The Market for Hospital Beds:
Performance of Portland Versus Other Markets

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Executive Summary

The Market for Hospital Beds:
Performance of Portland Versus Other Markets

Randall Pozdena, PhD, Managing Director, ECONorthwest
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Background:

News stories in the metro area the past few years have suggested that perhaps more hospitals will be needed in the foreseeable future. The facts contradict this claim.

The adequacy of hospital bed capacity is central to public policy toward health care in Oregon in general, and the Portland metropolitan area specifically. If the market for health care services operated like the theoretical, competitive economic paradigm, one could rely on private decisions by providers in determining the appropriate supply of hospital beds. Consumers of health care services, in such a hypothetical model, would be paying for their care directly and the resulting consumer discipline on provider costs would ensure that the observed supply of beds was economically efficient. That is, consumer sovereignty would elicit the appropriate balancing of consumer benefits and provider costs.

In fact, however, in the post-war period, the mechanism changed by which consumers of health care services paid for the services. In general, the proliferation of employer- and government-provided health insurance made the consumer become less cost-conscious. Indeed, whereas in the immediate post-war period government was primarily concerned that there were too few hospital beds, in more recent years, government has become concerned about over-expansion of hospital capacity.

Methodology:

This report analyses the metro hospital service area (Clackamas, Clark, Multnomah, Washington, and Yamhill counties) from two empirical perspectives. First from the published actual current licensed beds, plus those currently under construction, and future known capacity of existing facilities versus the demand for hospital beds generated by population growth and aging through the year 2025, including a summary of current applicable Oregon Certificate of Need (CON) law. And secondly, as a comparison of Portland metro area hospital bed supply versus similar urban areas nationally to further test that current supply trends are within expected limits. Also included is a statistical analysis of the impact of the concentration of hospital ownership locally among a few large corporations and its affect on health care costs and Certificate of Need regulation. The findings of both analyses have broad implications for future public policy at the city, region, and state level as it relates to new hospital construction and abating rapidly rising health care costs.

Findings:

• All metro communities are presently served by multiple hospitals (see page 8).
• Existing hospitals have the capacity to meet all foreseeable future demand (see pages 6 & 7).
• The concentration of hospital ownership contributes to higher costs.
• Excess hospital beds lead to increased utilization and cost.
• CON is less effective in areas with large influential hospital systems.
• Expanding existing hospitals costs half that of building new ones.
• Hospital expansion tends towards communities with higher income/insurance rather than need.
Introduction

The adequacy of hospital bed capacity is central to public policy toward health care in Oregon in general and, Oregon's largest single market, the Portland metropolitan area specifically. If the market for health care services operated like the theoretical, competitive economic paradigm, one could rely on private decisions by providers in determining the appropriate supply of hospital beds. Consumers of health care services, in such a hypothetical model, would be paying for their care directly and the resulting consumer discipline on provider costs would ensure that the observed supply of beds was economically efficient. That is, consumer sovereignty would elicit the appropriate balancing of consumer benefits and provider costs.

In fact, however, in the post-war period, the mechanism changed by which consumers of health care services paid for the services. In general, the proliferation of employer- and government-provided health insurance made the consumer become less cost-conscious. Indeed, whereas in the immediate post-war period government was primarily concerned that there were too few hospital beds,1 in more recent years, government has become concerned about over-expansion of hospital capacity.

The passage of Medicare and Medicaid legislation in 1965 had a particularly dramatic effect on demand for hospital services and beds. Initially, the primary impact was on prices, with the per-day cost of a hospital stay doubling in less than five years. But this, in turn, stimulated supply and government attention rapidly shifted from a hospital bed supply shortage to concerns about rampant growth in unnecessary bed supply and utilization. In 1972 this concern resulted in the establishment of the Certificate of Need (CON) program in Oregon that reviewed every hospital project with capital costs over $100,000.

The purposes of this White Paper are threefold:

1. To review metro area current and future hospital bed demand, supply, and expansion capacity of existing hospitals.
2. To examine the behavior of the hospital bed supply market and the factors driving this market nationally and regionally.
3. To discuss any implications of these trends and relationships for Oregon CON policy.

Oregon Certificate of Need Policy

It was recognized early in the application of CON policy that CON procedures did not adequately control all spiraling health care expenditures. These expenditure increases threatened the solvency of the Medicare program. In 1983 the federal government responded by implementing a DRG-based fixed payment system (Diagnosis Related Group payment by case) for the Medicare program, which rapidly reduced hospital admissions and length of stay nationally by an estimated 30% decline in hospital days. Reduced utilization also occurred in Oregon and resulted in large surpluses in hospital beds on a statewide level.

In the mid 1980s the current hospital bed need methodology was adopted to assure that no new hospital or hospital bed expansion would occur within the state until existing hospitals within 50 miles of a proposed hospital expansion were operating at approximately 80% utilization. In metropolitan areas this was generally considered to be a moratorium on the expansion of licensed hospital bed capacity. This was not a major concern to the hospital industry or to other public policy makers because operational capacity was running far below licensed capacity.

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1. The Hospital Survey and Construction Act (Hill Burton Act) was passed in 1946 to assure that adequate hospital capacity was available for an industry hard hit by the depression and World War II. Since 1946, the Hill Burton program aided 6,800 health care facilities in over 4,000 communities to expand hospital bed capacity.
While hospital inpatient utilization declined in Oregon well into the 1990s, there was still concern about rising healthcare costs and the Certificate of Need program remained in effect. In the mid-’90s, the Oregon Certificate of Need program was modified, eliminating all bed expansion or equipment projects for existing hospitals and leaving only the establishment of new hospitals subject to Certificate of Need regulation.

The first decade of the 21st century is ushering in new trends in hospitalization. The “baby boom” population that started the federal government’s participation in expanding hospital bed capacity and then regulating bed capacity is now aging and needing progressively more hospital care. In addition the Portland metropolitan area is still experiencing rapid population growth due both to in-migration and births. In recent years some Portland area healthcare representatives have raised concerns about future hospital bed supply needs and whether the existing hospitals in the community can meet that need.

**Oregon’s Certificate of Need Methodology**

The Oregon Certificate of Need program has adopted a hospital bed need methodology that has remained unchallenged for nearly two decades. This methodology is a useful starting point for evaluating future demand for hospital services through 2020 and beyond and its implications for the Portland metro area.

