

Hospital Mergers in Washington 1986-2017

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Summary of our analysis

In the last three decades, hospital resources and care in Washington have become more concentrated as hospitals have closed or become part of multi-hospital systems:

- The percentage of hospitals in systems grew from 10% in 1986 to almost half in 2017
- The system hospital share of measures for resources and patient care grew from approximately 20% to values between 70% and 80%

One system, Swedish, was itself acquired by another system, Providence, in a process completed in 2012. These developments have increased the influence that hospital systems have on hospital care.

Introduction

This analysis surveys hospital organization trends in Washington, their effect on hospital resources, and on the availability of hospital care, using data from 1986-2017.

Hospitals are categorized as independent or part of a system. A “system” of hospitals is an organization that includes two or more hospitals. An “independent” hospital is not part of a system.

The state saw a succession of hospital mergers in recent years. These developments resemble

trends across the United States, with a notable surge since 2010 (Beaulieu et al., 2020). These events continue during good and bad economic times and have not been affected by the COVID-19 pandemic (Rau, 2021). In 2017, 90% of hospital markets were defined as highly concentrated according to a standard measure used to assess competition, and previous years saw a marked increase in areas where a single system treats the majority of cases (Rau, 2021).

Reasons cited for the trend include beliefs that mergers strengthen hospital financial positions and that larger hospital systems represent more robust organizations (Dafny, 2021). Hospitals that struggle financially may pursue mergers as an alternative to possible closing. Public hospitals often face considerable financial pressures. **One analyst** questioned the viability of all public hospitals after a financially sound public hospital was sold to a non-public organization (Rau, 2021).

In the context of severe demands placed on hospitals by the COVID-19 pandemic, consolidation raises questions about whether concentrating resources in systems will affect hospitals’ ability to respond to extraordinary situations.

Common specific concerns about mergers relate to cost and quality of care. Although mergers are often heralded as opportunities to streamline operations and reduce patient care costs,

considerable research has found that mergers result in higher costs for patient care (Beaulieu et al., 2020; Singer, 2019; Dafny, 2021).

A 2021 article reported that, among rural hospitals, “merged hospitals were more likely than independent hospitals to eliminate maternal/neonatal and surgical care” (Henke et al., 2021). Studies have also found that mergers may lead to a “modestly worse patient experience” (Beaulieu et al., 2020) as well as reductions in patient satisfaction (Dafny, 2021).

Other factors also raise concerns. In Washington, the recent merger of a secular hospital system, Virginia Mason, with the Catholic health system CHI Franciscan prompted discussion about the impact of Catholic health care directives on patient care at hospitals that were previously not religiously affiliated. This topic is of national interest, as four of the top seven healthcare systems in the U.S. are Catholic (Meyer, 2020).

Methods

Mergers, consolidations, and closures of hospitals are tracked to identify trends over time. Measures of hospital resources and use include the numbers of beds and number of admissions in system and independent hospitals.

Data for this study come from the Department of Health (DOH) and the Office of Financial Management (OFM).

DOH annually collects data on hospital capacity and patient encounters from in-state hospitals. The data also reflect systems acquiring hospitals, since a hospital usually keeps the same license number when it joins or gets acquired by a new entity.¹ Media reports also track changes in hospital organizations.

In comparing independent and system hospitals, this analysis focuses on numbers of acute care and intensive care unit (ICU) hospital beds, and hospital admissions. Although data are available for 1986-2020, in many cases complete data are available only through 2017.

OFM’s Forecasting and Research Division estimates state and county populations. These values are used to calculate measures by population.

Changes in hospital organizations

In 1986, Washington had three systems and 105 hospitals. Eleven hospitals, or 10%, were part of a system. By 2017, 10 systems included 45 of 98 hospitals in the state, or almost half. At the same time, systems acquired a proportion of certain hospital resources that was larger than their percentage of hospitals.

Most of these changes happened between 2006 and 2017. From 1986 through 2006 the percentage of hospitals in systems ranged between 10% and 13%, decreasing in some years. After 2006, the percentage began to rise.

Patient admissions to system hospitals offers dramatic evidence of change. In 1986 the three systems accounted for 20% of admissions. By 2017, that value had almost quadrupled, rising to 79%. Less dramatic but still striking changes happened in system percentages of available hospital beds, and ICU beds. In 1986, these measures ranged between 19% and 23%. By 2017, each measure had more than tripled.

Regardless of how mergers may affect provision of health care, the concentration of hospital

¹ License numbers may cease to be used after a merger of hospitals.

resources within systems suggests that organizational decisions and policies may strongly affect health care, possibly in ways that are difficult to predict.

For example, in 1986 there were 98 hospital organizations. Broken down, that included 95 independent hospitals and three systems with 11 hospitals.

Figure 1 displays the total number of hospitals (in blue) and the sum of hospital systems and independent hospitals (in green) counted together. Data in Figure 1 also appear in Table A1 in the Appendix.

Figure 1 highlights these trends. The number of organizations (the green circles below) went down as the number of hospitals remained steady, particularly after 2005.

Figure 1. Hospitals and hospital organizations, Washington 1986-2017

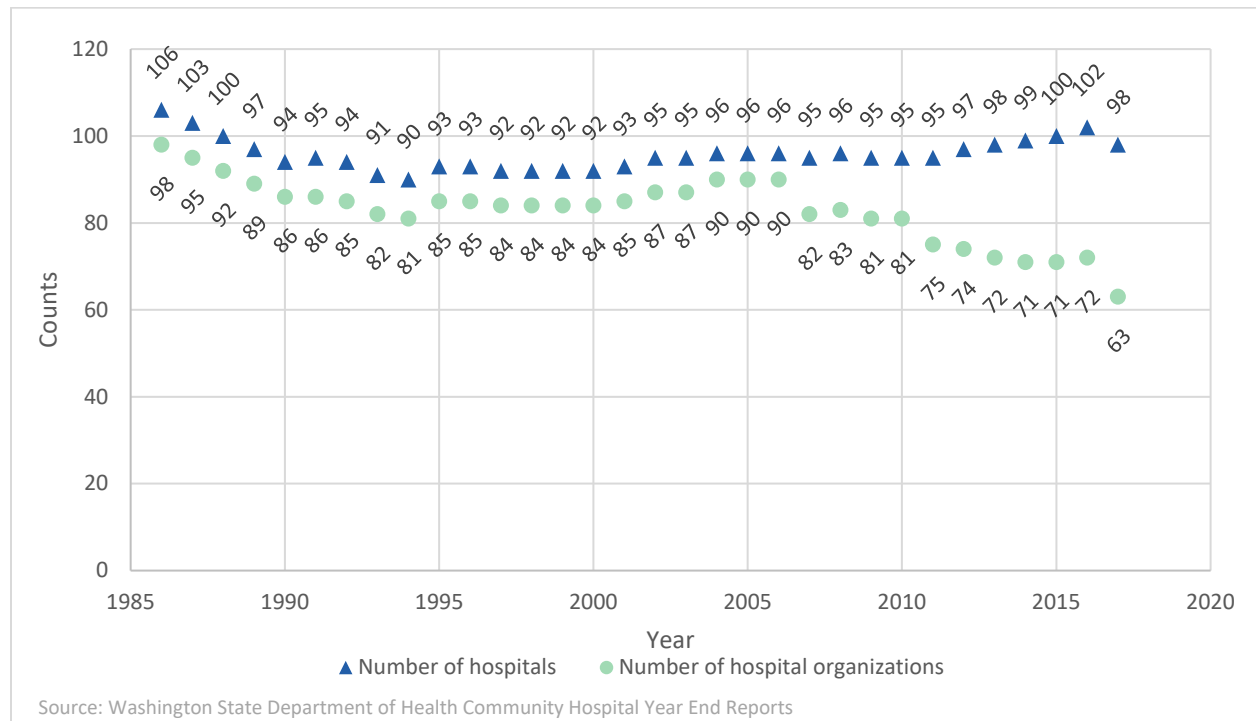
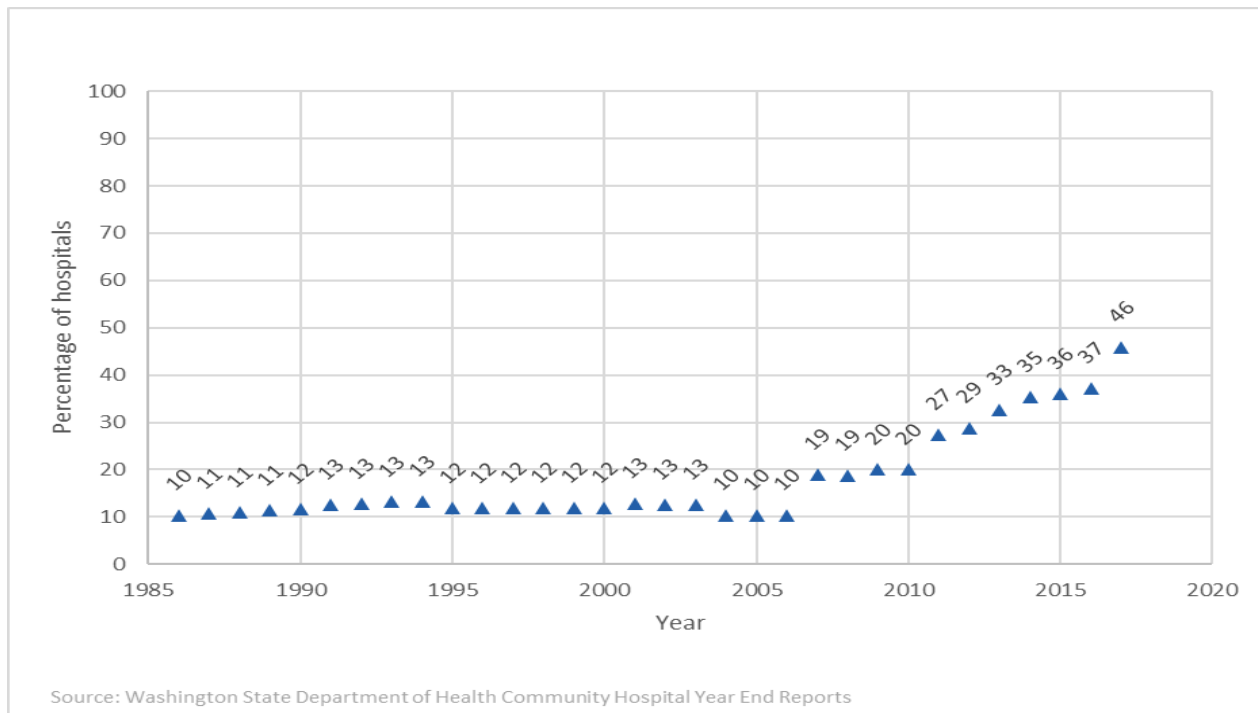


