

December 2023



Office of Financial Management
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Hospital care utilization, Washington 2010–22

Office of Financial Management

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Executive Summary

This report is an update to part of a 2010 report about strategic health planning. In 2010, the Office of Financial Management (OFM) Forecasting and Research Division released a report titled “Strategic Health Planning: A Progress report” in response to a state law (RCW 43.370) that directed OFM to develop a statewide health resources strategy. This strategy includes accurate health care information and statistics related to cost and quality of health care.

This report begins a new data analysis series at OFM focused on health care use and need. Using this analysis series, our subsequent reports will examine hospital costs and trends in how hospitals use their resources. Those trends include changes in demand for hospital care, developments in how hospital care is used for common diagnoses and procedures, and issues related to patients accessing care for different conditions.

This report specifically:

- Revisits data gaps highlighted in the original 2010 report.
- Describes and compares population demographics with inpatient demographics.
- Examines inpatient hospital bed use and availability.
- Projects future inpatient hospital usage.

We also used the analyses to highlight how the COVID-19 pandemic impacted hospital use.

What we found

1. Health care data gaps remain.

Despite progress to address many health care data gaps highlighted in the initial 2010 report, major gaps remain. These include not having a complete database of health care facilities and lacking a comprehensive population-based health database like the California Health Interview Survey. Statewide efforts are being made to fill these gaps.

2. Aging demographics will impact hospital use and need trends.

While Washington's population has increased faster than the U.S. population, the state has seen an increase in the proportion of people over age 65. These trends will affect hospital use and need. The hospital inpatient demographics already differ somewhat from the overall demographics of the state. These differences could be an extension of health disparities that we see in the general population. However, the pandemic made it difficult to assess new inpatient demographic trends from 2020 through 2022.

3. The need for beds will increase over time.

Hospital inpatient capacity has increased steadily over time, but bed use has varied and was greatly impacted by the pandemic. The overall hospital inpatient rate has decreased in Washington over time while inpatient length of stay steadily increased. We expect the need for available beds to increase over the next decade.

Data gaps impacted how we created a health resource strategy

In 2010, the Health Care Research Center (HCRC) in our Forecasting and Research Division worked to produce a thorough statewide health resource strategy that met legislative requirements. However, the center found data gaps that hampered this effort, and included this information in the 2010 report¹.

The chapters in that report (described as a “progress report”) estimated health care resources and services using hospital inpatient admissions data, population-based surveys, health care professional licensing data, and primary data collection. The report’s conclusions stated a lack of existing data sources meant the center couldn’t adequately create a health care services resource strategy that addressed hospital use and forecast health care needs.

In closing, the report named four databases the state must develop to meet legislative requirements:

1. A census of active health care professionals.
2. A census of health services facilities conducted on a periodic basis.
3. An all-payer claims database.
4. A comprehensive population-based, socio-economic and health database like the California Health Interview Survey (CHIS) or an expanded Behavioral Risk Factors Surveillance System for Washington.

¹ Washington State Office of Financial Management “Strategic Health Planning: A Progress Report” https://ofm.wa.gov/sites/default/files/public/dataresearch/healthcare/utilization_quality/OFM_Strategic_Health_Planning_2010.pdf

How the center gathered data without complete databases

Since 2010, HCRC staff partially filled in the gaps from not having the above databases. Here is an in-depth look at each workaround.

1. Census of active health care professionals

HCRC staff developed a methodology using multiple data sources to estimate the number of select types of active health care professionals across Washington. Detailed reports that include data sources and methodology are on the [OFM website](#). Starting in 2025, a [2023 law](#) requires registered, certified, and licensed health professionals to provide basic demographic information, practice specialty, and practice location when they apply for licenses and again when they renew their licenses with the Department of Health. This encouraging requirement will enhance provider licensing information and inform HCRC methodology for estimating active health care professionals.

2. Census of health services facilities

While the 2010 report showed an inventory we created of different facility types (Chapter 7), the state still does not have a complete database of health care facilities. We created the inventory by using multiple data sources and contacting facilities directly. We can derive some information from the Washington All-Payer Health Care Claims Database (WA-APCD), but 'place of service' is not always complete on the claims submitted. This issue has also hampered state efforts to estimate primary care expenditures².

²Primary Care Expenditures: Summary of current primary care expenditures and investment in Washington. <https://ofm.wa.gov/sites/default/files/public/publications/PrimaryCareExpendituresReport.pdf>

3. Washington All-Payer Health Care Claims Database

OFM secured federal funding to develop and release the 2018 Washington All-Payer Health Care Claims Database (WA-APCD). The state-mandated database, managed by Health Care Authority, includes claims from 2014 on from all Medicaid and Medicare payers as well as private insurers regulated in the state^{3,4}. The WA-APCD does not include claims for most self-insured employer plans⁵, federal employees living in Washington including active-duty military and dependents, Veterans Affairs services, and health care services that people pay for with cash. Neither does it include health services, particularly hospital care, for people without health insurance.

4. Comprehensive population-based health database

HCRC staff continue to work with Behavioral Risk Factor Surveillance System (BRFSS) data and have supported the inclusion of state-added questions related to health care coverage. However, BRFSS only surveys adults aged 18 and older and does not meet the needs that a comprehensive health care survey like the California Health Interview Survey (CHIS) would fulfill. For example, CHIS annually surveys California households on a wide range of health-related topics including health status and conditions, access to health care, and health insurance. HCRC staff are exploring ways to develop and gather the additional data it needs including applying for federal funding with academic partners.

