
- a population-based health information system can guide planning and regulatory decision-making
- we are trying to regulate and evaluate the performance of healthcare institutions
- therefore we need data on the inputs and output of healthcare for different regions and areas
- so far we only have national and state-level data but don’t have data for smaller areas
- national data shows a lot of variation in the inputs and outputs of healthcare (e.g., in Canada, hospital utilization rates can be 50% higher than in the US)
- state-level data shows a lot of variation across states (e.g., Medicare expenditures per enrollee were twice as high in California as in Arkansas in 1970)
- data from Vermont shows that variation across towns can be as large as variation across states
- this article looks at variation in bed and manpower use, expenditures, and utilization across hospital service areas in Vermont

Concepts and Measures

- Vermont is a largely rural state with a population of 440,000 (1970)
- organized into 251 towns
- data:
– hospital discharges
– nursing home admissions
– Medicare reimbursements
– health manpower
– facilities
– expenditures and mortality

• grouped towns into hospital service areas based on the hospital used most frequently by the town
• analyze 13 areas with at least 5,000 residents
• measures of healthcare delivery like age-adjusted utilization rates and indices of manpower are computed
• some technical problems because people can be hospitalized outside their area of residence, especially for specialized services
• allocate hospital capacities to areas based on the percentage of patients that come from different areas
• measure physician effort in units of one full-time equivalent (FTE) physician

Variations among Service Areas

• resources per 10,000 persons
  – hospital beds: 34 to 59
  – hospital personnel: 68 to 128
  – nursing home beds: 9 to 65
  – nursing home employees: 8 to 52
  – physician effort: 8 to 12 FTE physicians, larger variations for specialties (1:2 for internists and general surgeons, 1:10 for pediatricians and obstetricians)

• expenditures per capita
  – hospital services: 1:2
  – nursing home services: 1:5
  – range of reimbursements for Medicare Part B among Vermont communities is larger than among the 50 states
  – Part B expenditures $54 to $162
- 400% variation for diagnostic x-ray reimbursements, 600% variation for ECG reimbursements, 700% variation for total laboratory services reimbursements

- utilization per 1,000 persons (age-adjusted)
  - hospital discharge rates: 122 to 197
  - hospital patient days: 1,015 to 1,495
  - nursing home admission rates: 1.3 to 10
  - respiratory conditions treated: 10 to 36
  - surgery rates: 36 to 69
  - tonsillectomy days: 1.7 to 31.4
  - appendectomy rates: 4.2 to 20.4
  - prostatectomy days: 6.5 to 52.4
  - hysterectomy days: 6.4 to 61.6
  - mastectomy days: 2.1 to 19.8

**Evaluation of Variations**

- there is uncertainty concerning the value of a given level of healthcare delivery
- this applies both in the aggregate and to specific procedures
- expenditures are not correlated with age-adjusted mortality
- the large spending variation and variation in the number of procedures is puzzling
- didn’t have data on the prevalence of disease
- physicians concentrate efforts in the more populous and wealthier service areas
- poor correspondence between physician input and population need
- both consumer and physician behavior are likely important in explaining the variation
- potential inequity issues both under Medicare and private insurance
Price Commission and Hill-Burton Decisions

- public regulation didn’t take into account variation in inputs
- agencies make the problematic assumption that demand constitutes need
- this lead to recommendations that would increase capacities where they are already the highest
- Hill-Burton and Price Commission decisions have increased variation in healthcare
- they will result in the delivery of additional services without evidence that they have value

Summary and Conclusions

- health information about total populations is important for decision-making and planning
- Vermont data reveals that there are wide variations in resource input, utilization of services, and expenditures among neighboring communities
- uncertainty about the effectiveness of aggregate and specific utilization
- we need to take this data into account for decision-making and planning