Figure 2. Percentage of hospitals in systems, Washington 1986-2017



The decreasing total during the study period, from 98 to 63, reflects the trend of independent hospitals joining or being acquired by systems.

Approximately 10 hospitals closed without merging or being acquired. Reasons for closure varied, but they included financial difficulties, shifts from inpatient to outpatient care, aging physical facilities, and insufficient demand for services. The state closed two hospitals after it discovered unsafe conditions.

The percentage of hospitals in systems (Figure 2) also reflects changes during the study period. Data in Figure 2 also appear in Table A2 in the Appendix. As noted, the percentage grew from 10% in 1986 to 46% (almost half) in 2017. These values remained relatively steady from 1986 until 2006, ranging from 10% to 13%. After 2006, and particularly after 2010, the percentages climbed steadily.

The number of hospital organizations is the sum of independent hospitals and hospital systems. The percentage change of organizations gives us further perspective (see Table A2.1 in the Appendix). Negative values represent a decrease in the total number of hospital organizations, usually driven by mergers. It is again clear that the most dramatic period of change began in 2007.

In 1986, there were three systems in Washington, operating 11 hospitals in six counties (see Table 1): Franciscan Health System, with two hospitals in two counties; Providence, with seven hospitals in five counties; and the University of Washington, with two hospitals in one county. In following years, Franciscan joined Catholic Health Initiatives to form CHI Franciscan in 1996 and grew to nine hospitals by 2017. The University of Washington added two hospitals and Providence added six.

Table 1. Health care systems by counties and number of hospitals, Washington 1986 and 2017

Health Care System	Counties 1986	Number of hospitals 1986	Counties 2017	Number of Hospitals 2017
Astria			Yakima	3
Franciscan/CHIF	King	2	King	9
	Pierce		Pierce	
Confluence			Chelan	2
Evergreen Health			King	2
			Snohomish	
MultiCare			King	5
			Pierce	
			Spokane	
PeaceHealth			Clark	5
			Cowlitz	
			San Juan	
			Skagit	
Providence		7	Whatcom	13
			Benton	
	King		King	
	Lewis		Lewis	
			Pierce	
	Snohomish		Snohomish	
			Spokane	
			Stevens	
Thurston	Thurston			
	Walla Walla			
Skagit Regional Health			Skagit	2
			Snohomish	
University of Washington	King	2	King	4
Virginia Mason			King	2
			Yakima	
Total	6	11		47

In 2017 there were 10 hospital systems. They grew across many dimensions: there were seven additional systems, 36 more hospitals in systems, and systems present in 11 additional counties—including some with smaller populations, which was less common in 1986. The systems not only grew but also extended their reach in Washington.

Hospital resources and patient care

Beyond changes in organizations and direction, mergers affect availability and use of resources. These include the location of ICU and acute hospital beds, and patient admissions. This portion of the analysis compares resources in systems and independent hospitals and how Washingtonians use those resources.

The records furnish data to create four measures of hospital resources:

1. Hospital beds
2. Patient admissions
3. Admissions per available bed
4. ICU beds

Hospital beds

The number of available hospital beds per 100,000 population decreased from 298 to 170. The percentage of beds in hospital systems increased from 19% to 73%. A decreasing resource became increasingly concentrated in systems.

“Available” hospital beds are maintained and staffed for patient care. “Licensed” beds are the beds a hospital is authorized to provide (Washington State Department of Health, no date). However, the number of available beds is often lower than the number of licensed beds. The analysis considers available beds to compare hospital resources.

The number of hospital beds statewide provides important context for the impact of mergers. In 1986, Washington had more than 13,000 available beds. The number decreased to just under 11,200 in 2004 (see Figure 3; data in Figure 3 also appear in Table A3 in the Appendix). The count then began to increase, reaching 12,399 in 2017, but has not equaled the 1986 value.

Washington’s population grew as the number of beds fluctuated, so a more informative display presents the number of beds per 100,000 population (see Figure 4; data in Figure 4 also appear in Table A4 in the Appendix). These values steadily decrease, from 298 beds per 100,000 in 1986 to 170 in 2017.

As Washington’s population has grown, the number of available hospital beds available has decreased. Some of the change is attributable to the growing number of procedures performed in ambulatory surgical centers. The decrease in numbers, however, raises questions about hospitals’ ability to provide effective care when high demands are placed on resources.

