Measuring Preventable Hospitalizations for Diabetes Using AHRQ’s Prevention Quality Indicators and OSHPD Data

Christopher Krawczyk, PhD
Chief Analytics Officer
I. Overview of Current OSHPD Healthcare Data and Reporting

II. OSHPD Record-Level Data

III. AHRQ and the Quality Indicator Modules

IV. Prevention Quality Indicators (PQIs)

V. PQI Diabetes Measures

VI. Graphs/Visuals from the Diabetes Analyses
    Statewide & County (Alameda, Los Angeles, Sacramento, San Francisco, Santa Clara)
Current OSHPD Healthcare Data and Reporting

- **OSHPD collects data** from approximately 8,000 California licensed health facilities
- **OSHPD provides over 150 publicly available** reports, datasets, outcome and performance ratings, and unique special studies such as analyses on severe sepsis hospitalizations, diabetes, and cancer surgery volume
- **Risk-adjusted data** includes hospital outcome ratings for heart surgery, stroke, readmissions, hip fractures, and other procedures, as well as surgeon-level outcomes for coronary artery bypass grafts
- **Cost transparency data** includes hospital and long-term care facility financials, hospital Chargemasters, and prescription drug costs
- **Additional publicly released studies** are available on timely health topics such as preventable hospitalizations, strokes, utilization trends, and disparities
Current OSHPD Data – Audience & Use Cases

*OSHPD datasets are available on the California Health and Human Services Open Data Portal: [https://data.chhs.ca.gov/](https://data.chhs.ca.gov/)
# Patient Utilization Data

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Frequency</th>
<th>Hospital</th>
<th>Clinic</th>
<th>Records per Year</th>
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<tbody>
<tr>
<td>Inpatient Discharges – Health and Safety (H&amp;S) Code §127735</td>
<td>Semi-Annual</td>
<td>445</td>
<td></td>
<td>3.8 million</td>
</tr>
<tr>
<td>Ambulatory Surgery Visits – H&amp;S Code §128737</td>
<td>Quarterly</td>
<td>358</td>
<td></td>
<td>2.1 million</td>
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<tr>
<td>Emergency Department Visits – H&amp;S Code §128736</td>
<td>Quarterly</td>
<td>315</td>
<td></td>
<td>12.7 million</td>
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<tr>
<td>&quot;Freestanding&quot; Ambulatory Surgical Clinics – H&amp;S Code §128737*</td>
<td>Quarterly</td>
<td></td>
<td>33</td>
<td>94,000</td>
</tr>
<tr>
<td>Coronary Artery Bypass Graft Surgery – H&amp;S Code §128745</td>
<td>Semi-Annual</td>
<td>124</td>
<td></td>
<td>~20,000</td>
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<tr>
<td>Elective Percutaneous Coronary Intervention – H&amp;S Code §1256.01</td>
<td>Quarterly</td>
<td>11</td>
<td></td>
<td>~2,800</td>
</tr>
</tbody>
</table>

*Only ambulatory surgery centers operating under a hospital license are required to report data to OSHPD. 2007 Capan v. Shewry court decision greatly reduced the number of outpatient facilities required to report to OSHPD.
Patient Discharge Data ("Inpatient")

• All non-federal, California licensed hospitals in the state
  - A record for each inpatient discharge from a California-licensed hospital
  - Licensed hospitals include general acute care, acute psychiatric, chemical dependency recovery, and psychiatric health facilities

• Demographic, diagnostic, and utilization data
  - ICD-10-PCS and ICD-10-CM
  - 25 diagnosis fields; 21 procedure fields

• Collected since 1982; most current is 2020
OSHPD Administrative Data - Patient Discharge Data Elements

1. Demographic Data
   - Date of Birth
   - Ethnicity
   - Preferred Language Spoken
   - Race
   - Sex
   - ZIP Code

2. Procedural Data
   - Principal Procedure (ICD-10-PCS)
   - Other Procedures (ICD-10-PCS) – up to 24
   - External Cause of Morbidity
   - Major Diagnostic Code

3. Encounter Data
   - Principal Diagnosis (ICD-10-CM)
   - Other Diagnosis (ICD-10-CM) – up to 24
   - Patient Disposition
   - Expected Source of Payment
   - Total Charges
   - Service Date
Emergency Department Data

• All non-federal, California licensed hospitals in the state

• Demographic, diagnostic, and utilization data

• Patient level data regarding patients who had face-to-face contact with a provider at hospitals licensed to provide emergency medical services

• ED encounters that lead to admission are captured in the PDD (Inpatient) data

• Collected since 2005; most recent 2020
Ambulatory Surgery Data

- State-licensed surgical clinics
  - General acute care hospitals
  - Licensed freestanding Ambulatory Surgery Centers
  - Does not include office-based clinics operating under a physician’s license

