Insurance Coverage, Medical Care Use, and Short-term Health Changes Following an Unintentional Injury or the Onset of a Chronic Condition

Jack Hadley, PhD

Although prior research has found that uninsured individuals with chronic conditions receive less care than insured individuals,1,2 these studies have neither focused on those who experience the onset of a chronic condition nor analyzed the effect of not having insurance on health. Other studies have analyzed the effects of insurance status on individuals who experienced an injury but typically only in a single setting or for a narrowly defined type of injury.3,5

A substantial literature suggests that not having insurance has adverse effects on medical care use and health.6,7 However, much of this research is subject to methodological limitations because individuals were not randomly assigned to not having insurance. Analyses of observational data may be biased if unobserved differences between uninsured and insured individuals, rather than the difference in insurance coverage, explain both insurance status and the differences in medical care use and health outcomes.8

The RAND Health Insurance Experiment,9 conducted more than 30 years ago, randomly assigned individuals to different health insurance plans. However, its highest cost-sharing plan was essentially a catastrophic coverage plan and cannot be used to make inferences about those without insurance coverage.

Context Given the large and increasing number of uninsured US individuals, identifying the health consequences of being uninsured has assumed increased importance. Objective To compare medical care use and short-term health changes among US uninsured individuals and insured nonelderly individuals following a health shock caused by either an unintentional injury or the onset of a chronic condition.

Design, Setting, and Participants Multivariate logistic regression analysis of longitudinal data from Medical Expenditure Panel Surveys (1997-2004) limited to nonelderly individuals whose insurance status was established for 2 months prior to 1 or more unintentional injuries (20,783 cases among 15,866 individuals) and onset of 1 or more chronic conditions (10,485 cases among 7,954 individuals).

Main Outcome Measures Self-reported medical care use and change in short-term general health status following the health shock.

Results After experiencing a health shock, uninsured individuals were less likely to obtain any medical care (unintentional injury [UI] group: 78.8% uninsured vs 88.7% insured [adjusted odds ratio {AOR}, 0.47; 95% confidence interval {CI}, 0.43-0.51]; new chronic condition [NCC] group: 81.7% uninsured vs 91.5% insured [AOR, 0.45; 95% CI, 0.40-0.50]) and more likely not to have received any recommended follow-up care (UI group: 19.3% uninsured vs 9.2% insured [AOR, 2.59; 95% CI, 2.15-3.11]; NCC group: 9.4% uninsured vs 4.4% insured [AOR, 1.65; 95% CI, 1.32-2.06]). Based on the AORs, uninsured individuals with UIs had fewer outpatient visits (6.1% uninsured vs 9.0% insured; AOR, 0.71 [95% CI, 0.63-0.80]), office-based visits (41.8% uninsured vs 57.3% insured; AOR, 0.59 [95% CI, 0.56-0.62]), and prescription medicines (35.5% uninsured vs 35.6% insured; AOR, 0.71 [95% CI, 0.67-0.75]). Uninsured individuals with an NCC had fewer office-based visits (58.9% uninsured vs 68.3% insured; AOR, 0.77 [95% CI, 0.72-0.82]) and prescription medicines (52.7% uninsured vs 61.7% insured; AOR, 0.66 [95% CI, 0.57-0.76]). Higher proportions of uninsured individuals reported a decrease in health status (classified as much worse) approximately 3.5 months after the health shock (UI group: 9.8% uninsured vs 6.7% insured; AOR, 0.86 [95% CI, 0.75-0.98]; NCC group: 12.3% uninsured vs 10.1% insured; AOR, 0.74 [95% CI, 0.68-0.80]). Uninsured individuals with UIs were more likely to report not being fully recovered and no longer receiving treatment. At approximately 7 months after the health shock, uninsured individuals with NCCs still reported worse health status.

Conclusions Among individuals who experienced a health shock caused by an unintentional injury or a new chronic condition, uninsured individuals reported receiving less medical care and poorer short-term changes in health than those with insurance.

JAMA. 2007;297:1073-1084

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Other studies have found that obtaining Medicare coverage at age 65 years closed the gap in medical care use.
between previously uninsured and insured individuals, and that elderly individuals’ mortality rates declined faster than expected following the enactment of Medicare in 1965. Several studies used longitudinal data to compare populations grouped by their baseline insurance status and also concluded that not having insurance adversely affects health. However, these studies may still be subject to observational data bias because prior health may have affected both the general measures of the subsequent health change and the baseline health insurance status.

This study investigates whether uninsured individuals who experienced a health shock caused by either an unintentional injury or the onset of a chronic condition received the same amount of medical care and had similar short-term health outcomes as insured individuals.

METHODS
The data are from the household component of the Medical Expenditure Panel Surveys conducted between 1997 and 2004. The Medical Expenditure Panel Survey is a continuous, nationally representative, in-person survey of the civilian, noninstitutionalized population. It uses a rotating panel design that replenishes half of the total sample each year and collects information during 5 interview rounds spaced 4 to 5 months apart over 2 years. Individuals’ data can be linked across rounds to build a longitudinal round-by-round data file spanning the 2 years of survey participation. The combined response rates for the 1997-2004 Medical Expenditure Panel Survey range from 64.5% to 67.4% for the full-year files. The Urban Institute’s institutional review board process determined that further review was not required because all of the data are publicly available and do not include any personal identifying information.

The survey collects data on individuals’ sociodemographic characteristics, monthly insurance coverage, general health status, and medical care use. A sample of medical care providers identified by respondents is contacted to verify use and obtain additional information about diagnosis, charges, payments, and specific services provided. Insurance coverage is verified by checking insurance cards.

The initial interview inventories each person’s current health conditions. Subsequent interviews ask whether the person experienced any new health conditions since the previous interview. For each new condition identified, interviewers ascertain whether the condition is included on the Department of Health and Human Services’ list of “priority” conditions, and whether the condition was due to an injury. Chronic conditions were identified by applying the classification algorithm developed by the Agency for Healthcare Research and Quality to the survey’s International Classification of Diseases, Ninth Revision, condition codes.

New chronic conditions identified by this process may be either recurrences of a prior chronic condition, such as back pain or depression, that had been resolved before the baseline interview and was not included in the person’s initial condition inventory, or first occurrences of a condition the person had never experienced before. Both types of situations are referred to as new chronic conditions even though some of the cases may be recurrences of previously resolved conditions.

Priority-list conditions and unintentional injuries trigger the additional questions of (1) when the unintentional injury occurred and its type and location; (2) when the new condition was first noticed or diagnosed; (3) whether the person sought medical care; (4) the types and amounts of care received; and (5) whether the person is still receiving care at the time of the interview.

Analysis Samples
The research design assumes that prior insurance status in the 2 months before the unintentional injury or new chronic condition can be treated as exogenous (ie, predetermined and not caused by subsequent medical care use or changes in health associated with the injury or chronic condition). Therefore, the analysis samples are limited to individuals with uniform insurance coverage (uninsured or insured) for the 2 months before, the month of, and the month after the health shock. Those with multiple unintentional injuries or new chronic conditions are included as separate observations for each occurrence. (An additional analysis limiting the sample to 1 occurrence per person also was conducted.) Individuals aged 65 years or older are excluded because Medicare coverage is virtually universal.

Outcome Measures
There are 8 measures of medical care use: 2 dichotomous indicators of whether the person received any medical care; if he/she did receive care, whether any further care was recommended; if further care was recommended, a multichotomous indicator of whether the person is still receiving treatment, or received all, some, or none of the recommended follow-up care; and 5 measures of the quantities of care received for inpatient hospital stays, outpatient visits, office-based visits, emergency department visits, and number of prescription medications.