Staff will continue working with existing data sources while actively pursuing opportunities to expand data resources and fill in data gaps around health care access and use (e.g., updates to licensing registration information).

³ Statewide All-Payer Health Care Claims Database, Report to the Legislature. Dec 2017 (<https://ofm.wa.gov/sites/default/files/public/dataresearch/healthcare/APCD/AllPayerHCClaimsDatabaseReportToLegDec2017.pdf>)

⁴ Statewide All-Payer Health Care Claims Database, Biennial report to the Legislature. Feb 2021 <https://ofm.wa.gov/sites/default/files/public/publications/OFM%20Statewide%20All-Payer%20Health%20Care%20Claims%20Database%20Report%202021.pdf>

⁵ Gobeille v. Liberty Mut. Ins. Co., 577 U.S. 312 (2016)

Population demographics

Changes in Washington’s population provide the backdrop for demands on inpatient hospital resources in this report. Washington’s population has increased faster than the United States overall. During the 2010 to 2019 decade, Washington’s population increased by about 12%, from 6.7 million to 7.5 million. In comparison, the United States increased around 7%. According to OFM projections, the state will reach about 10 million residents by 2050 (Figure 1.1). Demands for increased health care service comes with an increasing population. And the proportion of the population over age 65 (Figure 1.2) is projected to be about a quarter of the total population by 2050; this demographic tends to need hospital use more than a younger demographic. These changes present unique health care needs.

Figure 1.1 Actual and population forecast, Washington 1990-2050.

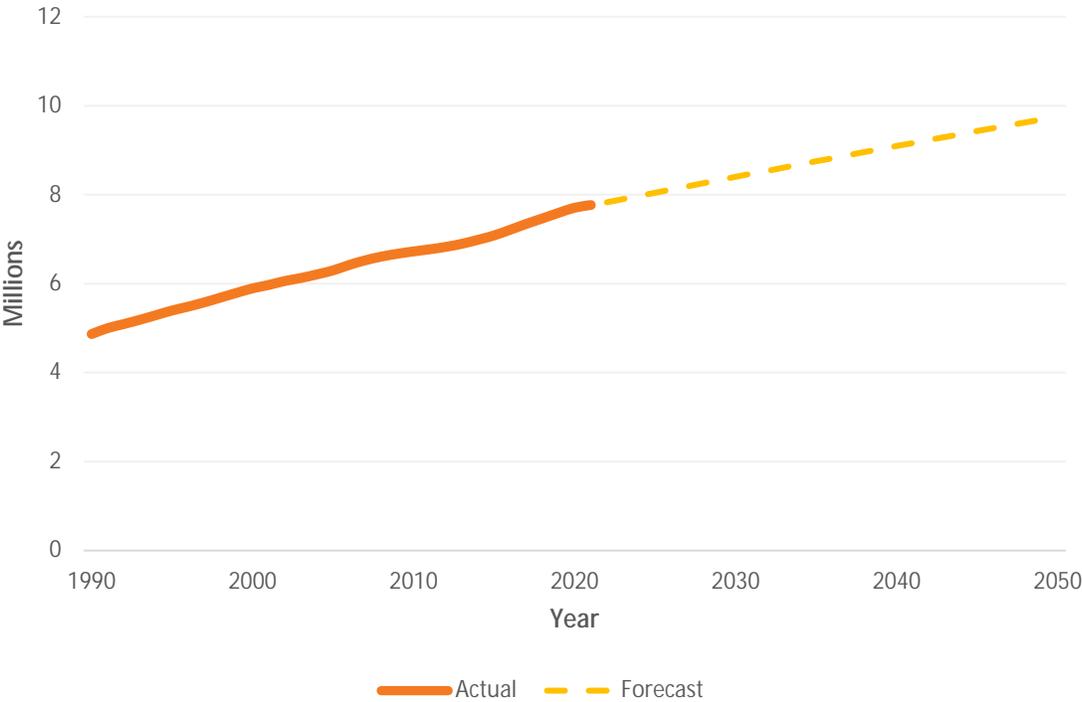
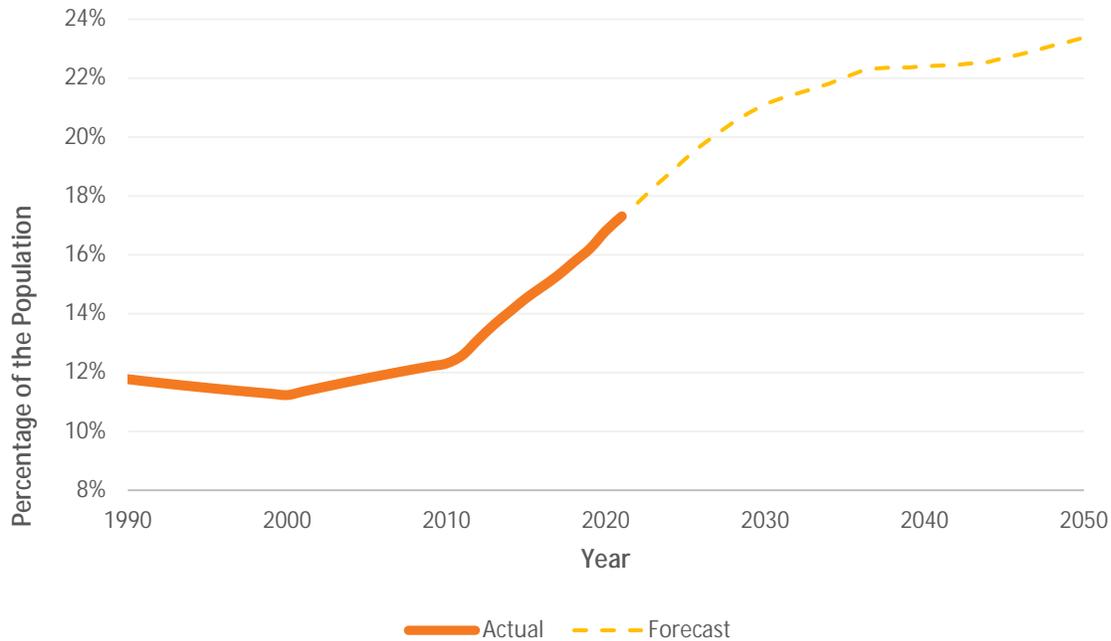


