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Is the U.S. Population Behaving Healthier?

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This study completes the second phase of a project that analyzes trends and projections of health risk factors, behaviors and mortality. In the first phase, we compared the risk factor profile of the population in the early 1970s with that of the population in the early 2000s, using data from National Health and Nutrition Examination Surveys (NHANES). We estimated the impact of demographics, smoking, drinking, obesity, blood pressure, and cholesterol on 10-year mortality rates; and we compare the predicted 10-year mortality in the two time periods. For the population aged 20-74, the 10-year probability of death fell from 9.8 percent in 1971-75 to 8.4 percent in 1999-2002. For the population aged 55-74, the 10-year risk of death falls from 25.7 percent to 21.7 percent. The largest contributors to these changes are reductions in smoking and better control of blood pressure. Increased obesity increased mortality risk, but not by as large a quantitative amount.

The second phase of the project, and the focus of the current study, is to look toward the future, projecting forward trends in health risk factors and behavior, and their implications for future health. Forecasting is important for two reasons. First, we want to understand how the disparate trends in risk factors will play out in the future. For example, will the increase in obesity become significant enough to overwhelm reductions in smoking and better control of blood pressure? Second, forecasting can help evaluate the impact of different interventions. How much would increased use of medications for hypertension and high cholesterol mitigate the impact of rising obesity, for example? We develop forecasts for individual demographic and behavioral factors through the early 2020s, and then integrate them into a model of overall health, based on the individual forecasts. Our forecasting methodology is explicitly extrapolative. We want to understand what will happen if current trends continue, rather than trying to predict how trends might change. The forecast includes the following components:

Education. We have reasonable data to guide our education simulation, since education rarely increases after age 25. In the 20-year forecast, the model predicts 17 percent of people with a high school degree or less (compared to 20 percent in 1999- 2002) and 59 percent of people with at least some college education (compared to 55 percent currently).

Smoking. We also have good data to guide our smoking simulation. Since people rarely start smoking after age 25, the share of elderly people in the future that smoke is bounded by the share of people who smoke currently. Our forecast suggests that if current trends continue, smoking rates will decline from 25 percent of the population in 1999-2002 to 15 percent two decades later. The share of former smokers would be relatively constant, falling from 26 to 23 percent. Smoking rates among those age 55 and older are projected to fall from 16 to 10 percent.

Drinking. We assume that heavy and light drinking will each change at the same annual rate in the next two decades as they have in recent decades. This leads to a forecast of 3.3 percent of the population being heavy drinkers in two decades (compared to 4.4 percent currently) and 61.2 percent being light drinkers (compared to 65.2 percent currently).

Obesity. Forecasting obesity is difficult, since obesity can change rapidly at any age. Further, obesity is a key input into hypertension and high cholesterol, so we cannot forecast those without understanding obesity trends. We start by extrapolating past changes in weight. We then calculate for each person their obesity status: underweight, normal weight, overweight, or obese. This forecast suggests that 33.9 percent of the population will be overweight (compared to 34.7 percent currently), and 45.4 percent will be obese (compared to 33.2 percent currently).

Hypertension and High Cholesterol. We use the obesity forecasts, combined with current treatment rates, to simulate the population's blood pressure and cholesterol in two decades. The simulation suggests that people taking anti-hypertensive medication have a reduction of 7.9 (9.2) mmHg in systolic (diastolic) blood pressure, and that people taking cholesterol-lowering medication have a reduction of 30.5 mg/dL in total cholesterol.

We consider independently how these changes affect mortality, noting that the cumulative effects will generally be additive. Continued reductions in smoking will reduce mortality risk, by roughly the same amount as changes over the past thirty years. Smoking and obesity are the most important, and offsetting components of our forecast. Based on reduced smoking, the mortality risk for the entire population aged 25 and older would decline by 0.7 percent, or 8 percent of the baseline rate. Increasing obesity, however, with current treatment rates – leads to increased hypertension and high cholesterol – and a 1.1 percent increase in mortality risk for the total population, or 13 percent of the baseline rate.

These results suggest substantial caution about the future. While smoking reductions can be expected to have continued impacts on improved health, future changes in obesity might more than overwhelm this trend. Two-thirds of the US population is overweight or obese. As a result, continued increases in weight from current levels have a bigger impact on health than did increases in weight from lower levels of BMI. A large part of the impact of BMI is moderated through its effect on hypertension and high cholesterol. Given that not everyone with these conditions takes medications, or is controlled by the medication they do take, the resulting impact of rising weight on health will depend a lot on future treatment rates. The optimistic side of this picture is the potential for better control. Understanding how to improve utilization of and adherence to recommended medications are key issues.

The full working paper is available on our website www.nber.org/programs/ag/rrc/books&papers.html as paper NB06-13, and as NBER Working Paper # 13013.

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