The distributions of the quantity variables are skewed and clustered at a limited number of discrete values, especially 0, 1, and 2. To accommodate this type of distribution in the statistical analysis, these measures were coded as ordered categorical variables. Inpatient hospital stays have 4 categories for 0, 1, 2, or 3 or more stays. The other use variables have 6 categories representing 0, 1, 2, 3 to 5, 6 to 10, or 11 or more visits (or prescriptions).

Self-reported general health status has been shown to be a good predictor of both medical care use and mortality both over time and across different populations. Diehr et al found that large short-term declines in older adults’ self-reported health measured at 6-month intervals were good pre-
dictors of mortality and other major adverse health events. In this study, the short-term change in health was constructed from individuals’ self-reported general health status, defined by a Likert scale with 5 categories (excellent, very good, good, fair, and poor health), in the interview round before the health shock, and the first and second (if available) interview rounds after the health shock. The change in health was measured as the arithmetic difference between the pre-event (unintentional injury or new chronic condition) and post-event scales. The measure has 9 possible categories (values ranging from plus 4 (from poor to excellent [the largest possible health improvement]) to negative 4 (from excellent to poor [the largest possible health decline]). A value of 0 represents no change in health.

Among individuals in the unintentional injury sample, 26 died and 7 were institutionalized (ie, were resident in a hospital or nursing home for ≥30 days at the time of the interview). Among those in the new chronic condition sample, 87 died and 3 were institutionalized subsequent to the first follow-up interview. These individuals were assigned to the category for the maximum decrease in health. Higher proportions of the deceased or institutionalized cases did not have insurance in the unintentional injury group (21.1% vs 16.2%) and in the new chronic condition group (25% vs 13%). The largest difference between the deceased or institutionalized cases and other cases was in their baseline health status. Among deceased or institutionalized cases, 25.2% in the unintentional injury group and 21.5% in the new chronic condition group reported poor baseline health compared with 2.0% and 4.9% of other cases. (Excluding these cases did not change any of the substantive results reported below.)

An additional health outcome for the unintentional injury sample was constructed from questions asking whether the person had fully recovered and if not fully recovered whether they were still being treated. The resulting variable was a trichotomous indicator of whether the person was fully recovered, still receiving treatment, or not recovered and not receiving care.

Control Variables
To reduce potential confounding, the statistical models control for the specific health condition that led to inclusion in the sample; the type and location of the unintentional injury; baseline health and sociodemographic characteristics (from the interview before the health shock); the person’s census region and metropolitan residence status; and a set of survey indicators for the month and year of the event, the survey round of the follow-up interview, the time interval between the event and the follow-up interview, and whether the follow-up information is self-reported or obtained from a proxy.

Statistical Analysis
The null hypotheses of no differences between uninsured and insured individuals were tested by estimating multivariate logistic regression models: bionomial models for the dichotomous measures; multinomial models for the categorical measures of the amount of follow-up care received and injury outcome; and ordered for the measures of medical care use and change in health status. All cases were weighted using the MEPS person-weights and all models were estimated using the survey logistic regression programs by StataCorp (College Station, Tex). All models include the control variables summarized in the previous section.

Although insurance status was observed 2 months before the health shock, it is possible that persistent unobserved differences between insured and uninsured individuals may influence both the likelihood of an unintentional injury and the distribution and severity of new health conditions. For example, insured and uninsured individuals may differ in terms of risky behaviors (ie, individuals without insurance may be more likely to drive without a seat belt or overuse alcohol whereas individuals with insurance may be more likely to ski or develop tennis elbow). Prior insurance status also can affect the likelihood of reporting a condition that typically requires a medical test to be detected, such as hypertension or early stage cancer. It also is possible that an uninsured person who experiences disease symptoms will conceal this information to obtain insurance coverage before seeking medical care.

While there is no formal statistical test of the assumption that an independent variable (insurance status) is exogenous, sensitivity tests can indicate whether the estimated effects of insurance are robust with respect to alternative variable specifications and alternative sample specifications that may reflect possible unobserved associations between insurance status and the distributions and the severity of the unintentional injuries and reported chronic conditions.

Therefore, the following sensitivity analyses also were conducted: (1) estimating the models without the control variables for the specific health condition to test whether they are correlated with insurance coverage and their omission results in altered estimates; (2) adding a self-reported measure of the condition’s severity (perceived influence on health); (3) excluding cases if the person reported that the health shock had no effect on their health; (4) eliminating cases with specific conditions that appear to be associated with insurance status, based on supplementary regression models of the relationship between insurance status and the indicator variables for specific conditions; (5) limiting the sample to individuals with family incomes that are less than 400% of the federal poverty level because family income is strongly associated with insurance status and also may reflect unobserved personal differences between insured and uninsured individuals; (6) estimating models limited to 1 occurrence per person to test for possible bias arising from multiple observations of some individuals; and (7) extending the look-back period for determining insurance status to 12 months before the health shock.
In additional analysis designed to estimate the magnitude of the association with insurance represented by the odds ratios in the primary analyses, the logistic regression models also were used to predict the distributions of the dependent variables first using the actual values of the insurance status variable and then changing the value for the uninsured from 1 to 0 so that it simulates having insurance. The differences between the predicted distributions in these hypothetical models illustrate the magnitudes of the associations with not having insurance after controlling for differences in health conditions and other characteristics.

**RESULTS**

**Sample Characteristics**

The new chronic condition sample includes 10,485 cases (7,954 individuals) and the unintentional injury sample includes 20,783 cases (15,866 individuals). The baseline health and sociodemographic characteristics (control variables) by insurance status for each sample are shown in **Table 1**.

Uninsured individuals make up 18.5% of the unintentional injury sample and 16.1% of the chronic condition sample. More uninsured individuals reported being in fair or poor health at baseline and had family incomes below 100% of the federal poverty level compared to insured individuals. The differences in age groups, educational attainment, and family income levels were also statistically significant.

