The Healthcare Cost and Utilization Project (HCUP)

Federal Administrative Data To Understand Healthcare Issues

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Today’s Presentation

- Two Major Data Collection Efforts at AHRQ
  - Medical Expenditure Panel Surveys (MEPS)
  - Healthcare Cost and Utilization Project (HCUP)

- Overview of HCUP

- Specific example of use of HCUP data to contribute to policy discussions
  - Cost implications of Massachusetts Health Reform
HCUP is the largest collection of multi-year, all-payer data.

Includes inpatient and selected outpatient data, based on the hospital billing record.

HCUP Databases
- SID
- SEDD
- SASD
- NEDS
- NIS
- KID

Research Tools

Research Publications

User Support
The HCUP Partnership
Current HCUP State Partners

Alaska State Hospital and Nursing Home Association
Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning & Development
Colorado Hospital Association
Connecticut Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Current HCUP State Partners

Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health and Hospitals
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Division of Health Care Finance and Policy
Michigan Health & Hospital Association
Minnesota Hospital Association
Mississippi Department of Health
Missouri Hospital Industry Data Institute
Montana Hospital Association
Nebraska Hospital Association
Current HCUP State Partners

Nevada Department of Health and Human Services
New Hampshire Department of Health & Human Services
New Jersey Department of Health
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota Minnesota Hospital Association
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems, Health Policy and Research
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina Budget & Control Board
South Dakota Association of Health Care Organizations
Current HCUP State Partners

- **Tennessee** Hospital Association
- **Texas** Department of State Health Services
- **Utah** Department of Health
- **Vermont** Association of Hospitals and Health Systems
- **Virginia** Health Information
- **Washington** State Department of Health
- **West Virginia** Health Care Authority
- **Wisconsin** Department of Health Services
- **Wyoming** Hospital Association

47 States and continuing to recruit additional States to the HCUP Partnership
Partnership:
HCUP Participation By State

Partners Providing Inpatient Data Only

Partners Providing Inpatient & Ambulatory Surgery Data

Partners Providing Inpatient, Ambulatory Surgery, & Emergency Department Data

Non-participating
The Foundation of HCUP Data is Hospital Billing Data

Demographic Data

Diagnoses

Procedures

Charges

UB-04 CMS 1500
The Making of HCUP Data

Patient enters hospital

Billing record created

AHRQ standardizes data to create uniform HCUP databases

States store data in varying formats

Hospital sends billing data and any additional data elements to data organizations
### HCUP State Databases

**State Inpatient Databases (SID)**

- All inpatient hospital discharge data (including those admissions that started in the ED) from participating HCUP States

**State Ambulatory Surgery Databases (SASD)**

- Ambulatory surgery data (hospital based and some freestanding) from participating HCUP States

**State Emergency Dept. Databases (SEDD)**

- Emergency department data (treat and release only) from participating HCUP States
What Data Elements are included in the HCUP databases?

Data Elements:

- Patient demographics (age, sex)
- Diagnoses & procedures
- Expected payer
- Length of stay
- Patient disposition
- Admission source & type
- Admission month
- Weekend admission
Some Data Elements Vary by State

- Race/Ethnicity
- Patient county
- Patient ZIP Code
- Severity of illness
- Birthweight
- Procedure date (days from admission)
- Primary payer details
- Secondary payer
- Detailed charges
- Patient identifiers encrypted
- Physician identifiers encrypted
- Physician specialty
- Hospital identifier unencrypted
HCUP National Databases

- **Nationwide Inpatient Sample (NIS)**
  - Inpatient hospital discharge data from a *sample of hospitals* in SID

- **Kids’ Inpatient Database (KID)**
  - Pediatric inpatient hospital discharge data from a *sample of pediatric discharges* in SID

- **Nationwide Emerg. Dept. Sample (NEDS)**
  - Emergency department data (treat and release & admitted) from a *sample of hospitals* in SID and SEDD
Linking to Other Databases