Figure 3. Count of hospital beds, Washington 1986-2017

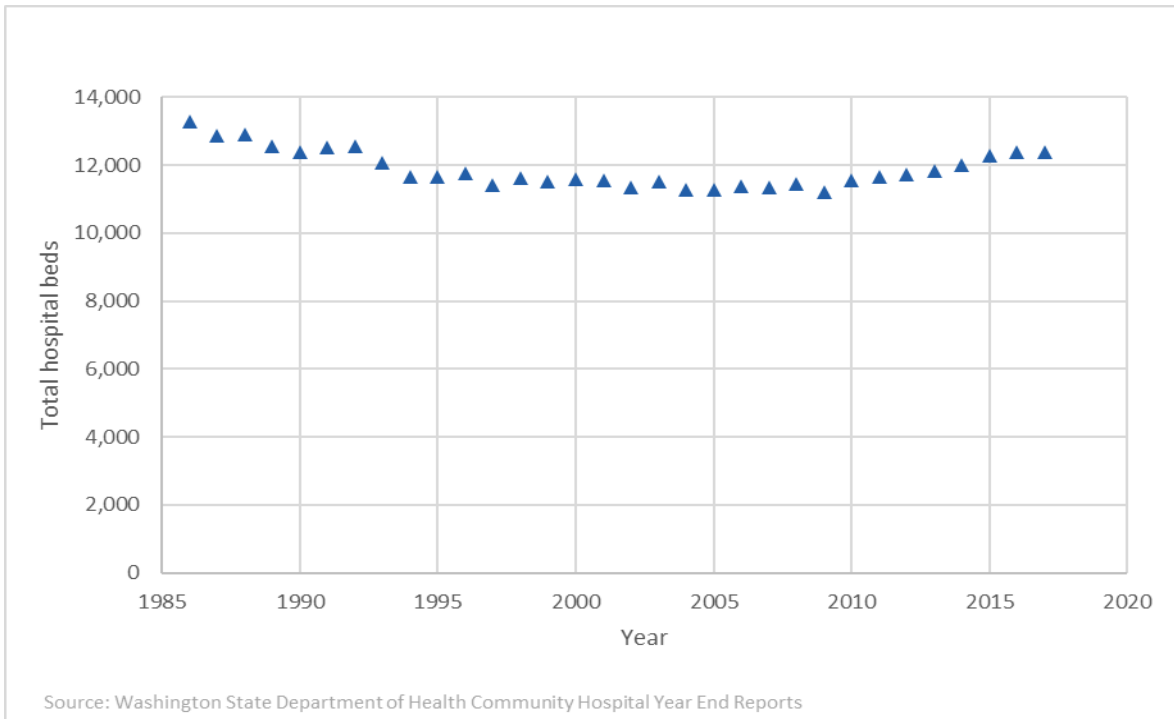


Figure 4. Available hospital beds per 100,000 population, Washington 1986-2017

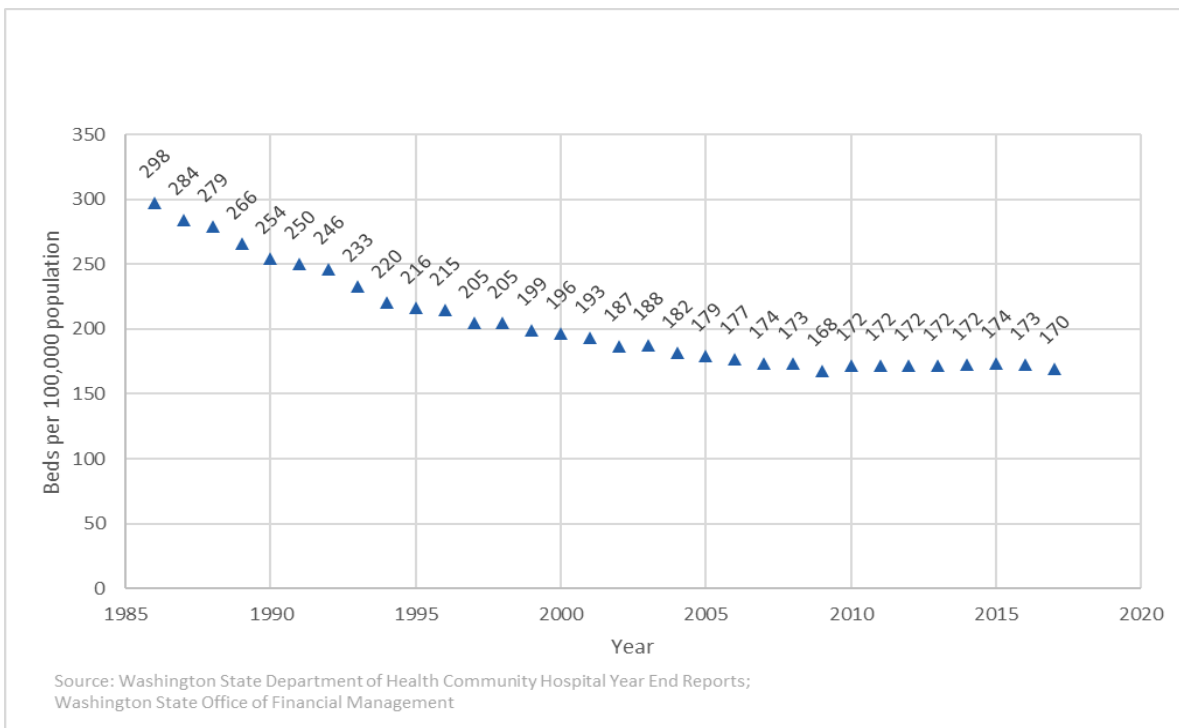
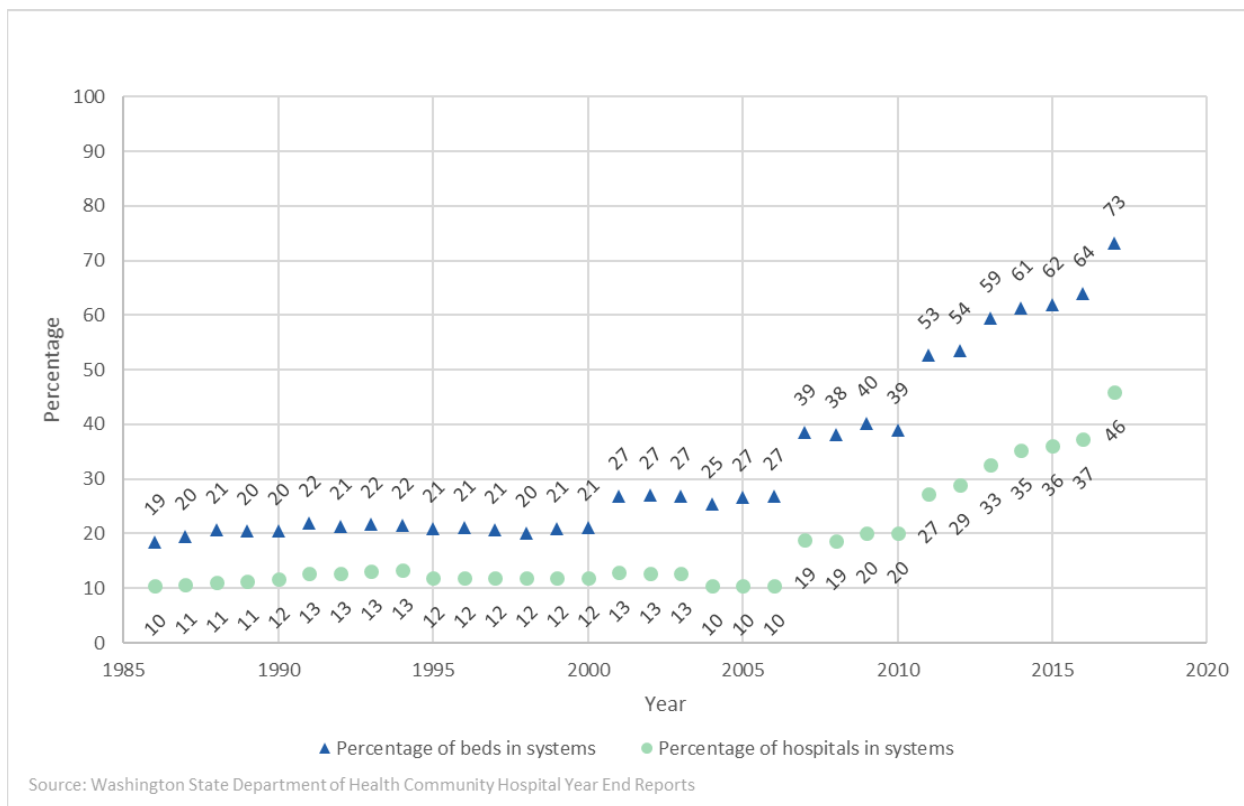


Figure 5. Percentage of hospital beds and hospitals in systems, Washington 1986-2017



In 1986, the 11 system hospitals had 2,461 available beds, or 19% of the state total. By 2017, the 45 system hospitals had 9,079 beds, or 73% of the total (see Figure 5; data in Figure 5 also appear in Table A5 in the Appendix). This large shift in resources from independent to system hospitals creates more influence for systems in health care policy and administration.

There was slight variation from 1986-2000, with percentages in systems ranging between 19% and 22%. An increase from 2001-2006 produced values from 25% to 27%, and another, larger increase from 2007-2010, saw values from 38% to 40%. Percentages then rose from 53% in 2011 to 73% in 2017.

The pattern of increases in available beds from 1986 to 2000 resembled that for hospitals in systems, although percentages of beds in systems were always higher than percentages of hospitals. The 2001 increase was caused principally by Swedish Medical Center adding a location and becoming a system.

Figure 5 also presents the percentage of hospitals in systems (see also Figure 2). After 2000, the percentage of beds in systems climbed more steeply than the percentage of hospitals in systems. This suggests that hospital resources are becoming concentrated in systems more rapidly than hospitals.

Patient admissions

The percentage of patient admissions to system hospitals compared to independent hospitals rose from 20% to 79%.

Patient admissions to hospitals represent another metric of resource use: how much hospital care the population consumes during a year.

The trend in admissions to system hospitals (see Figure 6; data in figure 6 also appear in Table A6 in the Appendix) resembles the trend for hospital beds in systems discussed earlier (see Figure 5; data in Figure 5 also appear in Table A5 in the Appendix). Admissions to hospitals in systems increased slightly from 1986 through 2000. The percentage rose in 2001 and remained steady until 2006, when it rose again, then remained steady until 2010. From 2011, the percentage grew to 79% in 2017. These trends contrast with those for hospitals that are part of systems (Figure 2); data in figure 2 also appear in Table A2 in the Appendix). The percentage for admissions to system hospitals rose more rapidly in recent years than those for numbers of hospitals in

systems. This effect could be due partly to mergers happening among larger hospitals.

Admissions per available bed

Admissions per available bed increased for much of the period before starting to decrease, with the greater decrease happening in independent hospitals.

Beyond how many hospital beds are available, it is useful to explore how are they used over time. Rates for admissions per hospital bed reflect demand for beds. For this metric, results for independent and for system hospitals were roughly comparable from 1986 to 2009 (see Figure 7; data in Figure 7 also appear in Table A7 in the Appendix). After 2009, while system hospitals saw variation, values for independent hospitals began a steady decrease.

The combination of increasing admissions in system hospitals during the last 30 years and fewer in independent hospitals since 2009 further reflects a larger footprint for systems. A continued decline in admissions to independent hospitals could affect those hospitals' long-term viability.

