RESEARCH LETTER

Trends in Adult Emergency Department Visits in California by Insurance Status, 2005-2010

Emergency department (ED) use has been affected by insurance patterns over time and will likely be further affected by expansions of coverage from health care reform. Because of their disproportionate ED use, uninsured patients are often described as high (and frequently inappropriate) ED users. However, insured patients can be more frequent ED users than uninsured patients, particularly those with Medicaid coverage, which still leaves them with difficulties in accessing primary care.

We investigated recent trends in the association between insurance coverage and ED use in California for adults (age <65 years), who have experienced the greatest changes in insurance coverage in recent years and are likely to see the biggest shifts as a result of health care reform. Previous studies have considered trends in ED use, but predate the recent economic downturn and related insurance changes.

Methods | We conducted a retrospective analysis of California ED visits by adults aged 19 to 64 years from 2005-2010 using the nonpublic versions of the California Office of Statewide Health Planning and Development’s Emergency Discharge Data and Patient Discharge Data. We excluded visits with missing sex (0.06%), admissions not from the ED (20%), scheduled admissions (0.05%), and Medicare patients (7.9%) because Medicare beneficiaries younger than 65 years are severely ill and disabled and not comparable with our remaining sample.

To study variations by insurance coverage, we grouped ED visits into 4 categories based on expected source of payment: Medicaid, private insurance, self-pay or uninsured, and other. We constructed visit rates using California population data stratified by insurance coverage from the State Health Access Data Assistance Center, derived from the Census Bureau’s Current Population Survey. In addition, we classified visits as ambulatory care sensitive conditions (ACSCs). We compared the distributions of visits and visit rates per population by payer across years using χ² tests. We tested for differences in trends in visit rates by payer using an ordinary least squares regression that allowed for payer-specific linear trends in rates. Statistical significance was assessed using 2-sided tests with a critical value of .05; Stata version 11 (StataCorp) was used for all analyses. The study was approved by the University of California, San Francisco, committee on human research.

Results | Between 2005 and 2010, the number of visits to California EDs by adults increased by 13.2% from 5.4 to 6.1 million per year. The largest increase in visits occurred in

Table. Emergency Department Visits Made by Adults Aged 19 to 64 Years From 2005-2010 in California

<table>
<thead>
<tr>
<th>Insurance type</th>
<th>2005 (n = 5418)</th>
<th>2006 (n = 5439)</th>
<th>2007 (n = 5576)</th>
<th>2008 (n = 5716)</th>
<th>2009 (n = 6099)</th>
<th>2010 (n = 6131)</th>
<th>Total (N = 34 378)</th>
<th>Increase from previous year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>2324 (43)</td>
<td>2318 (43)</td>
<td>2374 (43)</td>
<td>2416 (42)</td>
<td>2457 (40)</td>
<td>2350 (38)</td>
<td>14 239 (41)</td>
<td>1.2</td>
</tr>
<tr>
<td>Medicaid</td>
<td>1238 (23)</td>
<td>1246 (23)</td>
<td>1314 (24)</td>
<td>1416 (25)</td>
<td>1608 (26)</td>
<td>1679 (27)</td>
<td>8501 (25)</td>
<td>35.6</td>
</tr>
<tr>
<td>Uninsured</td>
<td>1230 (23)</td>
<td>1296 (24)</td>
<td>1342 (24)</td>
<td>1387 (24)</td>
<td>1494 (25)</td>
<td>1543 (25)</td>
<td>8293 (24)</td>
<td>25.4</td>
</tr>
<tr>
<td>Other c</td>
<td>626 (12)</td>
<td>578 (11)</td>
<td>546 (10)</td>
<td>497 (9)</td>
<td>539 (9)</td>
<td>560 (9)</td>
<td>3345 (10)</td>
<td>−10.6</td>
</tr>
<tr>
<td>Age, y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-25</td>
<td>1061 (20)</td>
<td>1070 (20)</td>
<td>1102 (20)</td>
<td>1121 (20)</td>
<td>1230 (20)</td>
<td>1214 (20)</td>
<td>6798 (20)</td>
<td>14.4</td>
</tr>
<tr>
<td>26-34</td>
<td>1170 (22)</td>
<td>1161 (21)</td>
<td>1202 (22)</td>
<td>1235 (22)</td>
<td>1337 (22)</td>
<td>1351 (22)</td>
<td>7456 (22)</td>
<td>15.5</td>
</tr>
<tr>
<td>35-44</td>
<td>1302 (24)</td>
<td>1281 (24)</td>
<td>1272 (23)</td>
<td>1267 (22)</td>
<td>1306 (21)</td>
<td>1289 (21)</td>
<td>7717 (22)</td>
<td>−1.0</td>
</tr>
<tr>
<td>45-54</td>
<td>1155 (21)</td>
<td>1172 (22)</td>
<td>1210 (22)</td>
<td>1258 (22)</td>
<td>1325 (22)</td>
<td>1335 (22)</td>
<td>7454 (22)</td>
<td>15.6</td>
</tr>
<tr>
<td>55-64</td>
<td>730 (13)</td>
<td>755 (14)</td>
<td>791 (14)</td>
<td>835 (15)</td>
<td>900 (15)</td>
<td>942 (15)</td>
<td>4952 (14)</td>
<td>29.1</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2439 (45)</td>
<td>2439 (45)</td>
<td>2482 (45)</td>
<td>2526 (44)</td>
<td>2659 (44)</td>
<td>2672 (44)</td>
<td>15 217 (44)</td>
<td>9.5</td>
</tr>
<tr>
<td>Female</td>
<td>2979 (55)</td>
<td>3000 (55)</td>
<td>3094 (55)</td>
<td>3190 (56)</td>
<td>3439 (56)</td>
<td>3459 (56)</td>
<td>19 161 (56)</td>
<td>16.1</td>
</tr>
<tr>
<td>Increase from previous year</td>
<td>21 (0.4)</td>
<td>137 (2.5)</td>
<td>140 (2.5)</td>
<td>383 (6.7)</td>
<td>33 (0.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a The numbers of emergency department visits are presented in the thousands. The χ² test was used to assess differences between the distribution of visits across insurance categories by year. In pairwise tests, the distribution in each year from 2006-2010 was statistically significantly different from the distribution in 2005 (P < .001 in all cases). The distributions are also jointly significantly different across years (P < .001). The numbers in each subsection may not equal the total at the top of the column due to rounding. 

