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Access to outpatient care in Manhattan and Paris: A tale of real change in two world cities

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ABSTRACT

France's system of universal health insurance (UHI) offers more equitable access to outpatient care than the patchwork system in the U.S., which does not have a UHI system. We investigate the degree to which the implementation of the Patient Protection and Affordable Care Act (ACA) has narrowed the gap in access to outpatient care between France and the U.S. To do so, we update a previous comparison of access to outpatient care in Manhattan and Paris as measured by age-adjusted rates of hospital discharge for avoidable hospital conditions (AHCs). We compare these rates immediately before and after the implementation of the ACA in 2014. We find that AHC rates in Manhattan declined by about 25% and are now lower than those in Paris. Despite evidence that access to outpatient care in Manhattan has improved, Manhattanites continue to experience greater residence-based neighborhood inequalities in AHC rates than Parisians. In Paris, there was a 3% increase in AHC rates and neighborhood-level inequalities increased significantly. Our analysis highlights the persistence of access barriers to outpatient care in Manhattan, particularly among racial and ethnic minorities, even following the expansion of health insurance coverage.

1. Introduction

Over the past 20 years, the literature comparing national health care systems [1,2] has been supplemented by efforts to compare health systems in cities, which share more characteristics and problems in common, than their respective nations. City-level comparisons provide notable advantages for more refined comparisons and cross-national learning [3–5]. Previous comparisons of Paris and Manhattan, the urban cores of two world cities, have found that French universal health insurance (UHI) offers more extensive and more equitable access to outpatient care than the patchwork system of health insurance coverage in the U.S. We extend these efforts here by updating a comparison of access to outpatient care in Manhattan and Paris, as measured by *age-adjusted rates of hospital discharge for avoidable hospital conditions* (heretofore AHC rates), before and after implementation of the Patient Protection and Affordable Care Act (ACA) in 2014. Since two explicit goals of the ACA were to improve access to health care and reduce health care inequalities [6] it is useful to build on a previous study, which compared access to outpatient care in Manhattan and Paris using AHC rates as an indicator of access. The previous study not only found that overall AHC rates were higher in Manhattan than Paris; it found that inequalities within Manhattan were larger. In this study, we assess the extent of change in both of these cities since the ACA's implementation.

Manhattan and Paris: Urban cores of two world cities. Due to their status as centers of medical excellence with a disproportionate share of hospitals, physicians, immigrants and indigent patients, in comparison to their surrounding regions (Table 1), Manhattan and the 20 *arrondissements* of Paris are defined by the World Cities Project [7-11, 5,12] as the "urban cores" [13] of New York City (population 8.6 million) and Paris, including its surrounding *départements* of Hauts de Seine, Seine Saint-Denis and Val de Marne (population 6.2 million). The rationale for the previous comparison of Manhattan and Paris grew out of an analysis of their convergent and divergent characteristics with the aim of improving understanding of how national and local health systems in France and the U.S. affect access to outpatient care.

Convergent characteristics. Both Manhattan and Paris have a higher population density than their surrounding region and include a mix of rich, poor and ethnically diverse people living in close proximity. Their economies, based on services and information, serve as employment centers that attract large numbers of commuters from their suburbs. They are medical "centers- of-excellence" with a disproportionate share of hospitals and specialist physicians, but substantial variations in access to primary care. They are both destinations for large immigrant communities from around the world: the foreign-born population of Paris

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0168-8510/

Table 1
Basic Indicators: Manhattan and Paris (2020).

Indicator	Manhattan	U.S.	Paris	France
Population characteristics				
Total population	1.7 million	329.5 million	2.1 million	67.4 million
Percent of population >65 yr of age	17%	16.9%	14.7% (Ile de France)	20.75%
Population density/sq. mile	74,781	94	20,515	119
Percent living below poverty (½ median household income)	28.5%	18.5%	16.1%	10%
Percent foreign-born	28.3%	13.7%	20%	9.7%
Health care system				
Percent of Physicians in Primary Care*	29%	30%	49%	*52%*
Percent of Physicians in Specialty Care**	71%	70%	51%	48%
Acute care hospital beds per 1000	6.4	2.2	6.3	3.1
Health status				
Infant mortality rate (deaths per 1000 live births)	3.9	5.6	3.2	3.6
Percent of adults who are obese	19.2%	42.4%	9%	17%
Premature death rate (before age 75)	257.6 per 100,000 (2019)	190.7 per 100,000 (2019)	170 per 100,000 (before 65)	203 per 100,000 (before 65)
Life expectancy at 65 yr of age, males***	17.89	17.0	20.6	19.4
Life expectancy at 65 yr of age, females***	20.45	19.8	22.4	23.2

Sources: US Census, 2000, 2020; New York City Health Department, Office of Vital Statistics;Conseil National de l'Ordre des Médecins 2020; Annuaire des statistiques sanitaires et sociales 2019; INSEE; New York City: New York State Department of Health, 2000; 2015.