Figure 6. Percentage of hospital admissions in systems, Washington 1986-2017

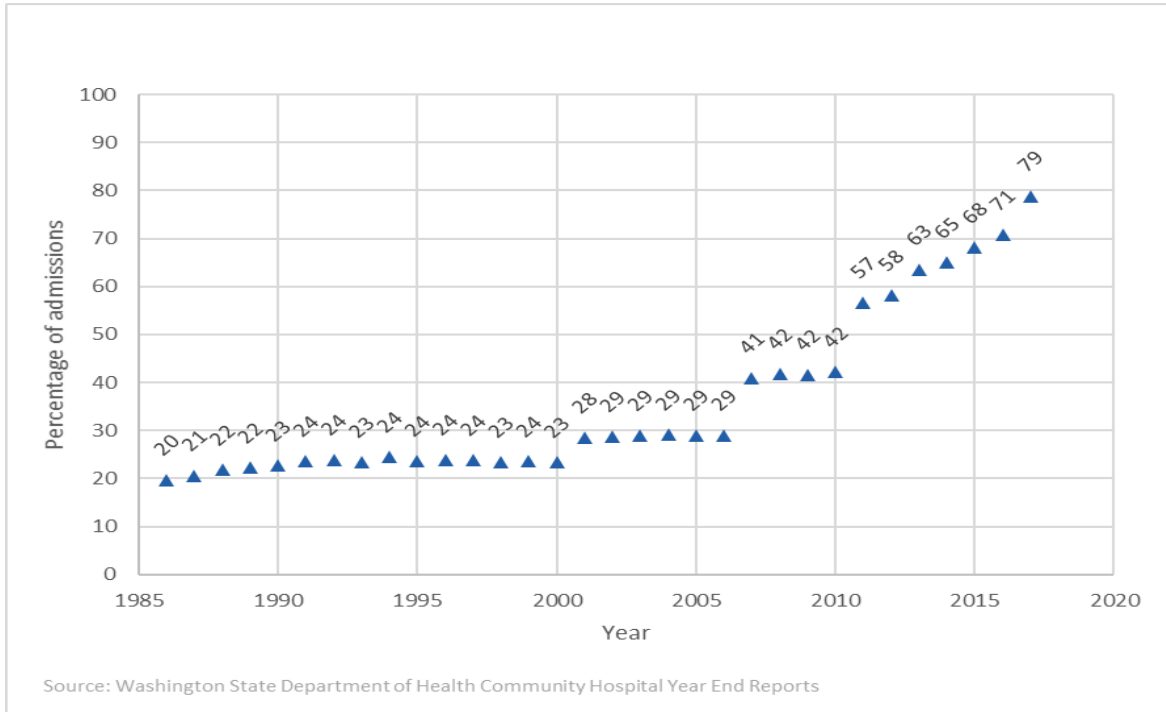
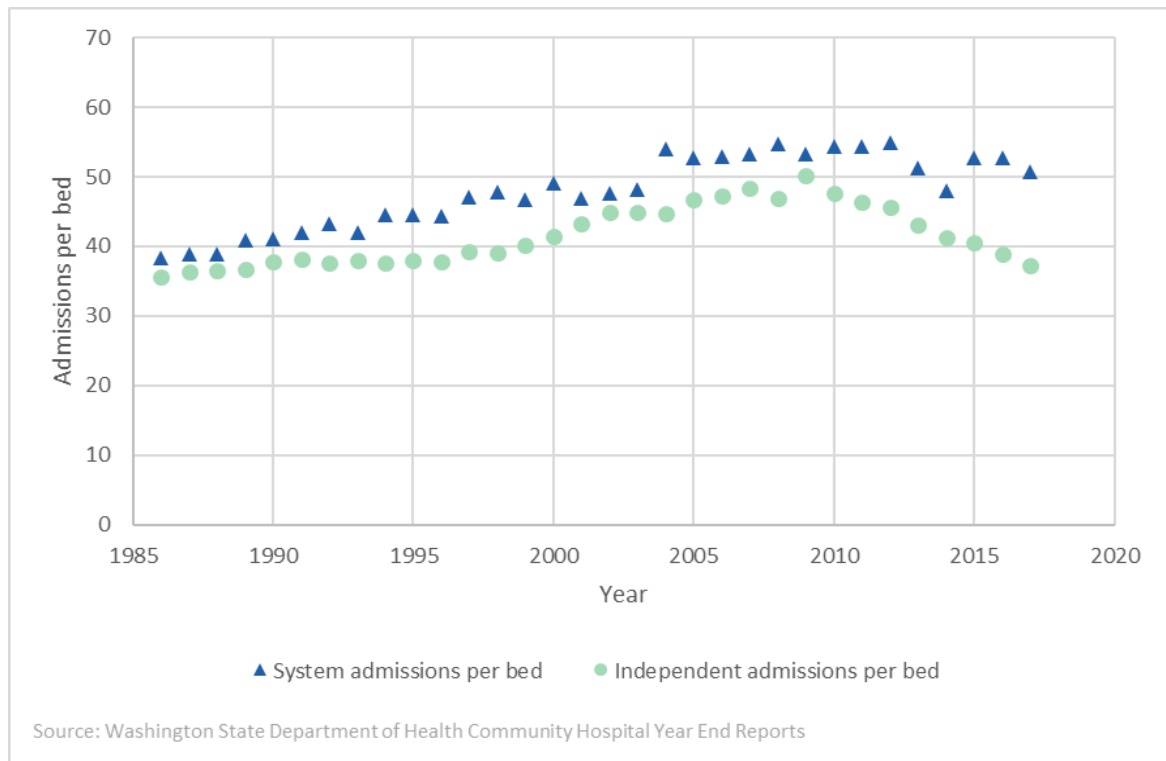


Figure 7. Admissions per available bed, Washington 1986-2017



ICU beds²

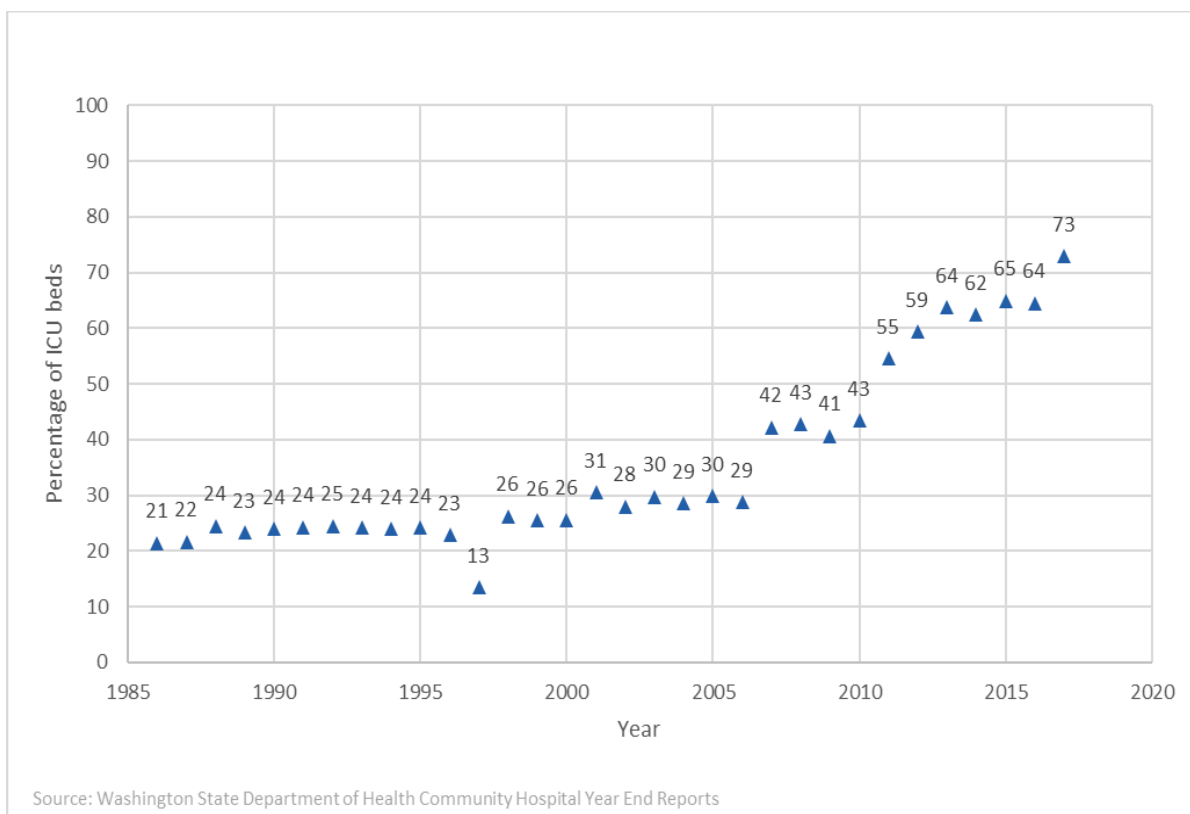
The percentage of ICU beds found in system hospitals rose from 19% to 73%. This is much higher than the percentage of hospitals in systems, which is less than 50%.

Intensive care is defined as services that “require extraordinary observation and care on a concentrated exhaustive and continuous basis”

(Washington State Department of Health, no date). The COVID-19 pandemic placed severe demands on ICUs.

The percentage of ICU beds in systems (Figure 8; see also Table A8 in the Appendix) shows trends like those in hospital beds (Figure 5; see also Table A5 in the Appendix), and admissions (Figure 6; see also in Table A6 in the Appendix), but with more variation.

Figure 8. Percentage of ICU beds in systems, Washington 1986-2017



² From 1986 to 1992, data for approximately 20 hospitals per year list “not reported” as the value for

the number of ICU beds. Most of these are rural hospitals that reported zero ICU beds in 2017.

The ICU bed percentage would be sensitive to system acquisition of hospitals with many ICU beds. By 2017, systems became major providers of intensive care and their policies would have an outsized influence in an emergency that included high demand for ICU resources.

Variation from 1996 to 1998 was due partly to small changes at several hospitals but also to one independent hospital that reported zero ICU beds in 1996, 1122 in 1997, and zero in 1998.

The year from 2006 to 2007 saw smaller variations in some hospitals but also an expansion of the Providence system, which went from three to eight hospitals. The new Providence hospitals had been independent, so their ICU beds were newly added to the system total in 2007.

County level impacts

In 1986, systems operated hospitals in six counties with 60% of the state population. Each of these counties was home to at least one independent hospital. Twenty-nine counties, with 39% of the population, were served only by independent hospitals. Four counties had no hospitals.

In 2017, systems operated hospitals in 17 counties. Eight, almost half, of those counties were served only by system-operated hospitals. Close to 90% of the population lived in a county with at least one system hospital, compared to 60% in 1986. These values suggest that systems have increased their influence.