Figure 1.2 Fraction of state population 65 and older - actual and forecast, Washington 1990-2050.



The number of residents hospitalized in Washington’s community hospitals was slightly smaller in 2019 (641,000) than in 2010 (652,000) (See Table 1.2).

Washington’s inpatient population demographics differ somewhat from those of the general population, although the changes within each demographic group from 2010 to 2019 appear similar in both the general population and hospital patients. In the general population, the proportions of whites and age groups under 65 decreased while the shares of API, Hispanics, and those 65 and older increased.⁶

When compared with the general population in 2010 and 2019, hospital inpatients included a greater share of females. They represented 50% of the general population in both years but were 59% of inpatients in 2010 and 56% in 2019. As our analysis focusing on diagnoses and procedures in hospitalization in an upcoming report for this series will

⁶ Race and Hispanic origin estimates for inpatient population in this analysis are calculated using only hospital discharge records with no missing data on these demographic characteristics. There was a sizeable share of the hospital discharge records that had missing data on these characteristics. Race data was missing in 22% of the records in 2010 and 15% in 2020. Hispanic origin data was missing in 29% of the records in 2010 and 8% in 2020.

show, the larger share of females in inpatient population is the result of women giving births in hospitals. There was also a higher proportion of whites among hospital patients than in the general population (approximately 85% and 80%, respectively). The share of individuals aged 65 and older was above 30% for hospital inpatients and around 15% for the general population. Shares of API, multi-racial groups, Hispanics, and age groups under 65 were smaller for hospital patients, compared with corresponding shares for the general population (Table 1.2).

Table 1.2 Demographic characteristics of Washington’s residents and hospital inpatients in 2010 and 2019

Demographics	Overall			Inpatients*		
	2010	2019	Direction of change	2010	2019	Direction of change
Total	6,724,540	7,546,410	▲	652,035	641,064	▼
Female	50.2%	50.1%	▼	58.6%	56.2%	▼
White	82.3%	78.8%	▼	88.6%	84.8%	▼
Black	3.8%	4.2%	▲	4.6%	5.1%	▲
AIAN	1.8%	1.8%	▲	1.9%	1.8%	▼
API	8.0%	10.0%	▲	4.7%	7.1%	▲
Multi-race	4.2%	5.1%	▲	0.2%	1.2%	▲
Hispanic	11.2%	13.2%	▲	7.7%	8.5%	▲
Age 0-17	23.5%	22.3%	▼	17.8%	16.2%	▼
Age 18-44	37.1%	36.2%	▼	26.2%	24.9%	▼
Age 45-64	27.1%	25.3%	▼	24.0%	21.8%	▼
Age 65 and over	12.3%	16.3%	▲	32.0%	37.1%	▲

*Calculations for racial groups and Hispanic ethnicity excludes patients with missing information

Hospital capacity

To measure hospital capacity, we first used available bed days by including licensed acute inpatient hospital beds. We then excluded the counts of beds in skilled nursing facilities,⁷ clinical decision units,⁸ chemical dependency/alcohol treatment units, and ambulatory treatment centers⁹. And we used licensed beds instead of staffed beds because a hospital's licensed beds are more stable over time. To calculate annual available bed days, we multiplied total licensed beds by 365 days. For example, if a hospital has 25 licensed beds, the hospital will have 9,125 bed days in a year. This value assumes that all beds have the potential to be occupied every day.

Hospital capacity reflects a hospital's flexibility to deal with unexpected demand. This flexibility can be affected by such factors as procedure transitions (e.g., joint replacement) to outpatient settings, reimbursement changes for how long patients stay, infectious disease outbreaks, and population aging. Available hospital bed days have implications for hospital management, whether there are too many (the hospital may be licensing and staffing beds it doesn't need), or too few (the hospital will have difficulty responding to a crisis).