* GYN/OB; general/family practice/internal medicine; pediatrics; geriatrics

** Medical subspecialities include: pulmonary disease medicine; cardiology; endocrinology; oncology; nephrology; neurology; infectious disease. Surgery: general surgery; neurologic surgery; orthopedic surgery; plastic surgery; thoracic surgery; other surgical subspecialities; urology. Other Specialists: ophthalmology; ENT; dermatology; anaesthesiology/critical care/emergency medicine; radiology; nuclear medicine; rheumatology; psychiatry; occupational medicine/preventive medicine; pathology/biology; allergy/immunology; physical medicine.

*** The statistics in this table are for Manhattan and the 20 arrondissement of Paris, but life expectancy at 65 numbers are for New York City and Paris and its first ring.

(2016) and Manhattan (2017) are respectively 20% and 29%. Within each urban core there are many wealthy as well as poor neighborhoods, but the extent of income inequality is greater in Manhattan. A recent comparison of the ratio between the highest and lowest income neighborhoods in Manhattan and Paris found that Manhattan had a ratio of 2.98 and Paris had a ratio of 2.03 [14].

Divergent Characteristics. Although Manhattan and Paris are both centers of medical excellence, Manhattan has an even higher concentration of hospitals than Paris (Table 1). The physician workforce in Paris and Manhattan diverge in ways that mirror well known differences between the U.S. and most other OECD health care systems. For example, there is a different balance between primary care and specialist physicians (Table 1). In Manhattan, 29 percent of all physicians provide primary care. In Paris, the comparable figure is 49 percent and there are minimal financial barriers to access.

French UHI covers the entire population legally residing in France [15]. Copayments and coinsurance do result in out-of-pocket expenditures, but most of the population has complementary private insurance coverage through a system that resembles Medigap coverage for U.S. Medicare beneficiaries [16]. In contrast to Medicare, benefits under French UHI are independent of patient costs. There are coinsurance payments for GPs, specialists and prescriptions (with exemptions for those with low incomes and chronic illness), which are usually covered by complementary insurance.

In Paris where fees for doctors are regulated under French UHI, about two thirds of physicians (27% of GPs and 75% of specialists) are allowed to balance bill. However, when patients pay out-of-pocket, since 96% have private complementary coverage (subsidized by the state for the poorest and by employers for their employees) these financial barriers are significantly reduced [17]. When balanced billing constitutes a financial barrier, patients can choose physicians who accept UHI rates, as payment in full, in private practice, in most hospital outpatient departments and or in most of the over 50 health centers located in all Paris neighborhoods [17]. These centers serve as a safety net for all patients who fall through the cracks, but are used by a broad segment of Parisians. In 2000, when UHI in France was extended to all those who previously fell through the cracks, the most disenfranchised population in Paris became eligible for coverage and received complementary coverage, as well, to cover all up-front out-of-pocket payments. Even after the extension of insurance, in 2000, to the 3 or 4 percent of Parisians who were previously not covered, there are still undocumented immigrants in Paris who make use, not only of these health centers, but also of public hospital outpatient departments, which are the main places that take care of these patients with dedicated services.

In contrast to France, the U.S relies on a complex patchwork public-private system of health insurance with significant gaps. The ACA represents the most extensive increase in health insurance coverage since the adoption of Medicare and Medicaid in 1965 and the first time the federal government adopted a law with the goal of providing nearly all legal residents in the nation with health insurance coverage. Although the ACA closes many of the previous gaps in health insurance coverage, it leaves the patchwork nature of the insurance system in place and leaves about 31 million residents (9.7%) without health insurance [18]. While the law offers important protection to millions of Americans without insurance and helps to minimize regional inequalities in access to public insurance for the poor, the adequacy of this protection, in light of anticipated cost increases and network restrictions, is still in doubt.

The ACA increased health insurance coverage through the expansion of Medicaid, the creation of federal and state marketplaces, subsidies for the purchase of insurance, and regulations that have made insurance available to those previously excluded from coverage, Several studies have found that the ACA is associated with better access to primary care [19] and reductions in premature mortality [20].

In New York, thanks to the combination of Medicaid expansion and the creation of a state marketplace with federal subsidies for insurance, the percent of residents without insurance fell by about half. In Manhattan, specifically, the ACA helped reduce the percent of population without health insurance from 9.8 percent in 2012 to 5.2 percent in 2018 [21]. Even after the ACA, the contrast between Manhattan and Paris with regard to income inequality and insurance coverage remains significant.

AHC as an Indicator of Access to Outpatient Care in Manhattan and Paris. Hospital discharge rates for AHCs are used around the world as a valid indicator of access to outpatient care [22–24]. Studies have found that the uninsured are more likely to be hospitalized for AHCs because they are less likely to receive appropriate and timely outpatient care than those with insurance [25–27]. Differences in disease prevalence or severity of disease, not access to outpatient care, may explain some differences in discharge rates for AHCs among low and high SES areas [28]. However, the literature suggests that these factors, alone, do not explain these differences (Fig. 1).

