

Hypertension Awareness, Treatment, and Control — Continued Disparities in Adults: United States, 2005–2006

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Importance

High blood pressure (BP) is a modifiable risk factor for cardiovascular disease (CVD) (1). High BP increases the risk of heart attack, heart failure, stroke, and kidney disease (2–4). Conversely, favorable BP levels are associated with a greater probability of survival to age 85 as well as increased longevity without major co-morbidities (5,6). Increasing the awareness, treatment, and control of hypertension will reduce morbidity and mortality. This is a goal of national public health programs and initiatives such as the National High Blood Pressure Education Program (7). Data on levels of this risk factor in the U.S. population help to identify subgroups where risk may be greatest and prevention efforts might be targeted. Comparison over time can also show if the population is experiencing improvement in controlling elevated levels of BP.

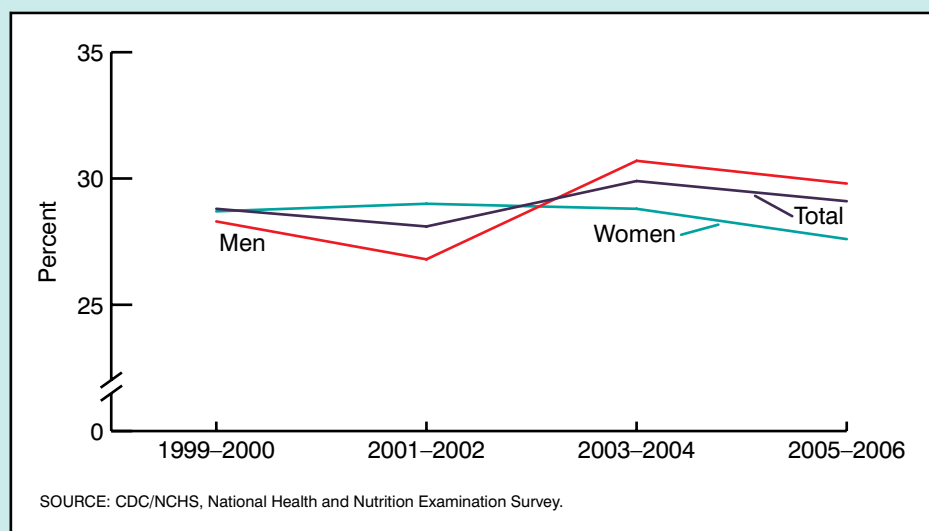
Keywords: hypertension • prevalence • trends

Findings

Has the prevalence of hypertension in U.S. adults declined since 1999?

- There was no significant change in hypertension prevalence from 1999 to 2006.

Figure 1. Age-adjusted prevalence of hypertension in adults: United States, 1999–2006



The overall age-adjusted prevalence varied only slightly between 28% and 30% during the period 1999 to 2006. There were no changes in hypertension prevalence by gender, age, or race/ethnicity.

Highlights

Data from the National Health and Nutrition Examination Surveys.

- ▶ In 2005–2006, 29% of all U.S. adults 18 years and older were hypertensive (systolic BP \geq 140 mmHg or diastolic BP \geq 90 mmHg or taking medications for hypertension). The prevalence of hypertension was nearly equal between men and women.
- ▶ In 2005–2006, an additional 37% of U.S. adults had pre-hypertension (systolic BP 120–139 mm Hg or diastolic BP 80–89 mm Hg, and not pharmacologically treated for high BP).
- ▶ In 2005–2006, 7% of the total U.S. adult population had a systolic BP \geq 140 mmHg or diastolic BP \geq 90 mmHg, but had never been told by a health care provider that they had high BP.
- ▶ Among hypertensive adults, 78% were aware of their condition.
- ▶ Overall, 68% of adults with hypertension were using anti-hypertensive medication.
- ▶ Over 64% of adults who were taking antihypertensive medication achieved BP less than 140/90 mm Hg.