The Oregon CON methodology includes the following analytic elements:

- Office of Economic Analysis population forecasts, 10-year forecasts forward from the date of an application for 0 to 14, 15 to 44, 45 to 64, and 65 and older age cohorts.
- Past hospital utilization by county by age group for the previous 10 years for 0 to 14, 15 to 44, 45 to 64, and 65 and older age cohorts.
- Most recent statewide patient origin analysis for the hospital planning area to determine net inflow or net outflow from hospitals to hospitals located within the metropolitan area.
- Occupancy set by formula based on the average daily census versus licensed beds of each hospital within 50 miles of the proposed hospital site.

As previously noted, Certificate of Need regulations require new hospital developers to first consider using existing facility capacity within 50 miles of any proposed new hospital.

When looking at the Portland Metropolitan Service Area this would involve all of the hospitals in Clackamas, Multnomah and Washington counties as a group. While the Certificate of Need program stipulates that future hospital bed need should only be evaluated at a point 10 years into the future, this analysis provides forward-looking estimates to 2025. As noted below, Columbia and Yamhill counties were added to the analysis of the metropolitan area (to address the 50-mile requirement) and the 65 and older age cohort was further split as to analyze the characteristics of the Medicare population.

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2. Columbia County is a 100% net exporter of patients. However, a new 15-bed critical access hospital is scheduled for construction by 2010 in St. Helens.
Portland Area Hospital Overview

Geographic Service Area

The concern about future hospital bed supply shortages has arisen in two counties in the Portland metropolitan service area: Washington County in Oregon and Clark County in Washington. As previously noted, Clark County, Washington, is not part of this analysis. Although a historic 30% outflow from Clark County to Portland area hospitals is documented and well understood, the impact of the soon-to-be-opened Legacy Salmon Creek hospital on Clark County resident use of Portland hospitals is unknown at this time. The Oregon state bed need methodology treats Clackamas, Multnomah and Washington counties as one service area and looks at hospitals within 50 miles of each other as sharing a service area population due to the inflow and outflow of patients among counties within this area.

The existing flows of hospital patients from one geographic area to another area within the Portland metropolitan service area, and possible future changes in these patterns, demonstrate that the population within the Portland metropolitan service area uses hospitals as a regional rather than a county-only resource.

Population Growth

The overall population is expected to increase to nearly 2.2 million persons within the 5-county area by 2025, a 38% increase from the 2000 population. Hospital utilization is expected to increase dramatically for the over age 65 population. This cohort will more than double from 165,038 persons in 2000 to 346,790 persons in 2025. Chart 1 summarizes this information.

![Chart 1. Projected Changes in Metropolitan Area Population](image-url)

Clackamas, Columbia, Multnomah, Washington & Yamhill Counties
Oregon Office of Economic Analysis Forecast
Utilization Rates and Future Hospital Utilization

Hospital utilization dropped dramatically during the early 1980s nationally. In Oregon, lower utilization was not as dramatic but was of significant concern in regard to surplus capacity. As a result, Oregon required any hospital applicant wishing to add hospital beds in the Portland metropolitan service area to justify why the patient days per 1,000 persons use rate would not continue to decline by 2.9% per year as it had done within the Portland area from 1977 through 1983. Chart 2, which is a projection of hospital use rates based on 1994 through 2003 annual hospital data, shows that hospital use rates have stabilized and have started to gradually increase, primarily due to the aging of the population. This sea change in hospital utilization is the reason for concerns about future capacity that will be discussed next.

Chart 3 shows that metropolitan area patient days are expected to grow by 57% to over 800,000 patient days due to general population growth and aging of the population from 2000 to 2025. The percentage growth in projected patient days is much higher than the expected population growth of 38% from 2000 to 2025.
Hospital Capacity

Licensed hospital capacity has kept up with the growth in hospital patient day demand which begins to accelerate after 2015. The current capacity of slightly more than 3,900 licensed hospital beds in the metropolitan area is expected to increase to more than 5,500 beds by 2025, the last year for available estimates. Over the same period, the percentage of surplus capacity remains stable at approximately 40% of total licensed capacity, slightly higher than the current 38% surplus capacity. It is important to note that not all future projects have been reported, most notably for Providence Milwaukie, Providence Newberg, Willamette Valley Medical Center, and the Legacy Health System. Chart 4 summarizes this data. Table 1 presents reported hospital capacity increases.

Chart 4. Service Area Bed Need, Capacity and Surplus
(In Clackamas, Columbia, Multnomah, Washington & Yamhill Counties 2005 To 2025)

In addition to hospital bed expansion currently under way at OHSU, Providence Portland, Providence St. Vincent, Kaiser Sunnyside, and the new St. Helen's hospital, Total Capacity includes known site capacity for additional beds at Adventist Medical Center, Legacy Meridian Park Hospital, Tuality Community Hospital, Willamette Falls Hospital and a new Kaiser Permanente hospital. The Chart excludes Clark County with 247 new beds on line by 2010 and 55 additional beds by 2015.

3. Regional bed capacity has been patient-origin adjusted to provide bed capacity for patient inflow to Portland hospitals from other counties in Oregon & SW Washington. Out-of-area utilization of Portland metropolitan area bed capacity (excluding Clark County) represents 33% of the total needed capacity for Portland area hospitals which has been added to the projected regional patient day projections in Chart 3. This total excludes over 300 new hospital beds in Clark County under construction that are scheduled to be in service before 2015. The Washington State Certificate of Need program is on record as supporting reducing the hospital patient outflow from Clark County to the Portland area, which is currently 30%, down to 5% through these bed additions. Washington State has a separate Certificate of Need program covering Clark County, Washington. Each state Certificate of Need program explicitly excludes hospital capacity in the adjoining state even though Clackamas, Multnomah and Washington counties in Oregon and Clark County in Washington make up a metropolitan service area. Columbia and Yamhill counties are included because they are within 50 miles of Portland area hospitals and are included in transportation and labor force regional studies.
Table 1. Metro Area Bed Supply By Hospital
(Known hospital expansion plans—licensed, under construction & shelled/planned capacity—2005-2025)

