



## Hospital Market Concentration in Wisconsin, 2018–2025: Evidence from Hospital Discharge Data\*

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## Executive Summary

Wisconsin's hospital markets are highly concentrated. Concentration increased between 2018 and 2025, driven primarily by ownership changes. This report measures concentration, using the Herfindahl–Hirschman Index (HHI), for every general acute-care hospital in Wisconsin over 32 quarters and roughly 4.2 million inpatient discharges, including all payers.

- **Seven of eight referral regions are highly concentrated, and all regions grew more concentrated.** Across Wisconsin's eight hospital referral regions, the patient-weighted mean HHI rose from 2,520 in 2018 to 2,857 in 2025. This is well above the 1,800 threshold at which Federal Merger Guidelines treat a market as highly concentrated. Only Madison remains below the threshold, barely, because two systems that have shared a joint operating agreement since 2017 are counted as rivals; when combined, Madison's HHI increases to 2,710.
- **The increase in concentration is driven primarily by mergers, not patient choice.** Holding ownership fixed and letting only patient volumes move accounts for 42 percent of the rise; holding volumes fixed and changing only ownership accounts for 58 percent. Moreover, none of these merger transactions drew a federal or state antitrust challenge.
- **The largest single increase came from one transaction.** Ascension's 2021 sale of seven hospitals to Aspirus raised the Wausau region's HHI by 1,656 points, to 5,489, and the Marshfield region by 282.
- **Wisconsin is more concentrated than Illinois.** Using identical Medicare-based discharge measures, Wisconsin's referral regions average 2,832 in 2025 versus 2,427 in Illinois, but Illinois outside the Chicago area averages 3,343. Because previous work comparing prices between Wisconsin and Illinois found broad price differences not driven by Chicago, local concentration is unlikely to fully explain Wisconsin's higher prices. One potential candidate is the insurance side of the market: hospital-owned plans hold more than a third of Wisconsin's fully insured commercial enrollment, compared with about 5 percent in Illinois.
- **The finding that mergers have increased market concentration in the state's regional markets is consistent across alternative market definitions.** Concentration is higher under narrower definitions: 3,439 by metropolitan area, 3,753 by county, and 4,080 by hospital service area, versus 2,857 by referral region. The referral region, used throughout, is the most conservative choice.
- **Closures matter as much as mergers.** The single largest change in market concentration observed in the Marshfield region was not a merger: the 2024 closure of two Hospital Sisters hospitals in the Chippewa Valley raised the region's HHI by 540 points.

## 1. Introduction and motivation

Hospital and health-system consolidation has accelerated across the United States, and Wisconsin is no exception. A large empirical literature finds that horizontal hospital consolidation raises prices for commercially insured patients, primarily by increasing providers' bargaining leverage with insurers.<sup>1,2</sup> Prior work by the authors documents that inpatient prices in Wisconsin are roughly 25 percent above those observed in neighboring Illinois.<sup>3</sup> That price gap motivates the present report, which asks a narrower set of questions: how concentrated are Wisconsin's hospital markets, how has it changed over time, and what has driven the observed changes? A 25 percent price gap should be evident in market structure: Wisconsin's markets should be concentrated at the level that hospitals bargain with insurers, and more concentrated than Illinois's. This report tests both implications.

Hospitals compete for patients within regions, not across the state as a whole: patients in Wausau rarely travel to Milwaukee for inpatient care. Concentration therefore must be measured within regional markets. We measure concentration using the traditional Herfindahl–Hirschman Index (HHI) at the health-system level, with the Hospital Referral Region (HRR) as the primary market definition. This well-vetted market definition has been widely used in prior research. We document four findings: (i) Wisconsin's local hospital markets are highly concentrated; (ii) concentration rose in every Wisconsin region between 2018 and 2025; (iii) roughly 58 percent of that increase is attributable to changes in ownership rather than to patients reallocating across hospitals; and (iv) Wisconsin's markets are more concentrated than Illinois's taken as a whole, though not more concentrated than Illinois outside the Chicago area. We report results for four market definitions, and the conclusions do not depend on which is chosen.

## 2. Data

The analysis uses Wisconsin Hospital Association (WHA) inpatient discharge files for 2018 Q1 through 2025 Q4. Each record is one inpatient discharge from a Wisconsin acute-care, non-federal hospital; the data do not include federal (e.g., Veterans Affairs) hospitals. We exclude specialty facilities (psychiatric and behavioral, rehabilitation, long-term acute care, children's-only, and freestanding surgical and single-specialty hospitals) as they do not represent substitutes for general acute care. The analysis covers 139 general acute-care hospitals, accounting for 92 percent of inpatient discharges (4,152,865 total discharges).

<sup>1</sup>Martin Gaynor, Kate Ho, and Robert J. Town, "The Industrial Organization of Health-Care Markets," *Journal of Economic Literature* 53, no. 2 (2015): 235–284.

<sup>2</sup>Zack Cooper, Stuart V. Craig, Martin Gaynor, and John Van Reenen, "The Price Ain't Right? Hospital Prices and Health Spending on the Privately Insured," *Quarterly Journal of Economics* 134, no. 1 (2019): 51–107. The authors find prices at monopoly hospitals roughly 12 percent above those in markets with four or more rivals.

<sup>3</sup><https://crowe.wisc.edu/2026/08/14/hospital-prices-in-wisconsin-and-illinois-a-cross-state-comparison/>, accessed 8/24/2026.

Our analysis represents a census, not a sample, and includes every general acute-care hospital that reports to the WHA Information Center for every payer, in every quarter, and every inpatient discharge count. Appendix C lists the facilities included in our study.

For each discharge we use the reporting facility, the patient's ZIP code, county of residence, and total charges. An important limitation is that the data record charges and not negotiated prices; we therefore measure market concentration directly and treat price effects by implication rather than observation. A second limitation is scope: inpatient files do not cover outpatient care, which accounts for roughly half of hospital revenue and an increasing share of the services over which hospitals and insurers bargain, nor do they cover ambulatory surgery centers. Inpatient concentration is the right structural measure for inpatient bargaining, but it does not fully capture hospital market power.

### **3. Methodology**

#### **3.1. Geographic market definitions**

We assign each discharge to the geographic market where the patient lives, and compute market shares based on where those residents went for care. Our study uses a nested set of definitions, from the whole state down to the individual service area, and reports results for all of them.

The Hospital Referral Region (HRR), from the Dartmouth Atlas of Health Care and its 2017 ZIP-code crosswalk, is the primary market definition. HRRs define regional markets for tertiary medical care based on where residents are referred for major health care procedures, making them empirically derived and the most widely used unit in the hospital-competition literature. Wisconsin residents fall predominantly into 8 WI-based HRRs: Appleton, Green Bay, La Crosse, Madison, Marshfield, Milwaukee, Neenah, and Wausau. The HRR is also the broadest accepted local definition, making it the conservative choice: every narrower unit yields a higher measured concentration (Section 4.5).<sup>4</sup>

We report three further definitions: we include Metropolitan statistical areas (MSAs, OMB 2023 definition) because they are the unit used by most published national estimates, so reporting them makes Wisconsin comparable to the figures quoted in national debate. We do not believe this is a superior measure for our purposes since only 13 Wisconsin-centered MSAs exist and they cover 73 percent of the state's residents. Counties are the unit of most state-level policy. Hospital Service Areas (HSAs) are the smallest geographic measure. The whole state as a single market is shown for reference.<sup>5</sup>

<sup>4</sup>The Dartmouth Atlas of Health Care, ZIP-code crosswalk to Hospital Service Areas and Hospital Referral Regions, 2017 edition. Referral regions are delineated from observed Medicare referral patterns for major cardiovascular and neurosurgical procedures.

<sup>5</sup>U.S. Office of Management and Budget delineations of metropolitan and micropolitan statistical areas, as distributed by the U.S. Census Bureau (2023 delineation file).

Only Wisconsin hospitals report to the WHA Information Center, so any border market that falls partially outside Wisconsin has an incompletely observed choice set. As a result, we do not observe instances in which Wisconsin residents use out-of-state facilities. This omission will mechanically inflate the market's measured HHI. To avoid this, we compute all statistics only over entirely Wisconsin-based markets. The excluded border HRRs (Minneapolis, St. Paul, Duluth, Dubuque, Rochester) account for 6.2 percent of Wisconsin residents' acute discharges and have a patient-weighted mean HHI of 4,151; thus, excluding them lowers, rather than raises, our estimated HHI. In the county results, we likewise suppress counties in which more than half of residents live in a ZIP code whose HRR is out of state, including Douglas (100 percent) and Florence (100 percent), because most or all of those residents' admissions are unobserved. We retain and flag three additional counties with partial exposure to out-of-state HRRs (Buffalo 17%, Grant 13%, Iron 20%). Residual exposure remains and cannot be removed: these data do not observe Wisconsin residents who cross a state line for care.