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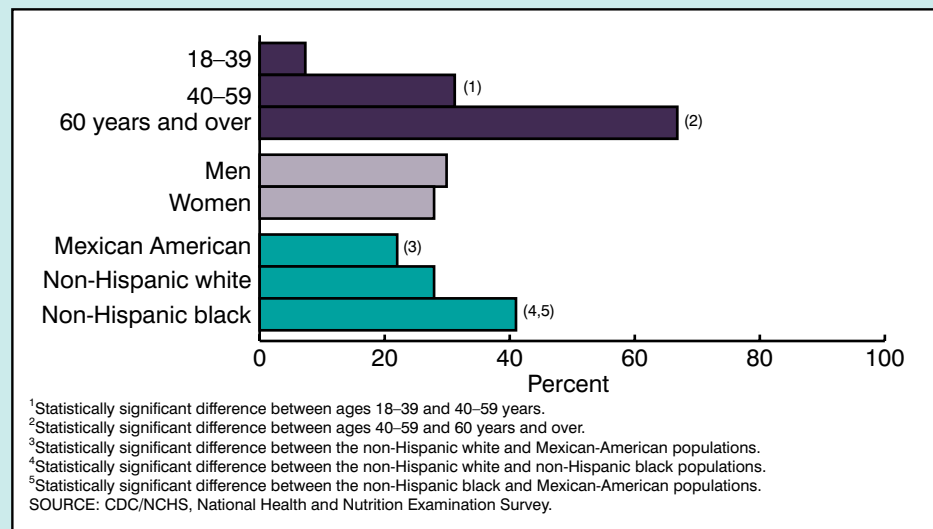
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Are some groups more likely to have hypertension compared with others?

- **Hypertension varied by age and race/ethnicity.**

The prevalence of hypertension increased with age from 7% among those aged 18–39 years to 67% among those aged 60 years and older. The non-Hispanic black population had a significantly higher prevalence of hypertension than the non-Hispanic white and Mexican- American populations (41% vs. 28% and 22%, respectively). The prevalence was also significantly higher for the non-Hispanic white population compared with the Mexican-American population.

Figure 2. Age specific and age-adjusted prevalence of hypertension in adults: United States, 2005–2006



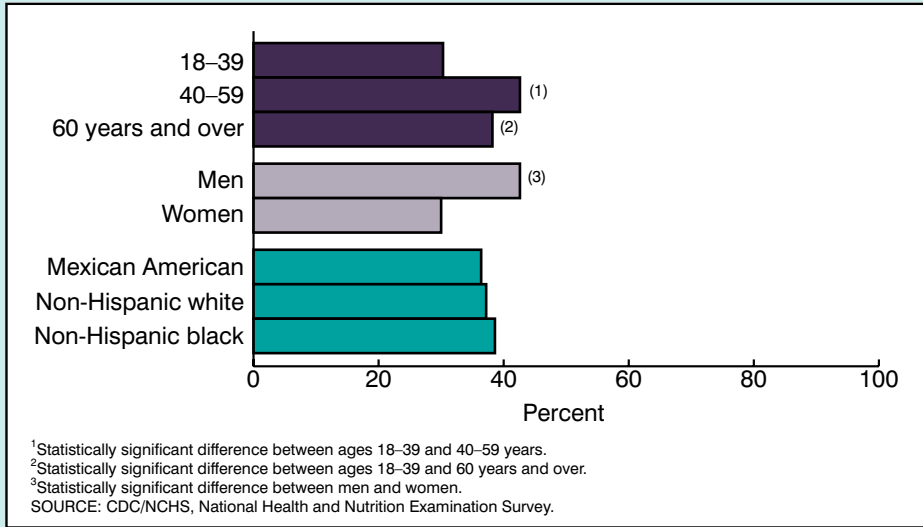
What proportion of U.S. adults have prehypertension?

- **Overall, 37% of adults had prehypertension, that is, they had a systolic BP 120–139 mm Hg or diastolic BP 80–89 mm Hg, and were not pharmacologically treated for high BP.**

The prevalence of prehypertension was higher in men compared with women (43% and 30%, respectively). The prevalence of prehypertension was lowest among persons aged 18–39 years compared with those aged 40–59 years and 60 years and older (30%, 43%, and 38%, respectively). There were no statistically significant differences in the prevalence of prehypertension among race/ethnic groups.