<table>
<thead>
<tr>
<th>HOSPITAL</th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLACKAMAS COUNTY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaiser Sunnyside Medical Center</td>
<td>196</td>
<td>328</td>
<td>328</td>
<td>328</td>
<td>328</td>
</tr>
<tr>
<td>Legacy Meridian Park Hospital</td>
<td>150</td>
<td>150</td>
<td>210</td>
<td>210</td>
<td>270</td>
</tr>
<tr>
<td>Providence Milwaukie Hospital</td>
<td>77</td>
<td>77</td>
<td>77</td>
<td>77</td>
<td>77</td>
</tr>
<tr>
<td>Willamette Falls Hospital</td>
<td>143</td>
<td>143</td>
<td>213</td>
<td>283</td>
<td>283</td>
</tr>
<tr>
<td>Subtotal</td>
<td>566</td>
<td>698</td>
<td>828</td>
<td>898</td>
<td>958</td>
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<tr>
<td><strong>COLUMBIA COUNTY</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Columbia County Health District</td>
<td>0</td>
<td>15</td>
<td>15</td>
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<tr>
<td>Subtotal</td>
<td>0</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td><strong>MULTNOMAH COUNTY</strong></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Adventist Medical Center</td>
<td>302</td>
<td>302</td>
<td>453</td>
<td>453</td>
<td>604</td>
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<tr>
<td>Legacy Emanuel Hospital &amp; Hlth Ctr</td>
<td>554</td>
<td>554</td>
<td>554</td>
<td>554</td>
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</tr>
<tr>
<td>Legacy Good Samaritan Hosp &amp; Med Ctr</td>
<td>539</td>
<td>539</td>
<td>539</td>
<td>539</td>
<td>539</td>
</tr>
<tr>
<td>Legacy Mount Hood Medical Center</td>
<td>115</td>
<td>115</td>
<td>115</td>
<td>115</td>
<td>115</td>
</tr>
<tr>
<td>OHSU Hospital</td>
<td>582</td>
<td>702</td>
<td>702</td>
<td>702</td>
<td>702</td>
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<tr>
<td>Physicians’ Hospital5</td>
<td>39</td>
<td>39</td>
<td>39</td>
<td>39</td>
<td>39</td>
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<tr>
<td>Providence Portland Medical Ctr</td>
<td>483</td>
<td>623</td>
<td>623</td>
<td>623</td>
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<tr>
<td>Subtotal</td>
<td>2,614</td>
<td>2,874</td>
<td>3,025</td>
<td>3,025</td>
<td>3,176</td>
</tr>
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<td><strong>WASHINGTON COUNTY</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Kaiser Washington County</td>
<td>0</td>
<td>0</td>
<td>80</td>
<td>196</td>
<td>196</td>
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<tr>
<td>Providence St Vincent Medical Ctr</td>
<td>451</td>
<td>591</td>
<td>591</td>
<td>591</td>
<td>591</td>
</tr>
<tr>
<td>Tuality Healthcare</td>
<td>215</td>
<td>215</td>
<td>335</td>
<td>335</td>
<td>455</td>
</tr>
<tr>
<td>Subtotal</td>
<td>666</td>
<td>806</td>
<td>1,006</td>
<td>1,122</td>
<td>1,242</td>
</tr>
<tr>
<td><strong>YAMHILL COUNTY</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Providence Newberg Hospital</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Willamette Valley Med Ctr</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Subtotal</td>
<td>116</td>
<td>116</td>
<td>116</td>
<td>116</td>
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<tr>
<td>TOTAL</td>
<td>3,962</td>
<td>4,509</td>
<td>4,990</td>
<td>5,176</td>
<td>5,507</td>
</tr>
</tbody>
</table>

**NOTE:** For purposes of Oregon CON analysis. Does not include SW Washington Medical Center’s 442 beds or Legacy Salmon Creek’s 165 beds.

In 2003, 30% of hospital care for residents of Clark County, Washington, was provided by Portland metro area hospitals. This is expected to decline with the current expansion of beds in Clark County.

4. Future site capacity is not reported for Providence Milwaukie, Providence Newberg, Willamette Valley Medical Center, Legacy Good Samaritan, Legacy Emanuel and Legacy Mount Hood.

5. Physicians’ Hospital is currently licensed for 39 beds, but was previously at 209 before Woodland Park closed.
Map 1. Portland Area Hospitals' Service Area for Top 50% of Discharges

Portland Area Hospitals
Service Area defined by top 50% discharges by ZIP code.

Hospitals
1. Legacy Emanuel Hospital & Health Center
2. Legacy Good Samaritan Hospital & Medical Center
3. Legacy Meridian Park Hospital
4. Legacy Salmon Creek Hospital
5. Legacy Mount Hood Medical Center
6. Providence St. Vincent Medical Center
7. Providence Portland Medical Center
8. Providence Milwaukie Hospital
9. Kaiser Sunnyside Medical Center
10. Kaiser Beaverton Medical Center (Proposed)
11. Tuality Community Hospital
12. Tuality Forest Grove Hospital
13. Adventist Medical Center
14. OHSU
15. Physicians’ Hospital
16. Southwest Washington Medical Center
17. Willamette Falls Hospital
18. Willamette Valley Medical Center

Source:
CON/Path 2003 Statewide Oregon Inpatient Discharge Data
A product of the Illinois Hospital & Health Systems Association (IHHA)
Provided to Oregon through the Oregon Association of Hospitals & Health Systems (OAHHS)

ECONorthwest
The Market for Hospital Beds
In the 1950s hospitals grew up in neighborhoods that had none. But for the past decade or more, virtually all hospital expansion has been in higher income and insured areas, further widening the gap between the haves and have-nots of health services, as can be clearly seen in Maps 2 and 3.
Conclusions of Certificate Of Need Analysis

Hospital utilization forecasts through 2025 and an assessment of area hospitals’ development plans show that there is stable and substantial surplus capacity among existing hospitals within the metropolitan area to assure ready access to inpatient hospital services.

The current Certificate of Need program promotes incremental growth of existing hospitals over the addition of new hospitals. As previously noted, developers wishing to establish a new hospital must demonstrate that existing hospitals are at approximately 80% utilization of licensed capacity and that a new hospital is superior to adding to existing hospitals. Table 2 demonstrates the rationale for discouraging the development of new hospitals. This table compares the publicly available cost estimates for similarly sized hospital bed expansions, one being a totally new hospital and the other being the addition of a new patient wing to an existing hospital. Table 2 shows that the new Legacy Hospital in Vancouver, Washington, will cost $162 million ($982,000 per bed for 165 licensed beds), while the Kaiser Sunnyside expansion in the Portland metropolitan area will cost $63.7 million ($483,000 per bed). In this example an incremental addition costs less than one-half of the cost of a completely new hospital, on a per-bed basis. So when it is possible, the cost-effective approach is to add to existing capacity rather than to duplicate the entire infrastructure in a new hospital.