<table>
<thead>
<tr>
<th></th>
<th>Unintentional Injury Sample, No. (%)</th>
<th>New Chronic Condition Sample, No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Insured (n = 12,933)</td>
<td>Uninsured (n = 2,933)</td>
</tr>
<tr>
<td>Baseline general health</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>4,807 (37.2)</td>
<td>867 (29.6)</td>
</tr>
<tr>
<td>Very good</td>
<td>4,352 (33.7)</td>
<td>862 (29.4)</td>
</tr>
<tr>
<td>Good</td>
<td>2,806 (21.7)</td>
<td>826 (28.2)</td>
</tr>
<tr>
<td>Fair</td>
<td>776 (6.0)</td>
<td>285 (9.7)</td>
</tr>
<tr>
<td>Poor</td>
<td>192 (1.5)</td>
<td>93 (3.2)</td>
</tr>
<tr>
<td>Age group, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5</td>
<td>1,086 (8.4)</td>
<td>85 (2.9)</td>
</tr>
<tr>
<td>6-18</td>
<td>3,259 (25.2)</td>
<td>454 (15.5)</td>
</tr>
<tr>
<td>19-34</td>
<td>2,975 (23.0)</td>
<td>1,291 (44.0)</td>
</tr>
<tr>
<td>35-64</td>
<td>5,613 (43.4)</td>
<td>1,103 (37.6)</td>
</tr>
<tr>
<td>Female sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White non-Hispanic</td>
<td>10,282 (79.5)</td>
<td>1,945 (66.3)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1,073 (8.3)</td>
<td>560 (19.1)</td>
</tr>
<tr>
<td>Black</td>
<td>1,203 (9.3)</td>
<td>331 (11.3)</td>
</tr>
<tr>
<td>Other race</td>
<td>375 (2.9)</td>
<td>97 (3.3)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;9 y</td>
<td>297 (2.3)</td>
<td>226 (7.7)</td>
</tr>
<tr>
<td>9-11 y</td>
<td>1,112 (8.6)</td>
<td>663 (22.6)</td>
</tr>
<tr>
<td>High school graduate</td>
<td>3,841 (29.7)</td>
<td>968 (33.0)</td>
</tr>
<tr>
<td>Some college</td>
<td>3,423 (26.5)</td>
<td>654 (22.3)</td>
</tr>
<tr>
<td>College graduate plus postgraduate work</td>
<td>4,260 (33.0)</td>
<td>422 (14.4)</td>
</tr>
<tr>
<td>Family income as % of federal poverty level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100</td>
<td>1,138 (8.8)</td>
<td>645 (22.0)</td>
</tr>
<tr>
<td>100-199</td>
<td>1,642 (12.7)</td>
<td>883 (30.1)</td>
</tr>
<tr>
<td>200-399</td>
<td>4,359 (33.7)</td>
<td>892 (30.4)</td>
</tr>
<tr>
<td>≥400</td>
<td>5,794 (44.8)</td>
<td>513 (17.5)</td>
</tr>
<tr>
<td>Medical Expenditure Panel Survey, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>1,779 (13.8)</td>
<td>425 (14.5)</td>
</tr>
<tr>
<td>1998</td>
<td>1,681 (13.0)</td>
<td>317 (10.8)</td>
</tr>
<tr>
<td>1999</td>
<td>1,811 (14.0)</td>
<td>382 (13.0)</td>
</tr>
<tr>
<td>2000</td>
<td>1,391 (10.8)</td>
<td>331 (11.3)</td>
</tr>
<tr>
<td>2001</td>
<td>2,082 (16.1)</td>
<td>479 (16.3)</td>
</tr>
<tr>
<td>2002</td>
<td>1,746 (13.5)</td>
<td>403 (13.7)</td>
</tr>
<tr>
<td>2003</td>
<td>1,616 (12.5)</td>
<td>370 (12.6)</td>
</tr>
<tr>
<td>2004</td>
<td>827 (6.4)</td>
<td>226 (7.7)</td>
</tr>
</tbody>
</table>

*Pooled data are from the 1997-2004 Medical Expenditure Panel Surveys. Percentages may not equal 100% due to rounding.
poverty level. Uninsured individuals also were more likely to be racial and ethnic minorities and to have less education.

The comparisons of the distributions of the control variables representing the types and locations of the injuries in the unintentional injury sample are shown in Table 2 and the variables representing the health conditions in the new chronic condition sample are shown in Table 3.

**Association of Insurance Status and Health Outcomes**

The distributions of the dependent variables and the adjusted odds ratios from the logistic regression models for the insurance status variable in each sample are shown in Table 4. Uninsured individuals were significantly less likely to see a clinician following an unintentional injury or a new chronic condition. However, if an individual did see a clinician, he/she was equally likely to have further care recommended regardless of insurance status. Despite the equal recommendations for further care, uninsured individuals in the unintentional injury sample were significantly more likely to have received none of the recommended follow-up care and significantly less likely to have received all of the recommended follow-up care. In the new chronic condition sample, uninsured individuals also were significantly more likely to have received none of the recommended follow-up care and were significantly less likely to still be receiving treatment for their chronic condition.

The models for the quantities of medical care indicate that uninsured individuals had significantly fewer office-based visits and prescription medicines in both samples. (The relative odds represent the proportional odds ratio of being in the next higher quantity category.) In the new chronic condition sample, uninsured individuals had significantly more emergency department visits and similar numbers of inpatient hospital stays as those with insurance. The number of emer-

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**Table 2. Types and Locations of Injuries in the Unintentional Injury Sample**

<table>
<thead>
<tr>
<th>Type of Injury</th>
<th>MEPS Classification Code</th>
<th>ICD-9 Code</th>
<th>No. (%) of Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper limb</td>
<td>232</td>
<td>840-842</td>
<td>695 (4.1)</td>
</tr>
<tr>
<td>Lower limb</td>
<td>232</td>
<td>843-844</td>
<td>508 (3.0)</td>
</tr>
<tr>
<td>Foot</td>
<td>232</td>
<td>845</td>
<td>1068 (6.3)</td>
</tr>
<tr>
<td>Back</td>
<td>232</td>
<td>846-847</td>
<td>847 (5.0)</td>
</tr>
<tr>
<td>Other</td>
<td>232</td>
<td>848</td>
<td>186 (1.1)</td>
</tr>
<tr>
<td>Open wound</td>
<td>Head, neck, trunk</td>
<td>235</td>
<td>1262 (7.4)</td>
</tr>
<tr>
<td>Extremity</td>
<td></td>
<td>236</td>
<td>1379 (8.1)</td>
</tr>
<tr>
<td>Fracture</td>
<td>Upper limb</td>
<td>229</td>
<td>1051 (6.2)</td>
</tr>
<tr>
<td>Lower limb</td>
<td>230</td>
<td>729 (4.3)</td>
<td></td>
</tr>
<tr>
<td>Joint and skin</td>
<td>Contusion</td>
<td>239</td>
<td>1542 (9.1)</td>
</tr>
<tr>
<td>Nontrauma joint</td>
<td>204</td>
<td>424 (2.5)</td>
<td></td>
</tr>
<tr>
<td>Connective tissue</td>
<td>211</td>
<td>475 (2.8)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>231</td>
<td>203 (1.2)</td>
</tr>
<tr>
<td>Injury due to external causes</td>
<td>244</td>
<td>286 (16.9)</td>
<td>736 (19.2)</td>
</tr>
<tr>
<td>Spontaneous</td>
<td>205</td>
<td>746 (4.4)</td>
<td>226 (5.9)</td>
</tr>
<tr>
<td>Intracranial</td>
<td>233</td>
<td>305 (1.8)</td>
<td>77 (2.0)</td>
</tr>
<tr>
<td>Burns</td>
<td>240</td>
<td>254 (1.5)</td>
<td>84 (2.2)</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>95-120</td>
<td>222 (1.3)</td>
<td>46 (1.2)</td>
</tr>
<tr>
<td>Poisoning</td>
<td>242-243</td>
<td>220 (1.3)</td>
<td>38 (1.0)</td>
</tr>
<tr>
<td>Nervous system</td>
<td>2-85</td>
<td>182 (1.1)</td>
<td>53 (1.4)</td>
</tr>
<tr>
<td>Excision</td>
<td>2-86-94</td>
<td>135 (0.8)</td>
<td>38 (1.0)</td>
</tr>
<tr>
<td>Head, neck, spine</td>
<td>226-228</td>
<td>137 (0.8)</td>
<td>42 (1.1)</td>
</tr>
<tr>
<td>Infections</td>
<td>135, 197</td>
<td>136 (0.8)</td>
<td>27 (0.7)</td>
</tr>
<tr>
<td>Crush or internal</td>
<td>234</td>
<td>102 (0.6)</td>
<td>19 (0.5)</td>
</tr>
<tr>
<td>Teeth and jaw</td>
<td>136</td>
<td>85 (0.5)</td>
<td>15 (0.4)</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>121-134</td>
<td>59 (0.4)</td>
<td>14 (0.4)</td>
</tr>
<tr>
<td>All others</td>
<td>NA</td>
<td>401 (2.4)</td>
<td>94 (2.5)</td>
</tr>
<tr>
<td>Unknown or missing</td>
<td>NA</td>
<td>271 (1.6)</td>
<td>60 (1.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of unintentional injury</th>
<th>No. (%) of Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>4092 (24.1)</td>
</tr>
<tr>
<td>Vehicle</td>
<td>2411 (14.2)</td>
</tr>
<tr>
<td>Sports</td>
<td>2783 (16.4)</td>
</tr>
<tr>
<td>Fire/burn</td>
<td>169 (1.0)</td>
</tr>
<tr>
<td>Gun/weapon</td>
<td>136 (0.8)</td>
</tr>
<tr>
<td>Poison</td>
<td>103 (0.6)</td>
</tr>
<tr>
<td>Other</td>
<td>7253 (42.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location of unintentional injury</th>
<th>No. (%) of Individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>3034 (17.9)</td>
</tr>
<tr>
<td>Home</td>
<td>6134 (35.2)</td>
</tr>
<tr>
<td>Road/sidewalk</td>
<td>2830 (16.7)</td>
</tr>
<tr>
<td>School</td>
<td>1593 (0.4)</td>
</tr>
<tr>
<td>Recreation facility</td>
<td>2068 (12.2)</td>
</tr>
<tr>
<td>Unknown/other</td>
<td>1288 (7.6)</td>
</tr>
</tbody>
</table>

