Objective Measurement of Productivity While at Work in US Employees With and Without Gastroesophageal Reflux Disease

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CONCLUSIONS
- Objective measurements indicate that GERD impacts productivity while at work.
- The observed link between GERD and at-work productivity supports findings from other studies using self-report productivity instruments.
- An opportunity therefore exists to reduce costs from an employer or society perspective through better management of patients with GERD.

INTRODUCTION
- Estimates suggest that around 60% of the total cost of gastroesophageal reflux disease (GERD) is accounted for by absence from work and reduced at-work productivity.1 Studies in working populations (using patient-reported data) have shown that GERD causes a reduction in at-work productivity of around 10%.2–4 Significantly higher levels of reduction in at-work productivity of around 2–4% have shown that GERD causes a significant impairment in productivity while at work.

METHODS
- An analysis was performed on data from the Human Capital Management Services (HCMS) medical records’ database consisting of approximately 350 000 employee records representing the retail, service, manufacturing, and financial industries. Anonymity of person-level data was maintained according to the Health Insurance Portability and Accountability Act guidelines.
- From the database, ICD-9 codes were used to identify employees with a primary, secondary, or tertiary diagnosis of GERD (530.1, 530.1, 530.10, 530.11, 530.12, 530.19, 530.81, 787.1x and 787.2x). Employees without GERD were defined as the control group.
- The index date for each employee with GERD was the date of diagnosis associated with the disease. For controls, the index date was the average index date of subjects with GERD.
- For the purposes of the analysis, subjects from the GERD and control groups needed to be continuously employed and eligible for financial industries. Anonymity of employee’s postal zip code). Tenure and salary were not included as they were too highly correlated with other variables in the model.

RESULTS
- Productivity data were available for 541 employees with GERD and 26 775 employees without GERD (control group). Demographic characteristics are summarized in Table 1.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Employees with GERD (n = 541)</th>
<th>Employees without GERD (n = 26 775)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age, years (at index date)</td>
<td>40.3</td>
<td>37.8</td>
</tr>
<tr>
<td>Mean tenure, years (at index date)</td>
<td>9.5</td>
<td>8.3</td>
</tr>
<tr>
<td>Women, %</td>
<td>24.8</td>
<td>21.9</td>
</tr>
<tr>
<td>Married, %</td>
<td>64.5</td>
<td>59.6</td>
</tr>
<tr>
<td>Race, %</td>
<td>77.3</td>
<td>64.2</td>
</tr>
<tr>
<td>White</td>
<td>15.3</td>
<td>21.4</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5.7</td>
<td>11.5</td>
</tr>
<tr>
<td>Full-time employment, %</td>
<td>76.9</td>
<td>73.2</td>
</tr>
<tr>
<td>Mean annual salary, $US</td>
<td>34 001</td>
<td>33 512</td>
</tr>
<tr>
<td>Mean Charlson Comorbidity Index</td>
<td>0.19</td>
<td>0.09</td>
</tr>
</tbody>
</table>

- Productivity was measured in terms of units processed per hour worked using real, day-to-day, person-level work output data collected electronically by their employers.
- At-work productivity was analyzed per hour (hourly productivity) and for a 12-month period (annual productivity):
  - hourly productivity was calculated by dividing the units processed during the given day by the actual hours worked that day
  - annual productivity was calculated from the number of units processed by each employee over the 12-month period following the employee’s index date.

- The observed annual at-work productivity loss was higher (6.0%) than the hourly loss (4.4%) because annual at-work productivity measurements also included absence from work.

Study strengths and limitations
- Main study strengths:
  - objective productivity measures have no recall or response bias that may be present in self-report results9
  - the models controlled for a broad array of differences between employees with and without GERD.
- Main study limitations:
  - employees studied work in specific task-oriented positions that may not necessarily be generalized to other populations
  - productivity measures only included a ‘quantity aspect’ in terms of units processed per time period, not a ‘quality aspect’ of the work performed.

REFERENCES