During the 1999-2001 period, the AHC rate in Manhattan was 2.5 times higher than in Paris. In this update of the comparison, we expected to find a convergence of AHC rates in these two world cities by the 2011-2013 period. Second, we expected to see a larger decrease in these rates

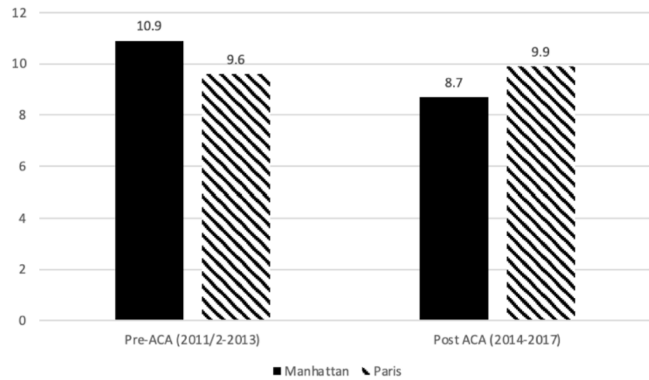

Fig. 1. Age-Adjusted Rates of Hospital Discharges for Avoidable Hospital Conditions (AHCs) in Manhattan (2011-2013 and 2014-2017) and Paris, (2012–2013 and 2014-2017) SOURCES: For Manhattan, the Agency for Healthcare Research and Quality (AHRQ) Hospital Cost Utilization Project (HCUP), Statewide Inpatient Database for New York, 2011-2013 and 2014-2017; for Paris, Programme de médicalisation des systèmes d'information (PMSI), 2012–2013 and 2014-2017. NOTE: Age-adjusted rates per 1,000 population age 18 and older using age-adjusted weights for U.S. 2000 standard population.

within Manhattan between the period immediately before and immediately after the implementation of the ACA than in Paris during the same time period. Likewise, we expected that the differences in AHC rates in Manhattan, by race and income of residence, would be reduced, significantly, between these time periods. Furthermore, we expected that after controlling for age, race, gender, severity of illness, and area of residence, those without health insurance and Medicaid recipients would continue to experience significantly higher AHC rates than those with private health insurance in Manhattan.

In Paris, we expected that, after controlling for age, gender, severity of illness, people living in neighborhoods with the lowest median household incomes and the lowest levels of education would have significantly higher AHC rates. Also, as in the initial analysis, we expected that these differences would not be as great in Paris as in Manhattan in either time period.

2. Materials and methods

2.1. The measurement of avoidable hospital conditions (AHCs)

We used the definition of AHCs developed by Joel Weissman and colleagues [29], which has been validated by previous studies [30,27]. The Weissman definition includes the following conditions: pneumonia, congestive heart failure, asthma, cellulitis, perforated or bleeding ulcer, pyelonephritis, diabetes with ketoacidosis or coma, ruptured appendix, malignant hypertension, hypokalemia, immunizable conditions, gangrene.[1] We calculated total population hospital discharge rates for AHCs, during both time periods, for age-adjusted cohorts, employing the direct standardization method. We used the United States standard population, in 2000, to obtain adjustment weights [31]. We present age-adjusted rates for each city for both time periods.

Neighborhood selection. Defining neighborhoods can be arbitrary. We are aware of the concerns surrounding the Modifiable Area Unit Problem [32], that summary values in assessing associations may be influenced by the shape and scale of the aggregation unit. In choosing the smallest unit of analysis available, we rely on three criteria: existing designations or administrative boundaries, a reasonable number of units for each city and data availability. For Paris, we rely on the 20 *arrondissements*. For Manhattan, we rely on 40 zip codes, excluding zip codes in New York County that do not have permanent residents, like Central Park.

Analytic strategy. In addition to our city and neighborhood-level comparisons, we present results from multiple logistic regression models for each city, which estimate the effects of both individual and neighborhood characteristics on the odds of hospitalization for AHCs. We ran separate regression equations, rather than pooling the hospital data and including a dummy variable for each city. Unfortunately, the legal restrictions on the use of the data make it impossible for us to pool the hospital data from the two cities into the same database.

For both Manhattan and Paris, we use comparable empirical models to estimate the probability of a patient being hospitalized with an AHC. In both models, we use individual independent variables age, gender, and number of diagnoses on the hospital administrative record. The neighborhood variables in both models include indicators for income quartile, physician density, and an education dummy in which more than 40 percent of the adult population does not have a baccalaureate degree, in Paris and in Manhattan, an education dummy for zip codes with more than 40% adult population without a high school diploma. The French baccalaureate degree is the U.S. equivalent of completing high school and a first year of college, so this is the one variable in the model that is not measured identically in the two cities.

In addition to the use of the comparable models described above to compare Manhattan and Paris, we ran an additional empirical model for Manhattan only to investigate the roles of race/ethnicity and insurance coverage in predicting hospitalizations for AHC. In this Manhattan- only model, the primary independent variables are age, gender, race/ethnicity, primary payers and number of diagnoses on the record (as a measure of severity of illness). The empirical model also controls for a number of the neighborhood variables at the zip-code level: income quartile, physician density, and dummy variables for zip codes in which more than 15 percent of the households are linguistically isolated and more than 40 percent 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, race and insurance. These variables did not change the results, so we dropped them from the final model. We did not run a model for Paris with race/ethnicity or "linguistic isolation" because the French hospital and census datasets do not include such indicators. Nor does the model have a measure for "payer source" because although French UHI includes multiple payers, the benefit packages and reimbursement levels are virtually identical, so there is no meaningful difference among them (Appendix 1).

