That markers of socioeconomic status (SES) such as household income and educational attainment are associated with major health outcomes is a compelling finding, although the cause(s) of the association are unknown.[1] The SES gradient in serious health problems is well established in the United States and other countries.[2] It is less clear if SES is related to health on a day-to-day basis, that is, to respiratory symptoms, headaches, and pain from all causes. Everyday symptoms are important components of health that significantly affect productivity and peoples' well-being.[3,4] Compared with other outcomes that have previously been related to SES, everyday symptoms may be associated with different pathological processes that are more short lived (eg, time-limited alteration in immune function) than chronic conditions. An opportunity to explore the associations between 4 everyday symptoms and SES in a large-scale, representative US population sample was possible through the use of a new Gallup-Healthways survey. We examined associations between education and household income (SES markers) and self-reported cold, influenza, headache, and pain reported for the previous day. Although self-reports are subject to various distortions, the brief recall interval reduces the likelihood of recall errors.[5]

Methods. Adults 18 years and older and living in the United States were interviewed by telephone between January 2, 2008, and December 31, 2008. Approximately 1000 individuals were interviewed by telephone every day of the year.[6] Survey respondents were asked a series of questions about their health, well-being, household income, education, standard of living, satisfaction with community, work, relationships, and personal health. The interview also included questions about the presence of headache, cold, or influenza ("Were you sick with any of the following yesterday?"). Another question asked respondents for a yes or no answer regarding whether they felt physical pain " . . . during A LOT OF THE DAY yesterday?" Logistic regression models, with SES variables treated as categorical predictors, were used. To give the reader a sense of the magnitude of differences, we report odds ratios with unadjusted outcomes comparing the lowest category with the highest category. To assess whether the differences in symptoms by SES persisted with appropriate adjustment for potential confounders, another set of logistic regressions was adjusted for 16 self-reported variables, specifically, age, sex, having a partner, child at home, having a full-time job, number of days over last week with at least 30 minutes of exercise, being a smoker, having health insurance, reporting that religion is an important part of daily life, and having ever been told by a physician or nurse that they had depres-

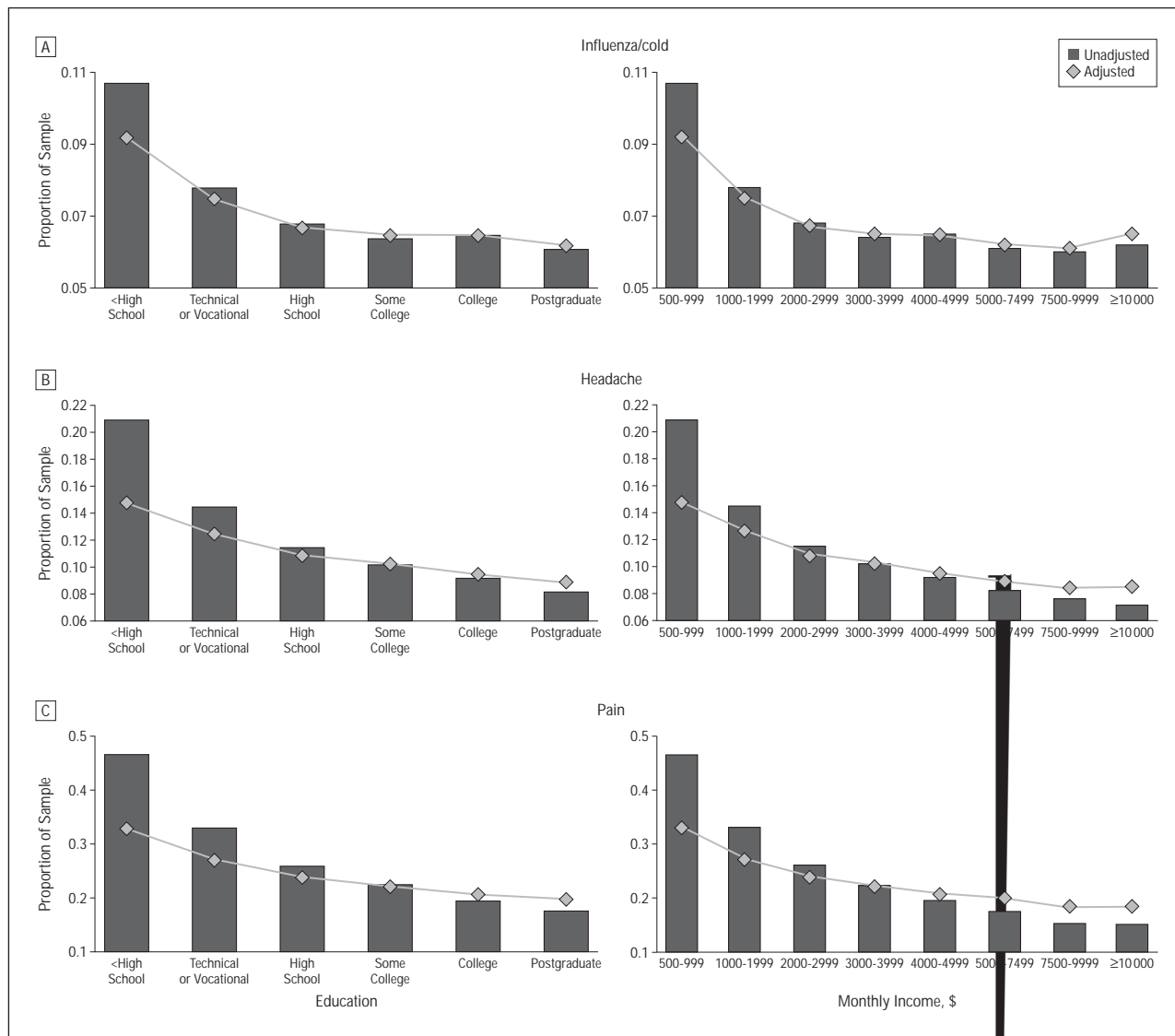|	No. (%)	% Influenza/Cold	% Headache	% Pain
Education				
Less than high school	20 308 (6)	10.1[a]	17.8[a]	35.9[a]
High school	72 924 (21)	6.8[a]	10.7[a]	26.4[a]
Technical or vocational	24 097 (7)	6.9[a]	11.7[a]	27.0[a]