Table 2. Is New Hospital Construction Efficient?

Two Examples

<table>
<thead>
<tr>
<th>Legacy Salmon Creek</th>
<th>Kaiser Sunnyside</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>Expansion</td>
</tr>
<tr>
<td>• New hospital with 165 licensed beds &amp; 55-bed shelled capacity</td>
<td>• Add 132 licensed beds &amp; remodel</td>
</tr>
<tr>
<td>• Completion date: 2005</td>
<td>• Completion date: 2007</td>
</tr>
<tr>
<td>• Capital cost: $162 million</td>
<td>• Capital cost: $63.7 Million</td>
</tr>
<tr>
<td>• Cost per bed: $981,818</td>
<td>• Cost per bed: $483,000</td>
</tr>
</tbody>
</table>
The Market for Beds: Implications for Oregon CON Policy

Oregon’s Certificate of Need (CON) policy was developed during a period in which policymakers were concerned about an “oversupply” of hospital capacity. Looking toward the future, a key question for the Portland area is whether hospital bed capacity in the region is too much or too little, when looked at from an economic efficiency standpoint. In particular:

- Does the CON process contribute to or retard efficient development of the hospital bed market in the Portland region?
- Are there other aspects of public policy toward hospitals that affect bed supply and utilization that should be considered in addition to the traditional CON factors?

To answer these questions we first define what “efficient” behavior in the hospital bed market means in the context of current health care policy. We then use a national database of hospitals to examine what factors seem to be driving hospital bed supply and utilization. From this latter analysis, we can then opine on whether the Portland region is at risk of having too few or too many beds under current and future demographic conditions. We also can isolate policy factors not currently considered that should be part of the process that regulates hospital bed supply in Oregon.

Efficiency in the Supply and Utilization of Hospital Beds

We alluded earlier to the notion of the “efficient” supply of hospital beds. Generally speaking, economists do not believe that efficient allocation of resources is fostered by governmental intervention in the marketplace for goods and services. The reason is that, in most markets, the interaction of the consumers and producers of services assures that there will be little over- or under-supply of services relative to the level that is best for the community. The interaction that ensures this beneficial result is competition. That is, first, the consumer makes the determination of whether or not to spend on a particular good or service. The consumer does this with his/her self-interest in mind. Second, there are alternative suppliers of services, none of whom has enough market power to set prices. As various producers compete for the business of the consumer, they are induced to provide the quantity, quality and price of service that the consumer finds most beneficial, given their budget limitations and self-interest.

Loss of Consumer Sovereignty

In the market for health care services, unfortunately, virtually all consumer sovereignty has been lost, and with it, the natural regulating mechanism on supply and utilization that makes the rest of the economy behave so efficiently. Since the widespread introduction of health insurance began in the 1940s, consumers spend less out of pocket as a percentage of total health expenditures, due to the use of insurance devices. Health insurance policies, whether private or public, break the one-for-one relationship between the incremental cost imposed by the supplier and the cost borne by the consumer. With it is lost the cost containment discipline of the consumer. We are willing to tolerate this loss, of course, in a rare-event context (wherein there exist rare, but extremely costly health events). In such cases, direct payment for the service by definition would impose a burden impossible for most consumers to bear. But the comprehensive nature of most health insurance schemes has also made minor, affordable, and commonplace health care needs undisciplined by consumer concerns about cost. Since approximately 80 percent of health care service events are commonplace, most health spending events do not display the rarity that is supposed to make them worthy of insurance.
The loss of consumer sovereignty in the health-care spending decision means that providers, insurers and governments make spending decisions. Providers are in the morally hazardous position that makes them interested in more rather than less spending than might otherwise be the case. The moral hazard problem is particularly pronounced when the consumer less easily perceives the need for the service. As studies at the Center for the Evaluative Clinical Sciences at Dartmouth Medical School have shown, increasing supply in this context results in increases in utilization spending because the provider has an incentive to utilize the quantity of services supplied and there is no counter discipline of the consumer to contain this incentive. (See Chart 5, illustrating the relationship between hospital bed supply and hospitalization rates for a cross section of U.S. hospital referral regions). Note that the relationship is weakest for surgical procedures because most surgery is elective and the consumer, therefore continues to exert some discipline. Similarly, with hip fractures, where patient and doctor incentives are nearly perfectly aligned, no additional supply of hospital beds increases utilization (“demand”).

Chart 5. The Dartmouth Bed Supply vs. Utilization

Source: Center for the Evaluative Clinical Sciences at Dartmouth Medical School
HRR = Hospital Referral Region  (see Appendix Page 31 for detailed explanation)

From the economist’s perspective, the inexorable upward spiral of health care costs (both on a per-event or unit cost basis and in total utilization) is a natural and unavoidable consequence of the ceding of sovereignty of the consumer to the provider in a comprehensive insurance context. Government’s response has been schizophrenic. On the one hand, government has responded to increases in unit costs by aggravating insurance distortions (through public health insurance) to help those who can no longer afford the elevated unit costs. On the other hand, government then finds aggregate cost spiraling out of control and attempts to contain this by rationing access, regulating bed supply, and regulating prices.
Market Structure Effects

In addition to the distorting effect of insurance on consumer discipline of prices and supply of hospital beds and other services, policy also has inadvertently promoted an uncompetitive market structure for the delivery of hospital services. Specifically, in limiting hospital bed supply through regulatory mechanisms such as CON, there has been a tendency to limit entry by competitor hospitals and for hospital bed supply to become increasingly concentrated in fewer hospital owners. The Portland hospital service area may be characterized as an imperfect competition with a few large provider systems serving the market.

Economists would argue that, even in the context of a distorted consumer or “demand side”, there might be virtue in maintaining a relatively atomistic (unconcentrated ownership) structure in the supply of health services. The reason is that such a structure may encourage more responsive or higher quality of services, even if prices in the marketplace are not much affected. Incentives to provide higher quality services are stimulated as alternative providers vie for the consumer and their insurance-backed spending.

The effect of CON regulations in this overall context of hospital bed supply is dependent upon the effectiveness of CON regulations in containing bed supply and/or its effects on market structure. Specifically, the Oregon CON process is nominally restrictive of supply. However, like most regulatory processes, it is prone to manipulation and influence by industry forces where those industry participants have political power. Hence, CON might be restrictive in its effects on small hospital expansion, but may be less effective in larger markets where larger (and politically more potent) providers are able to blunt the effects of CON restrictions, or see to it that they are applied selectively to competitors.

