



# Epi Data Brief

New York City Department of Health and Mental Hygiene

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## Physical Activity Measured by Accelerometer: A Comparison of New York City and the Nation

Physical activity is an important component of good health – helping individuals to achieve and sustain a healthy weight, as well as to prevent and manage chronic disease. Given high levels of obesity nationwide, increased physical activity levels can translate to improved overall public health. In 2011, the New York City Department of Health and Mental Hygiene conducted the Physical Activity and Transit Survey (PAT) of adult New Yorkers, which included an accelerometer component to objectively measure physical activity. The National Health and Nutrition Examination Survey (NHANES) also collected data on physical activity using accelerometers in 2003-2004 and 2005-2006. This Data Brief examines adult physical activity levels as measured by accelerometer in New York City and the United States.

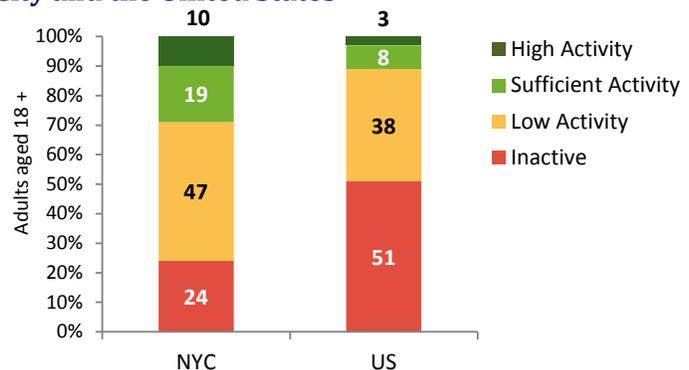
### What is an accelerometer?

An accelerometer is a small device attached to a belt worn around the waist that measures moment-to-moment acceleration. While accelerometers provide an objective measure of physical activity (in contrast to self-reported survey measures), they do not measure activity from swimming and underestimate activity from bicycling, weight-lifting and other stationary activity.

## Overall physical activity: New York City adults versus adults nationwide

- Based on the *2008 Physical Activity Guidelines for Americans*, adult New Yorkers were nearly three times as likely as adults nationwide to meet physical activity recommendations (29% vs. 11%). Both high activity and sufficient activity indicate meeting activity guidelines.
- In New York City 10% of individuals had high activity compared to 3% nationwide.
- Additionally, adult New Yorkers were far less likely to be inactive than adults nationwide (24% vs. 51%).

### Physical activity levels among adults in New York City and the United States



Both high activity and sufficient activity indicate meeting activity guidelines.  
Sources: NYC PAT Device Follow-up 2011; NHANES 2003-2004, 2005-2006

### Activity Guidelines

The *2008 Physical Activity Guidelines for Americans* are provided by the U.S. Department of Health and Human Services. The current minimum recommendation for a healthy lifestyle is for adults to receive at least 150 minutes of moderate activity (e.g., brisk walking) per week in durations of at least ten minutes (one vigorous minute of physical activity equals two moderate minutes). Individuals who receive more than 300 minutes of activity per week receive larger health benefits. Low activity provides health benefits over an inactive lifestyle. For more information, please visit [www.health.gov/paguidelines](http://www.health.gov/paguidelines).

### Definitions of activity in one week (measured in bouts of ten consecutive moderate minutes of activity):

- Inactive: Less than 10 consecutive active minutes
- Low Activity: 10 to 149 active minutes
- Sufficient (or Medium) Activity: 150 to 299 active minutes
- High Activity: 300 or more active minutes

**Validity Criteria:** In both PAT and NHANES, a participant must have worn the accelerometer for at least ten hours a day on four or more days in one week to be included in the analysis.