Figure 2.1 displays the total annual hospital bed days in millions for Washington for the years 2010-2019. Values range from about 5 million bed days in 2010 to just under 5.2 million in 2019, with an increasing trend. Nationally, the American Hospital Association stated that available bed days decreased from 2015 to 2016, increased in 2017, and decreased the next two years before a slight increase in 2020.¹⁰

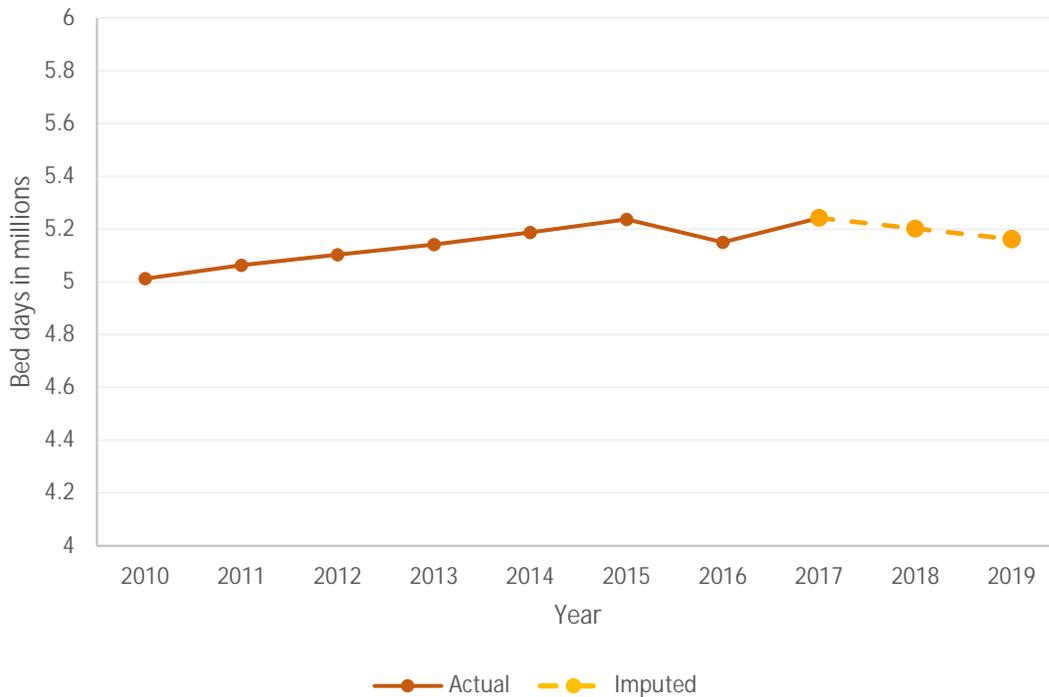
⁷ Skilled nursing facilities (SNFs) generally focus on skilled nursing care and related services, as well as rehabilitation services. SNFs or SNF beds usually provide less intensive care than patients receive in an acute care setting.

⁸ A clinical decision unit (CDU) is an observation unit, usually housed within a hospital emergency department, that allows hospital staff to monitor a patient to determine whether the patient should be admitted to the hospital.

⁹ Ambulatory treatment centers (ATCs) provide medical services on an outpatient basis.

¹⁰ <https://www.aha.org/statistics/fast-facts-us-hospitals>; note that these values are reported with a two-year lag.

Figure 2.1. Available hospital bed days in Washington, 2010-2019.



**2018 data is missing for several hospitals*

We imputed 2018 Washington data in Figure 2.1 because nine hospitals are missing from the data source called the “Community Hospital Year End Reports” from the Washington Department of Health¹¹. Data in the 2017 report suggested that the missing nine hospitals had a total of more than 67,000 available bed days. Adding that value to the calculated figure for 2018 would raise the 2018 total to approximately 5.2 million available bed days.

Figure 2.1 does not attempt to report counts of available bed days after 2019 because a quarter of the hospital data are missing from the reports. While reports are available for 2020 and 2021, those years include a warning that data are not representative because some hospitals did not report. The 2019 report lists 103 hospitals, while the 2021 report (at the time of writing this report) lists 77.

¹¹ <https://doh.wa.gov/data-statistical-reports/healthcare-washington/hospital-and-patient-data/hospital-financial-data/year-end-reports>

Utilized bed days

Available bed days describe how much inventory is available in a hospital. Utilized bed days and rates show how many days patients were hospitalized in a year and corresponds to the intensity of hospital use.

Utilized bed days were on the rise from 2010 to 2021 (Figure 3.1), except for 2020 when COVID-19 forced hospitals to temporarily suspend non-emergent hospital services. Utilized bed days increased from approximately 2.6 million in 2010 to 3.3 million in 2021. However, it's unclear if 2021 represents a return to 'normal' hospitalization numbers.

An increase in utilized bed days can be caused by population growth, more people being hospitalized, increased stay lengths, or all of the above. We use the overall population change in the utilized bed day rate. If the rate remains unchanged, then changes in the population are in sync with changes in bed day usage. If the rate changes in a different direction or intensity than bed day use, then one of three things is happening. One, the share of the overall population hospitalized is changing. Two, the average length of hospital stay is changing. And three, it could be both.

In Figure 3.1, total bed days used increased by about 25% since 2010. The utilized bed-day rate increased from 394 days per 1,000 population in 2010 to 429 days in 2021, with a notable decline in 2020 due to the pandemic. Estimates for the number of people hospitalized (Table 1.2) in the "Population Demographics" section and for the overall population admission rate (Figure 3.2) showed that fewer – rather than more – people were hospitalized from 2010 to 2019. This implies that the rise in utilization can be attributed to an increase in the average length of hospital stays. We display this in Figure 3.3.