Nineteen counties, with 11% of the state population, were served only by independent hospitals in 2017. All 19 are classified as rural (Sales and use tax for public facilities in rural counties, 1997 and revised 2012; Office of Financial Management, 2021).

Counties with only system hospitals

In 1986, there was no county where a system or systems operated all hospitals. However, in 2017, there were eight:

1. Clark
2. Cowlitz
3. Kitsap
4. San Juan
5. Stevens
6. Walla Walla
7. Whatcom
8. Yakima

These counties had a combined population of 1,432,920, representing almost 20% of the state.

Counties where a single system had more than half of available beds in 2017

In 1986 there were two counties, Lewis and Thurston, where a single system had almost half or more than half of available hospital beds. In 2017, there were fourteen counties where a single system had more than half of available hospital beds (see Table 2).

Two other county statistics from 2017 deserve mention. Pierce County appears in Table 2 because MultiCare has 52% of available beds in the county. However, MultiCare and CHIF together have more than 90% of available beds in Pierce County. PeaceHealth has all available beds in Cowlitz County and a large percentage in Clark County; in those counties combined, PeaceHealth has 73.5% of beds. Among Washington counties, Pierce ranks second in population, Clark ranks fifth, and Clark and Cowlitz as one county would rank fourth. These measures are examples of populous counties or regions where a limited number of systems dominates available beds.

By contrast, systems in King County have 74% of available beds but those beds are in six systems. It is not surprising that residents in sparsely populated areas have limited choices for hospital

care, but that is also true for some regions, like Pierce County, with comparatively large populations.

Table 2. Counties where a single system had more than half of available hospital beds, 2017

County	Health Care System						
	CHIF ³	Confluence	MultiCare	PeaceHealth	Providence	Skagit Regional Health	Virginia Mason
Benton					66%		
Chelan		86.5%					
Clark				66%			
Cowlitz				100%			
Kitsap	100%						
Lewis					80.2%		
Pierce			52%				
San Juan				100%			
Skagit						67%	
Snohomish					81%		
Spokane					60%		
Stevens					100%		
Thurston					76%		
Walla Walla					100%		
Whatcom				100%			
Yakima							52.4%

Critical access hospitals

The Centers for Medicare and Medicaid Services designate some hospitals as critical access hospitals (“CAH”; Medicare Learning Network, 2021). CAHs are usually found in rural areas and have other characteristics in common. These include:

- No more than 25 acute care inpatient beds
- Round-the-clock emergency care

- Must usually be located more than 35 miles from any other CAH or hospital
- Acute care patients have an average annual length of stay of no more than 96 hours

The CAH designation was intended to promote continuing access to health care in rural communities. CAHs receive certain benefits related to cost reimbursement, staffing and services, and access to other resources.

³ Franciscan Health System became known as CHI Franciscan in 2014 as part of a rebranding by its parent organization, Catholic Health Initiatives.

Washington has 39 CAHs (Washington State Rural Health Plan, 2020). Of these, six (15.4%) belonged to systems in 2017.

Counties with one hospital in 2017

As of 2017, 15 Washington counties have one hospital (Table 3). Of these, five belong to a system and 10 are independent. These

counties had a combined population of 1,026,510, or just under one out of seven in the statewide population.

In 1986, almost 13% of state residents lived in counties with one hospital that was not part of a system. By 2017, this value had decreased to 5%.

In six counties, the single hospital is a CAH.

Table 3. Washington counties with one hospital, 2017

County	Hospital	System	Critical Access Hospital
Asotin	Tri-State Memorial Hospital		
Columbia	Dayton General Hospital		
Cowlitz	PeaceHealth St John Medical Center	PeaceHealth	
Ferry	Ferry County Memorial Hospital		Yes
Franklin	Lourdes Medical Center		
Garfield	Garfield County Memorial Hospital		
Island	Whidbey Health Medical Center		Yes
Jefferson	Jefferson Healthcare		Yes
Kitsap	Harrison Medical Center	CHIF	
Kittitas	Kittitas Valley Healthcare		Yes
Mason	Mason General Hospital		Yes
Pend Oreille	Newport Hospital and Health Services		Yes
San Juan	PeaceHealth Peace Island Medical Center	PeaceHealth	
Walla Walla	Providence St Mary Medical Center	Providence	
Whatcom	PeaceHealth St Joseph Medical Center	PeaceHealth	

Counties with no hospital in 2017

In 1986, four Washington counties had no hospitals:

1. Douglas
2. San Juan
3. Skamania
4. Wahkiakum

That year, the counties had a combined population of 44,082, just under 1% of the state. In 2012, PeaceHealth Peace Island Medical Center opened in San Juan County with 10

available beds. None of the other three counties had a hospital by 2017. Their combined population was 57,140, or 0.78% of the state population.

Residents of the remaining three counties with no hospital must travel to another county for care. From an approximately central location in each county, travel times to a hospital may vary from 35 to 45 minutes to one hour or longer. The nearest hospital would often be a rural facility or critical access

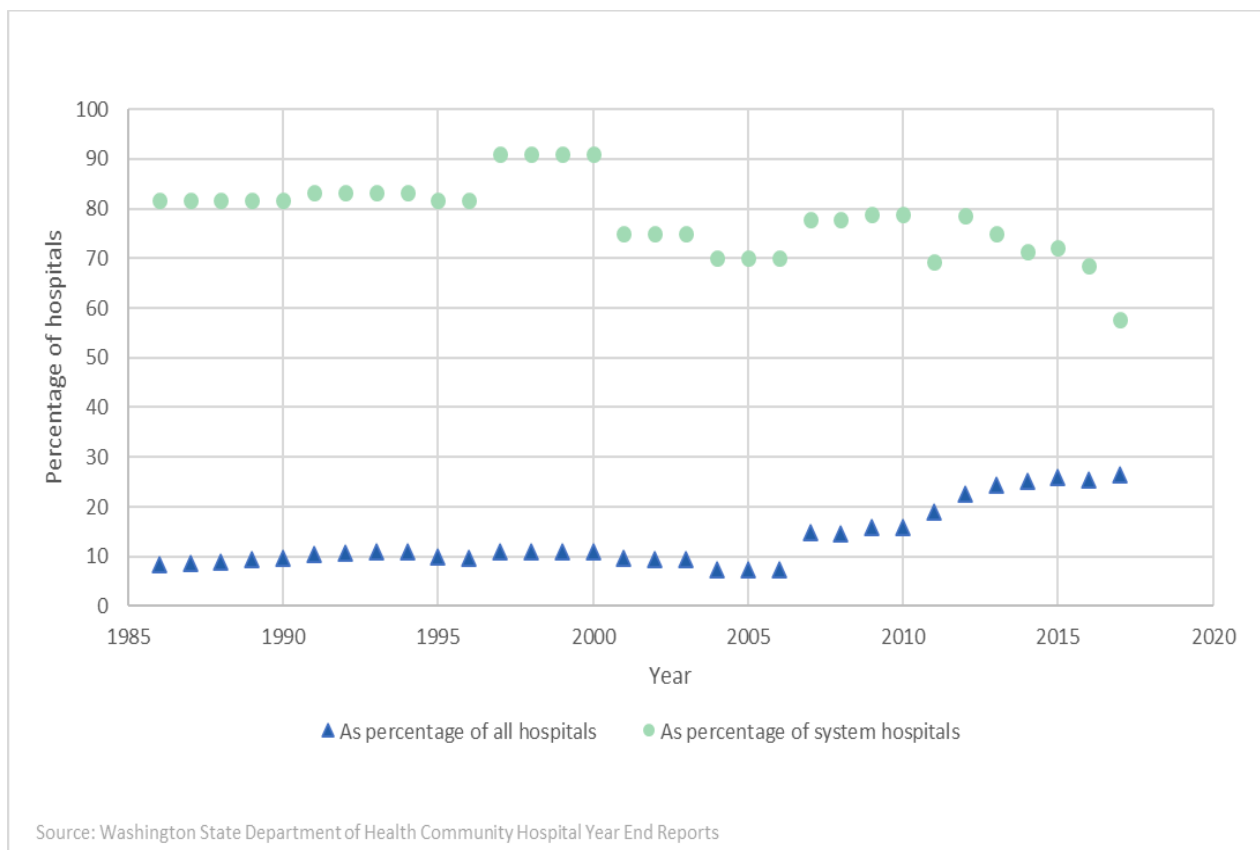
hospital with limited services and patients would make the trip over sometimes challenging routes.

Religiously affiliated hospital systems

Catholic health care systems are prominent nationwide and have developed a strong presence in Washington. In recent years, Catholic hospitals have increased their share of hospitals and resources among all hospitals but decreased their share among all system hospitals.

Growth in Catholic systems has caused concern among commentators and advocates who note that the directives that guide the provision of health care in Catholic settings (*Ethical and religious directives for Catholic health care services, 2018*) address issues related to end-of-life and reproductive health care. The directives may affect patient access to specific procedures or categories of care. The data used for this study do not measure access to these services. While the analysis provides context, it does not address specific information about access or use.

Figure 9. Catholic hospitals among all hospitals and system hospitals, Washington 1986-2017



Changes in metrics for Catholic hospitals reflect organizational changes in Catholic and non-Catholic hospital systems. A consistent theme is that the percentage of system resources in Catholic systems grew in earlier years, but that changed recently as secular systems expanded.