- Demographic, diagnostic, and utilization data

- Collected since 2005; most recent is 2020
<table>
<thead>
<tr>
<th>Data Type</th>
<th>Frequency Submitted</th>
<th>Hospital</th>
<th>Long Term Care</th>
<th>Clinic</th>
<th>Home</th>
<th>Total</th>
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<tr>
<td><strong>Utilization Reports</strong></td>
<td>Annual</td>
<td>503</td>
<td>1,375</td>
<td>1,449</td>
<td>710</td>
<td>3,685</td>
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<td><strong>Financial Disclosure Reports (Detailed)</strong></td>
<td>Annual</td>
<td>445</td>
<td>1,375</td>
<td></td>
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<td><strong>Utilization-Financial Reports (Summary)</strong></td>
<td>Quarterly</td>
<td>445</td>
<td></td>
<td></td>
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<td></td>
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## Cost Transparency Data

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<thead>
<tr>
<th>Data Type</th>
<th>Frequency Submitted</th>
<th>Hospitals Submitting</th>
<th>Drug Products Received</th>
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<tbody>
<tr>
<td>25 Common Out-Patient Procedures – H&amp;S Code §1339.56</td>
<td>Annual</td>
<td>406</td>
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<td>Chargemasters – H&amp;S Code §1339.51</td>
<td>Annual</td>
<td>406</td>
<td></td>
</tr>
<tr>
<td>Fair Pricing Policies and Patient Applications – H&amp;S Code §127400</td>
<td>Biennial</td>
<td>406</td>
<td></td>
</tr>
<tr>
<td>Community Benefit Plans* – H&amp;S Code §127340</td>
<td>Annual</td>
<td>228</td>
<td></td>
</tr>
<tr>
<td>Prescription Drugs Introduced to Market – H&amp;S Code §127681</td>
<td>As introduced</td>
<td>631</td>
<td></td>
</tr>
<tr>
<td>Prescription Drug Wholesale Acquisition Cost – H&amp;S Code §127679</td>
<td>Quarterly</td>
<td>2,581</td>
<td></td>
</tr>
</tbody>
</table>

*Non-profit hospitals; exempts rural hospitals
What will the Healthcare Payments Data Program Do?

**Health Plans expected to submit:**
- Fully-insured commercial plans
- Medicare advantage plans

*Note: DHCS will submit the Medi-Cal data they already receive from health plans*

**Data that will be collected:**
- Claims data
- Encounter data
- Member enrollment
- Provider registry data
- Non-claims payments data

**How data will be used:**
- Inform healthcare policy decisions
- Support improved health care cost and quality
- Develop innovative approaches to the delivery of health care
Current OSHPD Analytical Capabilities

Performance Reports for specific topics and procedures

- Performance ratings by hospital for procedures including Coronary Artery Bypass Grafts (CABG) and elective Percutaneous Coronary Interventions (Elective PCIs)

Coronary Artery Bypass Graft Performance Ratings

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Performance Measure</th>
<th>Year</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adventist Health Bakersfield</td>
<td>CABG+Valve Operative Mortality</td>
<td>2016-2017</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Isolated CABG Operative Mortality</td>
<td>2017</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Isolated CABG Post-Operative Stroke</td>
<td>2016-2017</td>
<td>167</td>
</tr>
<tr>
<td>Adventist Health Glendale</td>
<td>CABG+Valve Operative Mortality</td>
<td>2016-2017</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Isolated CABG Operative Mortality</td>
<td>2017</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td>Isolated CABG Post-Operative Stroke</td>
<td>2016-2017</td>
<td>249</td>
</tr>
<tr>
<td>Adventist Health St. Helena</td>
<td>CABG+Valve Operative Mortality</td>
<td>2016-2017</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Isolated CABG Operative Mortality</td>
<td>2017</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>Isolated CABG Post-Operative Stroke</td>
<td>2016-2017</td>
<td>158</td>
</tr>
</tbody>
</table>

Elective Percutaneous Coronary Intervention (PCI) Program Report

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Year</th>
<th>Performance Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>CABG+Valve Operative Mortality</td>
<td>2017-2018</td>
<td>Average 11</td>
</tr>
<tr>
<td>Isolated CABG 30-Day Readmission</td>
<td>2017-2018</td>
<td>Average 113</td>
</tr>
<tr>
<td>Isolated CABG Operative Mortality</td>
<td>2018</td>
<td>Average 65</td>
</tr>
<tr>
<td>Isolated CABG Post-Operative Stroke</td>
<td>2017-2018</td>
<td>Average 123</td>
</tr>
<tr>
<td>CABG+Valve Operative Mortality</td>
<td>2017-2018</td>
<td>Average 12</td>
</tr>
<tr>
<td>Isolated CABG 30-Day Readmission</td>
<td>2017-2018</td>
<td>Average 111</td>
</tr>
<tr>
<td>Isolated CABG Operative Mortality</td>
<td>2018</td>
<td>Average 64</td>
</tr>
</tbody>
</table>
Current OSHPD Analytical Capabilities (continued)