Abbreviations: ICD-9, International Classification of Diseases, Ninth Revision; MEPS, Medical Expenditure Panel Surveys; NA, not applicable.

*Pooled data from the 1997-2004 MEPS.

†Type of injury sums to greater than 100% because some observations report an injury as being of more than 1 type.
gency department visits did not vary significantly by insurance status in the unintentional injury sample.

Table 4 also shows that uninsured individuals in the chronic condition sample reported significantly worse short-term health changes at the first follow-up interview (approximately 3.5 months after the health shock), and that uninsured individuals in the unintentional injury sample were significantly more likely to report that they were not fully recovered and were no longer being treated. The difference in health change was not statistically significant between insured and uninsured persons in the unintentional injury sample at the second follow-up interview (approximately 7 months after the health shock). In contrast, the difference in health change persisted and remained statistically significant for those in the new chronic condition sample.

The results of the sensitivity analyses are reported in Table 5 and Table 6. The range of estimates from these alternative analyses cluster in a narrow range around those reported in Table 4, and the results generally remain statistically significant when the variation reduces the sample size.

Using the models to estimate the hypothetical change in outcomes that may occur if those who did not have insurance acquired insurance (Table 7), having insurance would be associated with an increase in the proportions seeing a clinician by 8.9% in the unintentional injury sample and by 7.8% in the new chronic condition sample. If insured, the proportion who received

### Table 3. Health Conditions in the New Chronic Condition Sample*

<table>
<thead>
<tr>
<th>Health Condition</th>
<th>Insured (n = 8802)</th>
<th>Uninsured (n = 1683)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neurotic disorder</td>
<td>300</td>
<td>616 (7.0)</td>
<td>.05</td>
</tr>
<tr>
<td>Acute reaction to stress</td>
<td>308</td>
<td>238 (2.7)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Depressive disorder</td>
<td>311</td>
<td>982 (11.2)</td>
<td>.01</td>
</tr>
<tr>
<td>Other mental disorder</td>
<td>290-319, V40</td>
<td>255 (2.9)</td>
<td>.05</td>
</tr>
<tr>
<td>Musculoskeletal system and connective tissue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arthropathy/arthritis</td>
<td>716</td>
<td>414 (4.7)</td>
<td>.20</td>
</tr>
<tr>
<td>Intervertebral disc disorder</td>
<td>722</td>
<td>255 (2.9)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Back disorder</td>
<td>724</td>
<td>903 (10.3)</td>
<td>.08</td>
</tr>
<tr>
<td>Other</td>
<td>710, 714, 715, 717</td>
<td>255 (2.9)</td>
<td>.05</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Essential hypertension</td>
<td>401</td>
<td>1135 (12.9)</td>
<td>.58</td>
</tr>
<tr>
<td>Acute myocardial infarction</td>
<td>410-412</td>
<td>141 (1.6)</td>
<td>.12</td>
</tr>
<tr>
<td>Other heart and circulatory</td>
<td>402-459</td>
<td>502 (5.7)</td>
<td>.58</td>
</tr>
<tr>
<td>Respiratory tract</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>493</td>
<td>519 (5.9)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Other</td>
<td>460-519</td>
<td>236 (2.7)</td>
<td>.59</td>
</tr>
<tr>
<td>Cancer (malignant neoplasms)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digestive and respiratory</td>
<td>141-164</td>
<td>70 (0.8)</td>
<td>.72</td>
</tr>
<tr>
<td>Bone and skin</td>
<td>107-172, 174-176</td>
<td>88 (1.0)</td>
<td>.18</td>
</tr>
<tr>
<td>Skin</td>
<td>173</td>
<td>176 (2.0)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Genitourinary organ</td>
<td>179-189</td>
<td>88 (1.0)</td>
<td>.02</td>
</tr>
<tr>
<td>Other neoplasms</td>
<td>191-239</td>
<td>167 (1.9)</td>
<td>.09</td>
</tr>
<tr>
<td>Blood disorder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>250, V56</td>
<td>378 (4.3)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Other endocrine, blood, or liver disorder</td>
<td>42, 135, 240-289, 555, 573, V08</td>
<td>106 (1.2)</td>
<td>.54</td>
</tr>
<tr>
<td>Nervous system condition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lipid metabolism disorder</td>
<td>272</td>
<td>898 (10.2)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Genitourinary system disorder</td>
<td>580-629</td>
<td>63 (0.7)</td>
<td>.78</td>
</tr>
<tr>
<td>Skin disorder or ulcer</td>
<td>696-707</td>
<td>62 (0.7)</td>
<td>.35</td>
</tr>
</tbody>
</table>

*Pooled data from the 1997-2004 Medical Expenditure Panel Surveys.
none of the recommended follow-up care would decrease by more than 40% in both samples. In the unintentional injury sample, most of the decrease would be offset by an increase in the proportion receiving all of the recommended care. In the new chronic condition sample, the proportions receiving some or all of the recommended care also would decline, with the percentage still receiving treatment absorbing the decreases in the other categories.

In these hypothetical models, the percentages of uninsured individuals receiving care would increase for outpatient visits, office-based visits, and number of prescription medications, whereas uninsured individuals would have fewer emergency department visits in the chronic condition sample, implying that the locus of care may shift from emergency departments to other ambulatory care settings.

In these hypothetical analyses, smaller proportions of uninsured individuals would experience substantial short-term health deteriorations (a change of 2 or more health states: from excellent health to good, fair, or poor; from very good health to fair or poor; or from good health to poor health) and correspondingly larger proportions would experience improved health. In the unintentional injury sample, the proportion of uninsured individuals who stop receiving treatment before they were fully recovered would decrease by 5.8% from the baseline value of 22.1%.