Because observations on individuals from the same neighborhood may be correlated, we tested for bias due to unobserved neighborhood-level heterogeneity by estimating the models with a dummy variable for each zip code or arrondissement as a replacement for neighborhood-level variables. The parameter estimates for the individual characteristics were not appreciably different than those generated by these models. In addition to examining models with dummy variables, we used STATA (version 8) to examine the variance inflation factor (VIF), as a test of collinearity (STATA command: collin). Since the VIF is less than 10 for all of our independent variables, we concluded the correlations among them are not causing unacceptable biases [33].

To assure an adequate number of hospital discharges and procedures for statistically meaningful comparisons, and reduce the likelihood of an annual anomaly affecting the results, as in the initial study, we calculated averages over a three-year period (1999-2001) for each city.

Data sources. Hospital data for the 2011-2013 and 2014-2017

[1] Bacterial pneumonia, J13, J14, J15, J16.0, J16.8, J18; Congestive heart failure I50; Asthma, J45; Cellulitis, J34.0, K12.2, L02, L03; Complications of peptic ulcer disease, K25.0, K25.1, K25.2, K25.4, K25.5, K25.6, K26.0, K26.1, K26.2, K26.4, K26.5, K26.6, K27.0, K27.1, K27.2, K27.4, K27.5, K27.6, K28.0, K28.1, K28.2, K28.4, K28.5, K28.6; Pyelonephritis, N10, N11, N12, N13.6, N15.8, N15.9, N17.2; Type 2 diabetes mellitus with hyperosmolarity or coma E10.0, E10.1, E11.0, E11.1, E13.0, E13.1, E14.0, E14.1; Ruptured appendix, K35.2, K35.3; Hypertension, I10, I11.0, I11.9, I12.0, I12.9, I13.0, I13.1, I13.2, I13.9, I15.0, I15.1, I15.2, I15.8, I15.9, I67.4; Hypokalaemia, E87.6; Immunizable conditions, A35, A36, A37, A80, B05, B26; Gangrene, I73.0, L88, I70.2.

periods in Manhattan are from the New York State Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality (AHRQ), which includes information for all residents of Manhattan discharged from all hospitals (public and private) in New York State with the exception of a small number of federal Veterans Administration hospitals. In Manhattan, this only excludes one hospital representing fewer than 2% of all acute hospital beds in the borough. For Paris, data for the 2012-2013 and 2014-2017 periods are from the Ministry of Health's Hospital Reporting System (PMSI - *Programme de Médicalisation des Systèmes d'Information*) which centralizes hospital discharge data by diagnosis, procedure, age and residence of patients). The PMSI includes data from all hospitals (public and private). The city-level hospital discharge data are for residents of both cities irrespective of whether they were hospitalized within or outside these cities. In both the HCUP and PMSI databases, diagnoses are coded using the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM) code. In both systems, the hospital administrative data are used, primarily, for billing purposes. This allows us to use identical codes to calculate AHCs among residents of Manhattan and Paris.

We focused our analysis on all residents 18 years and over in Manhattan and Paris. Our numerator is the number these residents discharged with AHCs from hospitals, respectively, in New York State and all of France. In calculating population denominators for these residents in each city, we rely on data obtained from the U.S. and French Census. For income, we use a similar measure of pre-tax, median household income, by neighborhood. For the logistic regressions, we calculate neighborhood income quartiles based on currencies in each city.

3. Findings

Compared with the 1999-2001 period examined in the previous analysis of AHC in Paris and Manhattan, the two cities have moved in opposite directions. Residents of Manhattan experienced a decline in AHC rates, but residents of Paris experienced an increase in these rates. By the 2011-2013 period, the AHC rate in Manhattan fell from 22 to 10.9 per 1000. In Paris, the AHC rate increased from 8.5 to 9.6 per 1000.

When compared with the period immediately before the implementation of the ACA (2011-2013), residents of Manhattan experienced about a 20% decline in the AHC rates during the period 2014-2017. We find that for people 18 years and older, age-adjusted AHC rates in Manhattan declined from 10.9 to 8.7 per 1000. In Paris, the AHC rate increased from 9.6 to 9.9 per 1000 between the 2012-2013 and 2014-2017 periods.

Despite evidence that access to outpatient care in Manhattan has improved, Manhattanites continue to experience greater residence-based neighborhood inequalities in AHC rates than Parisians. Indeed, the differences, in Manhattan, by neighborhood, were even larger during the 2014-2017 than they were before the implementation of the ACA.

In Paris there was a 3 percent increase in AHC rates and neighborhood-level inequalities increased substantially as well. Differences by neighborhood income were small during the 1999-2001 period. In both the 2012-2013 and 2014-2017 periods, they are similar to those in Manhattan.

