

## Prevalence of Hypertension, Awareness, Treatment, and Control in New York City

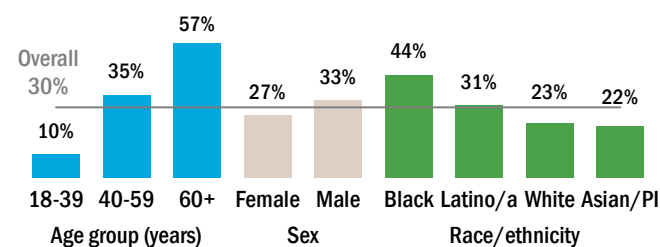
Hypertension (high blood pressure) is a major risk factor for cardiovascular disease, a leading cause of death in New York City (NYC) and nationally.<sup>1,2</sup> Despite decades of research demonstrating how a reduction in blood pressure can lower the risk of stroke, heart attack, and heart failure, less than half (48%) of adults in the United States with hypertension have controlled blood pressure.<sup>3</sup> Further, Black adults continue to be disproportionately affected by earlier onset and higher prevalence of hypertension, as well as the health conditions that hypertension can cause.<sup>4</sup> Structural racism is a driver of health inequities<sup>5</sup> as it has unfairly distributed factors that promote health or cause disease. For example, some communities have lower access to high quality health care, fewer opportunities for physical activity, less access to heart healthy foods and more fast-food establishments, along with other challenges to good health.<sup>6</sup>

In 2010 and 2018, the NYC Health Department conducted the Heart Follow-Up Study (HFUS) which included blood pressure measurements. These surveys supplemented ongoing hypertension prevalence surveillance in NYC that is based on self-reported information and dependent on those who are aware of their hypertension status. In this Epi Data Brief, we used HFUS data to estimate the prevalence of hypertension, awareness, treatment, and control among NYC adults in 2018, overall and among different groups. We also include data from 2010 to highlight where changes occurred.

### In 2018, 30% of New Yorkers (1.9 million adults) had hypertension

- The prevalence of hypertension increased with age, with more than half (57%) of adults 60 years and older having hypertension in 2018.
- Hypertension prevalence was greater among males (33%) than among females (27%).
- Black (44%) and Latino/a (31%) adults had the highest and second highest prevalence of hypertension compared with White (23%) and Asian/Pacific Islander (22%) adults.
- The prevalence of hypertension was higher among adults with household incomes less than 200% of the Federal Poverty Line (FPL) (32%) than among adults with household income equal to or greater than 400% of FPL (26%).

**Hypertension was more common among New Yorkers who are older, male, Black, or Latino/a in 2018**



White, Black, Asian/Pacific Islander (PI) race categories exclude Latino/a ethnicity. Latino/a includes Hispanic or Latino/a of any race.

Source: Heart Follow-Up Study 2018.

#### Data Sources:

##### Heart Follow-Up Study (HFUS)

**2018:** A survey conducted among a subset of participants from the 2018 NYC Community Health Survey (CHS) and a supplemental random digit dial survey (RDD) (total n=2,512 adults) to estimate population sodium and potassium intake from 24-hour urine samples. Blood pressure measurements and self-reported health information were also collected. The two samples (CHS and RDD) were weighted separately, combined, and raked to population control totals to create a final weight. Data are weighted to the adult (18 years and older) NYC population living in non-group quarters. Control totals came from a combination of Census 2010, the American Community Survey (ACS), and 2017 NYC Housing and Vacancy Survey data. Control totals were calibrated to the 2017 ACS adult NYC borough population totals (6,670,172).

##### Heart Follow-Up Study (HFUS)

**2010:** A supplemental survey to the 2010 CHS among a subset of 1,656 adults which provided baseline data on self-reported health information, blood pressure measurements, and 24-hour urine samples for sodium and potassium intake. Data are weighted to the 2006-2008 American Community Survey.

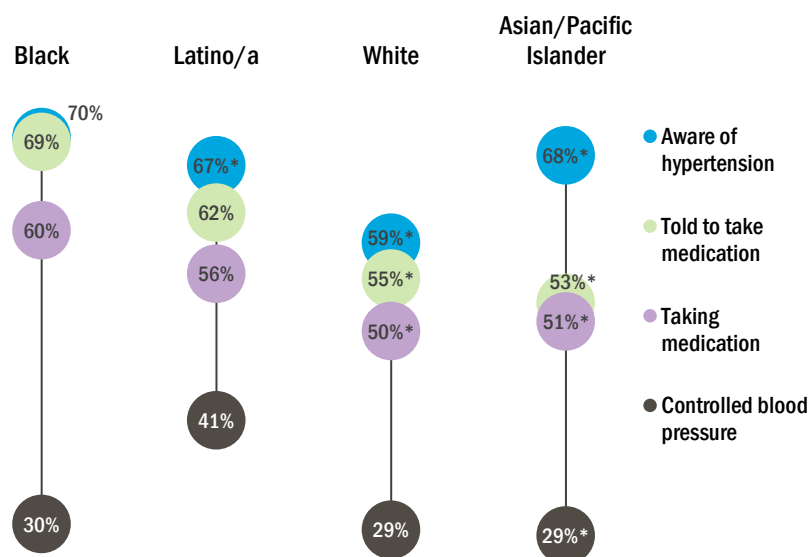
\* For data displayed with an asterisk, estimate should be interpreted with caution. Estimate's Relative Standard Error (a measure of estimate precision) is greater than 30%, or the 95% Confidence Interval half-width is greater than 10 or the sample size is too small, making the estimate potentially unreliable.

## Among all adults with hypertension, about one third (34%) or 480,000 New Yorkers were not aware they had it

- In 2018, half (49%\*) of adults ages 18 to 39 years were aware of their hypertension compared with 83% of adults 60 years and older.
- Hypertension awareness was lower among males (60%) than females (77%) with hypertension.
- Hypertension awareness was 70% among Black adults, 68%\* among Asian/Pacific Islander adults, 67%\* among Latino/a adults, 67%\* among Latino/a adults, and 59%\* among White adults.
- Adults with hypertension who lived in Staten Island had the lowest awareness (41%\*) compared with residents of other boroughs.