### Table 4. Distributions of Dependent Variables and Odds Ratios*

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Unintentional Injury Sample, %</th>
<th>New Chronic Condition Sample, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Insured (n = 16 947)</td>
<td>Uninsured (n = 3836)</td>
</tr>
<tr>
<td>Medical Care Use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received any care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>88.7</td>
<td>78.8</td>
<td>0.47 (0.43-0.51)</td>
</tr>
<tr>
<td>Further care recommended</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.7</td>
<td>39.0</td>
<td>0.96 (0.91-1.01)</td>
</tr>
<tr>
<td>Amount of recommended follow-up care received</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All (reference)</td>
<td>30.4</td>
<td>17.9</td>
</tr>
<tr>
<td>Some</td>
<td>9.8</td>
<td>11.1</td>
</tr>
<tr>
<td>None</td>
<td>9.2</td>
<td>19.3</td>
</tr>
<tr>
<td>Still being treated</td>
<td>50.6</td>
<td>51.7</td>
</tr>
<tr>
<td>No. of inpatient stays</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>96.4</td>
<td>96.8</td>
</tr>
<tr>
<td>1-2</td>
<td>3.5</td>
<td>3.2</td>
</tr>
<tr>
<td>≥3‡</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No. of outpatient visits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>91.0</td>
<td>93.9</td>
</tr>
<tr>
<td>1-2</td>
<td>7.2</td>
<td>5.1</td>
</tr>
<tr>
<td>≥3‡</td>
<td>1.8</td>
<td>1.0</td>
</tr>
<tr>
<td>No. of office-based visits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>42.6</td>
<td>58.2</td>
</tr>
<tr>
<td>1-2</td>
<td>37.2</td>
<td>25.3</td>
</tr>
<tr>
<td>≥3‡</td>
<td>20.1</td>
<td>16.5</td>
</tr>
<tr>
<td>No. of emergency department visits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>67.3</td>
<td>62.4</td>
</tr>
<tr>
<td>1-2</td>
<td>32.3</td>
<td>37.1</td>
</tr>
<tr>
<td>≥3‡</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>No. of prescription medicines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>64.4</td>
<td>64.5</td>
</tr>
<tr>
<td>1-2</td>
<td>30.7</td>
<td>29.8</td>
</tr>
<tr>
<td>≥3‡</td>
<td>4.9</td>
<td>5.7</td>
</tr>
</tbody>
</table>

(continued)
**SHORT-TERM HEALTH CARE CHANGES AMONG UNINSURED INDIVIDUALS**

**Table 4. Distributions of Dependent Variables and Odds Ratios (cont)**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Unintentional Injury Sample, %</th>
<th>New Chronic Condition Sample, %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Insured (n = 16,947)</td>
<td>Uninsured (n = 3,838)</td>
</tr>
<tr>
<td><strong>Short-term Change in Health</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First-round postevent§</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Much better†</td>
<td>3.3 5.2</td>
<td>3.0 2.8</td>
</tr>
<tr>
<td>No change</td>
<td>53.5 48.2</td>
<td>34.8 40.7</td>
</tr>
<tr>
<td>Worse¶</td>
<td>21.0 20.7</td>
<td>25.5 26.6</td>
</tr>
<tr>
<td>Much worse#</td>
<td>6.7 9.8</td>
<td>10.1 12.3</td>
</tr>
<tr>
<td>Second-round postevent**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Much better†</td>
<td>3.7 5.0</td>
<td>4.2 2.6</td>
</tr>
<tr>
<td>No change</td>
<td>51.2 46.4</td>
<td>47.4 43.9</td>
</tr>
<tr>
<td>Worse¶</td>
<td>21.3 20.7</td>
<td>22.5 22.0</td>
</tr>
<tr>
<td>Much worse#</td>
<td>6.4 8.5</td>
<td>9.7 13.2</td>
</tr>
<tr>
<td>Unintentional injury outcome</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fully recovered (reference)</td>
<td>63.4 56.2</td>
<td>NA</td>
</tr>
<tr>
<td>Not fully recovered, no longer being treated</td>
<td>14.6 22.1</td>
<td>1.55 (1.21-1.99)</td>
</tr>
<tr>
<td>Still being treated</td>
<td>22.0 21.7</td>
<td>0.92 (0.81-1.04)</td>
</tr>
</tbody>
</table>

| Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; NA, not applicable. |
| *Pooled data from the 1997-2004 Medical Expenditure Panel Surveys. All models include dichotomous control variables for the International Classification of Diseases, Ninth Revision.** 3-digit condition category, metropolitan area residence, census region, the interview round before the unintentional injury or new chronic condition, month of the unintentional injury or new chronic condition, year of the unintentional injury or new chronic condition, months between the date of the unintentional injury or new chronic condition and the follow-up interview, whether information was provided by a proxy and the following baseline characteristics: marital status (for adults), 1 or no parents in household (for children), age category, female sex, race/ethnicity, education level (adults), family income relative to the federal poverty level, self-reported general health status, and self-reported mental health status. Models estimated for the unintentional injury sample also include dichotomous control variables for the type and location of the unintentional injury and an interaction variable representing unintentional injuries that occurred at work for uninsured individuals. |
| †Binomial logistic for received any care and further care recommended; multinomial logistic for amount of recommended care received and unintentional injury outcome; ordered logistic for quantities of medical care and change in health status. |
| §Unintentional injury sample: average of 3.4 months between event and first follow-up interview; new chronic condition sample: average of 3.6 months between event and first follow-up interview. |
| **Unintentional injury sample: average of 3.4 months between event and first follow-up interview; new chronic condition sample: average of 3.6 months between event and first follow-up interview.** |
| ¶Shift of 2 or more health states: excellent to good, fair, or poor; very good to fair or poor; or good to poor. |
| #Shift of 2 or more health states: poor to very good, good, or excellent; fair to very good or excellent; good to excellent. |
| **Unintentional injury sample: average of 6.9 months between event and second follow-up interview; new chronic condition sample: average of 7.3 months between event and second follow-up interview.** |

**COMMENT**

The results of these analyses suggest that an uninsured person who experiences an unintentional injury or a new chronic condition has greater difficulty obtaining recommended medical care and takes longer to return to full health, if at all. These findings are consistent with and reinforce earlier research showing that uninsured individuals receive significantly less care than those with insurance and have poorer health outcomes.6,7

The finding that there were no differences in the likelihood of having further care recommended if a clinician was seen suggests that either there were no differences in severity or, more probably, that the severity threshold for recommending care is higher for an uninsured person than a person with insurance. If the latter, the major and significant differences in receiving follow-up care reinforce the inference that differences in the amounts of care received are at least partially related to poorer health outcomes in uninsured individuals.

If health remains compromised, it could make it more difficult for an uninsured person to obtain health insurance in the future, and could also contribute to reduced labor force participation, lower productivity, and lower future income. Although the change in health is measured over only a relatively short period, other research suggests that the progression from good to poor health resulting from lack of health insurance is cumulative and gradually leads to higher mortality rates for uninsured individuals over time.13

The findings for uninsured individuals with a new chronic condition are of particular concern. Because chronic conditions generally require care over an extended period, the finding that the uninsured are more likely to report no longer being treated at the first follow-up interview suggests that their care may have been inadequate. Moreover, their greater dependence on emergency departments for care probably in-
creases the likelihood that their care will be episodic and lack continuity. For individuals who require treatment for chronic conditions, a continuing relationship with a clinician and appropriate medication use may be especially important for improving or maintaining health status. Although the differences between the proportions of uninsured and insured individuals who experienced much poorer health were not large in absolute terms, these patients often require costly care and are at increased risk for death and disability. Thus, it is possible that savings in future medical costs may be larger than implied by the small absolute percentage changes between insured and uninsured individuals.