Two caveats apply to residence-based geographic markets generally: First, they mechanically describe who treats whom, but they do not model care substitution. Because most patients do not travel far, share-based measures using fixed geographies can miss that, for some conditions, patients seek care far from home, which can discipline prices even across markets. This is the "silent majority" critique of geographic market definition.<sup>6</sup> Despite this limitation, our approach is transparent and reproducible from administrative records.

Second, because we pool all inpatient discharges without distinguishing specific product markets, a hospital that draws complex cases from a wide area registers a high local share even where residents have real choices for routine care. This inflates measured concentration at regional referral hubs, and it is one reason we treat the smallest geographies as supporting rather than our primary evidence.

### **3.2. Firms: system-level ownership**

We measure concentration at the health-system (ownership) level: we combine hospitals under common ownership into a single firm and treat each independent hospital as its own firm. Because ownership changes over the study period, we construct a time-varying ownership crosswalk. We first read each facility's system quarter by quarter from the facility name in the WHA support tables, then correct it against an external review of documented Wisconsin hospital transactions (Appendix A). The corrections address two shortcomings of name-based assignment: the WHA facility name is sometimes updated years after a transaction closes, so we substitute actual transaction close dates; and some

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<sup>6</sup>Cory S. Capps, David Dranove, Shane Greenstein, and Mark Satterthwaite, "The Silent Majority Fallacy of the Elzinga-Hogarty Criteria: A Critique and New Approach to Analyzing Hospital Mergers," NBER Working Paper 8216 (2001).

acquired or long-held hospitals carry names that give no indication of their owner, so we add ownership from the documented record. Hospitals assigned to a system on this basis include the three northwestern Wisconsin hospitals owned by HealthPartners, three Hospital Sisters Health System hospitals that retained saint names, the two Mercyhealth hospitals, AdventHealth Durand, Essentia Health’s hospital in Superior, and three hospitals that WHA renamed only in 2018 and 2019, a decade or more after they joined their systems: Froedtert’s Menomonee Falls and West Bend hospitals and Marshfield’s Rice Lake hospital.

Three ambiguous ownership issues are worth noting. The most consequential is in Madison, where UW Health and UnityPoint Health–Meriter have operated since 2017 under a joint operating agreement that stops short of a merger; we count them as separate firms and report the combined alternative in Section 4.2. Tamarack Health (Ashland and Hayward, 2023) is a shared-brand affiliation between hospitals that remain separately owned; hence, we treat them as separate firms. Combining them would raise measured concentration in the Ashland area. Watertown Regional’s transfer between for-profit chains (2021) makes it the only Wisconsin hospital owned by its owner, so treating it as a standalone firm does not affect HHI. An acquisition in which a hospital both kept its name and was never publicly documented could still have been missed. Appendix A contains the full set of ownership changes.

### 3.3. Concentration measure

For each market and period, we compute  $HHI = \sum_i s_i^2 \times 10,000$ , where  $s_i$  is firm  $i$ ’s share of inpatient discharges among residents of that market. Discharge shares are the primary measure; charge-based shares yield nearly identical results, and we use this as a robustness check. A single monopoly firm with a 100% share of discharges in a market would yield an HHI of 10,000; inversely, many hospitals each with a small share of the total in a market would yield an HHI trending toward 0. We follow the 2023 U.S. Department of Justice/Federal Trade Commission Merger Guidelines, under which a market with an HHI above 1,800 is highly concentrated, and a merger is presumed to substantially lessen competition if it produces an HHI above 1,800 together with an increase of more than 100 points<sup>7</sup>. Because much of the hospital literature predates the 2023 revision, we reference the withdrawn 2010 Horizontal Merger Guidelines bands (unconcentrated below 1,500; moderately concentrated 1,500–2,500; highly concentrated above 2,500), which are more permissive at the top of the range. When the text references a single threshold, it refers to the 2023 threshold of 1,800.

<sup>7</sup>U.S. Department of Justice and Federal Trade Commission, Merger Guidelines, December 18, 2023. Section 2.1 sets the structural presumption at HHI above 1,800 together with an increase of more than 100 points. These Guidelines superseded the 2010 Horizontal Merger Guidelines, whose 1,500 / 2,500 bands are reported here only for comparability with the existing literature.

## 4. Results

### 4.1. Overview

Across Wisconsin's eight referral regions, the patient-weighted mean HHI was 2,520 in 2018 and 2,857 in 2025, well above the 1,800 threshold for a highly concentrated market, and it rose over the period (Figure 1). For reference, treating the whole state as a single market yields 948 in 2018 and 1,103 in 2025, though those values pool regional markets that do not compete with one another.

### 4.2. Concentration levels and trends by referral region

In 2025, 7 of the 8 Wisconsin HRRs are highly concentrated per the 2023 threshold, and the same 7 exceed even the more permissive 2010 threshold of 2,500. The only exception is Madison (HHI 1,726), but only when UW Health and UnityPoint Health are counted as separate firms, despite their joint venture agreement. Nevertheless, Madison sits only 74 points below the highly concentrated threshold, having risen 112 points since 2018. Indeed, concentration rose in every region between 2018 and 2025 (Table 1, Figure 2). The most concentrated regions are Wausau (HHI 5,702), La Crosse (4,202), and Appleton (3,826).

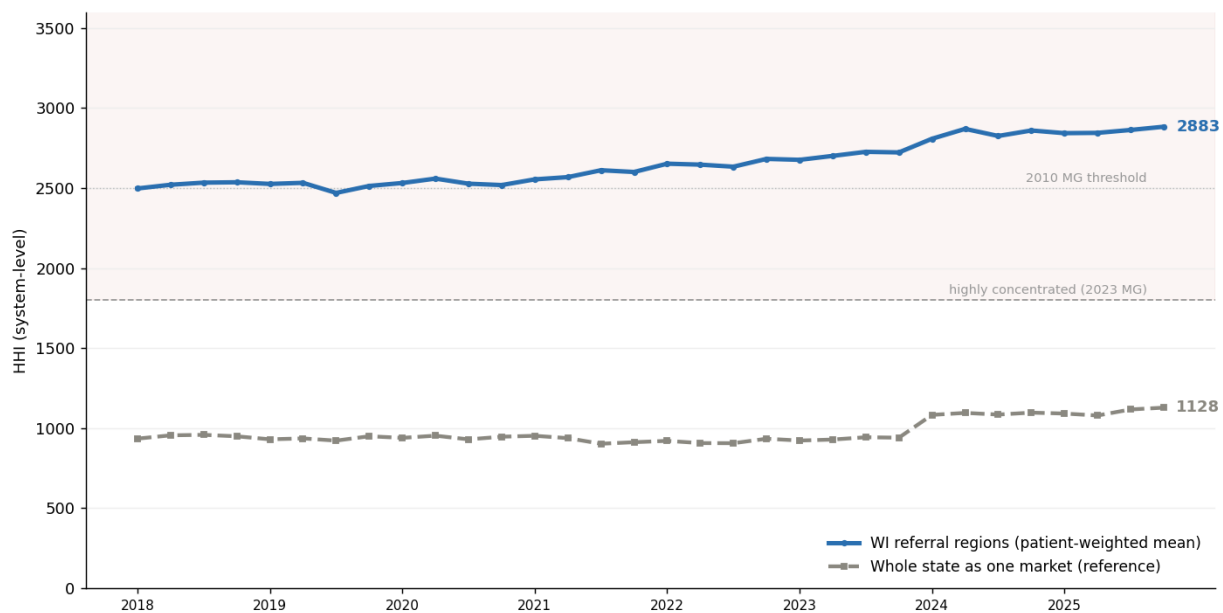


**Figure 1:** Patient-weighted mean HHI across Wisconsin's referral regions, 2018–2025, with the whole state treated as a single market shown for reference.

Madison's position depends on how two of those three systems are counted. Since July 2017, UW Health and UnityPoint Health–Meriter have operated under a joint operating

agreement, which the Federal Trade Commission reviewed before it took effect. Under the agreement, the two facilities remain separately owned but “align finances, clinical operations and strategy,” led by UW Health.<sup>8</sup> Counted as one firm, they account for 44 percent of the region’s discharges, and Madison’s HHI becomes 2,710 rather than 1,726. This implies all eight Wisconsin referral regions are highly concentrated. The discharge data for the two hospitals support substantial coordination rather than head-to-head competition: UW’s University Hospital treats 0.2 percent of the region’s childbirth admissions, while Meriter accounts for 46 percent of births. Generally, the two hospitals’ case mix overlaps far less with each other than with SSM’s. To err on the side of caution, we nonetheless treat them as separate institutions.