## Among adults with hypertension, 62% had been told to take medication for their high blood pressure, 56% were taking medication, and 33% had their blood pressure under control

Hypertension awareness, treatment, and control by race and ethnicity among New York City adults with hypertension in 2018



White, Black, Asian/Pacific Islander race categories exclude Latino/a ethnicity. Latino/a includes Hispanic or Latino/a of any race.

\*Estimate should be interpreted with caution due to large Relative Standard Error, wide 95% Confidence Interval, or small sample size.

Source: Heart Follow-Up Study 2018.

- Medication use was 60% among Black adults, 56% among Latino/a adults, 51%\* among Asian/Pacific Islander adults, and 50%\* among White adults.
- About three in 10 Black, Asian/Pacific Islander, and White adults (30%, 29%\*, and 29%, respectively) had controlled blood pressure while four in 10 Latino/a adults had control (41%).
- A greater proportion of females were taking medication (73%) and had controlled blood pressure (43%) compared with males (46% and 28%, respectively)

### Definitions:

**Hypertension:** Includes individuals with in-home exam measurements of average systolic blood pressure  $\geq 140$  mmHg or average diastolic blood pressure  $\geq 90$  mmHg, or a self-report of taking blood pressure medication.<sup>7</sup> The denominator (2018: n=2,440; 2010: n=1,592) excludes those who did not report whether they were taking high blood pressure medication and had missing blood pressure values.

**Awareness:** Among those with hypertension, those who answered “yes” to the question “Have you ever been told by a doctor, nurse, or other health professional that you have hypertension, also called high blood pressure?”

### Told to take medication:

Among those with hypertension, those who answered “yes” to the question “Have you ever been told by a doctor, nurse or other health professional that you need to take medicine for your high blood pressure?”

**Taking medication:** Among those with hypertension, those who answered “yes” to the question “Are you currently taking medication for your high blood pressure?”

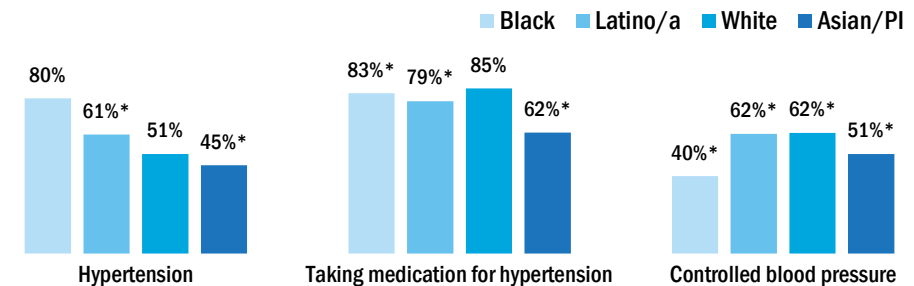
**Control:** Among those with hypertension, those with in-home exam measurements of average systolic blood pressure  $< 140$  mmHg and average diastolic blood pressure  $< 90$  mmHg.

**Race/ethnicity:** For this publication, Latino/a includes people of Hispanic or Latino/a origin, as identified by the survey question “Are you Hispanic or Latino/a?” and regardless of reported race. White, Black, and Asian (including Pacific Islander) race categories exclude Latino/a ethnicity.

## Medication use was highest among adults 60 years and older (79%) compared with adults 18 to 39 years old (34%\*) and adults 40 to 59 years old (66%)

- Blood pressure control was also highest among adults 60 years and older (55%) compared with adults 18 to 39 years old (12%\*) and adults 40 to 59 years old (45%).
- Among adults 60 years and older, Black adults (80%) had the highest prevalence of hypertension compared with Latino/a (61%\*), White (51%), and Asian/Pacific Islander adults (45%\*).
- Among adults 60 years and older and with hypertension, medication use was similar among Black adults (83%\*) compared with White adults (85%) and Latino/a adults (79%\*).
- Black adults who were at least 60 years old and had hypertension had lower control (40%\*) compared with Latino/a (62%\*) and White (62%\*) adults who were 60 years and older and had hypertension.

Prevalence of hypertension, treatment, and control by race and ethnicity among New York City adults 60 years and older in 2018



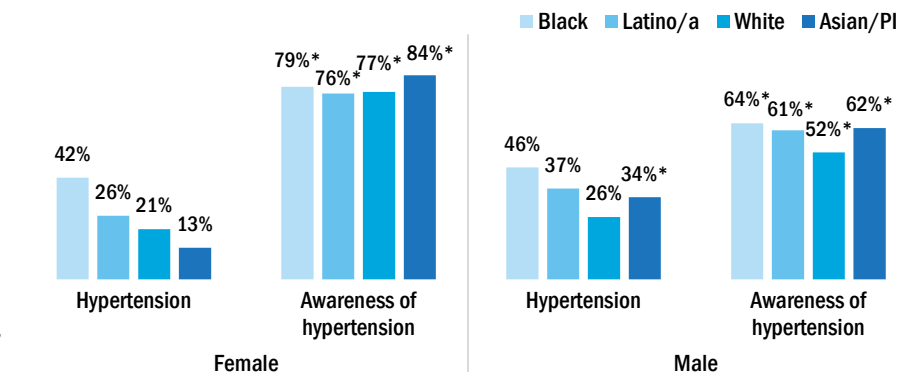
Note: "Taking medication" and "controlled blood pressure" are among all adults 60 and older with hypertension. White, Black, Asian/Pacific Islander (PI) race categories exclude Latino/a ethnicity. Latino/a includes Hispanic or Latino/a of any race. \*Estimate should be interpreted with caution due to large Relative Standard Error, wide 95% Confidence Interval, or small sample size.

Source: Heart Follow-Up Study 2018.