Table 5. Results of Sensitivity Analyses for Unintentional Injury Sample*

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Medical Care Use</th>
<th>Drop Cases With Conditions Significantly Related to Insurance (n = 13785)</th>
<th>Drop if Family Income ≤ 400% FPL (n = 13937)</th>
<th>1 Condition per Person Only (n = 15866)</th>
<th>12-Month Look-Back (n = 10991)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Add Perceived Severity Variables (n = 20783)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Sample</td>
<td></td>
<td>No Condition Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No Further care recommended, AOR†</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>95% CI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received any care, AOR†</td>
<td>(0.43-0.51)</td>
<td>(0.44-0.55)</td>
<td>(0.42-0.48)</td>
<td>(0.37-0.53)</td>
<td>(0.42-0.52)</td>
</tr>
<tr>
<td>Further care recommended, AOR†</td>
<td>0.96</td>
<td>0.99</td>
<td>0.89</td>
<td>0.95</td>
<td>0.96</td>
</tr>
<tr>
<td>Amount of recommended follow-up care received‡</td>
<td></td>
<td>Add Perceived Severity Variables (n = 20783)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No care, AOR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>95% CI</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Medical Care Use</td>
<td></td>
<td>1.47</td>
<td>1.50</td>
<td>1.45</td>
<td>1.78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>95% CI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drop Cases Without Effect on Health (n = 13866)</td>
<td></td>
<td>(1.05-2.04)</td>
<td>(1.05-2.13)</td>
<td>(1.05-2.00)</td>
<td>(1.28-2.49)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.50-1.00)</td>
<td>(0.64-0.83)</td>
<td>(0.61-0.76)</td>
<td>(0.64-0.85)</td>
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<tr>
<td></td>
<td></td>
<td>(0.71)</td>
<td>0.73</td>
<td>0.68</td>
<td>0.74</td>
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<tr>
<td></td>
<td></td>
<td>(0.50-1.00)</td>
<td>(0.64-0.83)</td>
<td>(0.61-0.76)</td>
<td>(0.64-0.85)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.95)</td>
<td>0.61</td>
<td>0.55</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.56-0.62)</td>
<td>(0.58-0.65)</td>
<td>(0.51-0.59)</td>
<td>(0.58-0.68)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.99</td>
<td>1.00</td>
<td>0.97</td>
<td>0.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td>95% CI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.91-1.08)</td>
<td>(0.91-1.10)</td>
<td>(0.89-1.06)</td>
<td>(0.85-1.13)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.71)</td>
<td>0.72</td>
<td>0.67</td>
<td>0.75</td>
</tr>
<tr>
<td>Prescription medicines, AOR§</td>
<td></td>
<td>(0.67-0.75)</td>
<td>(0.68-0.75)</td>
<td>(0.64-0.70)</td>
<td>(0.67-0.84)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.59-0.62)</td>
<td>(0.58-0.65)</td>
<td>(0.51-0.59)</td>
<td>(0.58-0.68)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.99</td>
<td>1.00</td>
<td>0.97</td>
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<td></td>
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<td>95% CI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.91-1.08)</td>
<td>(0.91-1.10)</td>
<td>(0.89-1.06)</td>
<td>(0.85-1.13)</td>
</tr>
<tr>
<td>Short-term Change in Health</td>
<td></td>
<td>Drop Cases With Conditions Significantly Related to Insurance (n = 13785)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>First-round postevent, AOR§</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>95% CI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient hospital stays, AOR§</td>
<td></td>
<td>(0.86)</td>
<td>(0.85)</td>
<td>(0.88)</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.75-0.98)</td>
<td>(0.78-0.85)</td>
<td>(0.75-1.02)</td>
<td>(0.78-1.02)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.91)</td>
<td>0.91</td>
<td>0.91</td>
<td>0.96</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.71-1.16)</td>
<td>(0.72-1.15)</td>
<td>(0.71-1.18)</td>
<td>(0.72-1.27)</td>
</tr>
<tr>
<td>Injury recovery‡</td>
<td>Not fully recovered, no longer receiving treatment, AOR</td>
<td></td>
<td>Drop if Family Income ≤ 400% FPL (n = 13937)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>95% CI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inpatient hospital stays, AOR§</td>
<td></td>
<td>(1.55)</td>
<td>1.55</td>
<td>1.51</td>
<td>1.67</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.21-1.99)</td>
<td>(1.21-2.03)</td>
<td>(1.15-2.00)</td>
<td>(1.34-2.07)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.92)</td>
<td>0.94</td>
<td>0.84</td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.81-1.04)</td>
<td>(0.84-1.06)</td>
<td>(0.77-0.92)</td>
<td>(0.80-1.22)</td>
</tr>
</tbody>
</table>

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; FPL, federal poverty level.
*Pooled data from the 1997-2004 Medical Expenditure Panel Surveys.  
†Binomial logistic model. 
‡Multinomial logistic model. 
§Ordered logistic model.

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to outpace income and wage growth, especially for those with lower incomes. The results of this analysis imply that the failure to address the problem of no insurance for US individuals will have adverse health consequences. Moreover, the fact that these consequences apply to uninsured individuals who experienced unintentional injuries or new chronic conditions runs counter to the perception that the uninsured receive care, either through the safety net or their own resources, when they really need it (eg, when they experience a health shock from an unintentional injury or develop a new chronic condition).

This study has several important limitations. Despite the robustness of the results in the sensitivity analyses, bias due to unobserved differences between uninsured and insured individuals is still possible. Two recent studies of insurance and health status used statistical methods to adjust for possible confounding from unobserved factors in longitudinal samples and found that the adverse effects of not having insurance on health status were understated.31,32 Thus, even if the results of the sensitivity analyses also are biased, other research suggests that the bias is conservative and the qualitative conclusion that uninsured individuals have adverse outcomes in medical care use and health status would still be true.

Second, the health change measure is constructed from subjective self-reported assessments of general health status. A more detailed and more objective health measure, such as the Short Form 3633 or the Health and Limitations Index34 would pro-