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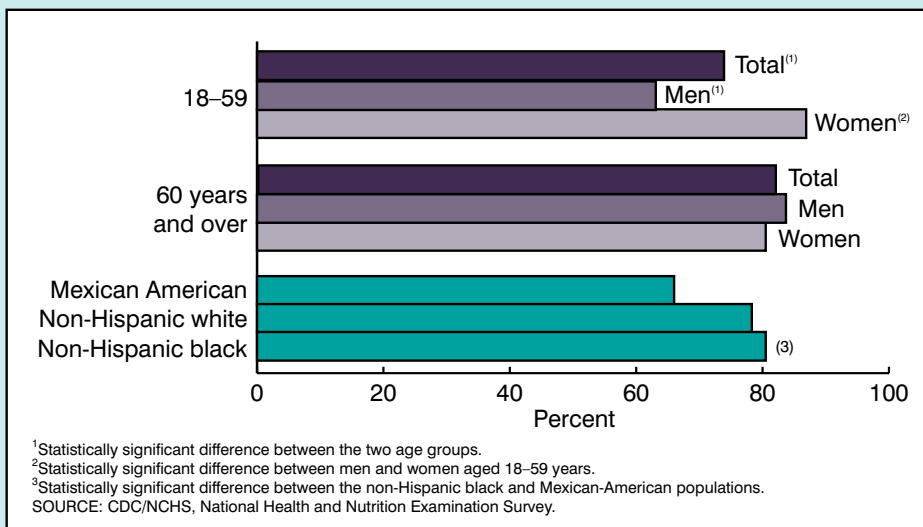
Figure 3. Age-specific and age-adjusted prevalence of prehypertension in adults: United States, 2005–2006



Are adults with hypertension aware that they have it?

- Overall, 78% of hypertensives were aware of their condition. Awareness of hypertension varied by age, gender, and race/ethnicity.

Figure 4. Awareness of hypertension among hypertensive adults: United States, 2005–2006



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Among hypertensives aged 18–59 years, men (63%) were less likely to be aware of their condition compared with women (87%). There was no difference in awareness among hypertensive men (84%) and women (81%) aged 60 years and older.

Among hypertensive men, awareness of hypertension increased with age from 63% for those aged 18–59 years to 84% for men aged 60 years and older. Awareness of hypertension did not differ by age for women.

Non-Hispanic blacks with hypertension were more likely to be aware of their hypertension compared with Mexican Americans with hypertension. There was no significant difference in the awareness of hypertension between non-Hispanic white and non-Hispanic black or between non-Hispanic white and Mexican-American hypertensives.

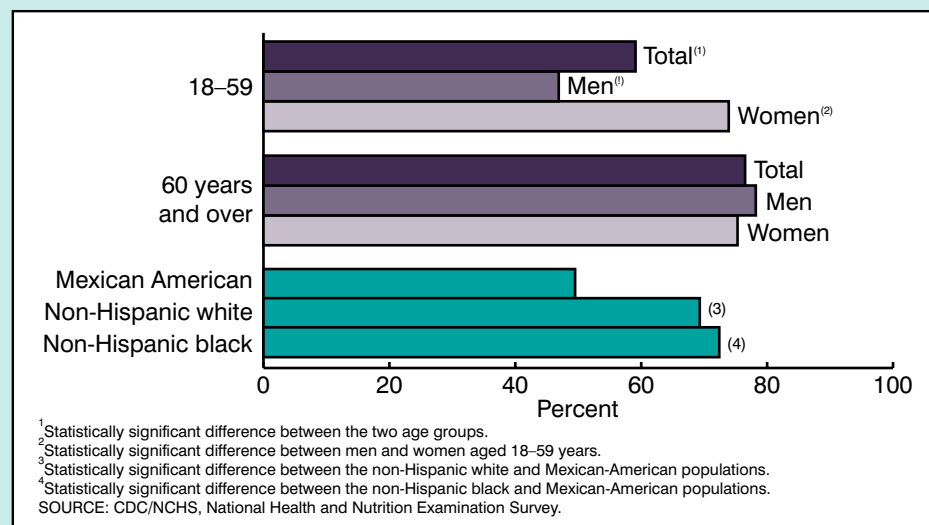
- **Overall, 6.6 % of U.S. adults had a systolic BP \geq 140 mmHg or diastolic BP \geq 90 mmHg, but had never been told by a health care provider that they had high BP (data not shown).**

The proportion of U.S. adults who had high BP but who had never been told by a health care provider that they had it was significantly higher for men compared with women (8.2% and 4.7%, respectively). Prevalence was 5.0% in those aged 18–59 and 12.1% for those \geq 60 years.