## New York City adults were more physically active than United States adults

- New Yorkers were more likely to meet physical activity guidelines than other Americans among all population subgroups, except for those aged 65 and older. The NYC estimate for older adults should be interpreted with caution due to small sample size.
- Physical activity levels decreased as age increased both in NYC and nationally.
- Physical activity varied by race/ethnicity in NYC, where white adults were most likely to meet guidelines at 41%, compared with 25% for Blacks and 23% for Hispanics. Nationally no significant racial/ethnic disparities in physical activity existed, but percentages were lower than NYC for all groups.
- Men were more likely to meet guidelines than women in NYC and the US, yet the difference was much larger in NYC. Men in NYC were twice as likely as women to meet guidelines while men nationwide were 1.4 times as likely.
- In NYC and nationwide, the most educated adults are approximately twice as likely to meet guidelines as less educated adults.

### Adults meeting physical activity guidelines by demographic characteristics, New York City and the United States

	NYC Adults % who meet guidelines	US Adults % who meet guidelines
<b>Age (years)</b>		
18-24	42*	17
25-44	40	12
45-64	25	10
65+	3*	6
<b>Race/ethnicity<sup>1</sup></b>		
White	41	11
Black	25	10
Hispanic	23	12
Asian	29*	--
<b>Gender</b>		
Male	40	13
Female	20	9
<b>Educational attainment<sup>2</sup></b>		
Less than high school	21*	9
High school diploma/ some college	21	7
College graduate	40	19

\*Estimate should be interpreted with caution due to small sample size.

<sup>1</sup>NHANES does not provide data on Asians.

<sup>2</sup>Educational attainment is among adults aged 25 and older.

Sources: NYC PAT Device Follow-up 2011; NHANES 2003-2004, 2005-2006

#### Data Sources:

**(1) NYC PAT Device Follow-Up:** The New York City Physical Activity and Transit Survey (PAT) 2011 combines an extensive self-reported questionnaire with objective measures, including accelerometer and Global Positioning System (GPS) data, to understand patterns of physical activity. NYC PAT Device Follow-Up includes valid accelerometer data on 679 New Yorkers aged 18 and older. This research was made possible by funding from the Department of Health and Human Services.

**(2) NHANES 2003-2006:** The National Health and Nutrition Examination Survey (NHANES), conducted by the Centers for Disease Control and Prevention, is a program of surveys, interviews, and clinical examination to assess the health and nutritional status of children and adults in the United States. Data presented here include valid accelerometer data on 6,579 adults aged 18 and older from NHANES 2003-2004 and 2005-2006.

**(3) US Census 2010:** The data for population density come from the US Census 2010 to calculate Zip Code Tabulation Area (ZCTA) population by geographic area.

#### References:

1. Physical Activity Guidelines Advisory Committee. Physical Activity Guidelines Advisory Committee Report, 2008. Washington, DC: U.S. Department of Health and Human Services, 2008. <http://www.health.gov/paguidelines/>
2. Tucker, Jared M., Gregory J. Welk, and Nicholas K. Beyler. Physical Activity in U.S. Adults Compliance with the Physical Activity Guidelines for Americans. *American Journal of Preventive Medicine*. 2011; 40(4): 454-451.
3. Toriano, Richard P., David Berrigan, Kevin W. Dodd, Louise C. Mâsse, Timothy Tilert, and Margaret McDowell. Physical Activity in the United States Measured by Accelerometer. *Medicine and Science in Sports and Exercise*. 2008; 40 (1) 181-188.

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## Living in densely populated areas is associated with more physical activity