HCUP Databases

- SID
- SEDD
- SASD
- NEDS
- NIS
- KID

- American Hospital Association (AHA) Annual Survey
- Health Resources and Services Administration’s (HRSA) Area Resource File (ARF)
- Zip Code Files from Census or Vendor
- Medicare Cost Reports
- Trauma Information Exchange Program (TIEP)
Summary

- Six types of HCUP databases
- Databases are based on administrative hospital data: inpatient, ED, ambulatory surgery
- Available for multiple years
  - National
    - NIS (1988-2011)
    - NEDS (2006-2010)
  - State
    - SID (1990-2011)
    - SASD (1997-2011)
    - SEDD (1999-2011)
- Can look at breadth of health care issues
- Can be linked to external files
Purpose of the Course:

- Emphasize the importance of data protection
- Reduce the risk of inadvertent violations
- Describe your individual responsibility when using HCUP data

Requirement:

Electronic Data Use Agreement (DUA) Course

Takes 15 minutes to Complete

www.hcup-us.ahrq.gov/tech_assist/dua.jsp
Pricing Information per Data Year

Nationwide Databases (NIS, KID, NEDS)

- **NIS**: $350 (CY 2010-2011; student price $50)
  $160-200 (earlier years; student price $20)
- **KID**: $350 (CY 2009; student price $50)
  $200 (earlier years; student price $20)
- **NEDS**: $500 (student price $75)

State Databases (SID, SASD, SEDD) – must be purchased

- Owned by state-level data organizations
- Access and costs varies by state
- $35 - $3,185

All funds returned to state partners

National data free to gov’t agencies
Value-added clinical and quality measurement tools

- Clinical Classifications Software
- Procedure Classes
- Chronic Condition Indicator
- Comorbidity Software
- Utilization Flags
- AHRQ Quality Indicators
  - Prevention Quality Indicators
  - Inpatient Quality Indicators
  - Patient Safety Indicators
  - Pediatric Quality Indicators
Supplemental files to enhance HCUP data

- Readmission/Revisit Files
- Cost-to-Charge Ratio Files
- Hospital Market Structure Files
- Trends Files (NIS & KID)
- NIS Hospital Ownership File
- AHA Linkage Files
HCUP data elements for Readmissions/Revisits

- Used to track sequential visits for a patient
  - Within a state
  - Across hospitals, ED, and ambulatory surgery settings
- Adhere to strict privacy guidelines
- Allow linkage across settings and time
  - Hospital readmissions
  - ED visits following hospital discharge
  - Inpatient hospitalizations following ambulatory surgery visits
- Limited to HCUP state databases with encrypted patient identifiers
- HCUP revisit variables can be used only with the SID, SASD, and SEDD (not national databases)
Charges vs. Costs vs. Price

- **Charges**: What the hospital charged for care *(includes charge BEFORE discount)*
- **Costs**: What it cost the hospital to provide the care
- **Price (Payment)**: What the insurer/individual paid for the care

HCUP Databases include **CHARGE** information and **COST** information can be estimated using cost-to-charge ratios
Welcome to H·CUPnet

H·CUPnet is a free, online query system based on data from the Healthcare Cost and Utilization Project (HCUP). It provides access to health statistics and information on hospital inpatient and emergency department utilization.

Begin your query here -

Statistics on Hospital Stays

National Statistics on All Stays
Create your own statistics for national and regional estimates on hospital use for all patients from the HCUP Nationwide Inpatient Sample (NIS). Overview of the Nationwide Inpatient Sample (NIS)

National Statistics on Children
Create your own statistics for national estimates on use of hospitals by children (age 0-17 years) from the HCUP Kids' Inpatient Database (KID). Overview of the Kids' Inpatient Database (KID)

National Statistics on Mental Health Hospitalizations
Interested in acute care hospital stays for mental health and substance abuse? Create your own national statistics from the NIS.