Complex Data Products & Analyses
- In-depth analyses that may integrate data from multiple sources
- Geospatial analysis based on county and medically underserved area mapping
- Hospital financial pivots

Severe Sepsis-Patient Information on in-hospital and 30-day mortality

Hospital Financial data-total assets by year and category by counties, cities, or facilities

Severe Sepsis-Hospital Characteristics ratings of hospitals for different facility size
Utilization Trends and COVID-19

Note: Data is preliminary as of May 2021. The number of encounters is all recorded health care encounters for a specific health category. Individual patients may be counted in more than one category if they were diagnosed with multiple types of health categories during a single encounter (e.g., a person who was homeless and had diabetes would be counted in both homelessness and diabetes categories).
Open Data

- All public datasets are available on the CHHS Open Data Portal, integrated with the OSHPD website
- Over 100 public datasets are available in open, machine-readable, and API-enabled formats with comprehensive metadata
AHRQ and the Quality Indicators
Who is AHRQ?

• AHRQ = Agency for Healthcare Research and Quality

• AHRQ is the lead Federal agency charged with improving the safety and quality of America’s health care system

• AHRQ develops the knowledge, tools, and data needed to improve the health care system and help Americans, health care professionals, and policymakers make informed health decisions
What are AHRQ Quality Indicators?

• AHRQ Quality Indicators (QIs), use hospital inpatient administrative data to measure health care quality, identify areas for further study, and track changes over time

• AHRQ Quality Indicators are standardized, evidence-based measures of health care quality that can be used with readily available hospital administrative data to measure and track clinical performance and outcomes
What are the (4) AHRQ QI Modules?

1) **Inpatient Quality Indicators (IQIs)** – include mortality indicators and utilization indicators for key procedures to help hospitals identify potential problem areas that might need further study, as well as for quality improvement and trending initiatives
   Examples-(Mortality) Acute Myocardial Infarction, Acute Stroke, Heart Failure
   Examples-(Utilization) Cesarean Delivery Rate, Vaginal Birth after Cesarean (VBAC) Delivery Rate

2) **Patient Safety Indicators (PSIs)** – reflect potentially avoidable safety events that represent opportunities for improvement in the delivery of care
   Examples: Pressure Ulcer Rate, Post-Operative Sepsis Rate, Central Venous Catheter-related Blood Stream Infection Rate
What are the (4) AHRQ QI Modules?

3) **Pediatric Quality Indicators (PDIs)** – specifically tailored to reflect the special characteristics of the pediatric population, including neonates, and can be used to identify potential quality and patient safety issues specific to the pediatric inpatient population.
   Examples: Asthma, Diabetes Short-term Complications, Accidental Puncture or Laceration Rate

4) **Prevention Quality Indicators (PQIs)** – area-level indicators that calculate admissions that might have been avoided through access to high-quality outpatient care (i.e. preventable hospitalizations) and are a key tool for community health needs assessments.
   Examples: COPD/Asthma, Diabetes, Urinary Tract Infection
What are the Prevention Quality Indicators (PQIs) and what do they measure?

- The Prevention Quality Indicators (PQIs) identify issues of access to outpatient care, including appropriate follow-up care after hospital discharge.

- The PQIs use data from hospital discharges to identify admissions that might have been avoided through access to high-quality outpatient care.

- The PQIs are population-based indicators that capture all cases of the potentially preventable complications that occur in a given population (in a community or region) either during a hospitalization or in a subsequent hospitalization.

- The PQIs are a key tool for community health needs assessments.

- Greater access to care = fewer hospitalizations (i.e., lower hospitalization rate).
What measures are included in the PQIs and PQI Composites?