**Table 1:** System-level HHI by Wisconsin HRR, general acute care, annual-pooled discharge shares. All 8 regions became more concentrated; 7 of 8 exceed the 1,800 highly concentrated threshold in 2025. Counting UW Health and UnityPoint Health–Meriter, which operate under a joint operating agreement, as one firm raises Madison to 2,441 in 2018 and 2,710 in 2025.

| Referral region (HRR)      | HHI 2018 | HHI 2025 | Change | Top system 2025      | Top share |
|----------------------------|----------|----------|--------|----------------------|-----------|
| Wausau                     | 4,062    | 5,702    | +1,640 | Aspirus              | 72%       |
| La Crosse                  | 3,764    | 4,202    | +438   | Emplify              | 59%       |
| Appleton                   | 3,507    | 3,826    | +319   | Froedtert ThedaCare  | 57%       |
| Marshfield                 | 2,008    | 3,312    | +1,304 | Sanford (Marshfield) | 45%       |
| Milwaukee                  | 2,703    | 2,843    | +140   | Aurora               | 41%       |
| Green Bay                  | 2,322    | 2,668    | +346   | Aurora               | 34%       |
| Neenah                     | 2,415    | 2,636    | +221   | Froedtert ThedaCare  | 40%       |
| Madison                    | 1,614    | 1,726    | +112   | SSM                  | 26%       |
| Statewide (for comparison) | 948      | 1,103    | +155   | Aurora               | 22%       |

We should note that Wisconsin’s referral regions were already highly concentrated at the start of the period: 79 percent of Wisconsin patients lived in a highly concentrated region in 2018, and 79.6 percent do in 2025. The finding is therefore not that Wisconsin’s markets became concentrated over this period, but that already concentrated markets became substantially more concentrated. The patient-weighted mean HHI rose 337 points, and every region moved in the same direction. On the older FTC/DOJ threshold of 2,500 for “highly concentrated,” the share of residents in such regions increased from 58.9 to 79.6 percent.

However, that jump reflects three regions crossing the line, two of them narrowly: Marshfield (2,008 to 3,312), Neenah (2,415 to 2,636), and Green Bay (2,322 to 2,668). We rely

<sup>8</sup>UW Health, “UW Health, UnityPoint Health, UnityPoint Health – Meriter Finalize Deeper Partnership,” July 10, 2017 (reprinted by Our Lives Wisconsin); UnityPoint Health, “UW Health Partnership,” accessed September 18, 2026; and the parties’ announcement of April 10, 2017, that the Federal Trade Commission had completed its review. Counting the two as one firm raises the patient-weighted mean across Wisconsin’s referral regions from 2,857 to 3,058 in 2025 and the Madison service area from 3,211 to 5,870. Scored as a merger on 2018 shares (22.1 and 18.7 percent), the combination adds about 830 points for an HHI of 2,441, which would meet the 2023 Guidelines’ structural presumption. Case-mix overlap is the share of each hospital’s discharges falling in the same major diagnostic categories in matching proportions: 48 percent for UW–Meriter, against 78 percent for UW–SSM and 69 percent for Meriter–SSM (2025).

on the levels and changes in Table 1 rather than on threshold-crossing counts, which are unstable when markets sit near a boundary.

### 4.3. What is driving the increase: ownership or patient choice?

A rise in measured concentration can come from two sources. Ownership can change, for example, when two competing systems merge, or patient distribution can change, for example, when a large system's hospitals win volume from smaller rivals or a hospital closes. Only mergers represent consolidation in the antitrust sense. Distinguishing them matters because a concentration trend driven entirely by patient choice would have different policy implications. Put differently, we do not want to punish hospitals for success and therefore acquiring more patients.

We separate the two phenomena by holding each constant in turn. Applying 2018 ownership to each facility's 2025 patient volumes isolates the contribution of patient reallocation; applying 2025 ownership to 2018 volumes isolates the contribution of ownership change. Because the two effects interact, we report the symmetric (Shapley) average of both decomposition orderings, so that the two components sum exactly to the observed change.

**Table 2:** Decomposition of the 2018–2025 change in system-level HHI into ownership change and volume reallocation, symmetric average of both orderings. The decomposition assigns each facility its modal owner within the year, so its 2018 baselines differ slightly from Table 1 where a roll-up straddled a year boundary.

| Referral region (HRR)     | HHI 2018 | HHI 2025 | Change | Ownership | Volume shift | % ownership |
|---------------------------|----------|----------|--------|-----------|--------------|-------------|
| Wausau                    | 4,062    | 5,702    | +1,640 | +1,559    | +81          | 95%         |
| Marshfield                | 1,973    | 3,312    | +1,339 | +947      | +392         | 71%         |
| La Crosse                 | 3,764    | 4,202    | +438   | +2        | +436         | 0%          |
| Green Bay                 | 2,322    | 2,668    | +346   | +327      | +19          | 94%         |
| Appleton                  | 3,507    | 3,826    | +319   | +191      | +128         | 60%         |
| Neenah                    | 2,415    | 2,636    | +221   | +175      | +46          | 79%         |
| Milwaukee                 | 2,703    | 2,843    | +140   | +18       | +122         | 13%         |
| Madison                   | 1,614    | 1,726    | +112   | +2        | +110         | 2%          |
| Patient-weighted mean     | 2,520    | 2,857    | +331   | +192      | +139         | 58%         |
| Statewide (single market) | 948      | 1,103    | +155   | +110      | +45          | 71%         |

Across Wisconsin's referral regions, ownership change accounts for 58 percent of the rise in concentration and volume moving between hospitals accounts for 42 percent; treating the state as a single market, ownership accounts for 71 percent. The pattern is not uniform across regions: in Wausau, where Aspirus acquired seven Ascension hospitals, ownership accounts for nearly the entire increase, while in La Crosse, Madison, and Milwaukee, the state's largest market, ownership accounts for little of the rise.

A note of caution is warranted in interpreting the ownership change column. First, we aggregate all transactions affecting a region over the full period. For example, Marshfield's ownership effect combines the Marshfield Clinic roll-up of 2018–2020 with the 2021



**Figure 2:** System-level HHI by quarter for each Wisconsin referral region (solid), with the statewide HHI dotted in every panel for comparison; general acute care, patient-residence Hospital Referral Regions (Dartmouth 2017 definitions). Dotted vertical lines mark each Appendix A transaction that raised that region's HHI by at least 25 points, measured by holding patient volumes fixed in the quarter before the deal and re-attributing the affected hospitals to their new owner. Appendix A reports the effect of every transaction on every region, including the one that reduced concentration.

Aspirus–Ascension deal. The reverse can also occur. Green Bay’s ownership effect is almost entirely one transaction: Aurora’s April 2019 move to full ownership of Bay Area Medical Center in Marinette, after the two operated previously as a joint venture since 2014. This transaction raised Green Bay’s HHI by about 340 points.

Additionally, the volume shift column should not be interpreted as solely a measure of patient preference; it also captures hospital closures, which can cause sharp volume changes. The 2024 exit of Hospital Sisters Health System from the Chippewa Valley is the clearest case, which we discuss below.

#### **4.4. Transactions, closures, and local concentration**

Event studies of local HRR concentration around documented transactions show heterogeneous effects (Figure 2). The Froedtert–ThedaCare merger in January 2024 raised concentration in the Appleton HRR by 365 points, and the Neenah HRR by 230 points (Figure 2). In Neenah, this appears as a single clean step in the first quarter of 2024. Appleton’s series steps up a quarter earlier, but that is partly an artifact: Ascension’s St. Elizabeth campus under-reported about 520 discharges in 2023 Q4 (Appendix C), which lifted the measured share of its largest rival just before the merger closed.