Figure. Socioeconomic status and influenza/cold (A), headache (B), and pain (C). Bars are raw rates; diamonds are rates adjusted for potential confounders.

sion, a heart attack, asthma, cancer, high blood pressure, high cholesterol, or diabetes.

Results. Of calls that resulted in contacts with eligible candidates, 31% agreed to be interviewed; of those, 90% completed the interview. Data on 355 334 individuals were analyzed. The mean age of respondents was 53.7 years (data were available for 350 324 individuals), and 49.8% were male. Data were available for 352 332 respondents on education and for 268 551 respondents on monthly household income before taxes. For income, the lowest 3 categories ($0, $1-$59, and $60-$499 per month) each contained 1% or less of the sample and were disproportionately represented by students. For these reasons, statistical testing included only those making at least $501-$999 per month.

On the basis of a high correlation and the similarity of the symptoms for colds and influenza, they were combined into 1 dichotomous variable, with a rate of 6.7% (n=355 007). Rates of the other 2 outcomes were 10.1% (n=355 085) for headache and 22.7% (n=354 773) for pain. For income, influenza/cold showed a steep decline from the lowest income category, leveling out at the $2000 to $2999 category (and   [bars]). The odds ratio [OR] on the adjusted data for the lowest vs highest income category was 1.82 (95% confidence interval [CI], 1.70-1.94). Headache (OR, 3.42; 95% CI, 3.25-3.61) and pain (OR, 4.98; 95% CI, 4.78-5.18) showed steeper gradients, with almost all subsequent income category levels having lower rates of symptoms. For education, all symptoms showed consistent declines in levels as educational level increased (influenza/cold: OR, 1.67; 95% CI, 1.59-1.78; headache: OR, 2.73; 95% CI, 2.61-2.86; pain, OR, 2.82; 95% CI, 2.72-2.92).

There are many variables that could partially or even fully explain the SES gradients, which could provide insight into its determinants. The 16 variables tested in a revised logistic model included demographic variables such as age, sex, and having a child at home; access to medical care such as health insurance; self-care behaviors such as regular exercise; and history or presence of medical conditions such as prior heart attack or diabe-

tes (list available from corresponding author). Results of these analyses are shown graphically in the Figure (lines); there was a reduction in the gradient in all 6 analyses, yet a significant SES gradient remained in all cases. It was also possible that the gradient is specific to certain seasons of the year, but the gradient was evident in each of the 4 seasons (data not shown).

Comment. It is notable that the SES association was graded across levels of income and education, so the effect is not merely due to a difference between people experiencing poverty or serious material hardship and all other people. Different mechanisms may contribute to the various associations. Colds and influenza as predicted by SES could be due to differential exposure to infection, with less educated or less affluent people having more exposure because of more crowded living and working conditions or greater use of public transportation, or it could be due to differential vulnerability to infection. Headache and pain as predicted by SES could be related to differences in noise exposure, working environments, and posture or to chronic mild neuroendocrine activation and increased muscle tone due to chronic stress.

A consideration for interpreting these results is potential reverse causality: low income could cause poor health outcomes or poor health could cause individuals to have low income. However, poor health is more likely to be a cause of low income for long-term, chronic conditions, like diabetes, than for transitory colds or influenza. Moreover, education is determined at comparatively young ages and is therefore less susceptible to arguments about reverse causality. Another potential concern is the response rate to the study, although the sheer number of respondents sampled (about 0.12% of the adult US population) allows for unusually precise estimates.

In conclusion, people with lower SES not only die at a younger age and have a higher likelihood of having a major illness or condition, they also experience daily colds, influenza, headache, and pain at higher rates than those with higher SES.

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