Table 6. Results of Sensitivity Analyses for New Chronic Condition Sample*

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Primary Sample (n = 10,485)</th>
<th>No Condition Variables (n = 10,485)</th>
<th>Add Perceived Severity Variables (n = 10,485)</th>
<th>Drop Cases Without Effect on Health (n = 8,040)</th>
<th>Drop Cases With Conditions Significantly Related to Insurance (n = 3,494)</th>
<th>Drop if Family Income ≥ 400% FPL (n = 6,342)</th>
<th>1 Condition per Person Only (n = 7,954)</th>
<th>12-Month Look-Back (n = 4,872)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received any care, AOR†</td>
<td>0.45</td>
<td>0.45</td>
<td>0.44</td>
<td>0.42</td>
<td>0.33</td>
<td>0.42</td>
<td>0.45</td>
<td>0.38</td>
</tr>
<tr>
<td>95% CI</td>
<td>(0.40-0.50)</td>
<td>(0.37-0.49)</td>
<td>(0.39-0.50)</td>
<td>(0.38-0.47)</td>
<td>(0.22-0.40)</td>
<td>(0.35-0.50)</td>
<td>(0.41-0.51)</td>
<td>(0.34-0.43)</td>
</tr>
<tr>
<td>Further care recommended, AOR†</td>
<td>0.95</td>
<td>0.98</td>
<td>0.94</td>
<td>1.02</td>
<td>1.03</td>
<td>1.08</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>95% CI</td>
<td>(0.82-1.10)</td>
<td>(0.86-1.12)</td>
<td>(0.80-1.10)</td>
<td>(0.87-1.19)</td>
<td>(0.82-1.24)</td>
<td>(0.92-1.15)</td>
<td>(0.88-1.33)</td>
<td>(0.75-1.06)</td>
</tr>
<tr>
<td>Amount of recommended follow-up care received‡</td>
<td>0.93</td>
<td>0.90</td>
<td>0.93</td>
<td>1.04</td>
<td>0.36</td>
<td>1.21</td>
<td>1.25</td>
<td>1.50</td>
</tr>
<tr>
<td>95% CI</td>
<td>(0.66-1.31)</td>
<td>(0.63-1.26)</td>
<td>(0.66-1.30)</td>
<td>(0.74-1.46)</td>
<td>(0.21-0.61)</td>
<td>(0.91-1.60)</td>
<td>(0.89-1.78)</td>
<td>(1.02-2.19)</td>
</tr>
<tr>
<td>No care, AOR</td>
<td>1.65</td>
<td>1.37</td>
<td>1.68</td>
<td>1.81</td>
<td>1.64</td>
<td>2.13</td>
<td>1.88</td>
<td>2.06</td>
</tr>
<tr>
<td>95% CI</td>
<td>(1.32-2.06)</td>
<td>(1.08-1.74)</td>
<td>(1.35-2.10)</td>
<td>(1.40-2.32)</td>
<td>(0.96-2.80)</td>
<td>(1.83-2.49)</td>
<td>(1.54-2.29)</td>
<td>(1.45-2.94)</td>
</tr>
<tr>
<td>Still being treated, AOR§</td>
<td>0.70</td>
<td>0.69</td>
<td>0.70</td>
<td>0.73</td>
<td>0.67</td>
<td>0.85</td>
<td>0.76</td>
<td>0.79</td>
</tr>
<tr>
<td>95% CI</td>
<td>(0.52-0.95)</td>
<td>(0.50-0.96)</td>
<td>(0.52-0.95)</td>
<td>(0.51-1.02)</td>
<td>(0.47-0.95)</td>
<td>(0.73-0.99)</td>
<td>(0.65-0.89)</td>
<td>(0.57-1.10)</td>
</tr>
<tr>
<td>Inpatient hospital stays, AOR§</td>
<td>1.01</td>
<td>0.95</td>
<td>1.01</td>
<td>1.01</td>
<td>0.86</td>
<td>1.10</td>
<td>1.06</td>
<td>1.06</td>
</tr>
<tr>
<td>95% CI</td>
<td>(0.68-1.52)</td>
<td>(0.75-1.19)</td>
<td>(0.65-1.57)</td>
<td>(0.66-1.52)</td>
<td>(0.48-1.53)</td>
<td>(0.81-1.49)</td>
<td>(0.73-1.55)</td>
<td>(0.63-1.77)</td>
</tr>
<tr>
<td>Outpatient visits, AOR§</td>
<td>0.74</td>
<td>0.72</td>
<td>0.73</td>
<td>0.73</td>
<td>0.60</td>
<td>0.80</td>
<td>0.71</td>
<td>0.67</td>
</tr>
<tr>
<td>95% CI</td>
<td>(0.46-1.17)</td>
<td>(0.52-1.01)</td>
<td>(0.45-1.18)</td>
<td>(0.48-1.10)</td>
<td>(0.43-0.82)</td>
<td>(0.51-1.24)</td>
<td>(0.44-1.16)</td>
<td>(0.40-1.14)</td>
</tr>
<tr>
<td>Office-based visits, AOR§</td>
<td>0.77</td>
<td>0.74</td>
<td>0.76</td>
<td>0.75</td>
<td>0.80</td>
<td>0.69</td>
<td>0.76</td>
<td>0.75</td>
</tr>
<tr>
<td>95% CI</td>
<td>(0.72-0.82)</td>
<td>(0.71-0.77)</td>
<td>(0.71-0.80)</td>
<td>(0.69-0.81)</td>
<td>(0.70-0.92)</td>
<td>(0.62-0.78)</td>
<td>(0.70-0.82)</td>
<td>(0.65-0.88)</td>
</tr>
<tr>
<td>Emergency department visits, AOR§</td>
<td>1.41</td>
<td>1.30</td>
<td>1.40</td>
<td>1.33</td>
<td>1.32</td>
<td>1.53</td>
<td>1.46</td>
<td>1.50</td>
</tr>
<tr>
<td>95% CI</td>
<td>(1.25-1.59)</td>
<td>(1.16-1.44)</td>
<td>(1.23-1.59)</td>
<td>(1.18-1.50)</td>
<td>(1.04-1.68)</td>
<td>(1.37-1.72)</td>
<td>(1.32-1.62)</td>
<td>(1.11-2.02)</td>
</tr>
<tr>
<td>Prescription medicines, AOR§</td>
<td>0.66</td>
<td>0.66</td>
<td>0.65</td>
<td>0.63</td>
<td>0.65</td>
<td>0.69</td>
<td>0.66</td>
<td>0.66</td>
</tr>
<tr>
<td>95% CI</td>
<td>(0.57-0.76)</td>
<td>(0.59-0.73)</td>
<td>(0.57-0.74)</td>
<td>(0.53-0.76)</td>
<td>(0.54-0.78)</td>
<td>(0.60-0.80)</td>
<td>(0.57-0.76)</td>
<td>(0.54-0.72)</td>
</tr>
<tr>
<td>First-round postevent, AOR§</td>
<td>0.74</td>
<td>0.76</td>
<td>0.76</td>
<td>0.75</td>
<td>0.70</td>
<td>0.72</td>
<td>0.77</td>
<td>0.81</td>
</tr>
<tr>
<td>95% CI</td>
<td>(0.68-0.80)</td>
<td>(0.70-0.83)</td>
<td>(0.70-0.83)</td>
<td>(0.70-0.81)</td>
<td>(0.57-0.85)</td>
<td>(0.61-0.84)</td>
<td>(0.71-0.83)</td>
<td>(0.72-0.91)</td>
</tr>
<tr>
<td>Second-round postevent, AOR§</td>
<td>0.79</td>
<td>0.81</td>
<td>0.75</td>
<td>0.74</td>
<td>0.73</td>
<td>0.70</td>
<td>0.73</td>
<td>0.90</td>
</tr>
<tr>
<td>95% CI</td>
<td>(0.69-0.90)</td>
<td>(0.71-0.92)</td>
<td>(0.66-0.87)</td>
<td>(0.65-0.85)</td>
<td>(0.51-1.06)</td>
<td>(0.58-0.84)</td>
<td>(0.60-0.88)</td>
<td>(0.67-1.23)</td>
</tr>
</tbody>
</table>

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; FPL, federal poverty level.
*Pooled data from the 1997-2004 Medical Expenditure Panel Surveys.
†Binomial logistic model.
‡Multinomial logistic model.
§Ordered logistic model.
provide a more accurate measure of the overall change in health as well as changes in particular dimensions of health status.

Third, the conditions in the new chronic condition sample are neither representative of all chronic conditions nor were they consistently coded from medical records. However, the broad similarity of the results across the 2 samples, which had varying mixes of underlying conditions, suggests that the results are not specific to the particular conditions represented in the samples.

Fourth, measures of the quantities of medical care received may not capture variations in either the content or quality of care. Other research documents that uninsured individuals receive lower quality care, which implies that the differences in quantities found in this analysis may underestimate the difference in the quality-adjusted amounts of care received.

And fifth, the follow-up observation period is too short to determine whether the differences in health outcomes are permanent or transitory, especially in the unintentional injury sample. Longer observation periods are necessary to investigate this issue but data with the requisite information on insurance status and medical care use do not currently exist.