By contrast, the Emplify merger of Bellin and Gundersen (November 2022) changed HHI in the Green Bay HRR by only 29 points. Similarly, the Sanford–Marshfield merger had no measurable effect. In both cases, the merging hospitals were in different regions. Cross-market mergers can still raise prices through system-wide bargaining leverage even when market-level HHI is unchanged, and the published evidence suggests the distinction matters: within-state cross-market mergers have been found to raise prices appreciably, while out-of-state acquisitions have not. Emplify is the former case and Sanford–Marshfield the latter. This is a channel HHI does not capture and that a charges-only dataset cannot measure directly.<sup>9</sup>

None of the mergers we document in Appendix A drew a public challenge. We found no record that the Federal Trade Commission, the U.S. Department of Justice, or the Wisconsin Attorney General sued to block, conditioned, or publicly objected to any of them, including the Aspirus–Ascension sale and the Froedtert–ThedaCare merger that produced the largest local increases. Federal premerger reviews are confidential, so the agencies may have investigated the transactions in some capacity. The FTC cleared Marshfield Clinic’s 2019 acquisition of Beaver Dam Community Hospitals early, for example. Nor is there a state venue like many states now use: Wisconsin has had no certificate-of-need

<sup>9</sup>Leemore S. Dafny, Kate Ho, and Robin S. Lee, “The Price Effects of Cross-Market Mergers: Theory and Evidence from the Hospital Industry,” *RAND Journal of Economics* 50, no. 2 (2019): 286–325. Cross-market mergers between hospitals in the same state raise prices by 7–9 percent for acquiring hospitals; out-of-state acquisitions do not produce significant increases.

review of hospitals since the mid-1990s and, unlike Illinois, Minnesota, and a dozen other states, requires no advance notice of health care transactions.<sup>10</sup>

The largest merger during our study period is the sale of seven Ascension hospitals in north-central Wisconsin to Aspirus, which closed in August 2021. It is usually described as a Wausau event, and the Wausau referral region records the largest observed local increase in HHI. But the transferred hospitals serve two referral regions, and slightly more of their volume comes from outside the Wausau region than from within it. Of the 6,938 discharges recorded by those hospitals in 2021, 50 percent came from residents of the Marshfield region and 43 percent came from residents of the Wausau region, with the remainder scattered thinly across the rest of the state. The transaction therefore represents a two-region event.

**Table 3:** The Aspirus–Ascension transaction, quarters bracketing the August 2021 close. No other Wisconsin referral region moved by more than about 200 points, in either direction, across these quarters.

| Referral region           | HHI 2021 Q2 | HHI 2021 Q4 | Change | Aspirus share | Ascension share |
|---------------------------|-------------|-------------|--------|---------------|-----------------|
| Wausau                    | 3,833       | 5,489       | +1,656 | 55% → 70%     | 17% → 0%        |
| Marshfield                | 2,616       | 2,898       | +282   | 21% → 30%     | 10% → 1%        |
| Statewide (single market) | 937         | 912         | –25    |               |                 |

In Wausau, the deal turned an already dominant hospital system into a near-monopoly: Aspirus went from 55 to 70 percent of the region’s discharges as Ascension fell from 17 percent to effectively nothing; HHI rose by 1,656 points to 5,489. In Marshfield, the same deal combined the region’s second- and fourth-largest firms, lifting Aspirus from 21 to 30 percent and the HHI by 282 points. Under the 2023 Federal Merger Guidelines both regions clear the FTC/DOJ threshold easily, even though the transaction was a divestiture by an exiting system rather than a combination of two expanding ones, and the counterfactual in some of these small markets may have been closure rather than continued operation.<sup>11</sup>

Statewide, the same transaction registered as a small decrease in concentration, from 937 to 912, because it moved hospitals from a larger system to a smaller one, a reminder that statewide figures say little about the markets in which hospitals compete.

The Marshfield referral region deserves separate treatment, because its trajectory is easy to misread and illustrates why transaction dates alone are a poor guide. Marshfield’s HHI

<sup>10</sup> FTC early termination notice 20190953, granted March 21, 2019. Governor Evers’ 2025–27 budget proposed advance notice of health care transactions to the Department of Health Services, with fuller review of deals above \$20 million; the Joint Committee on Finance removed the provision on May 8, 2025. Wisconsin’s hospital-sale statute, Wis. Stat. § 165.40, requires the Attorney General’s approval of sales of public and nonprofit hospitals but exempts acquisitions by another nonprofit with a similar charitable health purpose, which covers most of the transactions here; the 2018 sale of the county-owned hospital in Ladysmith fell under it. On state notice laws, see Goodwin Procter, “State Healthcare Transaction Notification Laws,” updated August 12, 2026.

<sup>11</sup> Merger Guidelines (2023), note 7.

rose more than any region except Wausau, from 2,008 to 3,312. The Marshfield Clinic Health System roll-up, along with the 2025 Sanford combination, would appear to be the cause. The transaction history is more complicated, though. Table 4 shows the five distinct incidents.

**Table 4:** Marshfield HRR, quarterly HHI around each candidate event. The direct effect re-attributes the hospitals involved to their new owner with volumes held at the prior quarter, as in Figure 2 and Appendix A (for the closure, the closed hospitals' volume is removed); the rest of each observed change is ordinary movement in volumes. The largest single movement is a hospital closure, and the transaction bearing the region's name has no effect at all.

| Episode                                     | Quarter   | HHI before | HHI after | Change | Direct effect |
|---------------------------------------------|-----------|------------|-----------|--------|---------------|
| Marshfield roll-up (Ladysmith, Neillsville) | 2018Q3–Q4 | 1,863      | 2,146     | +283   | +96           |
| Marshfield roll-up (Weston, Park Falls)     | 2020Q3    | 2,137      | 2,405     | +268   | +174          |
| Aspirus–Ascension                           | 2021Q3    | 2,616      | 2,898     | +282   | +396          |
| HSHS Chippewa Valley exit                   | 2024Q1    | 2,874      | 3,414     | +540   | +286          |
| Sanford–Marshfield (renaming only)          | 2025Q1    | 3,414      | 3,322     | –92    | 0             |

The ownership roll-up came in two stages, and its direct effect is modest. Ladysmith and Neillsville joined Marshfield in late 2018, and Weston and Park Falls in August 2020; re-attributing those hospitals to Marshfield raises the region's HHI by 96 and 174 points, respectively, about a fifth of the region's total rise of 1,304. The third episode is the spillover from the 2021 Aspirus–Ascension transaction, which added 282 points here as Aspirus went from 21 to 30 percent of the region's discharges and Ascension fell from 10 to 1 percent.

The largest single movement, +540 points in 2024, is not a merger. Hospital Sisters Health System closed Sacred Heart Hospital in Eau Claire and St. Joseph's in Chippewa Falls in March 2024; HSHS's share of Marshfield-region discharges fell from 7 percent to 0.3 percent, and the volume redistributed to Aspirus, Marshfield, and Mayo. Market exit raises concentration just as a merger does, and any analysis that looks only at transactions misses it. Finally, the Sanford–Marshfield combination of January 2025—the event whose name most strongly suggests it should matter here—changes nothing: Sanford operates no other Wisconsin hospital, so the transaction is a renaming, the leading firm's share is unchanged at 45 percent, and the region's HHI in fact drifts –92 points on ordinary quarterly variation. Reading that quarter as a merger effect would be a mistake in both direction and magnitude.

Our analysis represents descriptive before-and-after comparisons of observed HHI, not causal estimates. We do not have a control group, and any contemporaneous market change would be misattributed to the merger. Nevertheless, timing of observed changes is sharp, and the magnitudes are large relative to normal quarter-to-quarter variation, lending credence to our interpretation.

## 4.5. Market definition, and comparison with national estimates

Concentration rises monotonically as the market definition narrows: from the whole state (1,103 in 2025) to the referral region (2,857) to the metropolitan area (3,439) to the county (3,753) to the service area (4,080); the same ordering holds in 2018, and every rung lies above the 1,800 threshold except the entire state (Figure 3, Table 5). Because the HRR is the broadest regional market definition, using it as the primary measure is conservative: every geographic disaggregation yields more concentration.

**Table 5:** Patient-weighted mean system-level HHI by market definition, Wisconsin-based markets only, patient-residence shares throughout. The rungs differ only in how narrowly the geography is drawn.

| Market definition | Markets | Mean HHI 2018 | Mean HHI 2025 |
|-------------------|---------|---------------|---------------|
| Whole state       | 1       | 948           | 1,103         |
| Referral region   | 8       | 2,520         | 2,857         |
| Metro area        | 13      | 3,268         | 3,439         |
| County            | 70      | 3,509         | 3,753         |
| Service area      | 100     | 3,860         | 4,080         |

The MSA definition most closely connects our results to the national literature. Published estimates of hospital concentration are routinely quoted in policy debate and are much larger than the figures presented above: some estimates report a mean hospital HHI above 5,500 across metropolitan areas, with 90 percent of metros highly concentrated;<sup>12</sup> while others put the average at 5,092;<sup>13</sup> and a 2025 study of 374 metropolitan areas reports a mean hospital-system HHI of 5,603 and a median of 5,078.<sup>14</sup> Compared with our reported HHI of 2,857, Wisconsin could appear unusually competitive.

However, that comparison is misleading because these published figures differ in important ways from our approach. First, others often report unweighted means across markets, giving a small metro the same weight as large markets. Second, as noted, other studies use metropolitan areas rather than hospital referral regions. Lastly, other research often assigns each hospital's patient volume to the hospital's location rather than the patient's residence, which mechanically inflates the HHI measure.