## Among females, Black females (42%) had higher prevalence of hypertension compared with Latina (26%), White (21%), and Asian/Pacific Islander (13%) females

- Among females with hypertension, awareness was similar among Black females (79%\*) compared with Latina (76%\*), White (77%\*), and Asian/Pacific Islander (84%\*) females.
- Black males (46%) had a higher prevalence of hypertension compared with White males (26%).
- Among males with hypertension, awareness was similar among Black males (64%\*) compared with Asian/Pacific Islander (62%\*), Latino (61%\*), and White (52%\*) males.

Prevalence of hypertension and awareness by sex and race and ethnicity among New York City adults in 2018



Note: "Awareness" is among all adult females and males, respectively, with hypertension.

White, Black, Asian/Pacific Islander (PI) race categories exclude Latino/a ethnicity. Latino/a includes Hispanic or Latino/a of any race. \*Estimate should be interpreted with caution due to large Relative Standard Error, wide 95% Confidence Interval, or small sample size.

Source: Heart Follow-Up Study 2018.

## The overall prevalence of hypertension was similar between 2018 and 2010 (30%)

- Overall, among those with hypertension, awareness was similar between 2010 (61%\*) and 2018 (66%); however, there was an increase in awareness among Latino adults (45% to 67%\*).
- From 2010 to 2018, among Latino/a adults with hypertension, there was an increase in being told to take high blood pressure medication (42% to 62%) and in current use of high blood pressure medication (39% to 56%).
- Blood pressure control decreased among White (46%\* to 29%) and Asian/Pacific Islander (70%\* to 29%\*) adults and increased among Latino/a adults (24% to 41%) from 2010 to 2018.

## Implications

Nearly a third of NYC adults have hypertension. Some of the differences in prevalence of hypertension and treatment and control of hypertension among racial and ethnic groups in NYC are striking. These differences reflect the influence of structural and interpersonal racism on the social and environmental conditions that impact health, not biological differences among groups. Black New Yorkers have the highest prevalence compared with other racial and ethnic groups; and while this group also has high levels of awareness and treatment, this does not translate to high levels of controlled hypertension. These findings underscore the impact of unacceptable inequalities in access to high-quality treatment and socioeconomic conditions conducive to good health. In addition, race-based prescribing recommendations, which were intended to improve treatment for Black adults with hypertension, do not appear to have led to improvement.<sup>8-10</sup>

Due to the small sample size, subgroup disaggregation and interpretation of estimates were limited, particularly for Asian/Pacific Islander adults, and people who did not identify with the four major ethnic and racial groups were excluded from analyses by race and ethnicity. In addition, the survey did not ask about lifestyle modification in the absence of blood pressure medication.

Hypertension awareness, treatment, and control improved among Latino/a New Yorkers since 2010, whereas control may have worsened for other racial and ethnic groups. These groups comprise diverse ethnicities, cultures, and histories, which all may influence health outcomes within these groups but are masked when the groups are aggregated. Work is still needed to reach New Yorkers who are not aware that they have hypertension, ensure appropriate prevention and treatment, and especially address persistent inequities. The Health Department's efforts to achieve health equity around hypertension include improving access to healthy food, making neighborhoods more conducive to exercise, and working with health system partners and community organizations in areas with a high prevalence of chronic disease and poverty. This includes technical assistance and support to improve meaningful patient engagement and health outcomes, and placing blood pressure monitoring kiosks at pharmacies and other sites so that members of the public can more easily manage their blood pressure.

**Health equity** is attainment of the highest level of health and well-being for all people. Not all New Yorkers have the same opportunities to live a healthy life. Achieving health equity requires focused and ongoing efforts to address historical and contemporary injustices such as discrimination based on social position (e.g., class, immigration status) or social identities (e.g., race, gender, sexual orientation). For more information, visit the Centers for Disease Control and Prevention's [Health Equity](#) page.

**Authors:** Christine Dominianni, Beth Seltzer

**Acknowledgements:** Kinjia Hinterland, Katherine Bartley, Amber Levanon Seligson, Nneka Lundy De La Cruz, Hannah Gould, Charon Gwynn, Michelle Morse, Kim Kessler, John Jasek, Divya Prasad, Shadi Chamany, Ernesto Fana, Lisa Helburn, Rishi Sood, Max William Hadler

**References:** 1 Li W OC, Huynh M, Castro A, et al. Summary of Vital Statistics, 2019. New York, NY: Bureau of Vital Statistics, New York City Department of Health and Mental Hygiene.

2 Virani SS, Alonso A, Benjamin EJ, et al. Heart Disease and Stroke Statistics-2020 Update: A Report From the American Heart Association. *Circulation*. 2020;141(9):e139-e596.

3 Rana J, Oldroyd J, Islam MM, et al. Prevalence of hypertension and controlled hypertension among United States adults: Evidence from NHANES 2017-18 survey. *Int J Cardiol Hypertens*. 2020;7:100061.

4 Flack JM, Ference BA, Levy P. Should African Americans with hypertension be treated differently than non-African Americans? *Curr Hypertens Rep*. 2014;16(1):409.

5 Churchwell K, Elkind MSV, Benjamin RM, et al. Call to Action: Structural Racism as a Fundamental Driver of Health Disparities: A Presidential Advisory From the American Heart Association. *Circulation*. 2020;142(24):e454-e468.

**Suggested citation:** Dominianni C, Seltzer B. Hypertension prevalence, awareness, treatment, and control in New York City. New York City Department of Health and Mental Hygiene: Epi Data Brief (135); January 2023.

6 Landrine H, Corral I. Separate and unequal: residential segregation and black health disparities. *Ethn Dis*. 2009;19(2):179-184.

7 Chobanian AV, Bakris GL, Black HR, et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA*. 2003;289(19):2560-2572.

8. Holt HK, Gildengorin G, Karliner L, et al. Differences in Hypertension Medication Prescribing for Black Americans and Their Association with Hypertension Outcomes. *J Am Board Fam Med*. 2022;35(1):26-34.