Figure 3.1. Total number of hospital inpatient bed days utilized and rate per 1,000 population, 2010-2021

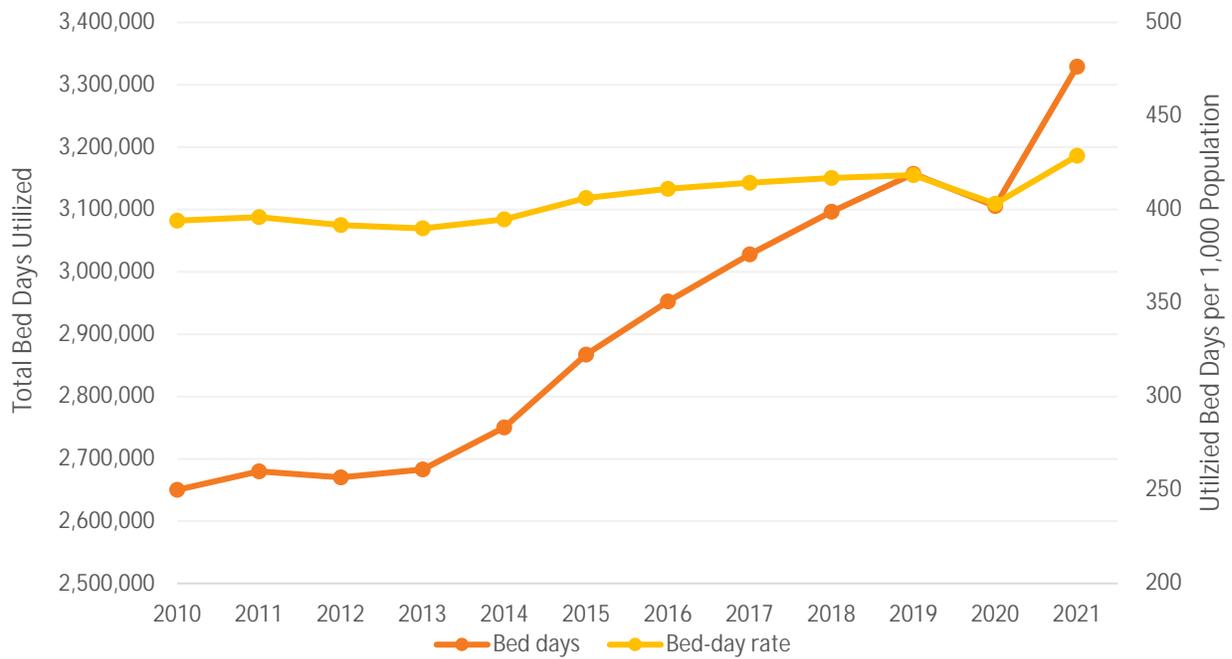