To illustrate the difference, when we measure HHI as these studies do, Wisconsin's unweighted mean MSA-level HHI is 5,294 in 2025 (median 5,091), up from 5,198 in 2018,

<sup>12</sup>Brent D. Fulton, "Health Care Market Concentration Trends in the United States: Evidence and Policy Responses," *Health Affairs* 36, no. 9 (2017): 1530–1538.

<sup>13</sup>Zack Cooper and Martin Gaynor, "Addressing Hospital Concentration and Rising Consolidation in the United States," 1% Steps for Health Care Reform policy brief. Cited as a policy brief rather than peer-reviewed work.

<sup>14</sup>Suhui Li, David Jones, Eugene Rich, and Aimee Lansdale, "How Do Hospitals Exert Market Power? Evidence from Health Systems and Commercial Health Plan Prices," *Health Affairs Scholar* 3, no. 1 (2025): qxae179. Hospital-system HHI is measured across 374 metropolitan statistical areas.

### The narrower the market, the more concentrated Wisconsin looks

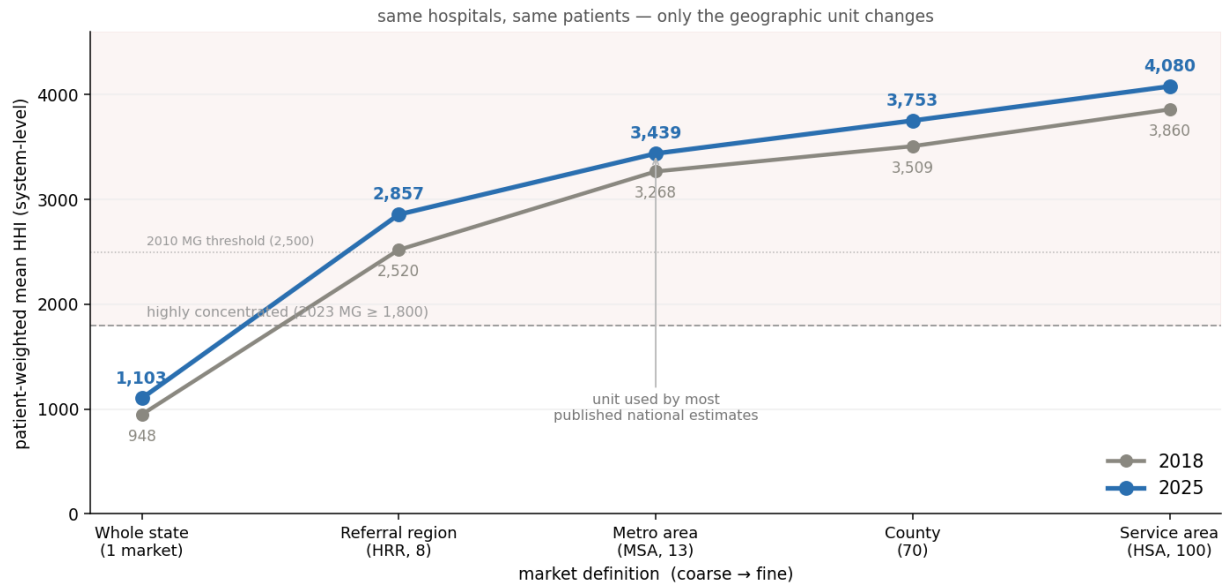


**Figure 3:** Patient-weighted mean HHI by market definition, 2018 and 2025. The narrower the market, the higher the measured concentration.

**Table 6:** The same Wisconsin hospitals and the same discharges, with one convention changed at each step. The final row is the construction used by the published national estimates. Nothing in the underlying data changes between rows, yet the 2025 figure rises from 2,857 to 5,294—85 percent higher.

| Step                          | Geography        | Shares by         | Averaging        | 2018  | 2025  |
|-------------------------------|------------------|-------------------|------------------|-------|-------|
| This report (headline)        | Referral region  | Patient residence | Patient-weighted | 2,520 | 2,857 |
| + drop patient weighting      | Referral region  | Patient residence | Unweighted       | 2,799 | 3,364 |
| + switch to metro areas       | Metro area (MSA) | Patient residence | Unweighted       | 3,736 | 4,008 |
| + switch to hospital location | Metro area (MSA) | Hospital location | Unweighted       | 5,198 | 5,294 |

which falls squarely within the published national range from other sources of roughly 5,092 to 5,603. We include Table 6 to validate our data and methodology against other published estimates of market concentration and to show that market definition matters.

One further caution about the widely used MSA measure: by construction, it does not cover the entirety of Wisconsin. The 13 Wisconsin MSAs represent 73 percent of the state's inpatient discharges. The remaining 27 percent are somewhat *more* concentrated, not less (service-area patient-weighted mean 4,371 outside metropolitan areas against 3,994 inside). National metro-based averages describe metropolitan America, not the whole country.

One independent source speaks directly to the Wisconsin results. The Health Care Cost Institute's Healthy Marketplace Index, built from commercial inpatient claims across 112 metropolitan areas, found that Milwaukee moved from moderately to highly concentrated between 2012 and 2016.<sup>15</sup> This corroborates our findings using different data, a different geography, a different payer population, and an earlier period. That two independent measurements agree on the timing of a change in Wisconsin's largest market is a useful external check on the ownership crosswalk and the market assignment used here.

#### **4.6. Comparison with Illinois**

Our discharge data cover Wisconsin hospitals only, so comparing the two states requires a source that covers both in the same way. The Medicare Hospital Service Area File reports every hospital's Medicare inpatient discharges by the patient's ZIP code. The obvious limitation is that these data do not include private insurance or Medicaid patients. Nevertheless, we can apply our identical methodology to both Wisconsin and Illinois, yielding the results presented in Table 7. Importantly, examining Medicare enrollees closely reproduces our Wisconsin results: the Medicare-based referral-region mean is 2,832 in 2025, versus 2,857 from the all-payer discharge data.<sup>16</sup>

Wisconsin's markets are more concentrated than Illinois's taken as a whole: 2,832 versus 2,427 by referral region and 4,270 versus 3,818 by service area in 2025. Chicago,

<sup>15</sup>Health Care Cost Institute, Healthy Marketplace Index (2019), covering commercial inpatient claims for 112 metropolitan areas, 2012–2016; 81 of the 112 areas were highly concentrated in 2016.

<sup>16</sup>Centers for Medicare & Medicaid Services, Hospital Service Area File, 2018 and 2025 (data.cms.gov), covering fee-for-service Medicare discharges and Medicare Advantage discharges for which hospitals file information-only claims; short-term acute and critical access hospitals. Hospitals are assigned to systems using the Agency for Healthcare Research and Quality's Compendium of U.S. Health Systems (2018 and 2023 editions), updated for later transactions (in Wisconsin, Froedtert–ThedaCare and Sanford–Marshfield; in Illinois, Prime Healthcare's purchase of eight Ascension hospitals and OSF's acquisition of KSB Hospital; the four UChicago Medicine AdventHealth hospitals are assigned to UChicago Medicine, which has held 51 percent of them since 2023). The file suppresses cells with fewer than 11 discharges (about 13 percent of volume in each state), which we impute at 2.5 discharges each. About 91 percent of each state's Medicare stays are at in-state hospitals. The Compendium codes the AMITA joint operating company of Ascension and AdventHealth (2015–2022) as two systems; treating it as one raises Illinois's 2018 referral-region mean from 1,934 to 2,008. Keeping the UChicago AdventHealth hospitals with AdventHealth instead changes Illinois's 2025 figure from 2,427 to 2,417.

however, plays a key role. The eight Chicago-area referral regions average an HHI of 2,051; the rest of Illinois averages 3,343, which is more concentrated than Wisconsin. Published estimates tell the same story: KFF's 2024 metropolitan figures put Chicago at 985, the fourth-lowest of 387 metro areas,<sup>17</sup> while downstate metro areas such as Peoria (5,324) resemble Wisconsin's (median 5,106). The pattern holds whether out-of-state hospitals are included, whether suppressed cells are dropped, and in all-payer data from hospital cost reports.<sup>18</sup> Concentration rose in both states between 2018 and 2025. Because our companion price comparison shows price differences between the two states are not driven solely by the Chicago market, this pattern cautions against attributing the Wisconsin–Illinois price gap to local concentration alone.

