (Tables 1 and 2). The odds ratios for those who are uninsured, or who are covered by Medicare or Medicaid, are slightly lower during the 2014–2017 (Table 2) period than they were during the 2011–2013 period (Table 1).

In both periods, patients who identified as non-Hispanic Black, Hispanic, or were members of an "other" race, were significantly more likely to be hospitalized with ACSC than patients who identified as non-Hispanic White. Similarly, residents in the low-income zip-code quartiles were more likely to be hospitalized with an ACSC than those in the highest-income zip-code quartiles, women were significantly less likely to be hospitalized with ACSC than among men (Tables 1 and 2). Patients living in zip codes that are more linguistically isolated were more likely to be hospitalized with these conditions, but a patient's number of diagnoses on the record, the zip code level measure of education, and number of physicians per 1000 in a zip code had little impact on hospitalizations for ACSC.

TABLE 1 Factors that predict inpatient hospitalizations for ASCS in New York City, 2011–2013

	Exp(B)	Sig.	95% CI for EXP(B)	
			Lower	Upper
Age in years at admission	1.016	0.000	1.015	1.016
Female	0.877	0.000	0.859	0.895
Black	1.292	0.000	1.256	1.329
Hispanic ethnicity (as received from source)	1.230	0.000	1.201	1.260
Asian	.910	0.000	0.893	0.927
Other Race	1.128	0.000	1.099	1.157
Medicare	1.231	0.000	1.188	1.275
Medicaid	1.358	0.000	1.313	1.406
Uninsured	1.796	0.000	1.699	1.898
Lowest Household Income Quartile Zip	1.291	0.000	1.237	1.348
Second Quartile Household Income Zip	1.485	0.000	1.395	1.581
Third Quartile Household Income Zip	1.128	0.000	1.1091	1.166
Percent linguistically isolated Zip	.977	0.196	0.944	1.012
Over 40% with No HS Diploma	1.083	0.000	1.040	1.127
Constant	.018	0.000		

Abbreviation: CI, confidence interval.

Sources: AHRC, HCUP NYS SID 2011–2013; U.S. Census.

DISCUSSION

In comparison with the ACSC rate in New York City before the full implementation of the ACA, we found significant improvements during the 2014 through 2017 period. Between the earlier period, 2011–13 and 2014–2017, the ACSC rate decreased by over 18%. Some of this decrease may reflect decreases in the prevalence of disease associated with ACSC. There were declines in the prevalence of congestive heart failure and pneumonia during this time period (Li et al., 2019). For other conditions that are components of ACSC, however, the rate of illness either remained constant, or increased slightly, during the same time period. For example, the percentage of the population reporting that they had asthma remained constant at 13% between 2012 and 2017, and the percentage of the population reporting that they had diabetes increased from 11% to 12% during that time period (NYC Health, 2022). Although it is possible that improvements in population health that were unrelated to the ACA explain the reduction in ACSC we document, it is unlikely that improvements in the underlying population health are solely responsible. The fact that there was a growth in health insurance coverage *and* the percentage of city residents reporting that they had a usual source of care suggests that the implementation of the ACA, reinforced by New York State's Medicaid reform efforts, was at least partly responsible for the overall decrease in hospitalizations for ACSC.

Although we find that AHC rate declined, in New York, disparities among these rates, by insurance status, race, ethnicity, and neighborhood, did not change over this period (Tables 1 and 2). The New York Community Health Survey reinforces this finding with data on disparities among New Yorkers, which indicate that racial and ethnic differences in

TABLE 2 Factors that predict inpatient hospitalizations for ASCS in New York City, 2014–2017

	Exp(B)	Sig.	95% CI for EXP(B)	
			Lower	Upper
Age in years at admission	1.021	0.000	1.021	1.022
Female	0.797	0.000	0.791	0.803
Black	1.484	0.000	1.468	1.501
Hispanic ethnicity (as received from source)	1.390	0.000	1.374	1.407
Asian	0.910	0.000	0.893	0.927
Other Race	1.173	0.000	1.159	1.187
Medicare	1.259	0.000	1.243	1.275
Medicaid	1.306	0.000	1.290	1.321
Uninsured	1.520	0.000	1.483	1.559
Lowest Household Income Quartile Zip	1.265	0.000	1.246	1.284
Second Quartile Household Income Zip	1.157	0.000	1.142	1.173
Third Quartile Household Income Zip	1.145	0.000	1.132	1.159
Percent linguistically isolated Zip	0.997	0.000	0.996	0.997
Over 40% with No HS Diploma	0.997	0.000	0.996	0.997
Constant	0.029	0.000		

Abbreviation: CI, confidence interval.