What is the current proportion of people with hypertension who are treated with antihypertensive medication?

- **Overall, 68% of hypertensives were treated with antihypertensive medication.**

Figure 5. Treatment of hypertension among hypertensive adults: United States, 2005–2006



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The prevalence of hypertension treatment among hypertensives increased with age from 59% in those aged 18–59 years to 77% in those aged 60 years and older.

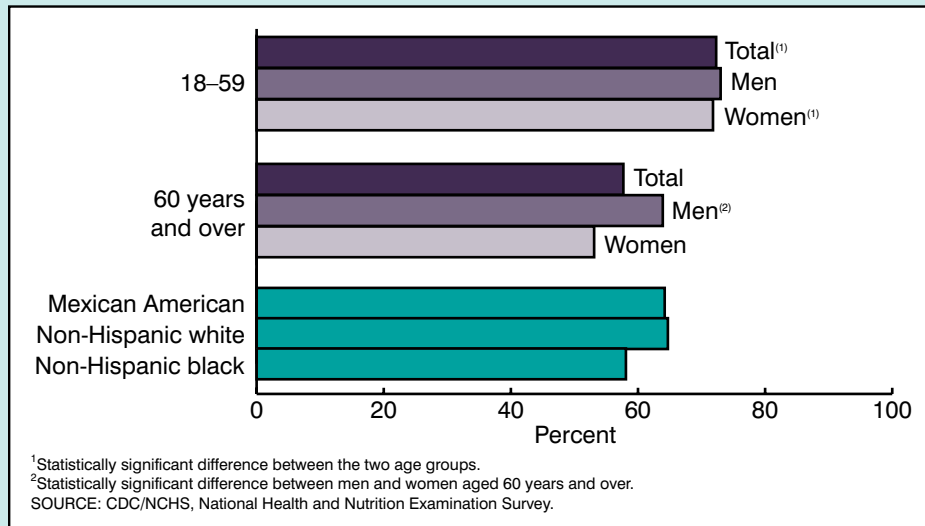
Among hypertensives aged 18–59 years, men (47%) were less likely to be treated compared with women (74%), but there was no difference in treatment between hypertensive men (78%) and women (75%) aged 60 years and older.

A smaller proportion of Mexican-American hypertensives (50%) were currently taking antihypertensive medication than non-Hispanic white (69%) and non-Hispanic black (72%) hypertensives.

What percentage of people treated with antihypertensive medication have their BP controlled?

- Overall, 64% of hypertensives who were treated with antihypertensive medication had successfully controlled BP.

Figure 6. Control of hypertension among treated hypertensive adults: United States, 2005–2006



Among treated hypertensives, those aged 18–59 years (72%) were more likely to have controlled their BP than those aged 60 years and older (58%).

Success in hypertension control among treated hypertensives was significantly higher in men aged 60 years and older than in women in the same age group (64 % for men and 53% for women).

There were no significant differences in blood pressure control between non-Hispanic white (65%), non-Hispanic black (58%), and Mexican-American (64%) hypertensives who were currently taking antihypertensive medication.

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Summary

Overall, 29% of adults aged 18 years and older had hypertension. This includes approximately 7% of the total population of adults whose BP was high but who had never been told so by a health care provider. The prevalence of hypertension did not change during 1999–2006. Among hypertensives, 78% were aware of their hypertension and 68% were taking antihypertensive medication. Among those taking medication, 64% had controlled BP (under 140/90 mm Hg).