- **PQI Acute Conditions ==> PQI Acute Composite**
  - Community-Acquired Pneumonia
  - Urinary Tract Infection
- **PQI Chronic Conditions ==> PQI Chronic Composite**
  - COPD or Asthma in Older Adults (Ages 40 and over)
  - Hypertension
  - Heart Failure
  - Asthma in Younger Adults (Ages 18-39)
  - Diabetes conditions (below)
- **PQI Overall Composite (includes Acute + Chronic conditions)**
- **PQI Diabetes Conditions (includes Type 1 and Type 2) ==> PQI Diabetes Composite**
  - **Diabetes Short-term Complications** – diabetes w/ ketoacidosis, hypersmolarity, coma
  - **Diabetes Long-term Complications** – diabetes w/ renal, eye, neurological, circulatory, etc
  - **Uncontrolled Diabetes** - diabetes w/o mention of short-term or long-term complications
  - **Lower-Extremity Amputation among Patients with Diabetes** - diabetes w/ a procedure of lower-extremity amputation (except toe); e.g., removal of leg or foot
Which Counties May Have Greater Unmet Diabetes Outpatient Needs?
Hospitalization rates per 100,000 population

- Alameda County
  - Risk-Adjusted Rate: 182.9
  - Statewide Risk-Adjusted Rate: 202.2
  - County Discharges: 1,889

- Los Angeles County
  - Risk-Adjusted Rate: 209.6
  - Statewide Risk-Adjusted Rate: 202.2
  - County Discharges: 16,572

- Sacramento County
  - Risk-Adjusted Rate: 213.4
  - Statewide Risk-Adjusted Rate: 202.2
  - County Discharges: 2,561

- San Francisco County
  - Risk-Adjusted Rate: 143.5
  - Statewide Risk-Adjusted Rate: 202.2
  - County Discharges: 841

- Santa Clara County
  - Risk-Adjusted Rate: 193.6
  - Statewide Risk-Adjusted Rate: 202.2
  - County Discharges: 1,928
OSHPD Diabetes Hospitalizations Visualization #2 – Individual Diabetes Indicators

- How do Individual Diabetes Indicators Compare Among Counties?
- May be able to help determine the focus of diabetes intervention(s) needed in each county
- Hospitalization rates per 100,000 population

### Risk-Adjusted Rates for Diabetes-Related PQIs Statewide and by County (2019)

<table>
<thead>
<tr>
<th></th>
<th>Diabetes Composite (PQI #93)</th>
<th>Diabetes Short-term Complications (PQI #1)</th>
<th>Diabetes Long-term Complications (PQI #5)</th>
<th>Uncontrolled Diabetes (PQI #14)</th>
<th>Lower-Extremity Amputation among Patients with Diabetes (PQI #16)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STATEWIDE</strong></td>
<td>202.2</td>
<td>60.9</td>
<td>97.1</td>
<td>30.5</td>
<td>29.6</td>
</tr>
<tr>
<td>Alameda</td>
<td>182.9</td>
<td>53.1</td>
<td>83.2</td>
<td>32.8</td>
<td>28.2</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>209.6</td>
<td>55.9</td>
<td>105.8</td>
<td>36.1</td>
<td>26.8</td>
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<td>Sacramento</td>
<td>213.4</td>
<td>86.2</td>
<td>81.5</td>
<td>26.8</td>
<td>37.5</td>
</tr>
<tr>
<td>San Francisco</td>
<td>143.5</td>
<td>44.0</td>
<td>64.1</td>
<td>23.3</td>
<td>21.1</td>
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<td>Santa Clara</td>
<td>193.6</td>
<td>54.5</td>
<td>91.3</td>
<td>32.0</td>
<td>32.9</td>
</tr>
</tbody>
</table>
How have individual county's diabetes hospitalizations changed over time?
The changes in rates may be due to programmatic and policy interventions
Hospitalization rates per 100,000 population
The PQIs in Summary

The PQIs:

• Provide a good starting point for assessing quality of health services in the community

• Flag potential health care quality problem areas that need further investigation

• Provide a quick check on primary care access or outpatient services in a community

• Help organizations identify unmet needs in their communities
Additional Resources
Preventable Hospitalizations for Diabetes:
https://oshpd.ca.gov/visualizations/preventable-hospitalizations-for-diabetes/

Prevention Quality Indicator Data (Open Data Portal):
https://data.chhs.ca.gov/dataset/rates-of-preventable-hospitalizations-for-selected-medical-conditions-by-county

AHRQ Prevention Quality Indicators:
https://www.qualityindicators.ahrq.gov/Modules/pqi_resources.aspx#techspecs

AHRQ PQI Technical Specifications:
## Additional Contacts and Resources

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<tr>
<th>OSHPD Contact:</th>
<th><a href="mailto:dataandreports@oshpd.ca.gov">dataandreports@oshpd.ca.gov</a></th>
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<td><a href="https://oshpd.ca.gov/data-and-reports/topics/">https://oshpd.ca.gov/data-and-reports/topics/</a></td>
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<tr>
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<td>I have questions or would like more information on the Healthcare Payments Data Program.</td>
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