National and State Statistics on Hospital Stays by Payer - Medicare, Medicaid, Private, Uninsured
Interested in hospital stays billed to a specific payer? Create your own statistics for a payer, alone or compared to other payers from the NIS, KID, and SID.

State Statistics on All Stays
Create your own statistics on stays in hospitals for participating States from the HCUP State Inpatient Databases (SID). Overview of the State Inpatient Databases (SID)

Quick National or State Statistics
Ready-to-use tables on commonly requested information from the HCUP Nationwide Inpatient Sample (NIS), the HCUP Kids' Inpatient Database (KID), or the HCUP State Inpatient Databases (SID).

http://hcup.ahrq.gov/hcup.net
Find detailed information on HCUP databases, tools, and products

Access HCUPnet

Find comprehensive list of HCUP-related publications, database reports, and fact books

Access technical assistance

http://www.hcup-us.ahrq.gov
Healthcare Cost and Utilization Project (HCUP)
Did Massachusetts Health Reform Lower Hospital Inpatient Cost?

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Zeynal Karaca, Ph.D.
Social & Scientific Systems, Inc.
Massachusetts healthcare reform bill enacted in April, 2006

- Provides near-universal coverage for all residents
- Protects against financial uncertainty due to medical bills
- Provides greater access to care

Existing studies

- Access to care, uninsured rate
- Few focus on utilization, total expenditures
  - Hypothesize to increase because of greater access
Simple Illustration:

\[ \text{Price or Cost/unit} \times \text{Quantity} = \text{Total Expenses} \]

Our study estimates the impact on the cost per unit
- Focus on hospital inpatient services

Panel data

Employ several methodological approaches
- Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) MA
  - AHRQ Database
  - Universe of inpatient visits in community hospitals in participating states
  - Data years 2005-2009

  - ARF: environmental factors
  - AHA: hospital characteristics
Analytic Approach

- Create panel data file
- Identify individuals using hospital inpatient services before and after reform
- Average monthly cost of inpatient visit for each individual
- Estimate the determinants average cost of inpatient visit
  - Focus on impact of Massachusetts Healthcare Reform
  - 3 models employed to assess robustness of findings
Empirical Model

\[ \log \text{COST}_{it} = \alpha + \beta \text{REFORM}_{it} + \lambda \text{TREND}_t + \theta \text{SWITCHER}_i + \Pi \text{DEMOGRAPHIC}_{it} \]


\[ + \Psi \text{RISK}_{dit} + \delta \text{COUNTY}_{cit} + \Omega \text{HOSPITAL}_{hit} + \xi_{it} \]

- \(\log \text{COST} = \log \text{avg. monthly cost per inpatient visit for individual}\)
- Reform = dummy variable for after reform
- Other controls: trend; individual switch primary payer; patient demographics; severity of inpatient visit; market factors; hospital characteristics
Empirical Strategy

- Empirical models estimated using:
  - Generalized linear model
  - Random effects panel model
  - Fixed effects panel model
## Estimated Effects of MA Health Reform

<table>
<thead>
<tr>
<th></th>
<th>Estimates (in range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health reform</td>
<td>[1.4 - 2.3] % decrease</td>
</tr>
<tr>
<td>Time trend</td>
<td>[3.6 - 4.1] % increase</td>
</tr>
<tr>
<td>N=</td>
<td>1,173,326</td>
</tr>
</tbody>
</table>

**Effects on hospital inpatient cost per visit**
Conclusions

- Number of hospital visits (discharges) in MA is trending upward, but trend …
  - May reflect population growth
  - Is modest
  - Is slower than U.S. average

- Average cost of inpatient visit similar in study population and all other individuals in MA

- MA reform decreases cost per inpatient visit after controlling for patient & hospital characteristics, severity, market factors
Conclusions (cont’d)

<table>
<thead>
<tr>
<th>Price / Cost per unit</th>
<th>Quantity</th>
<th>Total Expenses</th>
</tr>
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- Decrease in cost per inpatient visit may help offset or moderate possible increase in inpatient visits and total expenses due to increase in access.