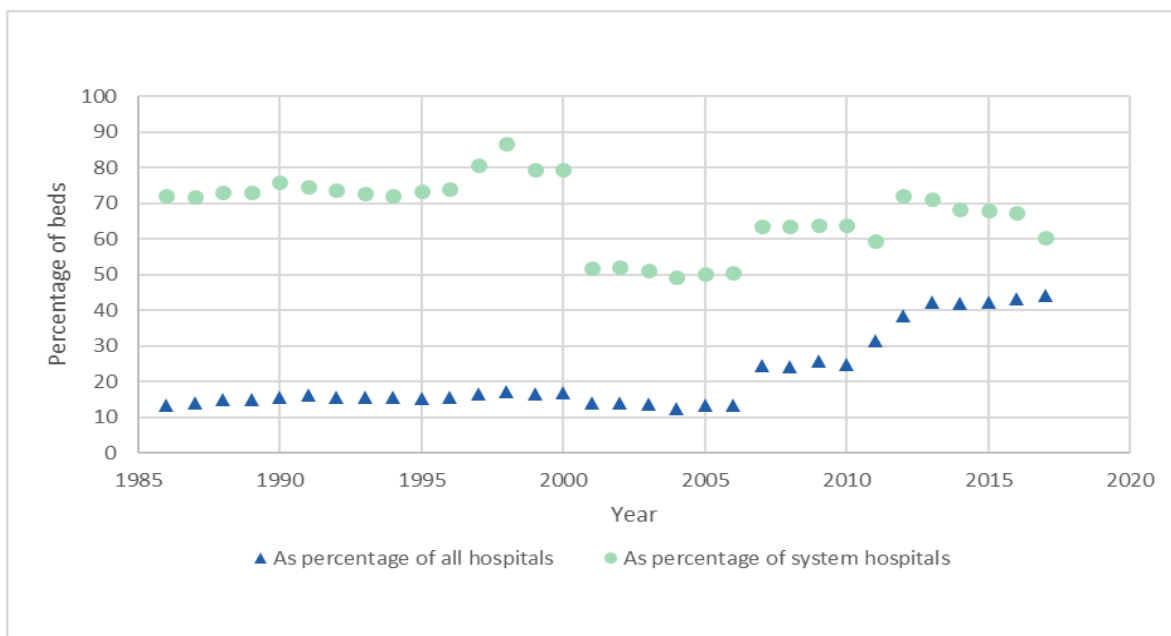
During the study period, the percentage of Catholic hospitals among all hospitals grew from less than 10% to more than 25%. Among system hospitals, the percentage rose as high as 91% during the late 1990s but decreased to 58% by 2017 (Figure 9; data in Figure 9 also appear in Table A9 in the Appendix). Four Washington

counties—Cowlitz, San Juan, Stevens, and Whatcom—are served only by Catholic-affiliated hospitals.

The measures used above for all system and independent hospitals will be used here to examine trends among Catholic-affiliated hospitals.

The percentage of beds in Catholic hospitals increased among all hospitals, especially after 2006, but was more variable in the context of system hospitals (Figure 10; data in Figure 10 also appear in Table A10 in the Appendix).

Figure 10. Beds in Catholic hospitals among all hospitals and system hospitals, Washington 1986-2017



The percentage of admissions to Catholic hospitals resembles the trends seen in available hospital beds (Figure 11; data in Figure 11 also appear in Table A11 in the Appendix). After 2000, the percentage among system hospitals saw some increases but also decreases, particularly after 2011.

Admissions per bed among independent hospitals, non-Catholic system hospitals, and Catholic hospitals follow roughly similar trends: a steady increase from 1986 through 2004 (Catholic hospitals) or through 2008-2009 (all other hospitals), followed by a noticeable decrease (Figure 12; data in Figure 12 also

appear in Table A12 in the Appendix). Catholic hospitals usually have the highest number of admissions per bed, while independent and other system hospitals vary in which has the

lowest number. Independent hospitals have had the lowest number of admissions per bed since 2013, with that value decreasing each year.

Figure 11. Admissions to Catholic hospitals among all hospitals and system hospitals, Washington 1986-2017

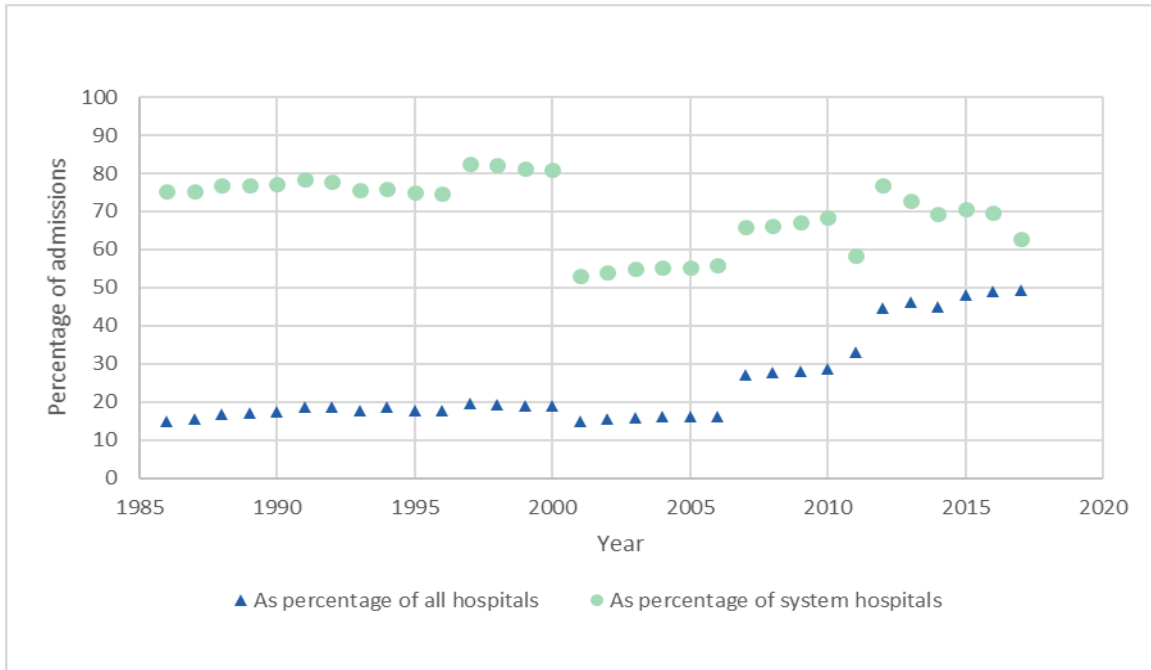
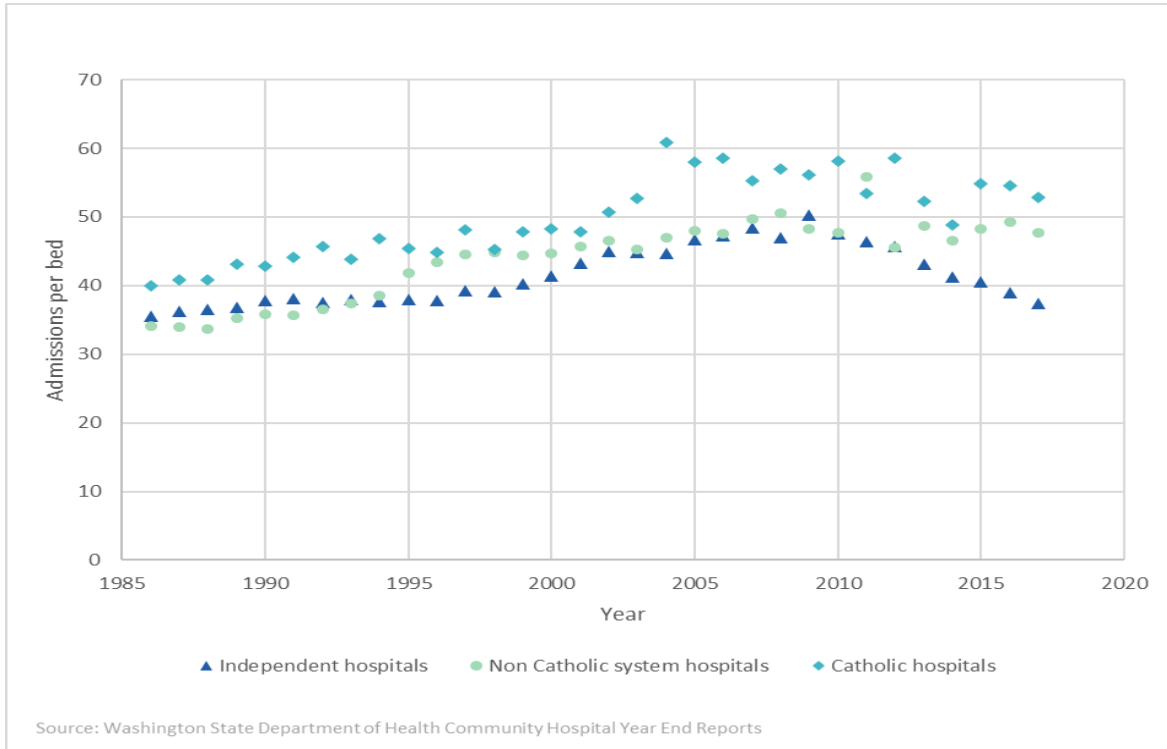