Multiple logistic regression analysis. Descriptive statistics for the independent variables included in our regression models are presented in Appendix 1. The odds ratios calculated for Paris in the 2011-2013 period reveal a statistically significant, but very small, influence for age, severity of illness, density of physicians, while female gender decreases the odds of hospitalization for AHC by 14 percent. Unlike the 1999-2001 period in which the neighborhood income and education variables were not significant in Paris (Gusmano et al. 2006), we find that the two lowest-income quartile neighborhoods of Paris had significantly higher AHC rates than the highest-income quartile neighborhoods during the 2012-2013 period. The education variable in Paris remained insignificant during the 2012-2013 period

In the 2014-2017 period, the odds ratios for Paris reveal a statistically significant, but very small, influence for age, severity of illness, physician density, while female gender decreases the odds of admission for AHC by about 9%. The education variable was not significant in the more recent period, but we found even larger differences within Paris by neighborhood-level median household income. The odds were about 24% higher among residents of the lowest-income neighborhoods, almost 11% higher in the second lowest-income neighborhoods, and 7.5% higher in the third lowest-income neighborhoods compared with those in the highest-income neighborhoods, by the 2014-2017 period (Table 2).

During the 2011-2013 period, in Manhattan, women had much lower odds of hospital discharge for AHCs (by 20%). There were also statistically significant, but very small, influences for age, number of diagnoses, density of physicians, and level of education. We found that the three lowest-income quartile neighborhoods of Manhattan had significantly higher AHC rates than the highest-income quartile neighborhood during the 2011-2013 period. Indeed, the neighborhood-level differences within Manhattan were even larger than they were in Paris. The odds were about 50% higher among residents of the lowest-income neighborhoods, 43% higher in the second lowest-income neighborhoods, and about 17% higher in the third lowest-income neighborhoods compared with those in the highest-income neighborhoods of Manhattan (Table 2).

As in Paris, during the 2014-2017 period, we found even larger differences in AHC rates within Manhattan by neighborhood-level median household income. The odds were about 56% higher among

Table 2
Logistic Regression Results for Characteristics Associated with AHC (Dependent Variable) in Manhattan and Paris for Adults 18+.

Variable	Manhattan 2014-2017	Manhattan 2011-2013	Paris 2014-2017	Paris 2012-2013
Age (continuous)	1.022 (1.021-1.022)	1.015 (1.014-1.015)	1.027 (1.027-1.028)	1.026 (1.025-1.026)
Female (omitted=male)	.797 (.783-.812)	.795 (.779-.811)	0.912 (0.900-0.925)	0.856 (0.839-0.873)
Income Quartile of Zip Code/Arrondissement (omitted=highest)	1.564 (1.525-1.603)	1.495 (1.430-1.564)	1.242 (1.193-1.293)	1.198 (1.124-1.278)
Lowest	1.659 (1.618-1.700)	1.430 (1.371-1.491)	1.109 (1.076-1.143)	1.109 (1.058-1.163)
Second	1.547 (1.494-1.601)	1.169 (1.129-1.209)	1.075 (1.044-1.107)	1.008 (0.966-1.053)
Third	1.025 (.957-1.098)	.997 (.953-1.044)	1.027 (1.027-1.028)	1.026 (1.025-1.026)
Zip Codes/Arrondissement with more than 40% adult population without a high school/baccalaureate degree	1.011 (1.010-1.012)	1.040 (1.038-1.042)	0.989 (0.969-1.009)	1.013 (0.984-1.043)
Number of Diagnoses on Record (Continuous)	1.000 (.999-1.001)	1.010 (1.008-1.013)	1.075 (1.074-1.076)	1.070 (1.069-1.072)
Physicians/1000 population	1.022 (1.021-1.022)	1.015 (1.014-1.015)	0.981 (0.976-0.987)	0.985 (0.977-0.993)

*Estimations for Manhattan and Paris are made separately, and the coefficients are not comparable directly. Tables with actual coefficients are available online in appendices 2 and 3.

Sources: Manhattan: the Agency for Healthcare Research and Quality (AHRQ) Hospital Cost Utilization Project (HCUP), Statewide Inpatient Database for New York, 2011-2013 and 2014-2017; Paris: Programme de médicalisation des systèmes d'information (PMSI), 2011-2013 and 2014-2017.

residents of the lowest-income neighborhoods, almost 66% higher in the second lowest-income neighborhoods, and almost 55% higher in the third lowest-income neighborhoods compared with those in the highest-income neighborhoods, by the 2014-2017 period.

The more expansive models to predict AHC rates in Manhattan, which included indicators of race/ethnicity, linguistic isolation, and health insurance, indicate that differences associated with these characteristics did not change after the implementation of the ACA (Table 4). During the 2011-2013 period in Manhattan, women had 19% lower odds of hospital discharge for AHCs than men. There were also statistically significant, but very small, influences for age, number of diagnoses, density of physicians, and level of education during both time periods. The percent of households "linguistically isolated" was not significantly related to AHC rates. The relationships among neighborhood income, race, insurance status and AHC rates were statistically significant and large. In 2011-2013, the odds of hospitalization for AHCs were about 28% higher among Non-Hispanic Blacks and 36% higher among Hispanic than Non-Hispanic Whites. The odds for people without health insurance were about 68% greater than for those with private insurance. The odds were 34% higher among Medicaid recipients and 31% higher among Medicare beneficiaries than among those with private health insurance. Even after controlling for these other factors, the odds of hospitalization for AHCs were 29% higher among residents of the lowest-income neighborhoods, 27% higher than the second lowest-income neighborhoods, and 10% higher among the third lowest-income quartile neighborhoods compared with those in the highest-income neighborhoods (Table 3).