**Table 7: Wisconsin and Illinois on an identical construction: Medicare inpatient discharges, patient-residence markets, system-level HHI, patient-weighted means, hospitals in the patient's home state. Highly concentrated = HHI above 1,800. Chicago area = the eight Illinois referral regions centered on the Chicago metropolitan area (Aurora, Blue Island, Chicago, Elgin, Evanston, Hinsdale, Joliet, Melrose Park); rest of Illinois = Bloomington, Peoria, Rockford, Springfield, and Urbana.**

|                  | Referral regions, 2018 | Referral regions, 2025 | Service areas, 2025 | Patients in highly concentrated referral regions, 2025 |
|------------------|------------------------|------------------------|---------------------|--------------------------------------------------------|
| Wisconsin        | 2,473                  | 2,832                  | 4,270               | 100%                                                   |
| Illinois         | 1,934                  | 2,427                  | 3,818               | 62%                                                    |
| Chicago area     | 1,652                  | 2,051                  | 3,049               | 46%                                                    |
| Rest of Illinois | 2,596                  | 3,343                  | 5,045               | 100%                                                   |

## 5. Limitations

While we do our best with the data at our disposal, our analysis has some limitations:

1. The data contain total charges rather than negotiated prices or payments. We measure concentration directly; we infer the link to prices from the literature and from the authors' separate price findings, not from estimates here (Section 2).

<sup>17</sup> Jamie Godwin, Zachary Levinson, and Tricia Neuman, "One or Two Health Systems Controlled the Entire Market for Inpatient Hospital Care in Nearly Half of Metropolitan Areas," KFF, March 27, 2026, using RAND Hospital Data and the AHA Annual Survey for 2024; metro values from the article's chart data. KFF assigns discharges to the metro area where the hospital sits, as in the last row of Table 6; its Wisconsin median of 5,106 compares with our 5,091 on that construction.

<sup>18</sup> Including out-of-state hospitals, 2025 referral-region means are 2,542 for Wisconsin, 2,127 for Illinois, 1,834 for the Chicago area, and 2,816 for the rest of Illinois; dropping suppressed cells gives 3,052, 2,654, 2,205, and 3,803. All-payer discharges from fiscal 2023 Medicare cost reports, assigned to the referral region where each hospital sits, give 3,167, 2,791, 2,445, and 3,924. WHA's own Medicare discharges give a Wisconsin referral-region mean of 3,030 in 2025.

2. We only focus on inpatient care. We do not measure outpatient care, ambulatory surgery centers, or physician markets; thus, this is not a complete measure of hospital market power (Section 2).
3. We do not distinguish between product-market variability. We pool all inpatient discharges, which inflates measured concentration at regional referral hubs (Section 3.1).
4. Only Wisconsin hospitals report to the WHA. We therefore exclude border markets and two counties, but residual exposure remains in the retained border counties and cannot be corrected without out-of-state discharge data (Section 3.1).
5. By using fixed geographic markets, we cannot infer the geographic substitution possibilities of the many patients who stay local from the observed behavior of the relatively small, self-selected group who travel (Section 3.1).
6. To measure ownership, our crosswalk combines facility names with a documented-transaction review; an undocumented acquisition where a hospital kept its name could be missed. Additionally, affiliations short of a full merger are judgment calls (Section 3.2). The most consequential such judgment is Madison's joint operating agreement, which we (conservatively) count as two firms (Section 4.2).
7. HHI measures seller concentration within a local market. It does not capture the price effects of cross-market mergers that operate through system-wide bargaining leverage; those effects may be present even where local HHI is unchanged.
8. Our report is descriptive and presents levels, changes, and a decomposition, with no standard errors, control group, or counterfactual. The event studies in Section 4.4 are before-and-after comparisons, not identified causal estimates.
9. No all-payer source covers both states, so the comparison with Illinois uses Medicare discharges (Section 4.6). The Medicare-based figures track our all-payer Wisconsin results closely, but commercially insured patients may choose hospitals differently, and the report does not measure prices, so it cannot say how much of the Wisconsin–Illinois price gap market structure explains.
10. The formation of Advocate Aurora Health (April 2018) falls at the very start of the panel and is treated as background rather than an in-sample event. The 2018 baseline for Milwaukee is therefore already post-merger, making the measured increase in concentration in that market conservative.

## 6. Conclusions

Wisconsin's hospital markets are highly concentrated. At the referral-region level, 7 of 8 Wisconsin markets are highly concentrated (all 8 if Madison's two jointly operated systems are counted as one firm). The patient-weighted mean HHI (2,857 in 2025) sits well above the federal threshold. The finding holds at every market definition tested.

Concentration increased in every Wisconsin region between 2018 and 2025, driven mainly by ownership change rather than volume moving between hospitals: about 58 percent of the rise is attributable to transactions. The largest single local movement follows the 2021 Aspirus–Ascension merger, which reshaped two distinct referral regions. But closure also matters: the largest single movement in the Marshfield region is a hospital closure. Structural change in hospital markets comes from exits as well as mergers.

Wisconsin's local hospital markets are concentrated by any standard measure, and they became more so through a sequence of documented transactions and closures rather than through shifting patient preference alone. None of those transactions drew a public challenge from federal or state antitrust enforcers. The research literature most consistently associates this market structure with higher commercial prices, and it aligns with the roughly 25 percent gap between Wisconsin and Illinois inpatient prices documented in our previous work. The comparison with Illinois also suggests that local concentration is not the whole story. Wisconsin is more concentrated than Illinois, but that difference is driven primarily by the Chicago market; the rest of Illinois is at least as concentrated as Wisconsin. Together with our prior work finding large price differences between the two states, this suggests more is going on in the Wisconsin healthcare market than meets the eye.

One distinctive feature of Wisconsin is the insurance side of the market. Health plans owned by Wisconsin hospital systems held 36 percent of the state's fully insured commercial enrollment in 2024. This fraction increases to 51 percent when counting Dean Health Plan, in which SSM Health holds a 45 percent stake in addition to Medica's 55 percent stake. The corresponding figures are about 5 percent in Illinois and 7 percent nationally.<sup>19</sup> In the discharge data, plans owned or co-owned by Wisconsin hospital systems covered

<sup>19</sup> Authors' calculation from the Centers for Medicare & Medicaid Services Medical Loss Ratio public use file, 2024 reporting year: comprehensive medical coverage in the individual, small-group, and large-group markets, which excludes self-funded employer plans. Plans counted as owned by health systems in Wisconsin: Quartz, Security Health Plan, HealthPartners, Network Health, Aspirus Health Plan, MercyCare, and Chorus Community Health Plans; Dean Health Plan, 45 percent owned by SSM Health, would add 15 percentage points. The Illinois share is almost entirely Carle's Health Alliance, which has since left the market; the national figure excludes Kaiser Permanente. Wisconsin ranks fourth among the states on this measure, and second counting Dean. An earlier estimate reported by Modern Healthcare put Wisconsin's share at 32 percent against 13 percent nationally in 2015 (Wisconsin Department of Employee Trust Funds, "Wisconsin Health Market: Review and Update," April 9, 2021).

18 percent of all privately insured inpatient stays in 2022–2024,<sup>20</sup> which includes self-funded employer plans. A hospital-owned insurer has little reason to exclude its parent from its network or to bargain hard with it, and less reason than an independent insurer to push rival hospitals' prices down, since low-priced rivals would draw its own members and those of competing insurers. The insurance markets in Illinois and Wisconsin also differ in structure: Blue Cross Blue Shield of Illinois holds 62 percent of Illinois's commercial market, while Wisconsin's market appears to be among the least concentrated in the country.<sup>21</sup> A dominant insurer has more leverage to hold hospital prices down. Either mechanism could raise Wisconsin's prices relative to Illinois's in ways that hospital concentration measures do not register, and the discharge data, which record charges rather than negotiated prices, cannot distinguish them. Enforcement has differed as well. Federal and state enforcers have gone to court to stop hospital mergers in Illinois, including prospective mergers in Rockford in 1989 and 2012 and in suburban Chicago in 2017, and Illinois reviews hospital ownership changes and, since 2024, requires advance notice of health care transactions.<sup>22</sup> In contrast, we found no federal enforcement action against a Wisconsin hospital merger, and Wisconsin does not require prior notice to the state of pending health care transactions.

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<sup>20</sup>WHA Information Center payer fields, which name the commercial plan from 2022 onward. Plans counted: Dean Health Plan (co-owned by SSM Health since Medica acquired a 55 percent stake in December 2021), Quartz (UW Health, Gundersen, UnityPoint Health, and Advocate Health), Security Health Plan (Marshfield Clinic, now Sanford Health), Network Health (Froedtert ThedaCare), and MercyCare (Mercyhealth). They covered 18 percent of all privately insured inpatient stays and 20 percent of those with a named plan. The 2025 share is lower mainly because Dean's business is moving to Medica-branded plans.

<sup>21</sup>American Medical Association, *Competition in Health Insurance: A Comprehensive Study of U.S. Markets*, 2025 update, Table A-1 (commercial enrollment, fully and self-insured, January 1, 2024): Illinois HHI 4,284, Health Care Service Corporation (Blue Cross Blue Shield of Illinois) 62 percent; Wisconsin HHI 1,616, with UnitedHealth Group (29 percent) and Elevance Health (22 percent) the largest insurers.

