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Letter to the Editor

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Upward Hypertension Trends: Changes in Blood Pressure or in Antihypertensive Treatment?

To the Editor:

Using population-based data gathered as part of National Health and Nutrition Examination Surveys, Cutler et al¹ showed that the age-adjusted prevalence of hypertension increased from 24.4% to 28.9% in the United States between 1988–1994 and 1999–2004, an absolute increase of 4.5%. A large part of this increase was attributed to the rising prevalence of obesity.

Interestingly, the proportion of persons under hypertensive treatment substantially increased during the period under study.¹ The age-standardized prevalence of persons taking antihypertensive medications was not provided. However, based on crude estimates (kindly provided by the authors), we can estimate that the prevalence of treatment has increased from 12.2% to 17.8%, ie, by 5.6%. This is larger than the increase in the prevalence of hypertension (defined as high blood pressure or treatment). Meanwhile, high blood pressure ($\geq 140/90$ mm Hg, with or without treatment) rose by 1.8% (from 17.0% to 18.8%, crude estimates).

If the proportion of persons treated had not increased, would the prevalence of hypertension have increased commensurably? This is questionable.

First, the prevalence of hypertension can increase irrespective of true blood pressure levels if the prevalence of treatment increases, because, by definition, treated patients are counted as hypertensive irrespective of blood pressure levels. Conversely, an increase in the prevalence of hypertension, so defined, does not necessarily reflect any increase in the average blood pressure in the population.

Second, there has likely been a trend over time to treat patients at increasingly lower levels of blood pressure, eg, “mild” hypertension.^{2,3} This partly reflects the increase in the proportion of the population that has blood pressure controlled. However, this also may have fueled an increase in the prevalence of hypertension. Diagnosis uncertainty of hypertension is high and may lead to inappropriate treatment.^{4,5} Because the probability of overdiagnosis of hypertension is greater in the case of mild hypertension than severe hypertension,⁴ overdiagnosis (and over-treatment) may be more frequent at the end of the period under study than at the beginning.

It is admittedly difficult to disentangle actual blood pressure trends that would have occurred irrespective of treatment, because the characteristics and number of persons treated and the type of treatment have changed over time.^{2,3} At the extreme, the prevalence of hypertension could increase, whereas mean blood pressure levels in the population may actually decrease. For instance, Cutler et al¹ reported that mean systolic blood pressure in men did not change, and diastolic blood pressure actually

decreased by 3 mm Hg, whereas the prevalence of hypertension largely increased.¹ These considerations underlie the need to carefully interpret trends in the prevalence of hypertension in populations, notably by taking into account trends in treatment prevalence, changes in treatment strategies, and diagnosis uncertainty.

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