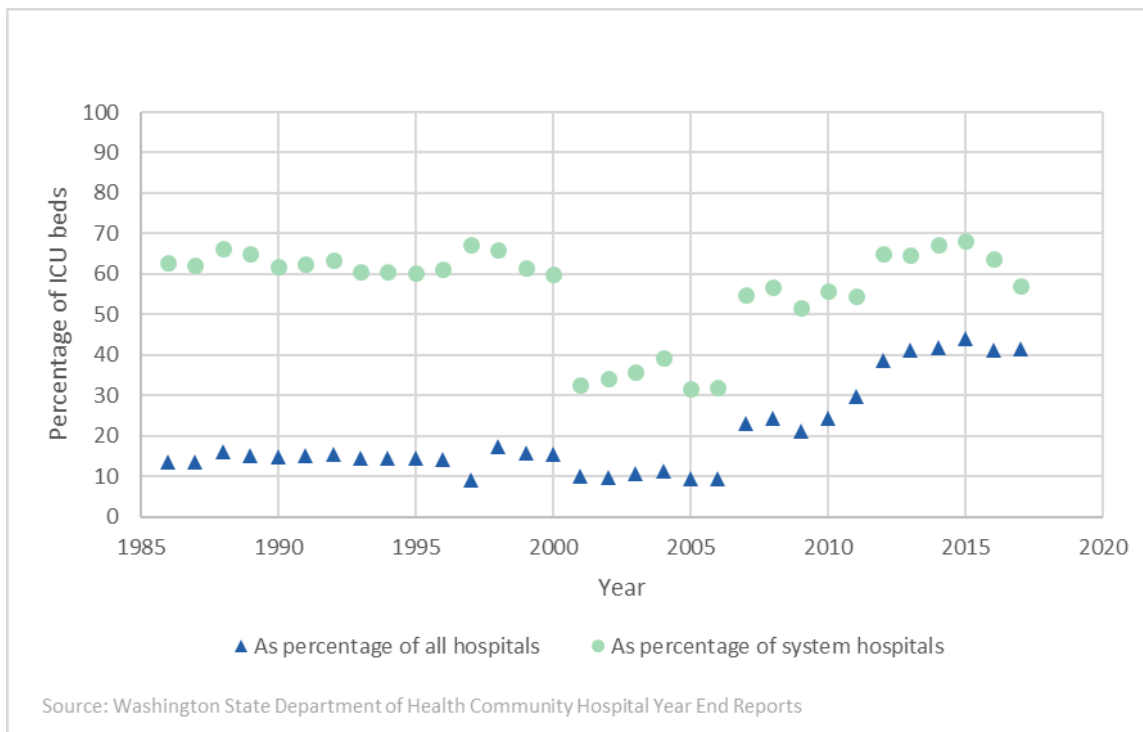
Figure 12. Admissions per bed in independent, non-Catholic system, and Catholic hospitals, Washington 1986-2017



ICU beds in Catholic hospitals present more varied patterns in comparison with other hospitals (Figure 13; see also Table A13 in the Appendix). Both percentages were steady until about 1996. Since then, the Catholic percentage of ICU beds among all hospitals remained steady until 2006, when it began to trend up, reaching

its highest value in 2015. The percentage among system hospitals dropped in 2001, when Swedish became a system, and then followed a series of plateaus that generally increased until 2016. After this time, MultiCare expanded and Virginia Mason and Atria became systems.

Figure 13. ICU beds in Catholic hospitals among all hospitals and system hospitals, Washington 1986-2017



Hospitals leaving systems and future developments

Some hospitals left systems during the study period. Yakima Regional Medical Center was part of the Providence system in 1986, left Providence in 2004, and joined Astria in 2017 to become Astria Regional Medical Center. Yakima Valley Memorial Hospital joined Virginia Mason in 2016, becoming Virginia Mason Memorial. However, in 2020, Virginia Mason Memorial’s board of directors voted to end the relationship with Virginia Mason Franciscan and become independent. A healthcare industry analyst suggested that decision was motivated in part by concern about providing reproductive services in a Catholic healthcare system (Kacik, 2021a).

The process of unwinding mergers can be complex (Kacik, 2021a). Motivations may include post-merger experiences that differ from what

parties expected, different organizational approaches to health care, and unexpected outcomes for expenses. Mergers are often promoted as a path to create synergy and improve efficiency, but this is not necessarily supported by real world experience or relevant research.

Meanwhile, mergers continue nationwide and in Washington. In 2021, CHI Franciscan merged with Virginia Mason to form Virginia Mason Franciscan Health. An August 2021 national news report discussed a “tidal wave” of merger applications to the Federal Trade Commission, amid suggestions that proposed mergers may face heightened scrutiny in the future (Kacik, 2021b). States and the federal government have taken different perspectives on antitrust issues in hospital mergers. Consolidation trends will likely continue although the regulatory picture is uncertain.

Table 4. Summary of system hospital measures, 1986 and 2017

	1986	2017
Total count of independent hospitals and systems	98	63
Counties with system hospitals	6	17
Hospitals in systems	10%	46%
Beds in systems	19%	73%
Admissions to systems	20%	79%
ICU beds in systems	21%	73%

Conclusion

Hospital mergers affect hospital resources — such as available beds and affiliation with other hospitals — and patient care, reflected in number of patient admissions. Overall, the data show that in the last three decades resources and care in Washington became concentrated as hospitals closed or became part of systems.

Table 4 presents a summary comparison of measures related to system hospitals in 1986 and 2017. The number of hospitals in systems grew from 10% to almost half. More dramatically, the system hospital share of resources and care grew from approximately 20% in each case to more than 70% and for some measures close to 80%.

Systems in the late 2010s had a greater say in how health care is administered and delivered, including in emergency situations. It remains to be seen how the growing influence of hospital systems and differing health care philosophies among organizations will affect Washingtonians. If patient experiences after hospital mergers in Washington are similar to those reported in literature, then the concentration of resources and care may result in higher costs for less satisfactory patient care.

Limitations

The analysis is subject to any limitations in the DOH datasets, including data quality issues and missing data. Hospitals that are part of the Military Health System and the Veterans Health Administration do not report to DOH, so metrics do not reflect resources in those facilities.

Transition during this period from inpatient to ambulatory surgery center procedures may have suggested to hospital planners and managers that Washingtonians needed fewer hospital resources than in previous years. The pandemic experience of 2020 demonstrates that unforeseen situations may rapidly and significantly affect demand for hospital resources.

Data on resources for residents who live near state boundaries may be incomplete. Some health systems provide hospital care in both Washington and Oregon, or Washington and Idaho. This cross-boundary presence means patients may obtain health care on either side of the state line. The DOH data analyzed here do not include information on hospitals outside Washington.

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Appendix

The Appendix uses tables to present data that appear in graphical form in the main text.

Table A1. Sum of independent hospitals and hospital systems, 1986-2017

Year	Number of hospitals	Number of hospital organizations
1986	106	98
1987	103	95
1988	100	92
1989	97	89
1990	94	86
1991	95	86
1992	94	85
1993	91	82
1994	90	81
1995	93	85
1996	93	85
1997	92	84
1998	92	84
1999	92	84
2000	92	84
2001	93	85
2002	95	87
2003	95	87
2004	96	90
2005	96	90
2006	96	90
2007	95	82
2008	96	83
2009	95	81
2010	95	81
2011	95	75
2012	97	74
2013	98	72
2014	99	71
2015	100	71
2016	102	72
2017	98	63

Table A2. Percentage of hospitals in systems, 1986-2017

Year	Percentage of hospitals in systems
1986	10.5
1987	10.8
1988	11.1
1989	11.5
1990	11.8
1991	12.8
1992	12.9
1993	13.3
1994	13.5
1995	12.0
1996	12.0
1997	12.1
1998	12.1
1999	12.1
2000	12.1
2001	12.9
2002	12.6
2003	12.6
2004	10.4
2005	10.4
2006	10.4
2007	18.9
2008	18.8
2009	20.0
2010	20.0
2011	27.4
2012	28.9
2013	32.7
2014	35.4
2015	36.0
2016	37.3
2017	45.9

Table A2.1. Annual percentage change in number of hospital organizations, 1987-2017

Year	Percentage change in number of organizations
1987	-3.1
1988	-3.2
1989	-3.3
1990	-3.4
1991	0.0
1992	-1.2
1993	-3.5
1994	-1.2
1995	4.9
1996	0.0
1997	-1.2
1998	0.0
1999	0.0
2000	0.0
2001	1.2
2002	2.4
2003	0.0
2004	3.4
2005	0.0
2006	0.0
2007	-8.9
2008	1.2
2009	-2.4
2010	0.0
2011	-7.4
2012	-1.3
2013	-2.7
2014	-1.4
2015	0.0
2016	1.4
2017	-12.5

Table A3. Count of hospital beds in Washington State, 1986-2017

Year	Total hospital beds
1986	13,277
1987	12,875
1988	12,889
1989	12,561
1990	12,376
1991	12,521
1992	12,546
1993	12,086
1994	11,659
1995	11,657
1996	11,766
1997	11,426
1998	11,634
1999	11,533
2000	11,569
2001	11,534
2002	11,332
2003	11,505
2004	11,281
2005	11,288
2006	11,376
2007	11,331
2008	11,440
2009	11,199
2010	11,566
2011	11,640
2012	11,716
2013	11,832
2014	12,007
2015	12,280
2016	12,392
2017	12,399