Sources: AHRC, HCUP NYS SID 2014-2017; U.S. Census.

self-reported health and the incidence of most acute and chronic illnesses were largely the same in 2017 as they were in 2002 when the survey was launched. As we have argued previously (Gusmano et al., 2017), we believe that this inertia reflects our inadequate investments in social programs that address the broader social and economic determinants of health (Bradley et al., 2010). National policies that produce inequalities in wealth and income, and offer inadequate protection against racial and ethnic injustice. Our analysis documents one important consequence of these political decisions.

LIMITATIONS AND BIAS

Analysis of AHC is based on hospital administrative data that do not include clinical information allowing for risk adjustment. Although we attempt to adjust for morbidity by including number of secondary diagnoses on the record, this is a limited measure. In addition, the hospital data do not include individual-level measures of income or education. Third, although our datasets include approximately 97% of all hospital discharges in New York City, the exclusion of Veterans Administration hospitals may bias the findings. Although we test for bias by estimating models with a dummy variable for each ZIP code, it is still possible that our regression models are biased due to unobserved neighborhood-level heterogeneity.

It is important to recognize that, although we find an association between the decline in hospitalizations for ACSC and the implementation of the ACA, our analysis does not allow us to attribute these findings to the ACA. Our models include endogenous variables as

independent variables and including them in the model results in biased estimates. Medicaid and Uninsured are endogenous variables because they were affected by the ACA. The composition of people who have Medicaid insurance changed after the ACA went into effect. Also, the composition of people who were uninsured changed. These changes in composition of the populations may influence the estimates for the other variables in the models. Similarly, the number of diagnoses on the record is endogenous because it could be influenced by the ACA if population health improved.

CONCLUSIONS AND POLICY RECOMMENDATIONS

The implementation of the ACA insurance expansion in 2014 was associated with improved access to outpatient care as measured by a reduction in hospitalizations for ACSC in New York. However, since the ACA focused on insurance expansion, it included only modest efforts to improve outpatient care and did not focus on the primary sources of health and health care inequalities. Furthermore, it did nothing to address payment differences between public and private insurance plans, so there was very little chance that it would have reduced the large differences in outcomes between patients with public insurance and those with private insurance. As a result, the ACA's insurance expansions, alone, are insufficient to address the persistent inequalities in health and health care, by race, ethnicity, and neighborhood, which our analysis has documented.

New York State's "Redesigning Medicaid" initiative, started in 2014, also sought to reduce AHC rates. Under the state's 1115 Medicaid waiver, New York committed to reducing these rates and avoidable emergency department visits by 25% over a 5-year period. To accomplish this, New York established 25 "Performing Provider Systems" (PPS), led by public or other (safety-net) hospitals (Gusmano & Thompson, 2015). Although we cannot determine whether these efforts contributed to the outcomes we document, the reduction in ASCS in New York City are consistent with the state's goals.

Beyond the limits of the ACA, it is possible that the broader social and economic inequalities in the nation, including tax and spending policies that have led to increased income and wealth inequalities (Menasce Horowitz et al., 2020), may help to explain why we see the persistent inequalities in hospitalizations for ACSC. The ACA was successful at expanding insurance coverage and improving access to ambulatory care, but it continues to operate in the context of policies that have expanded, rather than narrowed, racial, ethnic, and neighborhood-level inequalities of income and wealth.

CONFLICT OF INTEREST
The authors declare no conflict of interest.

ETHICS STATEMENT
The research presented in this manuscript was based on hospital administrative data and census data at the zip code level. It was exempt from IRB approval.

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