9. Williams SK, Ravenell J, Seyedali S, et al. Hypertension Treatment in Blacks: Discussion of the U.S. Clinical Practice Guidelines. *Prog Cardiovasc Dis*. 2016;59(3):282-288.

10. Flack JM, Buhnerkempe MG. Race and Antihypertensive Drug Therapy: Edging Closer to a New Paradigm. *Hypertension*. 2022;79(2):349-351.

**MORE New York City Health Data and Publications at [nyc.gov/health/data](https://nyc.gov/health/data)**

Visit EpiQuery – the Health Department's interactive health data system at [nyc.gov/health/EpiQuery](https://nyc.gov/health/EpiQuery)

New York City Department of Health and Mental Hygiene





# Epi Data Tables

January 2023, No. 135

## Prevalence of Hypertension, Awareness, Treatment, and Control in New York City

### Data Tables

- Table 1. Prevalence of hypertension among adults 18 and older, New York City, 2018**
- Table 2. Awareness of hypertension among adults 18 and older with hypertension, New York City, 2018**
- Table 3. Prevalence of hypertension treatment and control among adults 18 and older with hypertension, New York City 2018**
- Table 4. Prevalence of hypertension, awareness, treatment and control stratified by race and ethnicity, sex at birth, and age, New York City 2018**
- Table 5. Prevalence of hypertension, awareness, treatment, and control overall and by race and ethnicity, New York City, 2010**

### Data Sources

**Heart Follow-Up Study (HFUS), 2018:** A survey conducted among a subset of participants from the 2018 NYC Community Health Survey (CHS) and a supplemental random digit dial survey (RDD) (total n=2,512 adults) to estimate population sodium and potassium intake from 24-hour urine samples. Blood pressure measurements and self-reported health information were also collected. The two samples (CHS and RDD) were weighted separately, combined, and raked to population control totals to create a final weight. Data are weighted to the adult (18 years and older) NYC population living in non-group quarters. Control totals came from a combination of Census 2010, the American Community Survey (ACS), and 2017 NYC Housing and Vacancy Survey data. Control totals were calibrated to the 2017 ACS adult NYC borough population totals (6,670,172).

**HFUS, 2010:** A supplemental survey to the 2010 CHS among a subset of 1,656 adults which provided baseline data on self-reported health information, blood pressure measurements, and 24-hour urine samples for sodium and potassium intake. Data are weighted to the 2006-2008 American Community Survey.

**Table 1. Prevalence of hypertension<sup>1</sup> among adults 18 and older, New York City, 2018**

Source: Heart Follow-Up Study, 2018

Data are weighted to the NYC adult residential population per Census 2010, the American Community Survey 2017, and 2017 NYC Housing and Vacancy Survey.

Except for age groups, data are age adjusted to the 2000 U.S. Standard Population using the following groups: 18-39, 40-59, 60+.

Population estimates are rounded to the nearest thousand.

	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	P-value <sup>2</sup>	P-value <sup>2</sup>
<b>Overall</b>	1,931,000	29.6	27.4	31.8		
<b>Age group</b>						
18-39	285,000	10.0	7.8	12.8		
40-59	734,000	35.2	31.2	39.4		
60+	908,000	57.5	<sup>D</sup> 51.8	62.9	<b>&lt;0.001</b>	
<b>Sex at birth</b>						
Male	970,000	33.0	29.7	36.4	REF	
Female	961,000	26.6	23.9	29.5	<b>0.004</b>	
<b>Race/ethnicity<sup>3</sup></b>						
Asian/Pacific Islander	172,000	21.9	16.1	29.2	0.744	REF
Black	577,000	43.7	39.3	48.2	<b>&lt;0.001</b>	<b>&lt;0.001</b>
Latino/a	491,000	30.7	26.8	34.8	<b>0.006</b>	<b>0.026</b>
White	640,000	23.2	19.8	26.9	REF	0.744
<b>Education</b>						
Less than high school	433,000	32.1	26.5	38.1	<b>0.035</b>	
High school graduate	576,000	36.9	32.0	42.1	<b>&lt;0.001</b>	
Some college/technical school	336,000	28.2	24.1	32.8	0.231	
College graduate	582,000	24.9	21.7	28.3	REF	
<b>Household income (% of FPL)</b>						
<200%	1,074,000	32.3	29.3	35.6	<b>0.007</b>	
200-399%	301,000	29.7	24.7	35.1	0.204	
≥400%	556,000	25.5	<sup>U</sup> 21.9	29.4	REF	
<b>Borough of residence</b>						
Bronx	381,000	38.1	33.4	43.1	<b>&lt;0.001</b>	
Brooklyn	610,000	31.6	27.9	35.7	<b>&lt;0.001</b>	
Manhattan	288,000	21.4	17.6	25.8	REF	
Queens	526,000	28.3	24.2	32.9	<b>0.024</b>	
Staten Island	126,000	32.6	<sup>*</sup> 22.2	45.0	0.075	
<b>Neighborhood Poverty<sup>4</sup></b>						
0-<10% (Low)	392,000	28.0	23.1	33.5	REF	
10-<20% (Medium)	815,000	29.2	25.8	32.8	0.726	
20-<30% (High)	387,000	28.0	23.7	32.7	0.995	
30-<100% (Very High)	325,000	36.1	31.2	41.2	<b>0.029</b>	

<sup>1</sup>Those with an average systolic blood pressure ≥140 or an average diastolic blood pressure ≥90 measured at the in-home exam, or a self-report of taking blood pressure medication. The denominator excludes those with missing BP values and who did not report taking high blood pressure medication (n=2,440).

<sup>2</sup>All p-values were obtained from t-test comparisons except for the p-value for 3-level age group which was obtained from linear trend analysis.

<sup>3</sup>White, Black, Asian/Pacific Islander race categories exclude Latino/a ethnicity. Latino/a includes Hispanic or Latino/a of any race.