CONCLUSIONS

Among individuals who experienced a health shock caused by an unintentional injury or a new chronic condition, uninsured individuals reported receiving less medical care and poorer short-term changes in health than individuals with insurance. If the proportion of individuals without insurance continues to increase, more and more persons may experience preventable deteriorations in their health.

Author Contributions: Dr Hadley had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Dr Hadley was responsible for the conception and design; data acquisition; analysis and interpretation of the data; drafting and revising of the manuscript; statistical analysis; obtaining funding; and administrative management.

Financial Disclosures: None reported.

Adjusted Differences Associated With Uninsured Individuals Hypothetically Having Insurance*  

| Table 7. Adjusted Differences Associated With Uninsured Individuals Hypothetically Having Insurance* |
|---------------------------------------------------------------|---------------------------------------------------------------|
|                                                       | Unintentional Injury Sample | New Chronic Condition Sample |
|                                                       | Baseline Value, % | Adjusted Difference, OR (If Insured) | Baseline Value, % | Adjusted Difference, OR (If Insured) |
| Received any care | 78.8 | 8.9† | 81.7 | 7.8† |
| Amount of recommended follow-up care received | 17.9 | 7.7† | 14.9 | -2.9 |
| All | | | | |
| Some | 11.1 | -1.4 | 8.5 | -1.0† |
| None | 19.3 | -8.2 | 9.4 | -4.6 |
| No | | | | |
| Still being treated | 51.7 | 1.9 | 67.3 | 8.5 |
| No of inpatient stays | 96.8 | -1.1 | 89.9 | 0.1 |
| 0 | 96.8 | -1.1 | 89.9 | 0.1 |
| 1-2 | 3.1 | 1.1 | 9.7 | -0.1 |
| ≥3§ | 0.1 | 0 | 0.4 | 0 |
| No of outpatient visits | 93.9 | -2.8† | 92.0 | -2.1 |
| 0 | 93.9 | -2.8† | 92.0 | -2.1 |
| 1-2 | 5.1 | 2.2 | 6.6 | 1.5 |
| ≥3§ | 1.0 | 0.6 | 1.3 | 0.6 |
| No of office-based visits | 58.2 | -10.4† | 41.0 | -5.6† |
| 0 | 58.2 | -10.4† | 41.0 | -5.6† |
| 1-2 | 25.3 | 4.5 | 33.8 | 0.9 |
| ≥3§ | 16.5 | 5.9 | 25.1 | 4.7 |
| No of emergency department visits | 62.4 | -0.1 | 86.9 | 2.8† |
| 0 | 62.4 | -0.1 | 86.9 | 2.8† |
| 1-2 | 37.1 | 0.1 | 12.3 | -2.6 |
| ≥3§ | 0.5 | 0 | 0.8 | -0.2 |
| No of prescription medicines | 64.5 | -6.4† | 47.3 | -8.8† |
| 0 | 64.5 | -6.4† | 47.3 | -8.8† |
| 1-2 | 29.8 | 4.8 | 35.7 | 2.8 |
| ≥3§ | 5.7 | 1.5 | 17.0 | 6.0 |

Short-term Change in Health

| First-round postevent§ | Much better | 5.2 | 0.2† | 2.8 | 0.9† |
| Better | 16.2 | 0.7 | 14.5 | 2.9 |
| No change | 48.2 | 0.3 | 43.8 | 1.7 |
| Worse¶ | 20.7 | -0.7 | 26.6 | -2.9 |
| Much worse§ | 9.8 | -0.5 | 12.3 | -2.6 |
| Second-round postevent** | Much better | 5.0 | 0.3 | 2.6 | 1.0† |
| Better | 19.4 | 0.9 | 18.3 | 2.9 |
| No change | 46.4 | 0.1 | 43.9 | 0.8 |
| Worse¶ | 20.7 | -0.8 | 22.0 | -2.4 |
| Much worse§ | 8.5 | -0.5 | 13.2 | -2.3 |

Abbreviations: NA, not applicable; OR, odds ratio.

Reprinted JAMA, March 14, 2007—Vol 297, No. 10
Funding/Support: The research for this article was supported by contracts 04–1102–700 and 01–1282–180 from the Kaiser Family Foundation, Washington, DC.

Role of the Sponsor: The sponsor had no role in the design and conduct of the study; the collection, management, analysis, and interpretation of the data. The sponsor’s staff commented on a preliminary draft of the manuscript but had no role in the preparation, final review, or approval of the article.

Acknowledgment: Joel Ruhter and Matthew Caven provided computer programming and research assistance at The Urban Institute and were compensated as part of their salaries.

REFERENCES

Administrative, technical, or material support: Kortebein, Ferrando, Lombeida, Evans. Supervision: Ferrando, Wolfe, Evans. Financial Disclosures: None reported.

Role of the Sponsor: These organizations had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; and preparation, review, or approval of the manuscript.

Acknowledgment: We thank Douglas Paddon-Jones, PhD, Ola Ronsen, MD, PhD, and T. Brock Symons, PhD, of the University of Texas Medical Branch, Galveston, for their significant contributions toward the completion of this study, including data collection and analysis, as well as review of the manuscript. These individuals received compensation.


CORRECTIONS

Incorrect Wording: In the Medical News & Perspectives story entitled “Trials Probe New Agents for Kidney Cancer” published in the July 12, 2006, issue of JAMA (2006;296:155-157), sunitinib was misidentified as a second-line treatment for advanced renal cell carcinoma. On page 155, column 2, the first full sentence should be “The results led to sunitinib’s approval by the US Food and Drug Administration in January for advanced renal cell carcinoma.”

Mislabeled Column Headings in Table 7: In the Original Contribution entitled “Insurance Coverage, Medical Care Use, and Short-term Health Changes Following an Unintentional Injury or the Onset of a Chronic Condition” published in the March 14, 2007, issue of JAMA (2007;297:1073-1084), in Table 7, the column headings for columns 3 and 5 should be “Adjusted Difference, % (if Insured).” The dagger footnote should be “Underlying odds ratios (Table 4) for medical care use/health outcome category significantly different from insured, P<.05.”

Incorrect References Cited: In the Original Contribution entitled “Trends in Emergency Medicaid Expenditures for Recent and Undocumented Immigrants” published in the March 14, 2007, issue of JAMA (2007;297:1085-1092), 3 sentences cited incorrect references. On page 1090, within the Comment section, the second full sentence “In California, for example, a study in 2000 concluded that elimination of public funding for the prenatal care of undocumented immigrants would prove far more costly to taxpayers by substantially increasing low-birth weight, prematurity, and postnatal costs.” should cite reference 32. The third sentence “Only 8 states have taken advantage of a 2002 “unborn child” option under the State Children’s Health Insurance Program, which applies federal matching dollars to prenatal care coverage for undocumented women, while 5 additional states provide state funding for prenatal care regardless of immigration status.” should cite reference 44 instead of 30. The fifth sentence “Immigrants, and particularly Hispanic immigrants, account for a disproportionate number of workplace injuries and fatalities in the United States.” should cite “US Department of Labor. Occupational Safety and Health Administration’s efforts to protect immigrant workers, statement of John L. Henshaw, Assistant Secretary of Labor for Occupational Safety and Health before the Subcommittee on Employment, Safety and Training Committee on Health, Education, Labor and Pensions, United States Senate, February 27, 2002. http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=TESTIMONIES&p_id=286. Accessed November 2, 2006,” which is not listed among the article’s references.