Figure 3.2. Inpatient admission rate, Washington community hospitals, 2010-2019

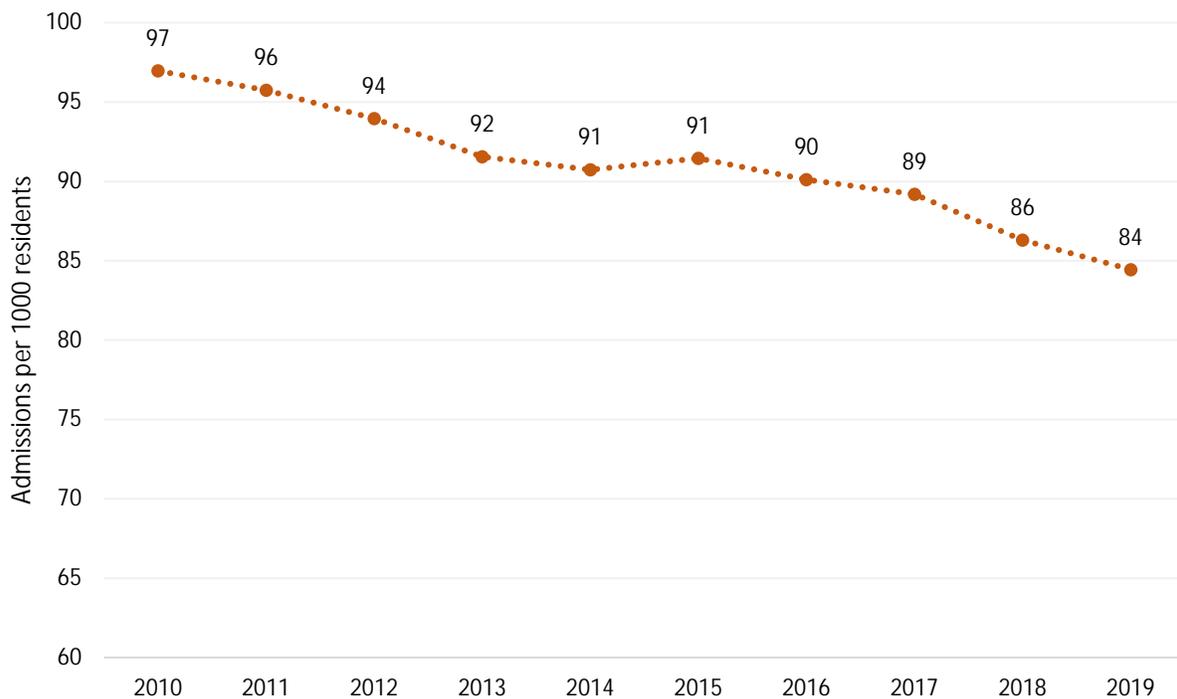
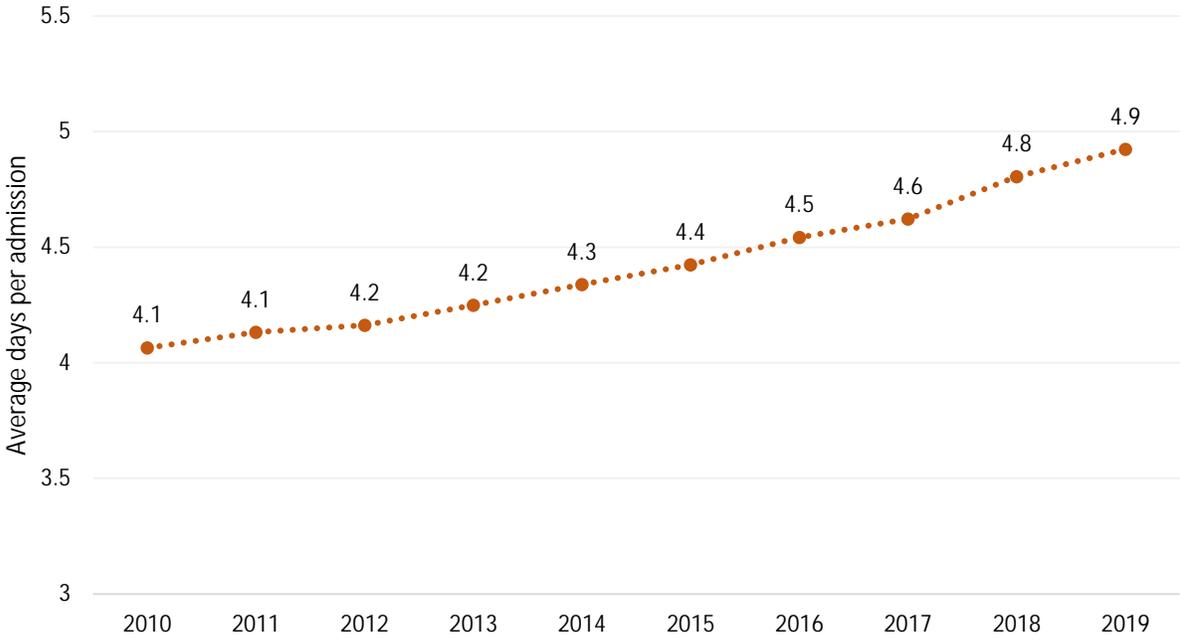


