Evaluating the Economic Burden of Psoriasis in the United States

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(Please see authors’ affiliations on the last panel)

Background

• Approximately 3.2% of the United States (U.S.) population are affected by psoriasis,¹ and about 25% of them suffer from moderate-to-severe psoriasis.²

• Psoriasis leads to direct medical costs and indirect costs due to factors such as leave of absence, lower productivity, disability, discrimination, and impaired quality of life.³,⁴,⁵

• Although some of these cost components have been studied, the total social and economic burden of psoriasis in the U.S. has yet to be fully aggregated and quantified.⁶
Study Objectives: To estimate the total economic burden of psoriasis in the U.S.

Study Design: A systematic literature review with a final data aggregation step to calculate a national-level, comprehensive burden estimate.

Study Flow Diagram

Citations collected from broad database searches
N = 3,737

Unique titles screened
N = 3,692

Abstracts screened
N = 1,541

Full-text screen
N = 321

Included
N = 91

Excluded studies
N = 45
- Duplicate citations (100%)

N = 2,151
- Not relevant to study objectives (100%)

N = 1,220
- Does not contain outcomes of interests (47%)
- Is not an original research study (36%)c
- Was not conducted in the U.S. (24%)d
- Does not involve psoriasis/psoriatic arthritis patients (2%)
- Clinical trial or RCT (<1%)
- Was published before 2003 (<1%)

N = 230
- Not conducted in the U.S. (80%)d
- Not an original research study (20%)c
- Does not contain outcomes of interests (6%)

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a PubMed yield = 3,663; Cochrane yield = 74
b Percentages are calculated using excluded studies in each level as the denominator
c Systematic reviews flagged for hand-screening citations: 58 in the abstract screen; 3 in the full-text screen
d Non-U.S. studies flagged for investigation if necessary: 261 in the abstract screen; 166 in the full-text screen
Data and Methods

Data: Estimates for prevalence, incremental medical costs, productivity loss, and reductions in health-related quality of life (HRQoL) associated with U.S. psoriasis patients were extracted from peer-reviewed journal articles published from January 2003 to June 2013.

Overview of Methods:

- **2013 prevalence estimate:** Calculated based on the most recent representative prevalence (2001) and incidence (1999) rates published. Annual prevalence cases for 2001-2013 were sequentially estimated by adding incidence cases to prior year prevalence and subtracting annual number of deaths in the psoriasis population based on U.S. mortality rates.

- **Incremental costs:** Calculated using estimates from studies that compared medical costs of a psoriasis group with a control group. All per patient per year costs were adjusted to 2013 dollars and the total costs were calculated using the estimated prevalence rate.

- **Productivity loss:** Estimated by summing estimates of presenteeism, absenteeism, and unemployment related costs. Presenteeism was measured using mean output demand scale (a scale from 0%-100% validated with actual productivity loss data) from the Work Limitations Questionnaire instrument. Absenteeism was measured using number of workdays missed due to poor health or doctor visits, and unemployment cost was measured by combining the estimate of unemployed psoriasis patients (ages ≥ 18) with average U.S. annual income.

- **Reductions in HRQoL:** Calculated using studies with Short Form Health Survey 12 scores for a psoriasis group and a control group and mapping the scores to a quality-adjusted life year (QALY) dollar value of $40,000.
Psoriasis Was Estimated to Affect Over Seven Million Americans in 2013