Table A4. Available hospital beds per 100,000 population, 1986-2017

Year	Beds per 100,000 population
1986	297.5
1987	284.4
1988	279.2
1989	265.7
1990	254.3
1991	250.4
1992	246.4
1993	233.0
1994	220.3
1995	216.0
1996	214.6
1997	204.8
1998	204.6
1999	199.1
2000	196.3
2001	193.2
2002	187.0
2003	187.8
2004	181.7
2005	179.2
2006	177.2
2007	173.7
2008	173.1
2009	167.8
2010	172.0
2011	172.0
2012	171.8
2013	171.9
2014	172.3
2015	173.9
2016	172.5
2017	169.6

Table A5. Percentage of hospital beds in systems, 1986-2017

Year	Percentage of beds in systems	Percentage of hospitals in systems
1986	18.5	10.4
1987	19.5	10.7
1988	20.7	11.0
1989	20.4	11.3
1990	20.4	11.7
1991	21.9	12.6
1992	21.4	12.8
1993	21.7	13.2
1994	21.5	13.3
1995	20.9	11.8
1996	21.1	11.8
1997	20.7	12.0
1998	20.0	12.0
1999	20.9	12.0
2000	21.2	12.0
2001	26.9	12.9
2002	27.0	12.6
2003	27.0	12.6
2004	25.3	10.4
2005	26.6	10.4
2006	26.8	10.4
2007	38.6	18.9
2008	38.2	18.8
2009	40.2	20.0
2010	38.9	20.0
2011	52.7	27.4
2012	53.6	28.9
2013	59.4	32.7
2014	61.4	35.4
2015	62.0	36.0
2016	64.0	37.3
2017	73.2	45.9

Table A6. Percentage of hospital admissions in systems, 1986-2017

Year	Percentage of admissions in systems
1986	19.7
1987	20.6
1988	21.8
1989	22.2
1990	22.6
1991	23.6
1992	23.9
1993	23.4
1994	24.5
1995	23.7
1996	23.9
1997	23.8
1998	23.4
1999	23.5
2000	23.4
2001	28.5
2002	28.8
2003	29.0
2004	29.1
2005	29.0
2006	29.0
2007	40.9
2008	41.8
2009	41.6
2010	42.2
2011	56.6
2012	58.2
2013	63.5
2014	64.9
2015	68.0
2016	70.7
2017	78.8

Table A7. Admissions per available bed, 1986-2017

Year	Admissions per hospital bed	
	System	Independent
1986	38.4	35.6
1987	38.9	36.3
1988	39.0	36.5
1989	41.0	36.8
1990	41.1	37.8
1991	42.0	38.2
1992	43.3	37.5
1993	42.0	38.0
1994	44.5	37.7
1995	44.5	37.9
1996	44.4	37.8
1997	47.1	39.3
1998	47.7	39.1
1999	46.7	40.2
2000	49.1	41.4
2001	46.8	43.2
2002	47.6	45.0
2003	48.1	44.9
2004	54.0	44.6
2005	52.7	46.7
2006	52.9	47.3
2007	53.3	48.4
2008	54.7	46.9
2009	53.3	50.2
2010	54.4	47.6
2011	54.3	46.3
2012	55.0	45.7
2013	51.2	43.1
2014	48.1	41.3
2015	52.7	40.5
2016	52.8	38.9
2017	50.7	37.3

Table A8. Percentage of ICU beds in systems, 1986-2017

Year	Percentage of ICU beds in systems
1986	21.4
1987	21.7
1988	24.5
1989	23.3
1990	24.0
1991	24.3
1992	24.5
1993	24.1
1994	24.0
1995	24.1
1996	22.9
1997	13.4
1998	26.2
1999	25.5
2000	25.6
2001	30.5
2002	28.0
2003	29.7
2004	28.6
2005	29.9
2006	28.7
2007	42.2
2008	42.7
2009	40.7
2010	43.4
2011	54.6
2012	59.4
2013	63.7
2014	62.5
2015	64.9
2016	64.5
2017	72.9

Table A9. Catholic hospitals as percentage of all hospitals and of system hospitals, 1986-2017

Year	As percentage of all hospitals	As percentage of system hospitals
1986	8.5	81.8
1987	8.7	81.8
1988	9.0	81.8
1989	9.3	81.8
1990	9.6	81.8
1991	10.5	83.3
1992	10.6	83.3
1993	11.0	83.3
1994	11.0	83.3
1995	10.0	81.8
1996	9.7	81.8
1997	10.9	90.9
1998	10.9	90.9
1999	10.9	90.9
2000	10.9	90.9
2001	9.7	75.0
2002	9.5	75.0
2003	9.5	75.0
2004	7.3	70.0
2005	7.3	70.0
2006	7.3	70.0
2007	14.7	77.8
2008	14.6	77.8
2009	15.8	78.9
2010	15.8	78.9
2011	18.9	69.2
2012	22.7	78.6
2013	24.5	75.0
2014	25.3	71.4
2015	26.0	72.2
2016	25.5	68.4
2017	26.5	57.8

Table A10. Hospital beds in Catholic hospitals as percentage of all hospitals and of system hospitals, 1986-2017

Year	As percentage of all hospitals	As percentage of system hospitals
1986	13.4	72.2
1987	14.0	71.7
1988	15.1	73.2
1989	14.9	72.9
1990	15.7	75.8
1991	16.4	74.7
1992	15.8	73.7
1993	15.8	72.7
1994	15.6	72.2
1995	15.3	73.4
1996	15.6	73.9
1997	16.7	80.7
1998	17.3	86.6
1999	16.6	79.4
2000	16.8	79.4
2001	14.0	51.9
2002	14.0	51.9
2003	13.8	51.3
2004	12.4	49.1
2005	13.4	50.3
2006	13.5	50.5
2007	24.5	63.5
2008	24.3	63.6
2009	25.7	63.9
2010	24.9	63.9
2011	31.3	59.5
2012	38.6	72.0
2013	42.3	71.2
2014	41.9	68.3
2015	42.1	67.9
2016	43.1	67.4
2017	44.1	60.3

Table A11. Admissions to Catholic hospitals as percentage of all hospitals and of system hospitals, 1986-2017

Year	As percentage of all hospitals	As percentage of system hospitals
1986	14.8	75.2
1987	15.5	75.3
1988	16.7	76.8
1989	17.0	76.7
1990	17.5	77.3
1991	18.6	78.6
1992	18.6	77.8
1993	17.7	75.7
1994	18.6	75.9
1995	17.7	74.9
1996	17.8	74.5
1997	19.6	82.5
1998	19.2	82.1
1999	19.1	81.2
2000	18.9	81.0
2001	15.1	53.0
2002	15.5	54.0
2003	15.9	54.9
2004	16.1	55.4
2005	16.1	55.4
2006	16.2	55.9
2007	27.0	65.9
2008	27.7	66.3
2009	28.0	67.3
2010	28.8	68.3
2011	33.1	58.4
2012	44.7	76.8
2013	46.1	72.7
2014	45.0	69.3
2015	48.0	70.6
2016	49.2	69.6
2017	49.4	62.7

Table A12. Admissions per hospital bed in independent, non-Catholic system, and Catholic hospitals, 1986-2017

Year	Independent hospitals	Non-Catholic system hospitals	Catholic hospitals
1986	35.6	34.1	40.0
1987	36.3	33.9	40.8
1988	36.5	33.7	40.9
1989	36.8	35.2	43.1
1990	37.8	35.8	42.9
1991	38.2	35.6	44.2
1992	37.5	36.5	45.7
1993	38.0	37.4	43.8
1994	37.7	38.5	46.8
1995	37.9	41.9	45.4
1996	37.8	43.4	44.8
1997	39.3	44.6	48.2
1998	39.1	44.8	45.3
1999	40.2	44.3	47.8
2000	41.4	44.7	48.3
2001	43.2	45.8	47.8
2002	45.0	46.6	50.6
2003	44.9	45.3	52.7
2004	44.6	46.9	60.9
2005	46.7	47.9	58.1
2006	47.3	47.6	58.6
2007	48.4	49.8	55.3
2008	46.9	50.6	57.0
2009	50.2	48.3	56.2
2010	47.6	47.8	58.2
2011	46.3	55.8	53.3
2012	45.7	45.6	58.6
2013	43.1	48.6	52.3
2014	41.3	46.5	48.8
2015	40.5	48.3	54.8
2016	38.9	49.2	54.5
2017	37.3	47.6	52.8

Table A13. ICU beds in Catholic hospitals as percentage of all hospitals and of system hospitals, 1986-2017

Year	As percentage of all hospitals	As percentage of system hospitals
1986	13.4	62.6
1987	13.5	62.2
1988	16.2	66.2
1989	15.1	64.9
1990	14.8	61.7
1991	15.2	62.6
1992	15.5	63.3
1993	14.6	60.5
1994	14.5	60.5
1995	14.5	60.3
1996	14.0	61.2
1997	9.1	67.4
1998	17.3	65.9
1999	15.7	61.5
2000	15.4	60.0
2001	10.0	32.6
2002	9.6	34.2
2003	10.6	35.7
2004	11.3	39.4
2005	9.4	31.6
2006	9.2	32.1
2007	23.1	54.8
2008	24.2	56.7
2009	21.1	51.8
2010	24.2	55.8
2011	29.9	54.7
2012	38.6	65.0
2013	41.3	64.8
2014	42.0	67.2
2015	44.2	68.1
2016	41.0	63.7
2017	41.5	56.9