In summary, therefore, this brief overview of the role of market efficiency considerations suggests that the following phenomena should be observed in the marketplace:

1. Markets in which insurance coverage in the aggregate (from public or private sources) is lower should display lower bed supply and utilization, everything else being equal.

2. Markets in which market share of beds is already concentrated in fewer owners might be expected to display fewer beds, greater utilization, higher cost per unit of service (e.g., patient day or procedure) and lower quality of service (e.g., physicians per bed), everything else being equal.

3. In small markets, state CON policy might be expected to be more effective in limiting bed supply than in larger markets.

Measuring the Strength of CON and Market Efficiency Forces

It is not possible to determine from Portland-region data alone whether the CON process is functioning as intended to contain bed supply or whether the Oregon CON process needs to consider other factors in its procedures in order to assure more efficient supply and utilization of hospital beds in the region. However, by examining the behavior of the hospital bed market in a wide variety of local markets, it is possible to test for relationships between CON policy, market structure, the degree of insurance coverage, and other factors on the performance of the hospital bed market.

With this in mind, data on the bed, utilization, and other characteristics was obtained for every U.S. hospital available in the Verispan database. These hospital data were merged with economic and demographic data using two different geographic market definitions. In the first case, each county was assumed to be a relevant market geography; in the second case, the metropolitan area was assumed to be a relevant market geography.
Hospital Performance Variables
Numerous hospital performance variables were aggregated to the market level and examined for relationships with economic and demographic variables describing each market. The variables were examined and their rationale for inclusion were as follows:

1. **Number of beds.** Both staffed beds and licensed beds were studied. This is the primary measure in the study of the extent of the hospital bed market.

2. **Bed occupancy.** This is the proportion of available bed days during which the bed was occupied. This is a primary measure of the utilization of the available licensed beds.

3. **Number of facilities.** This is the number of individual hospital facilities in the market. A particular hospital operator, of course, may have multiple facilities. This is a measure of the extensiveness of the hospital services, and may give some indication of the extent to which facilities are proximate to users. Everything else the same, it is presumed that quality of service increases with number of operators in the market area.

4. **Physicians per bed.** This variable was constructed from the number of licensed physicians and number of beds in the marketplace. It is a measure of the maximum intensity of physicians’ care available per bed. Everything else being equal, this may indicate a higher level of available care. Alternatively, it may be a manifestation of inefficient spending practice.

5. **Operating expense per bed.** This variable was constructed using available data on total operating expenses and number of staffed beds. The meaning of this variable is not unambiguous, but is an indicator of the intensity of spending per bed, which may reflect either higher quality, lower efficiency, or both.

Economic and Demographic Variables
The primary purpose of the market study is to examine how, in a large cross-section of counties or metropolitan areas, the economic and demographic characteristics of the market influence licensed bed supply, utilization, and other variables. A very large number of variables were assembled, only some of which proved useful in explaining the cross-sectional variation in hospital characteristics. Unless otherwise noted, the data were obtained from Census information. The variables examined in the study included:

1. **Market population.** This is the total population in the respective market (county or MSA). The expectation is that this will have a positive effect on the size of the hospital bed market.

2. **Population shares by gender and age.** These are the shares of the total market population that fall into various gender and age cohorts. The presumption is that the need for hospital beds would be higher when the share of child-bearing females and the elderly are greater.

3. **Household income.** This is the income measured as the median income. It is expected that demand for health services is income responsive, so we anticipate a positive effect of this variable.

4. **Unemployment rate.** This is the percentage of the total workforce that is unemployed. Since insured status is inversely related to employment status, this variable was used as a proxy for an imperfect insured status variable (See #6). The expectation is that the higher the unemployment rate, the lower the bed supply offered.
5. **Manufacturing share of employment.** This is the share of total employment represented by jobs in the manufacturing sector. The *a priori* expectations regarding this sector are ambiguous. On the one hand, since this sector historically has involved more dangerous jobs and less healthy working conditions, it might be expected that this variable might be positively related to need for hospital beds. On the other hand, this sector has been economically weak, and wages and insurance coverage have been deteriorating relative to other sectors in recent years, auguring a negative relationship.

6. **Insured status.** It is assumed that the insured status of patients determines the demand for and supply of beds. Unfortunately, insured status data are not available at the county or MSA level measured in a consistent manner. The percent of the population with any insurance (percent insured), the percent with Medicaid (OHP) insurance, and the percent with Medicare insurance are available at a state level, but not a local level. See the discussion of the unemployment rate, above.

7. **State CON policy indicator.** An indicator variable was constructed to show whether the state Certificate of Need process affected bed supply.

8. **Multi-state MSA indicator.** When using the MSA as the market measure, cases are encountered when the MSA spans two or more states. The economic and demographic data captures the effects of both states, but the State CON indicator and other state level variables can be assigned only to one state. They are assigned to the state with the largest role in the MSA. This indicator is present to help capture any distortions created by this necessary assignment procedure. Since this is our situation, a comment on Clark County and the rest of the Portland MSA may be in order, i.e., the massive number of beds just approved in Washington which has a different CON process.

The relationship between the hospital performance variables and the economic/demographic variables was examined using regression analysis. The variables that were in level form were transformed by taking the natural logarithm. Variables that were indicator or share variables were not transformed.
Table 3. Effect of Economic and Demographic Factors on Hospital Market Performance (MSA)

<table>
<thead>
<tr>
<th>Economic &amp; Demographic Factors</th>
<th>Beds</th>
<th>Occupancy</th>
<th>Facilities</th>
<th>Op Expense per Bed</th>
<th>Physicians per Bed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Share</td>
<td>--</td>
<td>++</td>
<td>--</td>
<td>++</td>
<td>-</td>
</tr>
<tr>
<td>Multi-State MSA</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>-</td>
<td>+</td>
<td>--</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Total Population</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Share, Males 0-19</td>
<td>+</td>
<td>--</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Share, Males 20-44</td>
<td>--</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Share, Males 45-64</td>
<td>--</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Share, Males 65-85</td>
<td>--</td>
<td>++</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Share, Females 0-19</td>
<td>--</td>
<td>++</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Share, Females 20-44</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Share, Females 45-64</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>++</td>
</tr>
<tr>
<td>Share, Females 65-85</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>++</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>--</td>
<td>+</td>
<td>--</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Percent Insured</td>
<td>-</td>
<td>++</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Percent Government Insured</td>
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<td>+</td>
</tr>
<tr>
<td>Percent Privately Insured</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Percent Medicare Insured</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Manufacturing Share of Jobs</td>
<td>--</td>
<td>--</td>
<td>-</td>
<td>-</td>
<td>--</td>
</tr>
<tr>
<td>Certificate of Need System</td>
<td>+</td>
<td>-</td>
<td>--</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>91%</td>
<td>11%</td>
<td>92%</td>
<td>24%</td>
<td>32%</td>
</tr>
</tbody>
</table>