During the 2014-2017 period in Manhattan, women had 18% lower odds of AHC rates than men. As with the earlier period, there were also statistically significant, but very small, influences for age, number of diagnoses, and physician density. Zip-code level education was no longer significant, but the percent of households "linguistically isolated" was significantly related to AHC rates in the 2014-2017 period. The relationships among median household income (by zip code of residence), race and insurance status, on AHC rates, were statistically significant and large. In fact, inequalities by race and ethnicity were similar after the implementation of the ACA than they were during the period immediately before implementation. The odds of hospitalization for AHCs were about 40% higher among Non-Hispanic Blacks and 30% higher among Hispanics than among Non-Hispanic Whites. The odds of hospitalization for AHCs for people without health insurance were about 66% greater than for those with private insurance. The odds were 53% higher among Medicaid recipients and 40% higher among Medicare beneficiaries than among people with private health insurance. The odds were 27% higher among residents of the lowest-income neighborhoods, 29% higher than the second-lowest income neighborhoods, and almost 30% higher among the third lowest-income quartile neighborhoods compared with those in the highest-income neighborhoods (Table 3).

Limitations of analysis and alternative explanations. We are unable to account directly for any effect of differences in disease prevalence on AHC rates, but previous research suggests that this is unlikely to explain the magnitude of the observed differences. For example, Oster and

Table 3
Logistic Regression Results for Characteristics Associated with AHC Discharges (Dependent Variable) in Manhattan for Adults 18+ (Full Model).

Independent Variable	2011-2013 18+ Population			2014-2017 18+ Population		
	Coeff. (S.E.)	P>|z|	Odds Ratio 95% C.I.	Coeff. (S.E.)	P>|z|	Odds Ratio 95% C.I.
Age(continuous)	.014 (.000)	.000	1.014 (1.014-1.015)	.021 (.000)	.000	1.021 (1.020-1.022)
Female(omitted=male)	-.203 (.010)	<.001	.817 (.800-.833)	-.197 (.009)	<.001	.821 (.806-.836)
Income Quartile of zip code (omitted=highest)						
Lowest	.254 (.024)	<.001	1.289 (1.281-1.429)	.241 (.026)	<.001	1.272 (1.234-1.312)
Second	.238 (.022)	<.001	1.269 (1.216-1.325)	.253 (.016)	<.001	1.288 (1.249-1.328)
Third	.100 (.018)	<.001	1.103 (1.068-1.145)	.258 (.019)	<.001	1.295 (1.248-1.343)
Number of Diagnoses on Record (continuous)	.038 (.001)	.000	1.039 (1.037-1.041)	.012 (.001)	<.001	1.012 (1.010-1.013)
Zip code with more than 15% households linguistically isolated (dummy)	.112 (.020)	.056	.973 (.947-1.001)	.080 (.013)	<.001	1.083 (1.057-1.110)
Zip code with more than 40% adult population not high school graduates	-.089 (.027)	<.001	1.119 (1.076-1.163)	.041 (.035)	.246	1.042 (.972-1.116)
MD/1000 pop	.007 (.001)	<.001	1.007 (1.005-1.009)	-.001 (.001)	.145	.999 (.998-1.000)
Primary Payer (omitted == private)						
Medicare	.267 (.018)	<.001	1.306 (1.261-1.352)	.337 (.017)	<.001	1.401 (1.356-1.447)
Medicaid	.293 (.017)	<.001	1.341 (1.296-1.387)	.427 (.016)	<.001	1.533 (1.486-1.581)
Self Pay/No insurance	.519 (.028)	<.001	1.68 (1.591-1.775)	.504 (.031)	<.001	1.655 (1.558-1.758)
Race/Ethnicity (omitted=white)						
Black	.245 (.014)	<.001	1.277 (1.242-1.313)	.337 (.013)	<.001	1.401 (1.366-1.436)
Hispanic	.309 (.014)	<.001	1.362 (1.326-1.399)	.266 (.013)	<.001	1.304 (1.272-1.338)
Asian	.034 (.027)	.200	.966 (.917-1.018	-.204 (.026)	<.001	.816 (.775-.859)

SOURCES: For Manhattan, the Agency for Healthcare Research and Quality (AHRQ) Hospital Cost Utilization Project (HCUP), Statewide Inpatient Database for New York, 2011-2013 and 2014-2017.

Bindman argue that higher AHC rates among African-Americans and Medicaid patients do "not appear to be explained by either the differences in disease prevalence or disease severity" [34]. Similarly, Laditka and colleagues find that higher AHC rates African Americans and Hispanics, compared with non-Hispanic Whites, are not due to differences in disease prevalence [35]. The notion that underlying prevalence of disease is unlikely to explain differences in AHC rates is reinforced further by the work of Wennberg, who finds that population illness rates do not explain hospitalization rates [36].