<sup>4</sup>Neighborhood poverty (based on ZIP code) is defined as the percentage of the population living below the Federal Poverty Line (FPL) per the American Community Survey (2012-2016). Neighborhoods are categorized into four groups as follows: "Low poverty" neighborhoods have <10% of the population living below the FPL; "Medium poverty" neighborhoods have 10-<20% of the population below FPL; "High Poverty" neighborhoods have 20-<30% of the population living below the FPL; "Very high poverty" neighborhoods have ≥30% of the population living below the FPL.

\*Estimate should be interpreted with caution due to large Relative Standard Error, wide 95% Confidence Interval, or small sample size.

U When reporting to nearest whole percent, round up

D When reporting to nearest whole percent, round down

**Table 2. Awareness<sup>1</sup> of hypertension among adults 18 and older with hypertension, New York City, 2018**

Source: Heart Follow-Up Study, 2018

Data are weighted to the NYC adult residential population per Census 2010, the American Community Survey 2017, and 2017 NYC Housing and Vacancy Survey.

Except for age groups, data are age adjusted to the 2000 U.S. Standard Population using the following groups: 18-39, 40-59, 60+.

Population estimates are rounded to the nearest thousand.

	Weighted N	Prevalence		Lower 95% Confidence Interval	Upper 95% Confidence Interval	P-value <sup>2</sup>	P-value <sup>2</sup>
<b>Overall</b>	1,451,000	66.1		60.0	71.7		
<b>Age group</b>							
18-39	140,000	49.1	*	36.7	61.7		
40-59	555,000	75.6		69.5	80.7		
60+	753,000	83.0		75.5	88.5	<0.001	
<b>Sex at birth</b>							
Male	666,000	60.1		52.5	67.2	REF	
Female	784,000	77.3		68.9	84.0	0.001	
<b>Race/ethnicity<sup>3</sup></b>							
Asian/Pacific Islander	109,000	67.7	*	47.0	83.2	0.422	
Black	447,000	69.9		60.8	77.6	0.136	
Latino/a	380,000	67.0	*	56.0	76.4	0.303	
White	491,000	58.6	*	46.1	70.0	REF	
<b>Education</b>							
Less than high school	369,000	78.5	D*	60.6	89.6	0.059	
High school graduate	414,000	62.6	*	51.9	72.3	0.873	
Some college/technical school	263,000	64.5	U*	51.4	75.8	0.706	
College graduate	402,000	61.5	D*	51.1	70.9	REF	
<b>Household income (% of FPL)</b>							
<200%	801,000	63.4		55.7	70.5	0.767	
200-399%	241,000	76.9	*	58.1	88.8	0.246	
≥400%	409,000	65.5	D*	53.5	75.8	REF	
<b>Borough of residence</b>							
Bronx	311,000	70.5	U*	58.9	80.0	0.350	<0.001
Brooklyn	481,000	69.4		59.2	78.0	0.399	<0.011
Manhattan	199,000	62.1	*	47.4	74.9	REF	0.022
Queens	384,000	69.5	D*	55.8	80.4	0.443	<0.001
Staten Island	77,000	41.5	D*	31.3	52.4	0.022	REF
<b>Neighborhood Poverty<sup>4</sup></b>							
0-<10% (Low)	298,000	54.5	U*	42.1	66.4	REF	
10-<20% (Medium)	594,000	68.0		58.3	76.4	0.086	
20-<30% (High)	281,000	61.9	*	50.6	72.0	0.381	
30-<100% (Very High)	269,000	78.4	*	66.7	86.8	0.003	

<sup>1</sup>Among those with hypertension, those who self-reported "yes" to the question "Have you ever been told... that you have hypertension, also called high blood pressure?"<sup>2</sup>All p-values were obtained from t-test comparisons except for the p-value for 3-level age group which was obtained from linear trend analysis.<sup>3</sup>White, Black, Asian/Pacific Islander race categories exclude Latino/a ethnicity. Latino/a includes Hispanic or Latino/a of any race.<sup>4</sup>Neighborhood poverty (based on ZIP code) is defined as the percentage of the population living below the Federal Poverty Line (FPL) per the American Community Survey (2012-2016). Neighborhoods are categorized into four groups as follows: "Low poverty" neighborhoods have <10% of the population living below the FPL; "Medium poverty" neighborhoods have 10-<20% of the population below FPL; "High Poverty" neighborhoods have 20-<30% of the population living below the FPL; "Very high poverty" neighborhoods have ≥30% of the population living below the FPL.

\*Estimate should be interpreted with caution due to large Relative Standard Error, wide 95% Confidence Interval, or small sample size.

U When reporting to nearest whole percent, round up

D When reporting to nearest whole percent, round down

**Table 3. Prevalence of hypertension treatment and control among adults 18 and older with hypertension, New York City 2018**

Source: Heart Follow-Up Study, 2018

Data are weighted to the NYC adult residential population per Census 2010, the American Community Survey 2017, and 2017 NYC Housing and Vacancy Survey.

Except for age groups, data are age adjusted to the 2000 U.S. Standard Population using the following groups: 18-39, 40-59, 60+.

Population estimates are rounded to the nearest thousand.