Notes:
- Positive and significant ++
- Negative and significant --
- Positive +
- Negative -
### Table 4. The Effect of Economic Demographic Factors on Hospital Market Performance (County Data)

<table>
<thead>
<tr>
<th>Economic and Demographic Factor</th>
<th>Beds</th>
<th>Occupancy</th>
<th>Facilities</th>
<th>Op Expense per Bed</th>
<th>Physicians per Bed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Share</td>
<td>--</td>
<td>++</td>
<td>--</td>
<td>++</td>
<td>--</td>
</tr>
<tr>
<td>Median Household Income</td>
<td>--</td>
<td>+</td>
<td>--</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Total Population</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>--</td>
</tr>
<tr>
<td>Share, Males 0-19</td>
<td>+</td>
<td>--</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Share, Males 20-44</td>
<td>++</td>
<td>--</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Share, Males 45-64</td>
<td>+</td>
<td>--</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Share, Males 65-85</td>
<td>--</td>
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<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Share, Females 0-19</td>
<td>+</td>
<td>--</td>
<td>++</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>Share, Females 20-44</td>
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<td>--</td>
<td>++</td>
<td>++</td>
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<tr>
<td>Share, Females 45-64</td>
<td>+</td>
<td>+</td>
<td>--</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Share, Females 65-85</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>--</td>
<td>-</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>-</td>
<td>++</td>
<td>--</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Percent Insured</td>
<td>--</td>
<td>+</td>
<td>--</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Percent Government Insured</td>
<td>++</td>
<td>+</td>
<td>++</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Percent Privately Insured</td>
<td>++</td>
<td>+</td>
<td>++</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Percent Medicare Insured</td>
<td>--</td>
<td>-</td>
<td>--</td>
<td>-</td>
<td>++</td>
</tr>
<tr>
<td>Manufacturing Share of Jobs</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Certificate of Need System</td>
<td>-</td>
<td>+</td>
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<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>81%</td>
<td>28%</td>
<td>80%</td>
<td>19%</td>
<td>17%</td>
</tr>
</tbody>
</table>

**Notes:**
- Positive and significant ++
- Negative and significant --
- Positive +
- Negative -
Implications of the Market Analysis

In general, the statistical results confirm our expectations that the economic and demographic setting of the marketplace, including the policy setting, significantly influences the market for hospital beds. Table 3 and Table 4 indicate the direction and statistical significance obtained among the various hospital performance and economic and demographic measures for the Metro Area.

The most important findings of the study using the MSA market definition are:

1. **Market bed supply is driven strongly, but not proportionately, by market population.**
   At the MSA level, a 10 percent increase in population results in a 6 percent increase in bed supply. This less-than-proportional relationship shows that simple indicators of bed need such as population cannot be used on a per capita basis to determine bed “need”. Bed need grows more slowly than population likely because of economies of scale that result from the ability to more efficiently utilize capacity under conditions of variable (“lumpy”) demand.

2. **Bed occupancy, number of facilities, and operating expense per bed also are positively and significantly related to market population.**

3. **Median household income generally does not have a statistically significant effect on either beds or occupancy, but does influence the number of facilities negatively and operating expenses per bed positively.** This is consistent with the notion that higher local incomes may help support larger and more elaborate (or inefficient) facilities.

4. **Market share concentration significantly affects all performance variables examined.** Specifically, the more concentrated is the structure of the market, the fewer beds and facilities are supplied, the higher is the occupancy rate and expenses per bed, and the lower is the number of physicians per bed. These findings are consistent with the monopoly model of market supply, wherein the total amount of service (beds and facilities) and quality of service (spare beds and physicians per bed) is lower and operating expenses are higher.

5. **The age and gender distribution of the population has some significant effects on the performance of the hospital marketplace.** In general, higher proportions of elderly women and women of child-bearing age (ages 20-44) and young males and females are associated with a greater number of beds and facilities. The pattern for occupancy is less consistent. Operating expenses per bed are positively related with the share of older males and child-bearing and middle-aged females.

6. **The effect of insurance variables (and the surrogate, the unemployment rate) are generally consistent with the notion that the higher the proportion of the population privately or government insured, the greater the number of beds and facilities supplied.** The higher the Medicare share, the greater the number of physicians per bed supplied. These findings are generally consistent with the notion that the expansion of comprehensive insurance has had a stimulative effect on spending on health care facilities and services. Higher unemployment rates tend to increase occupancy, operating costs per bed, and physicians per bed. Although generally consistent with the theory that insurance coverage drives up the size and cost of the health sector, these results must be interpreted with caution since only state, rather than county, measures of these variables were available for the insurance indicators.

7. **The share of manufacturing jobs is negatively and significantly related to beds, occupancy, and number of facilities.** As indicated earlier, this result may be indicating that manufacturing share is serving as a proxy for the dependency of the region on industrial sectors that are weak relative to other regions’ industries.
8. The existence of a Certificate of Need process seems to reduce the number of facilities in the MSA regressions. The effect is less significant at the MSA level than in the county regressions (discussed below), consistent with the notion that the CON process may be more easily influenced by large, urban providers with political power.

Using the county as the market definition, most of the findings at the MSA level hold. However, because the county market definition is a poorer proxy for the true market geography, due to known in-flows and out-flows of patients, fewer variables are measured with statistical significance. However, the significance of the effect of market share variables remains strong, as does total population. Gender and age composition variables generally display the same pattern, albeit with the indication that the female population share is a stronger driver than is the male share in some age cohorts. Insurance variables are generally less significantly measured, although the pattern of positive effects—though less consistent—generally supports the notion that more comprehensive coverage by private or government plans is stimulative to spending. The existence of a Certificate of Need system appears to have an effect on the number of facilities (though statistically less significant), but not the number of beds or other performance measures.