Various age, gender, and race/ethnic disparities in hypertension prevalence, awareness, treatment and control were present. Older individuals (aged 60 years and older) had a higher prevalence of hypertension compared with those in younger age groups, and non-Hispanic blacks had higher prevalence compared with non-Hispanic whites and Mexican Americans. Awareness of hypertension and treatment with antihypertensive medication among those with the condition were higher in women aged 18–59 years compared with men in the same age group, whereas awareness and treatment were comparable between men and women aged 60 years and older. Control of BP among those who were currently taking antihypertensive medication was similar for men and women aged 18–59 years, but the proportion with controlled BP was higher for men than for women aged 60 years and older. Mexican Americans with hypertension were less likely to be aware of their condition compared with non-Hispanic blacks and less likely to be treated compared with non-Hispanic blacks and non-Hispanic whites. There were no race/ethnic differences in the proportion who had controlled blood pressure among those taking medication.

Despite recent advances in medical treatment of hypertension and public health campaigns to reduce the prevalence of hypertension, this condition remains a significant public health problem in the United States. Information about awareness of hypertension, treatment, and control of BP among those with the disease provide a basis for targeting public health efforts to reduce blood pressure levels and the prevalence of hypertension.

Definitions

Hypertension: systolic BP \geq 140 mm Hg or diastolic BP \geq 90 mm Hg or currently taking medication to lower high BP.

The average of up to three brachial systolic and diastolic BP readings was used for systolic and diastolic BP values. All BP readings were obtained at a single examination visit. BP was measured in a mobile examination center (MEC) by trained physicians following a standard protocol. Appropriate BP cuff sizes were used for participants based on measurement of mid-arm circumference.

Prehypertension: systolic BP 120–139 mm Hg or diastolic BP 80–89 mm Hg, and not pharmacologically treated for high BP.

Awareness of hypertension: defined by an affirmative response to the question “Have you ever been told by a doctor or health professional that you had hypertension, also called high blood pressure?”

Currently taking medication to lower BP: Among all hypertensives, defined by affirmative responses to the following questions: 1) “Because of your high blood pressure/hypertension, have you ever been told to take prescribed medicine?” and 2) “Are you now following this advice to take prescribed medicine?”

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Controlled Hypertension: Systolic BP <140 mmHg and diastolic BP < 90 mmHg among those currently taking medication to lower BP.

Data source

The National Health and Nutrition Examination Survey (NHANES) data were used for these analyses. NHANES is designed to monitor the health and nutritional status of the U.S. population. The survey consists of interviews conducted in participants' homes, standardized physical examinations conducted in specially outfitted MECs, and laboratory tests utilizing blood and urine specimens provided by participants during the physical examination.

The NHANES sample is selected through a complex, multistage design that includes selection of primary sampling units (counties), household segments within the counties, and finally sample persons from selected households. The sample design includes oversampling in order to obtain reliable estimates of health and nutritional measures for population subgroups. In 2005–2006, African Americans, Mexican Americans, persons with low income, persons 12–19 years of age, and persons 60 years and older were oversampled. In 1999, NHANES became a continuous survey, fielded on an ongoing basis. Each year of data collection is based on a representative sample covering all ages of the civilian, noninstitutionalized population. Public-use data files are released in 2-year cycles.

Sample weights, which account for the differential probabilities of selection, nonresponse and non-coverage, were incorporated into the estimation process. The standard errors of the percentages were estimated using Taylor Series Linearization, a method that incorporates the sample weights and sample design.

Estimates for the total population were age adjusted to the 2000 U.S. standard population using three age groups, 20–39, 40–59, and ages 60 years and older (8). Differences between groups were evaluated using a univariate *t*-statistic. Trend tests were done to evaluate changes in estimates over time. All significance tests were two-sided using $p < 0.05$ as the level of statistical significance. For comparison of estimates by age and race/ethnicity, adjustments for multiple comparisons were made using the Bonferroni method by dividing 0.05 by the number of comparisons (9). All differences reported are statistically significant unless otherwise indicated.

Statistical analyses were conducted using the SAS System for Windows (release 9.1; SAS Institute Inc, Cary, N.C.) and SUDAAN (release 9.0; Research Triangle Institute, Research Triangle Park, N.C.).

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