Figure 3.3 Inpatient length of stay, Washington community hospitals, 2010-2019

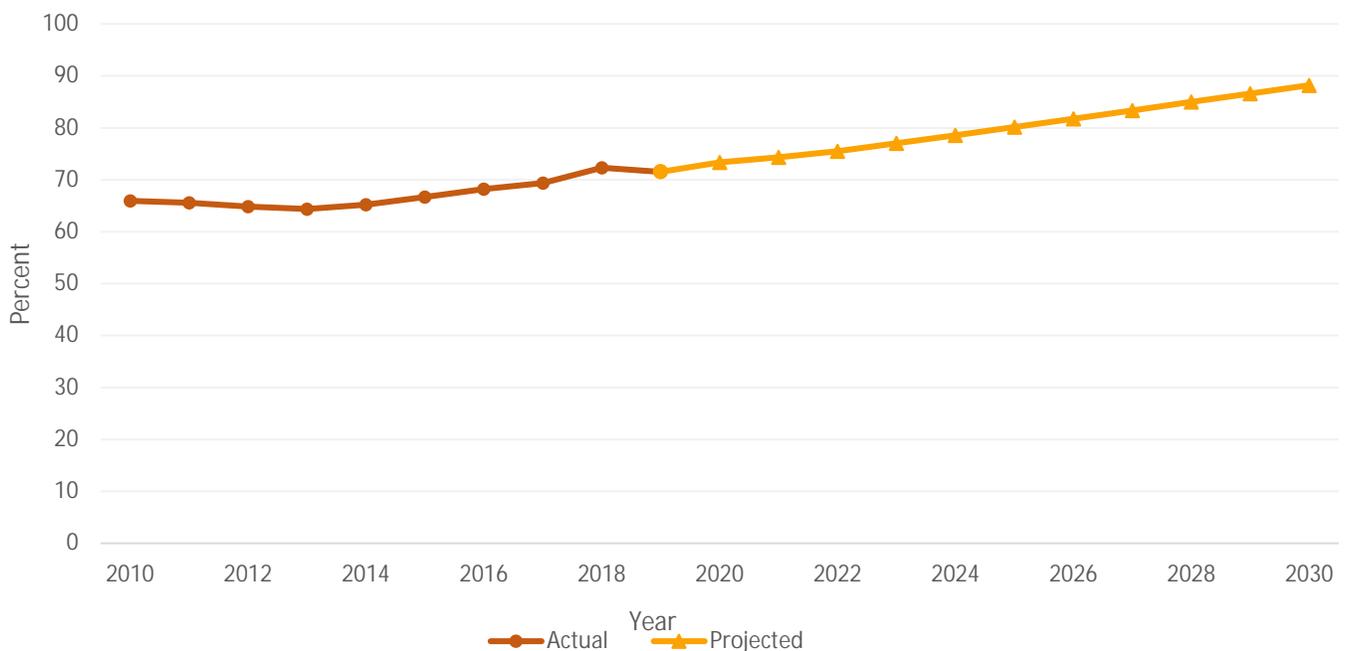


Projecting future inpatient hospital bed day use

Forecasting a future need for hospital inpatient beds is difficult. That’s because advances in medicine, changes in payment incentives for health care services, and population changes can affect the number of hospital beds needed. Our projection for 2020 and beyond assumes 2019 hospital utilization patterns and available bed days applied to OFM’s projections changes in the general population’s age-sex structure.

The age- and sex-adjusted percentages of bed days used for the years 2010-2030 are displayed in Figure 4.1.

Figure 4.1. Percentage of available bed days used in Washington and projected use, 2010-2030.



The actual trend through 2019 showed some variability with a slight dip in percentage of bed days used from 2010 through 2013 and 2018 to 2019. Under the assumption that there are no increases in available hospital bed days from 2019, then an increasing population with older Washingtonians representing a greater share of the total population will result in the portion of available bed days used to steadily climb to 90% by 2030.

Summary

This report provided a high-level summary of statewide inpatient hospital use in relation to its capacity. While the population of Washington is increasing *and* aging, sufficient hospital resources will be key to keep up with demand. We will keep monitoring trends in available hospital beds and hospital utilization. As we move further from COVID-19 pandemic hospital restrictions, we will better understand how the pandemic permanently affected hospitalizations.

In future reports, we will explore other hospital use topics. These will include changes in hospital inpatient treatment, cost and cost drivers for hospital care; use for common diagnoses and procedures; and geographic variation in health care use and access.

Washington's hospitals are vital to improving population and individual health and this series will become a resource for health care planners and policymakers in Washington. Relevant data and analyses are essential elements to measure hospital resource use.

Methods and data sources

Actual and forecasted state [population estimates](#) come from the OFM Population Unit. We also used these estimates for age- and sex-adjustment.

For hospital inpatient data, our analyses used the Comprehensive Hospital Abstract Reporting System (CHARS) from the Washington Department of Health (DOH). This data includes all community hospitals in the state. Data files date from the 1980s and measurements stay relatively consistent over time.

For inpatient demographics, we used 2019 as the reference year because hospitalizations during the COVID-19 pandemic may not represent a “normal” year of hospital use. For example, when we compare pre-pandemic (2018) to pandemic (2020-2021) years, we saw large reductions in total inpatient numbers. During pandemic years, inpatients included proportionately more Blacks, Asian and Pacific Islanders (API), Hispanics, and people younger than 45. However, these years had fewer multiracial persons and non-Hispanics. Plus, proportions of American Indian and Alaskan Native (AIAN) inpatients who were age 65 and older decreased in 2020 but increased in 2021 (Table 1.1).

Table. 5.1 Washington’s hospital inpatient demographic change before and during COVID-19

Year	Pre- Pandemic		Pandemic		% Change from 2019*		
	2018	2019	2020	2021	2018	2020	2021
Total inpatients	644,407	641,064	583,414	592,287	-0.5	-9.0	-7.6
Demographics (%)							
Sex							
Male	43.4	43.8	44.1	44.4	1.0	0.6	1.2
Female	56.6	56.2	55.9	55.6	-0.7	-0.4	-1.0
Race							
White	85.1	84.8	84.5	83.8	-0.4	-0.3	-1.1
Black	5.2	5.1	5.3	5.6	-0.8	3.2	9.0
AIAN	1.8	1.8	1.8	1.9	1.4	-0.4	3.3
API	7.0	7.1	7.2	7.6	0.5	2.3	8.0
Multi-race	0.9	1.2	1.1	1.1	37.3	-7.8	-13.3
Hispanic ethnicity							
Hispanic	7.9	8.5	10.5	10.7	7.6	23.7	26.1
Non-Hispanic	92.1	91.5	89.5	89.3	-0.6	-2.2	-2.4
Age							
0-17	16.4	16.2	16.8	16.9	-0.6	3.3	3.9
18-44	24.8	24.9	26.5	26.8	0.6	6.4	7.8
45-64	22.3	21.8	21.2	20.8	-2.4	-2.6	-4.5
65+	36.6	37.1	35.5	35.5	1.4	-4.2	-4.3

*Percent change is calculated by: $[(\text{current year} - \text{older year}) / \text{older year}] \times 100$.

As we mentioned in the report, we extracted data for available hospital beds from the [Community Hospital Year End Reports](#) through DOH. The agency compiles reports from annual submissions by Washington hospitals. These

reports include data on hospital admissions, total days that patients spend in hospitals, and hospital financial information.

To estimate future use of inpatient hospital beds, the ratio of inpatient beds used to total beds was calculated and adjusted by age and sex using population projections. Age and sex-population projections are taken from OFM's Population Unit. We based the projection on the use rate from 2019 and the assumption that the number of available beds is maintained at the 2019 level. It is tempting to present percentage of bed days used for 2020 and 2021 with available data. However, we projected 2020 and 2021 data because the bed count data for those years was incomplete and are atypical years due to the pandemic.