The statistical models can also be used to determine if the Portland metro area has, in general, more beds and facilities or fewer beds and facilities than would be expected given our economic and demographic make-up as compared to the U.S. as a whole. This calculation is performed by comparing the performance predicted by the model for the region versus that actually observed in the data. In general, given the region's economic, demographic, and hospital market characteristics, the findings suggest that, at an MSA level, Portland has:

- Slightly fewer-than-expected beds
- Fewer facilities than expected
- Approximately the expected occupancy
- Greater expenses per bed
- More physicians per bed.

Table 5. Portland Metro Hospital Indicators: Actual vs. Predicted

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Actual</th>
<th>Predicted</th>
<th>% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beds</td>
<td>4683</td>
<td>* 6057</td>
<td>-29.30%</td>
</tr>
<tr>
<td>Occupancy</td>
<td>52.30%</td>
<td>52.40%</td>
<td>-0.30%</td>
</tr>
<tr>
<td>Facilities</td>
<td>20</td>
<td>28</td>
<td>-40.10%</td>
</tr>
<tr>
<td>Op Ex/Bed</td>
<td>$563,707</td>
<td>$479,410</td>
<td>15.00%</td>
</tr>
<tr>
<td>Physicians/Bed</td>
<td>0.0396</td>
<td>0.0269</td>
<td>32.00%</td>
</tr>
</tbody>
</table>

* See Appendix, Pages 29-30 for reconciliation with current licensed beds.

6. The finding of fewer-than-expected beds may be partly an anomaly of the pattern of recent population growth in the Portland region. The region experienced rapid economic and population growth in the mid-1990s, and bed supply may not have caught up with the equilibrium level given the region's present characteristics (see Table 1, Metro Area Bed Supply). Indeed, there are approximately 547 beds in 5 facilities currently under construction. Although insufficient to fill the entire gap between actual and predicted beds or facilities, inclusion of these in the existing bed count greatly narrows the deviation.
All of these findings are consistent with the notion that the Portland market behaves differently than other markets when economic and demographic factors are considered. Portland thus is a statistical “outlier” in that, even after controlling for its particular economic and demographic characteristics, it does not fit the national statistical mold in several dimensions of hospital bed market performance. From other crude comparisons we find that Portland’s shorter length of stay explains fewer beds than expected quite well and perhaps less well for greater expense per bed and more physicians per bed. In regard to facilities, we have fewer specialty hospitals, e.g., long-term care hospitals, rehabilitation hospitals and psychiatric hospitals, which is probably due to insurers, no mental health parity in Oregon, and low mandated benefits.

There are several additional possible explanations for this “outlier” finding. One is that Portland’s market structure may be unusually concentrated in fewer owners. For example, aggressive regional land-use planning may have had the effect of concentrating population in the region in an unusual way, inadvertently reinforcing the pattern of market share concentration. This would explain the fewer-than-expected beds and facilities, and the greater expenses per bed. The finding of more physicians per bed—as a manifestation of the source of the higher cost per bed—also is consistent with this notion, but is inconsistent if this measure is interpreted as a manifestation of higher quality of the service.

Alternatively, Oregon’s CON process may be more effective or aggressive in limiting supply by limiting facilities. This is not necessarily consistent with the finding that the occupancy rate is the expected rate, but is consistent with the bed, facility, expenses per bed and physicians-per-bed findings.

**Conclusions of Economic Analysis**

We have been able to explain variation in hospital market performance across MSA and county markets reasonably successfully with a statistical model based on economic, demographic, and hospital market characteristics. This model is generally consistent with the notion that market share concentration has the expected monopoly-like effects on the market’s performance, and that comprehensive insurance stimulates supply, utilization, and cost.

Using this model we find that the Portland metro area is somewhat of a statistical outlier, demonstrating characteristics that may be reflective of special factors contributing to an unusually high level of effective market share concentration. This may include CON policy, land use policy, and policies toward acquisitions and expansions by existing healthcare firms.

**Summary Policy Implications for Metro Area Bed Supply**

There would appear to be adequate capacity to meet need through the expansion of existing metro area facilities into the foreseeable future. It is far less expensive to expand a facility that has costly medical support infrastructure than to build a new facility. If current facility expansion capacity is ever exceeded and an additional hospital(s) is added, increasing the existing market concentration should be avoided to minimize the greater cost per unit associated with increased market power of large systems.
Appendix
Map 4. Clackamas County – Service Area for 50% of Discharges

Clackamas County Hospital Service Area
Service Area defined by top 50% discharges by ZIP code.

Hospitals
1. Legacy Emanuel Hospital & Health Center
2. Legacy Good Samaritan Hospital & Medical Center
3. Legacy Meridian Park Hospital
4. Legacy Salmon Creek Hospital
5. Legacy Mount Hood Medical Center
6. Providence St. Vincent Medical Center
7. Providence Portland Medical Center
8. Providence Milwaukie Hospital
9. Providence Newberg Hospital
10. Kaiser Sunnyside Medical Center
11. Kaiser Beaverton Medical Center (Proposed)
12. Tuality Community Hospital
13. Tuality Forest Grove Hospital
14. Adventist Medical Center
15. OHSU
16. Physicians’ Hospital
17. Southwest Washington Medical Center
18. Willamette Falls Hospital
19. Willamette Valley Medical Center

Source:
CHRP Data 2003 Statewide Oregon Hospital Discharge Data
A Project of the Health Systems Association (IHHA)
Provided to Oregon through the Oregon Association of Hospitals & Health Systems (OAHH)
Map 5. Clark County – Service Area for 50% of Discharges
Map 7. Washington County – Service Area for 50% of Discharges

Washington County Hospital Service Area
Service Area defined by top 50% discharges by ZIP code.

Hospitals
1. Legacy Emanuel Hospital & Health Center
2. Legacy Good Samaritan Hospital & Medical Center
3. Legacy Meridian Park Hospital
4. Legacy Salmon Creek Hospital
5. Legacy Mount Hood Medical Center
6. Providence St. Vincent Medical Center
7. Providence Portland Medical Center
8. Providence Milwaukie Hospital
9. Providence Newberg Hospital
10. Kaiser Sunnyside Medical Center
11. Kaiser Beaverton Medical Center
12. Tuality Community Hospital
13. Tuality Forest Grove Hospital
14. Adventist Medical Center
15. OHSU
16. Physicians’ Hospital
17. Southwest Washington Medical Center
18. Willamette Falls Hospital
19. Willamette Valley Medical Center

Source:
COMPdata 2003 Statewide Oregon Inpatient Discharge Data
A product of the Illinois Hospital & Health Systems Association (IHHA)
Provided to Oregon through the Oregon Association of Hospitals & Health Systems (OAHHS)
Map 8. Yamhill County – Service Area for 50% of Discharges

Yamhill County Hospital Service Area
Service Area defined by top 50% discharges by ZIP code.

