Getting To Know The Super-user: Experience From A Large Urban Hospital System

Arima Chesnokova, MPH; 3; Kallool Mahata, MS; 3; Li Gai, MSBA; 2; David Buck, MD MPH; 3

* Baylor College of Medicine, 3 Patient Care Intervention Center

Summary of findings

- A large proportion of super-users utilize at high rates over prolonged periods of time.
- Super-users are often atypical of non-super-user ER and hospital patients.
- Neighborhood factors may play a role in super-utilization for this cohort of patients.
- We recommend including factors that determine the complexity to identify high-risk cohorts.

Introduction

- We approach research practically.
- Questions are directed to impact selection of complex patient populations and the structure of population health decision making.
- Literature has failed to include the complexity of this population: frequency of visits, cost thresholds do not include the social and medical factors resulting in utilization.
- We describe risk and long-term use to identify needier patients and indicate the role of geographic location.

Longitudinal look at Super Users

Background

- There is a paucity of longitudinal data describing behavior of frequent users outside of a year (typically) during which high utilization is documented.
- All literature focuses on frequent users of the ED.
- Studies suggest that only a small proportion of frequent users remain in the frequent use category.
- It is not clear how longitudinal utilization varies depending on definition of super-user.
- Patients who use outside of a discrete period should potentially be prioritized for intervention.
- We marked year 2014 as the index year and considered utilization in two flagging years – 2013 – 15 – to track before and after for patients fitting super-user criteria.
- We then compared super-users who used for more than one year against those who only used one year.

<table>
<thead>
<tr>
<th>Race (%):</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>69.1</td>
<td>68.3</td>
</tr>
<tr>
<td>White</td>
<td>26.9</td>
<td>26.7</td>
</tr>
<tr>
<td>Asian</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Other</td>
<td>1.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Table 1: Longitudinal behavior of Super Users (SUs), with SUs defined based on Camden Coalition derived definition (2013-2015). ǂ*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results

- There is a high proportion of SUs who have high rates of utilization before and after an index year.

Risk Factors for Super Utilization

Background

- Majority of literature that characterizes risk factors for SUs focuses on ED frequent users.
- For those users, several measures of utilization are consistently highlighted in primary research.
- They are more likely to:
  - suffer from mental health conditions and substance abuse disorders.
  - be insured by Medicaid.
  - be poor.
  - have a bimodal age distribution peak in the group aged 25-44 years and older than 65 years.
- It is not clear whether these risk factors apply when considering a more complex population and to what extent chronic, mental health, and substance abuse condition when considered together.
- We looked at a single cross-sectional year to arrive at a sample of super-users using our intervention-based definition (use thresholds) and a comparator group of patients with at least one ER visit.
- We compared them across a host of individual characteristics chosen based prior literature and our experience both in bivariate comparisons and using logistic regression.

Table 2: Risk factors for long-term SUs compared to single-year SUs – bivariate comparisons and logistic regression results (2013-2015).

- Applying stringent criteria allows for the selection of the most vulnerable and needy patients.
- A high proportion of SUs have high rates of utilization before and after an index year.

Lessons learned and next steps

- SUs differ dramatically from non-SUs. The burden of chronic disease, mental health conditions, and substance abuse among SUs is astounding.
- Those few healthcare systems that utilize stringent criteria select the most vulnerable and needy patients.
- We highlight the medical aspects of super-use, but important social factors remain to be studied.
- We observe that all insurance types are protective against super-use when compared to Medicaid, but few other processes of social impacts are available.
- Interaction between chronic conditions, mental health and substance abuse disorders, and social factors should be studied.

Contact

Arima Chesnokova
Population Health Fellow at Patient Care Intervention Center (PIC)
Email: ac369@bcm.edu
Phone: (713) 798-3562
Website: www.piccs.org

References

- The study was approved by the Baylor College of Medicine Institutional Review Board.
- Unless otherwise noted, we used the following statistical analyses and ArcGIS® for Desktop (2) at least 2 chronic conditions, both of which have at least one ER visit during that year estimates for 2014 were obtained from data provided by Baylor College of Medicine and urban hospital system that covers 3 counties.
- Population of interest was defined based on the index year (mean, SD).
- Neighborhood poverty rate and race were included in the models to control for cross-sectional neighborhood factors that may influence utilization, while a measure like density of these facilities is not controlled for.
- A high proportion of SUs has high rates of utilization before and after an index year.
- We found that all insurance types are protective against super-use when compared to Medicaid.
- We hypothesized that neighborhood would have a significant effect on super-utilization. We did not find this to be the case.

Geographic context of Super Users

- There have been few reports documenting the relationship between geographic factors and super-utilization.
- Existing reports focus on availability of resources – hospital-based versus outpatient – and whether it predicts unnecessary use of the emergency department.
- Here we look more broadly at whether socioeconomic and diversity indicators have an effect on super-use. Furthering our knowledge on the discriminatory predictions of super-utilization would allow us to target the phenomenon in a neighborhood-level.
- Houston is diverse, yet highly segregated along socioeconomic lines. We hypothesized that measures of disparity and lower SES would positively predict super-use, while a measure like density of foreign-born individuals would be protective against super-use consistent with prior reports and are not widely attended in our geographic area.

Results

- We observed that all insurance types are protective against super-use when compared to Medicaid, but few other processes of social impacts are available.
- Interaction between chronic conditions, mental health and substance abuse disorders, and social factors should be studied.

Table 4: Comparing super-users to non-super-users in cross-section on neighborhood characteristics – results of bivariate comparisons and multilevel modeling (2015). ǂ*|

- Neighborhood factors are significant predictors of SU in a neighborhood of complex patients for intervention and subsequently build a multi-level logistic regression to see whether neighborhood-level factors would predict super-utilization.

- Results

- We observed that all insurance types are protective against super-use when compared to Medicaid, but few other processes of social impacts are available.
- Interaction between chronic conditions, mental health and substance abuse disorders, and social factors should be studied.

Table 4: Comparing super-users to non-super-users in cross-section on neighborhood characteristics – results of bivariate comparisons and multilevel modeling (2015). ǂ*|