<sup>22</sup>*United States v. Rockford Memorial Corp.*, 717 F. Supp. 1251 (N.D. Ill. 1989), *aff'd*, 898 F.2d 1278 (7th Cir. 1990); *FTC v. OSF Healthcare System*, 852 F. Supp. 2d 1069 (N.D. Ill. 2012); *FTC v. Advocate Health Care Network*, 841 F.3d 460 (7th Cir. 2016), after which the parties abandoned the merger in March 2017. Illinois reviews changes of hospital ownership through its Health Facilities and Services Review Board (20 ILCS 3960) and requires 30 days' notice of health care transactions to the Attorney General (Public Act 103-0526, effective January 1, 2024).

## Appendix A. Wisconsin hospital transactions, 2018–2025

The table lists provider transactions affecting general acute-care hospitals during the study period, compiled from company and press announcements and industry trade press and reconciled with ownership changes visible in the data. “Close” is the transaction’s effective date; where the WHA facility name changed later, the analysis uses the close date. Roll-ups that absorbed hospitals over several quarters are shown as a single deal with a date range, though as Section 4.4 shows, such a range can conceal a single sharp step.

**Table A1:** Provider transactions and exits affecting Wisconsin general acute-care hospitals, 2018–2025. The final column gives each transaction’s effect on every referral region where it reaches 25 HHI points, holding patient volumes fixed in the quarter before the deal and re-attributing the affected hospitals to their new owner. “None” means the transaction moved no HRR by 25 or more points, typically because the parties did not compete in the same place, or because a single-hospital owner simply changed name.

| Transaction                                                                                             | Type                       | Close     | WI acute hospitals | Referral regions affected ( $\Delta$ HHI)         |
|---------------------------------------------------------------------------------------------------------|----------------------------|-----------|--------------------|---------------------------------------------------|
| Marshfield Clinic roll-up (Ladysmith, Neillsville, Beaver Dam, Park Falls, Weston)                      | System expansion           | 2018–2020 | 5                  | Marshfield +270; Appleton –30; Wausau –342        |
| SSM Health – Agnesian & Monroe Clinic (St. Agnes, Ripon, Waupun, Monroe)                                | Acquisition                | Jan 2018  | 4                  | Closed before the first panel quarter; background |
| Advocate Aurora – Bay Area Medical Center (Marinette)—Aurora joint-venture partner from 2014            | Acquisition                | Apr 2019  | 1                  | Green Bay +337                                    |
| Aspirus – Divine Savior (Portage)                                                                       | Acquisition                | Feb 2020  | 1                  | none                                              |
| Froedtert – Holy Family Memorial (Manitowoc)                                                            | Acquisition (majority)     | 2021      | 1                  | Green Bay +25                                     |
| Aspirus – Ascension (Stevens Point, Rhinelander, Merrill, Eagle River, Tomahawk, Stanley, Howard Young) | Divestiture/acquisition    | Aug 2021  | 7                  | Wausau +1,754; Marshfield +396                    |
| Watertown Regional → ScionHealth                                                                        | For-profit chain transfer  | Dec 2021  | 1                  | none                                              |
| Emplify Health (Bellin + Gundersen)                                                                     | System merger              | Nov 2022  | 2 systems          | none                                              |
| Tamarack Health (Ashland + Hayward)                                                                     | Shared-brand affiliation   | Nov 2023  | 2                  | none                                              |
| Froedtert + ThedaCare                                                                                   | System merger              | Jan 2024  | 18 combined        | Appleton +365; Neenah +230; Green Bay +30         |
| HSHS exit—Sacred Heart (Eau Claire) and St. Joseph’s (Chippewa Falls) closed                            | Market exit (not a merger) | Mar 2024  | 2 closed           | Marshfield +286; La Crosse +50                    |
| Black River Memorial + Krohn Clinic (Black River Health)                                                | Hospital–clinic merger     | Dec 2024  | 1                  | none                                              |
| Sanford Health + Marshfield Clinic                                                                      | System merger              | Jan 2025  | no WI overlap      | None                                              |

**Context and exclusions.** The formation of Advocate Aurora Health (Advocate Health Care of Illinois and Aurora Health Care of Wisconsin) closed April 1, 2018, at the start of the panel, and the Advocate Aurora–Atrium combination (December 2022) involved no Wisconsin hospitals; both are treated as background. SSM Health’s acquisition of Agnesian HealthCare and Monroe Clinic closed on January 4, 2018, before the first panel quarter, and is likewise treated as background. Pre-existing system memberships

in which a hospital retained a name giving no indication of its owner were added from the documented record: HealthPartners (Hudson, Westfields, Amery), Hospital Sisters Health System (St. Nicholas/Sheboygan, St. Clare/Oconto Falls, St. Mary's/Green Bay), Mercyhealth (Janesville, Lake Geneva), AdventHealth (Durand), Essentia Health (St. Mary's/Superior), Froedtert (Community Memorial/Menomonee Falls since 2000 and St. Joseph's/West Bend since 2008, both renamed in 2019), and Marshfield (Lakeview/Rice Lake since 2008, renamed in 2018). Excluded as outside the inpatient scope are insurer and health-plan deals, ambulatory-surgery and physician-group transactions, the Aspirus–St. Luke's (Duluth, Minnesota) combination, and Aspirus's Michigan facilities. One entry has the opposite effect. The Marshfield roll-up raised concentration in the Marshfield region but reduced it in Wausau, where the hospital it absorbed at Weston moved out of Ascension, then the second-largest system there, and into a much smaller Marshfield, leaving two comparably sized rivals behind Aspirus instead of one large one.

## **Appendix B. County, service-area, and metropolitan detail**

Section 4.5 reports the market-definition ladder. This appendix gives the underlying detail for the three finer definitions.

### **B.1. County-level results**

At the county level, the patient-weighted mean HHI rose from about 3,509 in 2018 to 3,753 in 2025 across the 70 retained counties. In 2025, counties accounting for 97.0 percent of inpatient discharges were highly concentrated on the 2023 threshold (88.1 percent on the 2010 threshold of 2,500), compared with 95.7 percent in 2018. Douglas and Florence counties are excluded because most residents' inpatient care takes place at out-of-state hospitals that this dataset does not observe (Section 3.1).

### **B.2. Service-area (HSA) results**

At the smallest geographic level, the measured pattern is even sharper. Of the 99 Wisconsin HSAs with at least 200 annual discharges, 94 are highly concentrated in 2025 on the 2023 threshold (up from 92 in 2018), and 81 exceed even 2,500, covering about 93.8 percent of patients. Even the Madison HSA, only moderately concentrated at the HRR scale, reaches 3,211 here, and 5,870 if UW Health and UnityPoint Health–Meriter are counted as one firm. As Section 3.1 notes, part of this is definitional: Dartmouth assigns each ZIP code to the service area where most of its residents are hospitalized, so within-HSA concentration is partly built into the geography. These results support the referral-region findings rather than standing alone.

Concentration does not simply increase as markets get smaller. Mean 2025 HHI by HSA size quartile runs 3,992 (smallest), 3,775, 4,277, and 4,424 (largest), which are all highly

concentrated, with the largest quartile the most concentrated of the four. The most concentrated individual HSAs are small areas served by a single hospital (Ashland, 7,347, Neillsville, 7,058, New Richmond, 6,962), but the largest urban service areas are not appreciably less concentrated.

**Table B1: System-level HHI for the largest Wisconsin HSAs, 2018 vs 2025.**

| HSA (by 2025 volume) | HHI 2018 | HHI 2025 | Change | Top system share 2025 |
|----------------------|----------|----------|--------|-----------------------|
| Milwaukee            | 3,415    | 3,431    | +16    | 43%                   |
| Madison              | 3,095    | 3,211    | +116   | 37%                   |
| Green Bay            | 3,053    | 2,952    | −101   | 39%                   |
| Waukesha             | 3,951    | 4,029    | +78    | 58%                   |
| Appleton             | 4,188    | 4,511    | +323   | 60%                   |
| Racine               | 5,495    | 4,043    | −1,452 | 51%                   |
| Kenosha              | 4,413    | 4,493    | +80    | 51%                   |
| La Crosse            | 4,721    | 4,974    | +253   | 63%                   |
| Eau Claire           | 3,967    | 5,844    | +1,877 | 73%                   |
| Wausau               | 4,989    | 5,557    | +568   | 70%                   |
| Fond Du Lac          | 4,584    | 4,766    | +182   | 66%                   |
| Sheboygan            | 4,600    | 5,145    | +545   | 68%                   |

Fond du Lac is highly concentrated throughout (4,584 in 2018 and 4,766 in 2025). Its three general hospitals, St. Agnes, Ripon, and Waupun, were already under common ownership in Agnesian HealthCare, which joined SSM Health in January 2018, before the first quarter we observe.