	Told to Take Medication <sup>1</sup>					Taking Medication <sup>2</sup>					Controlled Blood Pressure <sup>3</sup>									
	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	P-value <sup>4</sup>	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	P-value <sup>4</sup>	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	P-value <sup>4</sup>	P-value <sup>4</sup>				
<b>Overall</b>	1,395,000	62.2	56.2	67.7		1,309,000	55.8	50.3	61.3		838,000	33.5	<sup>D</sup> 29.3	37.9						
<b>Age group</b>																				
18-39	124,000	43.6	*	31.9	56.1	98,000	34.4	*	24.0	46.5	33,000	12.1	*	6.4	21.6					
40-59	528,000	72.0		65.7	77.6	488,000	66.5	<sup>D</sup>	59.9	72.5	319,000	45.1		38.3	52.0					
60+	739,000	81.4		73.9	87.1	<0.001	720,000	79.3		71.8	85.2	<0.001		47.4	62.6	<0.001				
<b>Sex at birth</b>																				
Male	617,000	54.2		47.2	61.0	REF	560,000	45.8		39.9	51.9	REF		23.7	33.2	REF				
Female	777,000	75.9		67.5	82.7	<0.001	749,000	73.2		64.7	80.3	<0.001		42.8	52.0	0.005				
<b>Race/ethnicity<sup>5</sup></b>																				
Asian/Pacific Islander	98,000	52.8	*	31.7	73.0	0.850	95,000	50.9	*	30.1	71.4	0.933		28.8	*	15.8	46.6	0.942	0.191	
Black	443,000	69.4		60.3	77.2	0.066	402,000	60.3		51.6	68.5	0.162		30.0		23.0	38.1	0.910	0.061	
Latino/a	360,000	62.1		51.6	71.5	0.405	338,000	55.8		46.3	64.9	0.447		246,000	40.7		32.8	49.0	0.030	REF
White	470,000	55.3	*	42.8	67.1	REF	451,000	49.9	*	38.2	61.6	REF		320,000	29.4		23.8	35.8	ref	0.030
<b>Education</b>																				
Less than high school	357,000	68.8	*	52.9	81.2	0.255	336,000	59.9	*	47.2	71.4	0.628		218,000	35.8		28.9	43.4	0.873	
High school graduate	406,000	60.8	*	50.2	70.5	0.759	359,000	51.1		41.8	60.3	0.481		216,000	28.0		21.3	35.7	0.129	
Some college/technical school	244,000	58.4	*	46.1	69.7	0.981	236,000	54.1	*	42.4	65.3	0.807		150,000	32.6		25.0	41.2	0.491	
College graduate	387,000	58.6		48.3	68.2	REF	377,000	56.0		45.8	65.6	REF		253,000	36.8		28.5	45.8	REF	
<b>Household income (% of FPL)</b>																				
<200%	791,000	62.0		54.4	69.1	0.569	747,000	55.2		48.3	62.0	0.906		439,000	28.4		24.2	32.9	0.064	
200-399%	220,000	70.9	*	53.2	83.9	0.190	192,000	57.3	*	41.2	72.0	0.896		141,000	45.7	*	31.0	61.3	0.304	
≥400%	383,000	58.3	*	47.6	68.2	REF	370,000	56.0	*	45.5	66.0	REF		259,000	36.6		29.4	44.5	REF	
<b>Borough of residence</b>																				
Bronx	300,000	67.8	*	56.3	77.6	0.200	279,000	59.8	*	49.2	69.5	0.642		176,000	36.8		30.3	43.7	0.536	
Brooklyn	471,000	67.6		57.5	76.4	0.190	438,000	60.3		50.6	69.3	0.588		249,000	32.3		25.0	40.5	0.244	
Manhattan	180,000	56.2	*	41.8	69.6	REF	178,000	55.6	*	41.3	69.0	REF		140,000	41.5	<sup>U</sup> *	28.9	55.3	REF	
Queens	367,000	62.2	*	49.1	73.7	0.537	340,000	53.6	*	41.7	65.2	0.838		230,000	31.0		22.9	40.5	0.201	
Staten Island	77,000	41.5	<sup>D</sup> *	31.3	52.4	0.106	74,000	38.3	*	28.4	49.3	0.056		43,000	21.8	*	13.6	33.2	0.021	
<b>Neighborhood Poverty<sup>6</sup></b>																				
0-<10% (Low)	293,000	53.7	*	41.3	65.7	REF	279,000	46.2		38.4	54.1	REF		193,000	29.0		22.5	36.3	REF	
10-<20% (Medium)	564,000	62.5	<sup>U</sup>	53.0	71.2	0.264	526,000	55.8		46.8	64.5	0.111		337,000	33.5	<sup>U</sup>	26.7	41.1	0.371	
20-<30% (High)	269,000	58.3	*	47.2	68.5	0.587	260,000	54.6	*	44.1	64.8	0.206		157,000	33.2		24.5	43.1	0.479	
30-<100% (Very High)	259,000	74.9	*	63.1	83.9	0.011	237,000	67.2	*	55.2	77.3	0.003		144,000	37.0		28.5	46.5	0.167	

<sup>1</sup>Those who self-reported "yes" to the question "Have you ever been told by a doctor, nurse or other health professional that you need to take medicine for your high blood pressure?" among those with hypertension.<sup>2</sup>Those who self-reported "yes" to the question "Are you currently taking medication for your high blood pressure?" among those with hypertension.<sup>3</sup>Average systolic blood pressure <140 and average diastolic blood pressure <90 measured at the in-home clinical exam among those with hypertension.<sup>4</sup>All p-values were obtained from t-test comparisons except for the p-value for 3-level age group which was obtained from linear trend analysis.<sup>5</sup>White, Black, Asian/Pacific Islander race categories exclude Latino/a ethnicity. Latino/a includes Hispanic or Latino/a of any race.<sup>6</sup>Neighborhood poverty (based on ZIP code) is defined as the percentage of the population living below the Federal Poverty Line (FPL) per the American Community Survey (2012-2016). Neighborhoods are categorized into four groups as follows: "Low poverty" neighborhoods have <10% of the population living below the FPL; "Medium poverty" neighborhoods have 10-<20% of the population below FPL; "High Poverty" neighborhoods have 20-<30% of the population living below the FPL; "Very high poverty" neighborhoods have ≥30% of the population living below the FPL.

\*Estimate should be interpreted with caution due to large Relative Standard Error, wide 95% Confidence Interval, or small sample size.

<sup>U</sup> When reporting to nearest whole percent, round up<sup>D</sup> When reporting to nearest whole percent, round down



**Table 4. Prevalence of hypertension, awareness, treatment and control stratified by race and ethnicity, sex at birth, and age, New York City 2018**

Source: Heart Follow-Up Study, 2018

Data are weighted to the NYC adult residential population per Census 2010, the American Community Survey 2017, and 2017 NYC Housing and Vacancy Survey. Population estimates are rounded to the nearest thousand.