Similarly, the effects of race and insurance observed in Manhattan and the gender effects noted for both cities may be the result of patients' compliance or care-seeking behavior. It is also possible that the behavior of physicians may influence these rates [29]. Despite this concern, others suggest that physician practice style is unlikely to explain the observed differences [37]. Our data do not allow us to test these alternative hypotheses.

4. Discussion

We find that the age-adjusted hospital discharge rate of AHCs fell dramatically in Manhattan before and after the implementation of the ACA. Although this appears to be a positive development that reflects better access to outpatient health care, it is difficult to assess how much of this decline can be attributed to the ACA because the AHC rate has been falling for more than a decade. In contrast, the AHC rate increased slightly in Paris.

During both time periods, women have much lower odds of hospitalisation with AHCs in both cities, which is consistent with well-known gender differences in health status and higher use of outpatient care among women than men [38]. Likewise, hospitalisation with AHCs is related, significantly, to neighborhood-level income in both cities. The results are similar, over time, in Manhattan, but the magnitude of this spatial inequality grew significantly in Paris. We find a large increase in disparities among wealthier and poorer neighborhoods in Paris during the more recent period.

Our findings are consistent with a recent analysis, over the same period, which documents a significant increase in infant mortality among Paris neighborhoods [14]. Until the mid-2000s, there was no statistically significant relationship between infant mortality and neighborhood income, in Paris, but this changed since 2003. By the 2012-2016 period, the IM rates in the highest-income neighborhoods of Paris were 77% of those in the lower-income neighborhoods ([14] Weisz et al. 2022). Historically, Paris has been known as a 'soft' global city because it provides more income support, social and health services to the poor compared with New York and other 'hard' global cities [39]. During the past two decades, however, there has been a large increase in neighborhood-level inequalities within Paris and the surrounding region [40]. Despite the existence of UHI and low out-of-pocket expenses, the growing economic inequality among Paris neighborhoods appears to be driving inequalities in hospitalization for AHCs.

In Manhattan, our findings suggest that, even after the implementation of the ACA and its significant expansion of health insurance, multiple barriers to healthcare access remain. Although, as Jamila Michener has argued, one goal of the law was to "reduce health inequities based on race and ethnicity" [6], the intersection of racism, neighborhood income, gender and insurance status limit the use of timely and effective outpatient care and result in hospitalizations that could have been avoided. Medicare beneficiaries, Medicaid recipients and the uninsured, in Manhattan, are all more likely to be hospitalized for AHCs than the population with private health insurance. Blacks, Hispanics, and other racial and ethnic minorities also have higher odds of hospitalization for AHCs than non-Hispanic Whites.

5. Conclusions

As in the U.S. and Manhattan, France, and Paris, have experienced significant growth of socioeconomic inequalities over the past 20 years [14]. A recent study suggests that the growth of such inequalities, in Paris, coincided with significant neighborhood-level inequalities in infant mortality rates [13]. We believe that the Manhattan findings presented in this article reflect inadequate investments in social programs that address the broader social and economic determinants of health in the U.S. compared with France [41]. They also reflect U.S. national policies that produce inequalities in wealth and income, and offer inadequate protection against racial and ethnic injustice. The expansion of health insurance by the ACA improved access to outpatient services, but it failed to address the health and healthcare inequalities driven by the social factors that affect them so strongly. Similarly, despite France's UHI, neighborhood-level gentrification within Paris has increased spatial inequalities in access to health care.

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Declaration of Competing Interests

None

Appendix 1

Descriptive Statistics for Independent Variables Included in the Regression Models Predicting AHC Discharges Among Patients 18+ in Manhattan and Paris**.

Variable	Manhattan 2014-2017 (SD)	Manhattan 2011-2013 (SD)	Paris 2014-2017 (SD)	Paris 2012-2013 (SD)
Age	59` (20.8)	57* (20.8)	62* (18.9)	61* (19.0)
Female	55.9%	58.4%	55.9%	57.0%
Number of Diagnoses on the Record	8* (6.1)	7* (5.0)	3* (4.7)	2* (4.3)
% Hospitalizations Among Residents of Lowest Income Quartile Neighborhoods	27.8%	25.1%	28.03%	29.11%
% Hospitalizations Among Residents of Second Lowest Income Quartile Neighborhoods	24.6%	24.5%	26.45%	25.50%
% Hospitalizations Among Residents of Third Lowest Income Quartile Neighborhoods	24.2%	24.9%	24.01%	25.68%

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Variable	Manhattan 2014-2017 (SD)	Manhattan 2011-2013 (SD)	Paris 2014-2017 (SD)	Paris 2012-2013 (SD)
Physician Density Lowest Quartile Neighborhoods	5.46* (1.2)	5.46* (1.2)	1.56* (0.2)	1.4* (0.1)
Physician Density Second Lowest Quartile Neighborhoods	1.5* (0.4)	1.5* (0.43)	3.62* (0.5)	2.89* (0.6)
Physician Density third Lowest Quartile Neighborhoods	1.47 (0.4)	1.47 (0.4)	3.02* (0.4)	3.51* (0.4)
% of Zip Codes with More than 40% below baccalaureate/HS diploma in the Lowest Quartile Neighborhoods	9%	10%	17.59%	27.09%
% Zip Codes with More than 40% below baccalaureate/HS diploma in the Second Lowest Quartile Neighborhoods	0%	0%	9.16%	12.45%
% Zip Codes with More than 40% below baccalaureate/HS diploma in the Third Lowest Quartile Neighborhoods	0%	0%	0%	6.31%
Variables for Manhattan Only				
Medicare	43.2%	39.8%		
Medicaid	27.4%	32.8%		
Self Pay/No insurance	2.9%	4.1%		
Black	20.7%	29.4%		
Hispanic	19.5%	19.9%		
Asian	4.8%	5.7%		

*Median.