Limitations with the data

CHARS does not include all inpatient care that Washington residents receive. Data on hospital care from Veteran Affairs or military hospitals are not included in CHARS. Also, the data doesn't include inpatient care that Washington residents receive out of state. This is particularly relevant for Washingtonians who live in border counties. Finally, hospitalizations in Washington's two state psychiatric hospitals (Western State Hospital and Eastern State Hospital) are not reported in CHARS.

Even though data is supposed to be submitted annually, the financial reports show there are missing data from year to year. And these reports also don't include information from military or out-of-state medical facilities.

We base any hospital bed days projections on current hospitalization practices. Advances in health care and changes within the medical community could alter these projections.

Appendix A

Data tables for report figures

Figure 1.1. Actual and forecast state population, Washington, 1990-2050

Year	Actual	Year	Forecasted
1990	4866663	2022	7828148
1991	5000353	2023	7899046
1992	5091138	2024	7970302
1993	5188009	2025	8041743
1994	5291577	2026	8113136
1995	5396569	2027	8184752
1996	5483103	2028	8256407
1997	5579140	2029	8327864
1998	5685459	2030	8399102
1999	5792214	2031	8470088
2000	5894143	2032	8540885
2001	5970452	2033	8611021
2002	6059698	2034	8680598
2003	6126917	2035	8749819
2004	6208532	2036	8818703
2005	6298797	2037	8887396
2006	6420219	2038	8955926
2007	6525121	2039	9024194
2008	6608234	2040	9092210
2009	6672263	2041	9160401
2010	6724540	2042	9228097
2011	6772395	2043	9295370
2012	6826826	2044	9362242
2013	6896112	2045	9428796
2014	6986681	2046	9495021
2015	7084858	2047	9560968
2016	7212325	2048	9626684
2017	7344285	2049	9692186
2018	7467033	2050	9757560
2019	7591516		
2020	7707047		
2021	7766975		

Figure 1.2. Actual and forecast fraction of Washington population age 65 or older, Washington 1990-2050.

Year	Actual (%)
1990	11.66
1991	11.73
1992	11.76
1993	11.77
1994	11.71
1995	11.65
1996	11.59
1997	11.53
1998	11.48
1999	11.42
2000	11.37
2001	11.33
2002	11.28
2003	11.24
2004	11.35
2005	11.47
2006	11.59
2007	11.70
2008	11.81
2009	11.91
2010	12.01
2011	12.12
2012	12.21
2013	12.31
2014	12.59
2015	13.13
2016	13.64
2017	14.08
2018	14.53
2019	14.91
2020	15.30
2021	15.76

Year	Forecasted (%)
2022	16.21
2023	16.81
2024	17.31
2025	17.77
2026	18.29
2027	18.77
2028	19.26
2029	19.71
2030	20.12
2031	20.50
2032	20.83
2033	21.12
2034	21.32
2035	21.48
2036	21.64
2037	21.81
2038	22.03
2039	22.23
2040	22.33
2041	22.36
2042	22.37
2043	22.41
2044	22.43
2045	22.46
2046	22.50
2047	22.55
2048	22.68
2049	22.81
2050	22.95

Figure 2.1. Available hospital bed days in Washington, 2010-2019

Year	Bed days in millions
2010	5.01218
2011	5.06365
2012	5.10307
2013	5.14139
2014	5.18775
2015	5.23702
2016	5.14979
2017	5.24213
2018	5.20198*
2019	5.16183

*Imputed

Figure 3.1. Total number of hospital inpatient bed days utilized and rate per 1,000 population, 2010-2021

Year	Bed days	Bed day rate
2010	2,650,155	394
2011	2,679,678	396
2012	2,670,100	392
2013	2,683,155	390
2014	2,750,382	395
2015	2,867,198	406
2016	2,952,250	411
2017	3,027,867	414
2018	3,096,460	417
2019	3,156,895	418
2020	3,105,686	403
2021	3,329,299	429

Figure 3.2. Inpatient admission rate, Washington community hospitals, 2010-2019

Year	Admissions per 1000 residents
2010	96.96351
2011	95.73925
2012	93.96914
2013	91.56623
2014	90.73063
2015	91.46323
2016	90.12295
2017	89.19561
2018	86.30148
2019	84.44888
2020	75.70344
2021	76.27049

Figure 3.3. Inpatient length of stay, Washington community hospitals, 2010-2019

Year	Average days per admission
2010	4.064437
2011	4.132856
2012	4.162205
2013	4.24919
2014	4.338785
2015	4.424661
2016	4.541951
2017	4.622147
2018	4.805064
2019	4.924223

Figure 4.1. Percentage of available bed days used in Washington and projected need, 2010-2030.

Year	Percent occupancy
Actual	
2010	65.96
2011	65.56
2012	64.86
2013	64.37
2014	65.23
2015	66.69
2016	68.19
2017	69.35
2018	72.32
2019	71.52
Projected	
2020	73.34
2021	74.36
2022	75.52
2023	77.03
2024	78.56
2025	80.16
2026	81.73
2027	83.35
2028	85.00
2029	86.59
2030	88.21