Two movements stand out. Eau Claire's sharp increase reflects the 2024 HSHS exit discussed in Section 4.4, which left the market a Mayo–Marshfield duopoly; Figure B1 shows the resulting reallocation. Racine's decline, from 5,495 to 4,043, is a rare de-concentration, and it reflects capacity expansion by the incumbent second-largest system rather than new entry: Aurora, already present with 18 percent of Racine-area discharges in 2018, grew to 35 percent by 2025, while Ascension's leading share fell from 71 to 51 percent. The erosion began before Aurora's Mount Pleasant hospital opened and continues after it, so the new facility accelerated a shift already underway rather than initiating one.

### B.3. Metropolitan areas

Section 4.5 explains why metropolitan areas are reported for comparability with the published literature rather than as a preferred market definition. The table gives both constructions for each of Wisconsin's 13 metropolitan areas in 2025: residence-based shares (this report's convention) and hospital-location shares (the literature's). Duluth and

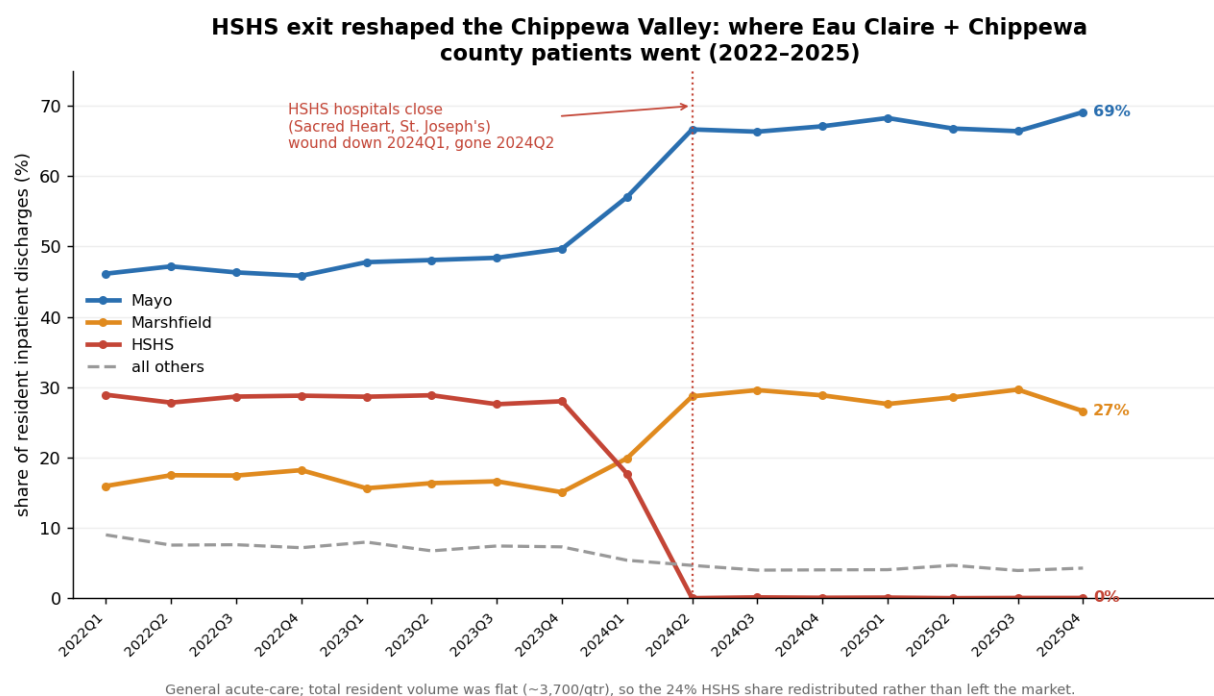


**Figure B1:** Reallocation of Eau Claire and Chippewa county residents after the 2024 HSHS closures. Total volume was flat, so the exiting system's share redistributed to the two remaining systems rather than leaving the market.

Minneapolis-St. Paul contain Wisconsin counties but are centered out of state and are excluded for the same reason as the border referral regions.

The gap between the two columns is informative in itself. It is widest where a single system owns most of the hospitals physically located in a metro area but that metro's residents also use hospitals elsewhere—Fond du Lac and Wausau are the clearest cases. Location-based shares treat those residents as though their only options were the local hospitals; residence-based shares count where they went. Neither is wrong, but they answer different questions, and only the residence-based measure reflects the choices patients made.

## Appendix C. Data-quality checks and reproducibility

Because this analysis uses a licensed dataset to draw conclusions about the organizations that supply it, we document the checks in full here.

- **Control totals.** The extracted panel reproduces WHA's published statewide quarterly inpatient record counts to within 6 records, a maximum discrepancy of 0.004 percent.
- **Facility combinations.** WHA's `tlkFacility` support table records hospitals whose reporting was merged into another facility. Every such event either predates the study

**Table B2:** System-level HHI for Wisconsin metropolitan areas, 2025, on both constructions. The location-based column is the one comparable to published national estimates. OMB 2023 CBSA delineations.

| Metropolitan area     | HHI (residence) | HHI (hospital location) | Discharges (location) |
|-----------------------|-----------------|-------------------------|-----------------------|
| Milwaukee-Waukesha    | 2,995           | 3,100                   | 175,773               |
| Madison               | 2,841           | 4,249                   | 50,092                |
| Green Bay             | 2,969           | 3,521                   | 37,175                |
| La Crosse-Onalaska-MN | 4,790           | 5,689                   | 25,113                |
| Eau Claire            | 5,368           | 6,268                   | 22,403                |
| Wausau                | 5,194           | 6,994                   | 20,806                |
| Oshkosh-Neenah        | 3,193           | 4,578                   | 19,763                |
| Appleton              | 4,029           | 5,008                   | 19,085                |
| Kenosha               | 4,476           | 5,091                   | 15,006                |
| Racine-Mount Pleasant | 3,669           | 5,214                   | 14,902                |
| Janesville-Beloit     | 2,350           | 3,599                   | 13,485                |
| Fond du Lac           | 5,001           | 8,956                   | 9,406                 |
| Sheboygan             | 5,232           | 6,556                   | 8,771                 |

period or involves an ambulatory-surgery or specialty facility excluded from the analysis, so no in-panel reporting change shifts discharges between firms.

- Known reporting omission. WHA’s historical caveats record that Bellin Hospital omitted 382 inpatient records from its 2018 Q1 submission, and Oconto Hospital four, after a claims-format changeover; the corrected totals were published but not back-filled into the released files, so the panel carries the as-submitted figures. Restoring them lowers the Green Bay HRR by 40 points in 2018 Q1 and 8 points for 2018 as a whole.
- Undocumented one-quarter volume anomalies. Several facilities report a single quarter far below their own trend and recover fully the next, a pattern that indicates a submission problem rather than a change in the market. We scanned all 4,448 facility-quarters for it, excluding 2020 Q2 where the fall in volume was real. Thirty-six quarters qualify, totaling 4,539 discharges, or 0.11 percent of the analyzed total. Three are large enough to move a market visibly and none carries a caveat: Bellin Hospital in 2025 Q3, about 950 discharges short, which raises the Green Bay HRR by 134 points that quarter and 19 for the year; Ascension All Saints in 2024 Q2, about 670 short, which lowers the Racine service area by 254 points that quarter; and Ascension St. Elizabeth in 2023 Q4, about 520 short, which raises the Appleton HRR by 160 points that quarter and 29 for the year. All quarters are retained as delivered; the full list of anomalies is available upon request.
- Quarter coverage. All 32 quarters from 2018 Q1 to 2025 Q4 are present. The 2018

Q2 file was reissued by WHA and the revised data set was used in our work.

- Facility scope. 139 general acute-care hospitals, 92 percent of all inpatient discharges, all payers, all procedures. We exclude psychiatric and behavioral, rehabilitation, long-term acute care, children-only, and freestanding surgical and single-specialty hospitals using an explicit, published classification rather than a name-matching rule alone.
- Geographic assignment. Markets are assigned from patient ZIP code via the Dartmouth Atlas 2017 crosswalk and the OMB 2023 CBSA delineations. When WHA's small-cell rules suppress a ZIP code, the discharge is assigned to its county's modal market; this affects under 3 percent of discharges. Assignment coverage after that fallback is complete.

*Source: WHA Information Center, Inpatient Data, April 10, 2026 release. The WHA Information Center asks that data users share a copy of any resulting publication; a copy of this report will be provided to WHAIC on release.*