	Hypertension <sup>1</sup>					Awareness <sup>2</sup>					Taking Medication <sup>3</sup>					Controlled Blood Pressure <sup>4</sup>				
	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	p-value	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	p-value	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	p-value	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	p-value
<b>Race/ethnicity by Age<sup>5</sup></b>																				
Black, 60+	187,000	80.0	69.5	87.6	REF	167,000	89.2	* 78.6	94.9	REF	154,000	82.5	U* 68.6	91.1	REF	70,000	39.8	* 26.8	54.5	REF
Latino/a, 60+	201,000	61.3	* 49.2	72.1	<b>0.012</b>	171,000	84.6	* 65.0	94.2	0.579	158,000	78.5	U* 60.8	89.6	0.667	122,000	61.7	* 46.9	74.6	<b>0.032</b>
White, 60+	406,000	51.3	43.2	59.4	<b>&lt;0.001</b>	353,000	86.9	78.2	92.5	0.664	345,000	85.0	75.9	91.1	0.714	249,000	62.2	* 50.4	72.8	<b>0.016</b>
Asian/Pacific Islander, 60+	84,000	45.4	* 28.0	63.9	<b>0.001</b>	52,000	62.3	* 31.0	85.8	0.094	52,000	62.3	* 31.0	85.8	0.222	43,000	51.3	* 24.3	77.6	0.493
Black, 40-59	277,000	53.3	44.6	61.8	REF	220,000	79.5	U 69.9	86.7	REF	203,000	73.3	63.0	81.5	REF	110,000	40.7	* 30.1	52.2	REF
Latino/a, 40-59	212,000	36.7	29.9	44.0	<b>0.004</b>	175,000	82.8	72.6	89.7	0.593	158,000	74.8	63.9	83.2	0.825	112,000	57.2	* 45.3	68.3	<b>0.046</b>
White, 40-59	168,000	23.5	U 17.7	30.6	<b>&lt;0.001</b>	116,000	68.9	54.9	80.2	0.175	86,000	51.4	* 36.9	65.7	<b>0.015</b>	69,000	42.0	* 28.3	57.1	0.889
Asian/Pacific Islander, 40-59	58,000	25.3	* 15.0	39.4	<b>&lt;0.001</b>	33,000	56.1	* 29.8	79.4	0.106	30,000	50.9	* 25.9	75.4	0.125	19,000	32.6	* 13.0	60.9	0.570
Black, 18-39	110,000	16.3	11.2	23.0	REF	57,000	51.4	* 33.7	68.8	REF	41,000	37.6	* 22.1	56.1	REF	16,000	15.7	* 6.3	34.1	REF
Latino/a, 18-39	77,000	9.4	6.0	14.4	0.060	34,000	44.2	* 24.4	66.1	0.623	21,000	27.6	* 12.6	50.0	0.453	12,000	15.5	Da 5.5	36.4	0.981
White, 18-39	66,000	8.0	* 4.3	14.3	<b>0.032</b>	23,000	34.8	* 14.1	63.4	0.314	20,000	29.9	* 11.4	58.7	0.626	^	^	^	^	^
Asian/Pacific Islander, 18-39	30,000	6.6	* 2.6	15.6	<b>0.024</b>	^	^	^	^	^	13,000	45.0	* 12.2	82.9	0.758	^	^	^	^	^
<b>Race/ethnicity by Sex at birth<sup>5</sup></b>																				
Black, Male	258,000	45.8	39.2	52.5	REF	182,000	64.3	* 52.5	74.6	REF	157,000	52.2	42.5	61.8	REF	68,000	22.9	16.1	31.7	REF
Latino/a, Male	256,000	37.2	31.5	43.2	0.060	183,000	60.6	* 48.0	72.0	0.662	152,000	46.2	36.5	56.2	0.401	104,000	32.2	24.7	40.7	0.108
White, Male	331,000	25.5	U 20.5	31.3	<b>&lt;0.001</b>	230,000	51.7	* 41.2	62.1	0.109	190,000	37.8	28.4	48.3	<b>0.045</b>	145,000	26.7	19.7	35.1	0.504
Asian/Pacific Islander, Male	113,000	33.6	* 24.2	44.5	0.052	64,000	61.8	* 38.0	81.0	0.846	53,000	44.2	* 23.3	67.4	0.540	37,000	27.7	* 12.8	50.1	0.652
Black, Female	319,000	41.6	35.9	47.5	REF	265,000	78.9	* 66.0	87.9	REF	244,000	74.1	* 60.8	84.0	REF	128,000	42.6	* 28.7	57.8	REF
Latino/a, Female	235,000	26.0	21.2	31.4	<b>&lt;0.001</b>	197,000	76.1	* 58.1	88.0	0.768	186,000	69.5	Da 52.4	82.5	0.643	142,000	51.9	* 36.8	66.8	0.397
White, Female	309,000	20.6	16.5	25.4	<b>&lt;0.001</b>	262,000	76.8	* 58.7	88.5	0.821	262,000	76.8	* 58.7	88.5	0.780	174,000	33.2	25.0	42.6	0.288
Asian/Pacific Islander, Female	58,000	13.0	7.6	21.3	<b>&lt;0.001</b>	45,000	83.6	* 63.6	93.7	0.615	42,000	77.5	Da 57.2	89.8	0.743	29,000	25.7	* 12.6	45.3	0.139
<b>Sex at birth by Age</b>																				
Male, 60+	412,000	60.9	52.9	68.3	REF	311,000	75.7	* 63.5	84.8	REF	296,000	72.0	* 60.0	81.5	REF	204,000	50.4	* 39.7	61.0	REF
Male, 40-59	366,000	38.0	32.0	44.4	<b>&lt;0.001</b>	283,000	77.4	68.8	84.2	0.796	230,000	62.7	53.1	71.5	0.206	144,000	41.6	32.2	51.5	0.237
Male, 18-39	192,000	14.0	10.2	18.9	<b>&lt;0.001</b>	71,000	37.1	* 23.4	53.2	<b>&lt;0.001</b>	34,000	17.7	* 9.4	30.6	<b>&lt;0.001</b>	^	^	^	^	^
Female, 60+	497,000	54.9	47.0	62.5	REF	442,000	89.0	* 79.5	94.4	REF	424,000	85.4	75.7	91.7	REF	283,000	59.2	* 48.0	69.4	REF
Female, 40-59	368,000	32.8	27.6	38.6	<b>&lt;0.001</b>	271,000	73.7	64.8	81.0	<b>0.006</b>	258,000	70.2	61.1	78.0	<b>0.010</b>	175,000	48.5	D 38.9	58.1	0.151
Female, 18-39	92,000	6.3	4.3	9.2	<b>&lt;0.001</b>	68,000	74.2	* 55.4	87.0	0.101	64,000	69.3	* 50.9	83.1	0.086	23,000	29.3	* 14.2	50.9	<b>0.008</b>