**Paris is defined as the 20 arrondissement of the city.

Sources: Manhattan: the Agency for Healthcare Research and Quality (AHRQ) Hospital Cost Utilization Project (HCUP), Statewide Inpatient Database for New York, 2011-2013 and 2014-2017; Paris: Programme de médicalisation des systèmes d'information (PMSI), 2011-2013 and 2014-2017.

Appendix 2

Logistic Regression Results for Characteristics Associated with AHC (Dependent Variable) in Paris for Adults 18+ with full coefficients.

Independent Variable	2011-2013 18+ population			2014-2017 18+ population		
	Coefficient (S.E.)	P>|z|	Odds Ratio 95% C.I.	Coefficient (S.E.)	P>|z|	Odds Ratio 95% C.I.
Age (continuous)	0.0254 (0.0003)	<.0001	1.026 (1.025-1.026)	0.0271 (0.0002)	<.0001	1.027 (1.027-1.028)
Female (omitted=male)	-0.1554 (0.0100)	<.0001	0.856 (0.839-0.873)	-0.0917 (0.0071)	<.0001	0.912 (0.900-0.925)
Income Quartile of arrondissement (omitted=highest)						
Lowest	0.1809 (0.0328)	<.0001	1.198 (1.124-1.278)	0.2166 (0.0207)	<.0001	1.242 (1.193-1.293)
Second	0.1033 (0.0241)	<.0001	1.109 (1.058-1.163)	0.1032 (0.0154)	<.0001	1.109 (1.076-1.143)
Third	0.00846 (0.0218)	0.6986	1.008 (0.966-1.053)	0.0721 (0.0149)	<.0001	1.075 (1.044-1.107)
Arrondissement with more than 40% adult population without a baccalaureate degree	0.0129 (0.0150)	0.3912	1.013 (0.984-1.043)	-0.0108 (0.0103)	0.2925	0.989 (0.969-1.009)
Number of Diagnoses on Record (Continuous)	0.0681 (0.00067)	<.0001	1.070 (1.069-1.072)	0.0725 (0.0004)	<.0001	1.075 (1.074-1.076)
Physicians/1000 arrondissement population	-0.0154 (0.00419)	<.0001	0.985 (0.977-0.993)	-0.0189 (0.0029)	<.0001	0.981 (0.976-0.987)

Sources: Programme de médicalisation des systèmes d'information (PMSI), 2011-2013 and 2014-2017.

Appendix 3

Logistic Regression Results for Characteristics Associated with AHC (Dependent Variable) in Manhattan for Adults 18+ (Paris Model) with full coefficients.

Independent variable	2011-2013 18+ population			2014-2017 18+ population		
	Coefficient (S.E.)	P>|z|	Odds Ratio (95% C.I.)	Coefficient (S.E.)	P>|z|	Odds Ratio (95% C.I.)
Age (continuous)	.015 (.000)	.000	1.015 (1.014-1.015)	.021 (.000)	.000	1.022 (1.021-1.022)

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Independent variable	2011-2013 18+ population			2014-2017 18+ population		
	Coefficient (S.E.)	P>|z|	Odds Ratio (95% C.I.)	Coefficient (S.E.)	P>|z|	Odds Ratio (95% C.I.)
Female (omitted=male)	-.229 (.010)	<.001	.795 (.779-.811)	-.227 (.009)	<.001	.797 (.783-.812)
Income Quartile of Zip Code (omitted=highest)						
Lowest	.402 (.023)	<.001	1.495 (1.430-1.564)	.447 (.013)	<.001	1.564 (1.525-1.603)
Second	.357 (.021)	<.001	1.430 (1.371-1.491)	.506 (.013)	.000	1.659 (1.618-1.700)
Third	.156 (.017)	<.001	1.169 (1.129-1.209)	.436 (.018)	<.001	1.547 (1.494-1.601)
Zip Code with more than 40% adult population with less than a high school diploma	-.003 (.023)	.901	.997 (.953-1.044)	.025 (.035)	.481	1.025 (.957-1.098)
Number of Diagnoses record (continuous)	.039 (.001)	.000	1.040 (1.038-1.042)	.011 (.001)	<.001	1.011 (1.010-1.012)
Physicians/1000 population	.010 (.031)	<.001	1.010 (1.008-1.013)	.000 (.001)	.783	1.000 (.999-1.001)

SOURCES: For Manhattan, the Agency for Healthcare Research and Quality (AHRQ) Hospital Cost Utilization Project (HCUP), Statewide Inpatient Database for New York, 2011-2013 and 2014-2017.

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