b The number of visits to California emergency departments increased by 13.2% from 5.4 to 6.1 million per year.

c Includes workers compensation, other government programs, automobile medical, CHAMPUS (TRICARE), Title V, Veterans Affairs, and other.
In addition, Medicaid patients consistently had the highest rate of visits for ACSCs (54.76 per 1000 population) compared with privately insured (10.93 per 1000 population) and uninsured (16.60 per 1000 population) patients (Figure). Rates of ED use for ACSCs increased from 2005-2010 among Medicaid beneficiaries (6.8%) and uninsured patients (6.2%), but declined among privately insured patients (~0.7%).

Discussion | Visit rates to the ED by adults younger than 65 years increased in California from 2005-2010, particularly among Medicaid patients. Increasing ED use by Medicaid beneficiaries could reflect decreasing access to primary care,2,4 which is supported by our findings of high and increasing rates of ED use for ACSCs by Medicaid patients. The increase in ED visits was highest in 2009, likely due to the H1N1 pandemic and the influence of the economic downturn on coverage transitions and access to care.

Our analysis is limited in that it uses administrative data and is only generalizable to California. As major changes in insurance coverage approach with the implementation of health care reform, continued monitoring of changes in ED use is needed.

Renee Y. Hsia, MD, MSc
Julia Brownell, BA
Suzanne Wilson, MPH
Nicole Gordon, BA
Laurence C. Baker, PhD

Author Affiliations: Department of Emergency Medicine, University of California, San Francisco (Hsia, Brownell, Gordon); Department of Health Research and Policy, Stanford University, Stanford, California (Wilson, Baker).

Corresponding Author: Renee Y. Hsia, MD, MSc, Department of Emergency Medicine, San Francisco General Hospital, 1001 Potrero Ave, 1E21, San Francisco, CA 94110 (renee.hsia@emergency.ucsf.edu).

Author Contributions: Drs Hsia and Baker had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Hsia, Baker.
Acquisition of data: Hsia.
Analysis and interpretation of data: Hsia, Brownell, Wilson, Gordon, Baker.
Drafting of the manuscript: Hsia, Brownell, Wilson, Gordon.
Critical revision of the manuscript for important intellectual content: Hsia, Brownell, Baker.
Statistical analysis: Brownell, Wilson, Gordon, Baker.
Obtained funding: Hsia, Baker.
Administrative, technical, or material support: Hsia, Brownell, Gordon.
Study supervision: Hsia, Baker.

Conflict of Interest Disclosures: The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

Funding/Support: This study was primarily funded by a grant from the California HealthCare Foundation. Additional financial support was provided by the National Center for Advancing Translational Sciences, National Institutes of Health, through University of California, San Francisco-Clinical and Translational Sciences Institute grant KL2 TR000143 (Dr Hsia) and the Robert Wood Johnson Foundation Physician Faculty Scholars Program (Dr Hsia).

Role of the Sponsors: The sponsors had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

To the Editor Dr Doig and colleagues1 highlighted how the provision of adequate calorie support during the first 7 days of stay in the intensive care unit (ICU) may be critical. Although previous research suggested that starvation is associated with worse outcome and nutritional support should be considered during the highly catabolic state of critical illness, recent trials2,3 have emphasized that early is not always better in the ICU.

Timing and amount of nutrients administered by the parenteral route should be balanced for benefits and harms. There is evidence that overzealous parenteral nutrition and overfeeding should be avoided because delayed and targeted calorie support results in better outcomes.2,3

For example, supplemental parenteral nutrition starting 4 days after ICU admission resulted in reduced nosocomial infections.2 However, the lack of positive effects in this study on most end points may be explained not by calories but by fluids. In the study by Doig et al,4 nutritional support was provided as early as in the Early Parenteral Nutrition Completing Enteral Nutrition in Adult Critically Ill Patients (EPaNIC) trial, which showed higher rates of complications and mortality in patients receiving early parenteral nutrition.3 However, in the first 2 days, nutritional support was not limited to glucose infusions, as in the EPaNIC trial, thus improving glucose control and nitrogen balance and reducing the adverse effects of hyperglycemia.4

It is likely that patients allocated to early parenteral nutrition received higher amounts of intravenous fluids than those in the control group receiving standard care. It would be interesting to look at the data on fluid loads and the use of vasopressors.

One study of elderly patients5 with gastrointestinal cancer and perioperative fluid restriction suggests that during acute stress conditions, fluid restriction results in better cellular immunity and reduced complication rates. The positive effects of nutritional support may have been masked by the negative effects of a higher fluid load.

Emanuele Cereda, MD, PhD
Carlo Marena, MD
Riccardo Caccialanza, MD

Author Affiliations: Nutrition and Dietetics Service, Fondazione IRCCS Poli clinico San Matteo, Pavia, Italy.

Corresponding Author: Emanuele Cereda, MD, PhD. Nutrition and Dietetics Service. Fondazione IRCCS Poli clinico San Matteo, Viale Golgi 19, 27100 Pavia, Italy (e.cereda@smatteo.pv.it).

Conflict of Interest Disclosures: The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.