<table>
<thead>
<tr>
<th>Population</th>
<th>Prevalence cases (% of total U.S. population)</th>
<th>% of total psoriasis population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total U.S. population</td>
<td>242,556,624 (100.00%)</td>
<td>--</td>
</tr>
<tr>
<td>Total psoriasis cases</td>
<td>7,372,990 (3.04%)</td>
<td>100.00%</td>
</tr>
<tr>
<td><strong>Psoriasis by severity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>6,139,489 (2.53%)</td>
<td>83.27%</td>
</tr>
<tr>
<td>Moderate</td>
<td>842,733 (0.35%)</td>
<td>11.43%</td>
</tr>
<tr>
<td>Severe</td>
<td>390,768 (0.16%)</td>
<td>5.30%</td>
</tr>
<tr>
<td><strong>Psoriasis by gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>3,584,010 (1.48%)</td>
<td>48.61%</td>
</tr>
<tr>
<td>Female</td>
<td>3,788,980 (1.56%)</td>
<td>51.39%</td>
</tr>
<tr>
<td><strong>Psoriasis by race/ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>6,487,816 (2.67%)</td>
<td>87.99%</td>
</tr>
<tr>
<td>Non-white</td>
<td>885,174 (0.36%)</td>
<td>12.00%</td>
</tr>
</tbody>
</table>

*Based on the prevalence rate reported by Stern et al (2004), and incidence growth and incidence rates reported by Icen et al (2009). The average mortality rate was calculated from the mortality data for 2004-2011 from CDC FASTSTATS death and mortality.\(^9\)\(^{11}\)

\(^b\)The population estimate for 2013 is from the Census population clock accessed on November 5, 2013.\(^{12}\)
Annual Economic Burden of Psoriasis in the U.S. Was Estimated at $47.2 Billion in 2013

<table>
<thead>
<tr>
<th>Annual economic burden estimate based on 2013 psoriasis population</th>
<th>Per patient burden ($/patient/year)</th>
<th>Total U.S. burden ($billions/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total medical costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total healthcare costs from payer</td>
<td>1,757</td>
<td>12.9</td>
</tr>
<tr>
<td>Total out-of-pocket costs</td>
<td>527</td>
<td>3.9</td>
</tr>
<tr>
<td><strong>Total medical costs</strong></td>
<td>2,284</td>
<td>16.8</td>
</tr>
<tr>
<td><strong>Quality of Life</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental health &amp; physical health</td>
<td>2,203</td>
<td>16.2</td>
</tr>
<tr>
<td><strong>Productivity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presenteeism</td>
<td>728</td>
<td>5.3</td>
</tr>
<tr>
<td>Absenteeism</td>
<td>463</td>
<td>3.4</td>
</tr>
<tr>
<td>Unemployment</td>
<td>743</td>
<td>5.5</td>
</tr>
<tr>
<td><strong>Total productivity costs</strong></td>
<td>1,935</td>
<td>14.2</td>
</tr>
<tr>
<td><strong>Total psoriasis burden</strong></td>
<td><strong>6,422</strong></td>
<td><strong>47.2</strong></td>
</tr>
</tbody>
</table>

*a All costs were adjusted to 2013 dollars based on medical-related consumer price index from the BLS. Healthcare cost reflects incremental cost of psoriasis patients compared with patients without psoriasis.

*b Costs related to quality of life were estimated using a quality adjusted life year (QALY) value of $40,000 and QALY utility weights from Sullivan and Ghushchyan (2006).

*c Estimated costs were from Allen, Bunn and Naim (2012), and the methodology was adapted from Schmitt and Ford (2006).

*d Estimated costs were based on Ciocon, Horn, and Kimball (2008) and Pearce et al (2006).
Conclusions

- A total of 7.4 million people were estimated to be living with psoriasis in the U.S. in 2013.

- A total burden of psoriasis was estimated to be $47.2 billion annually, including both direct and indirect costs.

- Direct healthcare costs totaled $16.8 billion, while indirect costs resulting from reduced quality of life and loss of productivity was $30.4 billion. Compared with other chronic diseases such as diabetes, a larger proportion (approximately two-thirds) of the total burden of psoriasis was due to either reduced productivity or diminished quality of life.
References


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Disclosures: Y. Zhao, Novartis Pharmaceuticals Corporation; J. Lu, was a fellow of Novartis Pharmaceuticals Corporation when the study was conducted.