<sup>1</sup>Those with an average systolic blood pressure ≥140 or an average diastolic blood pressure ≥90 measured at the in-home exam, or a self-report of taking blood pressure medication. The denominator excludes those with missing BP values and who did not report taking high blood pressure medication (n=2,440).

<sup>2</sup>Those who self-reported "yes" to the question "Have you ever been told... that you have hypertension, also called high blood pressure?" among those with hypertension.

<sup>3</sup>Those who self-reported "yes" to the question "Are you currently taking medication for your high blood pressure?" among those with hypertension.

<sup>4</sup>Average systolic blood pressure <140 and average diastolic blood pressure <90 measured at the in-home clinical exam among those with hypertension.

<sup>5</sup>White, Black, Asian/Pacific Islander race categories exclude Latino/a ethnicity. Latino/a includes Hispanic or Latino/a of any race.

\*Estimate should be interpreted with caution due to large Relative Standard Error, wide 95% Confidence Interval, or small sample size.

^Data are suppressed due to imprecise and unreliable estimates.

U When reporting to nearest whole percent, round up

D When reporting to nearest whole percent, round down

**Table 5. Prevalence of hypertension, awareness, treatment, and control overall and by race and ethnicity, New York City, 2010**

Source: Heart Follow-Up Study, 2010

Data are weighted to the 2006-2008 American Community Survey.

Data are age adjusted to the 2000 U.S. Standard Population using the following groups: 18-39, 40-59, 60+.

Population estimates are rounded to the nearest thousand.

	Hypertension <sup>1</sup>					Awareness <sup>2</sup>					Told to Take Medication <sup>3</sup>				
	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	2018 vs. 2010 p-value	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	2018 vs. 2010 p-value	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	2018 vs. 2010 p-value
<b>Overall</b>	1,804,000	30.4	27.4	33.6	0.660	1,394,000	61.4	* 50.5	71.3	0.447	1,362,000	57.3	* 46.8	67.1	0.419
<b>Race/ethnicity<sup>6</sup></b>															
Asian/Pacific Islander	171,000	28.9	* 17.5	43.8	0.358	120,000	73.6	* 45.6	90.3	0.703	120,000	73.6	* 45.6	90.3	0.204
Black	552,000	41.4	35.6	47.5	0.554	450,000	73.6	* 54.0	86.9	0.698	431,000	60.9	* 43.9	75.6	0.368
Latino/a	371,000	30.1	23.9	37.0	0.873	245,000	44.7	* 34.6	55.3	<b>0.003</b>	240,000	41.8	32.6	51.6	<b>0.004</b>
White	630,000	24.0	20.4	28.1	0.745	509,000	56.7	* 43.6	69.0	0.841	501,000	56.0	* 42.8	68.4	0.937
	Taking Medication <sup>4</sup>					Controlled Blood Pressure <sup>5</sup>									
	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	2018 vs. 2010 p-value	Weighted N	Prevalence	Lower 95% Confidence Interval	Upper 95% Confidence Interval	2018 vs. 2010 p-value					
<b>Overall</b>	1,307,000	54.5	<sup>U</sup> * 44.1	64.6	0.825	870,000	40.1	* 30.2	51.0	0.251					
<b>Race/ethnicity<sup>6</sup></b>															
Asian/Pacific Islander	120,000	73.6	* 45.6	90.3	0.166	108,000	69.7	* 42.1	87.9	<b>0.006</b>					
Black	396,000	55.8	* 38.9	71.4	0.635	227,000	35.9	* 21.1	54.0	0.538					
Latino/a	229,000	39.3	30.7	48.6	<b>0.013</b>	137,000	23.7	17.1	32.0	<b>0.003</b>					
White	494,000	55.5	<sup>D</sup> * 42.4	67.9	0.533	367,000	46.1	* 32.9	59.8	<b>0.030</b>					

<sup>1</sup>Those with an average systolic blood pressure  $\geq 140$  or an average diastolic blood pressure  $\geq 90$  measured at the in-home exam, or a self-report of taking blood pressure medication. The denominator excludes those with missing BP values and who did not report taking high blood pressure medication (n=1,592).

<sup>2</sup>Those who self-reported "yes" to the question "Have you ever been told... that you have hypertension, also called high blood pressure?" among those with hypertension.

<sup>3</sup>Those who self-reported "yes" to the question "Are you currently taking medication for your high blood pressure?" among those with hypertension.

<sup>4</sup>Those who self-reported "yes" to the question "Are you currently taking medication for your high blood pressure?" among those with hypertension.

<sup>5</sup>Average systolic blood pressure  $< 140$  and average diastolic blood pressure  $< 90$  measured at the in-home clinical exam among those with hypertension.

<sup>6</sup>White, Black, Asian/Pacific Islander race categories exclude Latino/a ethnicity. Latino/a includes Hispanic or Latino/a of any race.

\*Estimate should be interpreted with caution due to large Relative Standard Error, wide 95% Confidence Interval, or small sample size.

<sup>U</sup> When reporting to nearest whole percent, round up

<sup>D</sup> When reporting to nearest whole percent, round down