Hospitals
- Legacy Emanuel Hospital & Health Center
- Legacy Good Samaritan Hospital & Medical Center
- Legacy Meridian Park Hospital
- Legacy Salmon Creek Hospital
- Legacy Mount Hood Medical Center
- Providence St. Vincent Medical Center
- Providence Portland Medical Center
- Providence Milwaukie Hospital
- Providence Newberg Hospital
- Kaiser Sunnyside Medical Center
- Kaiser Beaverton Medical Center (Proposed)
- Tuality Community Hospital
- Tuality Forest Grove Hospital
- Adventist Medical Center
- OHSU
- Physicians’ Hospital
- Southwest Washington Medical Center
- Willamette Falls Hospital
- Willamette Valley Medical Center

Source: COMPdata 2003 Statewide Oregon Inpatient Discharge Data
A product of the Illinois Hospital & Health Systems Association (IHHA)
Provided to Oregon through the Oregon Association of Hospitals & Health Systems (OAHHS)
Reconciliation of Certificate of Need and Econometric Analyses of Bed Need

The analysis of hospital bed need using the Oregon Certificate of Need (CON) bed need methodology and the need analysis using an econometric analysis based on a comparison of independent variables associated with all of the nation's Metropolitan Service Areas (MSA) requires some data adjustments.

MSA and CON Methodology Adjustment

The two methodologies measure different regions so a geographic adjustment is required, i.e., subtracting hospitals and hospital beds from counties that are not in the Portland MSA and adding hospitals and hospital beds that are in other states but are included in the Portland MSA. In addition, the CON methodology specifically excludes state and federal hospitals in the projection methodology. Even after making this adjustment there is still a 193-bed difference in the number of licensed beds reported by the Oregon Health Division and licensed beds reported by Verispan, a national market research company that receives its licensing information from the American Hospital Association and other sources. The principal reason for this difference in beds is the timing of when licensing information is measured. The Health Division generates an on-demand license status while Verispan relies on periodic updates. There were substantial changes during 2003 and 2004. For example two hospitals located in Multnomah County ceased operation.

Current Construction

With the worst unemployment figures in the country for the past 3 to 5 years, Oregon's economy has staggered with corresponding reductions in Medicaid and private insurance enrollment. This slowed the growth in hospital patient volume and delayed hospital construction plans in comparison with other states. With modest improvements in the economy a number of hospitals have undertaken projects that are expected to be licensed in 2005 or 2006. Table 1 shows the impact of this delay in construction with six hospitals adding 783 beds (including Clark County), expanding capacity by over 17% in the next two years.

Adjustment for Adverse Reimbursement Climate

The Portland MSA is unique in not having a single DRG-exempt long-term care hospital. It is one of 13 states without such a facility but the other hospitals have much lower population bases. Based on national averages, the Portland MSA should have approximately 155 long-term acute-care hospital beds. The Portland MSA also has lost specialty psychiatric and rehabilitation beds in the last 5 years even though there is a well recognized need for a substantial addition to capacity. The reasons for this loss in capacity is the hostile reimbursement climate for these services in the commercial insurance sector and the reduction in Medicaid reimbursement in the public sector. The Portland MSA should have at least an additional 280 specialty beds but is unlikely to see growth in this area until there is parity between mental health and physical health insurance coverage.

Remaining Differences in Hospital Capacity

Most of the differences between licensed hospital bed capacity in the Portland MSA and expected hospital bed capacity can be explained by factors such as the small-area deep recession and the hostile reimbursement climate for one class of hospitals. There still remains a 4% difference between actual capacity and expected capacity. Given Oregon's low overall length of stay (49th lowest among the 50 states and the District of Columbia) and lowest Medicare length of stay, it would be difficult to reach a conclusion that CON legislation has caused a current bed supply shortage or that there is any other cause for concern that existing Portland MSA hospitals are unable to meet current or future hospital bed requirements.
### Table 6. Data Table

<table>
<thead>
<tr>
<th>Hospital</th>
<th>2004 Licensed Beds Included in Oregon CON Study</th>
<th>MSA and CON Methodology Adjustment: Eliminate Yamhill County and Add Clark County Beds</th>
<th>Factor 1: CON Approvals and Construction Underway</th>
<th>Subtotal: Reconciliation of MSA and CON Methodology for Existing Area Hospitals</th>
<th>Factor 2: Lack of Expected Hospital Facilities In Service Area Due to Reimbursement</th>
<th>Total: Reconciliation of Non-CON Related Hospital Capacity Factors</th>
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<td>Factor 1: CON Approvals and Construction Underway</td>
<td>Subtotal: Reconciliation of MSA and CON Methodology for Existing Area Hospitals</td>
<td>Factor 2: Lack of Expected Hospital Facilities In Service Area Due to Reimbursement</td>
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The Association Between Hospital Beds and Hospitalization

The Association Between Hospital Beds and Hospitalizations for Hip Fracture and Medical and Surgical Conditions

The influence of the supply of hospital beds on clinical decision making does not uniformly apply to all conditions. Because the incidence of hip fracture determines the rate of hospitalization for hip fracture victims, one would expect that the local supply of hospital beds would have little influence on the rate at which patients with broken hips are hospitalized. The data bear this out; there is almost no correlation ($R^2 = .08$) between the supply of beds and the rates of discharges for hip fracture (see below).

The local supply of hospital beds has a modest relationship with the discharge rates for surgical conditions ($R^2 = .22$). The supply of hospital beds has virtually no relationship with discharge rates for low variation procedures ($R^2 = .05$) or with moderate variation surgical procedures ($R^2 = .04$) (plot not shown).

In the case of common medical conditions, however, the local supply of staffed hospital beds has a critical influence on the relative risk of hospitalization. The association between hospital beds per thousand residents and hospitalization rates for medical conditions is strong ($R^2 = .56$), indicating that beds account for the majority of variation in hospitalization rates. Even the hospitalization rates for moderate variation medical conditions are strongly associated with bed capacity ($R^2 = .45$) (plot not shown).

HRR = Hospital Referral Region