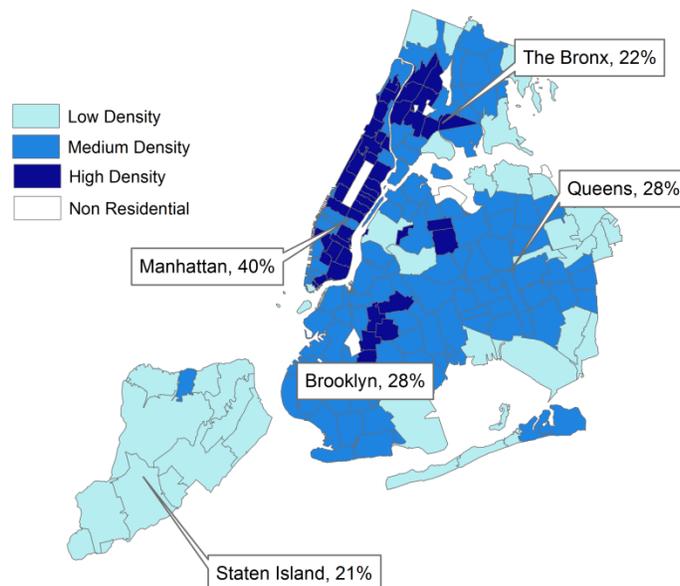
New York City residents are more likely to walk or use public transportation and less likely to drive personal automobiles than people in the rest of the country. This difference in transportation preferences relates in part to population density (the number of people living in a given area). High-density areas typically also have a high concentration of stores, restaurants and other destinations, allowing residents to easily walk or take public transit to get from place to place. Even within NYC, the availability of subways and the ease of walking vary with population density, as do physical activity levels among residents.

- The majority of Staten Island is composed of low-density zip codes, with 55% of participants driving to work and only 21% of meeting activity guidelines.
- In comparison, Manhattan has consistently high population density, with only 9% of participants driving to work and 40% of residents meeting activity guidelines.
- Only 20% of adults in low-density zip codes meet physical activity recommendations, compared with 31% and 36% in medium- and high-density zip codes, respectively.
- Adult New Yorkers living in high-density areas were also less likely to be inactive (with no 10-minute activity bouts in one week) than those in low-density areas (19% vs. 40%).

### Population Density Definition and Calculation

Low density areas include a population of 1,300-15,500 people per square mile; medium density ranges from 16,000-56,900 and high density ranges from 57,000-150,000 people per square mile. These are based on density of Zip Code Tabulation Areas (ZCTAs) from the 2010 US Census grouped into the bottom 25% of density; middle 25-75% and top 25%. ZCTAs are area based units and do not include all zip codes.

### Population density by New York City zip code with physical activity levels by borough

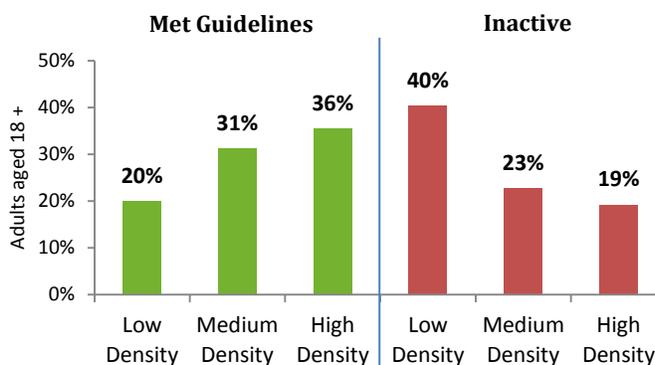


#### The percent of adults in each borough who met physical activity guidelines is presented after each borough label.

NYC zip codes (ZCTAs) were grouped by population density into low density (bottom 25%), medium density (middle 25%-75%) and high density (top 25%) based on ZCTA-level population per square mile.

Sources: NYC PAT Device Follow-up 2011; US Census 2010

### Physical activity status by population density in NYC



NYC zip codes (ZCTAs) were grouped by population density into low density (bottom 25%), medium density (middle 25%-75%) and high density (top 25%) based on ZCTA-level population per square mile.

Sources: NYC PAT Device Follow-up 2011; US Census 2010

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- Visit EpiQuery – the Health Department’s online, interactive health data system at [nyc.gov/health/EpiQuery](http://nyc.gov/health/EpiQuery)  
Data & Statistics at [nyc.gov/html/doh/html/data/data.shtml](http://nyc.gov/html/doh/html/data/data.shtml).