Trends in US Hospital Electronic Health Record Vendor Market Concentration, 2012–2021

KEY WORDS: electronic health records; market concentration; EHR vendor transitions.

J Gen Intern Med 38(7):1765–7
DOI: 10.1007/s11606-022-07917-3

INTRODUCTION

Following the passage of the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009, acute care hospitals have rapidly adopted electronic health records (EHRs).[1] Most hospitals purchased commercially available systems from EHR vendors, which at the time of HITECH's passage was a competitive market.[2] However, in the intervening years, concerns have been raised regarding increasing concentration in this market as many hospitals have transitioned to a new EHR vendor.[3] EHR vendor is associated with system performance,[4] interoperability,[5] and patient safety,[6] making EHR market dynamics an important area of inquiry. In this study, we describe the US hospital EHR vendor market and measure market concentration over time.

METHODS

Our sample included hospitals responding to at least 1 year of the American Hospital Association Annual Survey and IT Supplement in 2012, 2014–2019, and 2021 (no survey was fielded in 2020). The 2021 survey was fielded from April to September 2021. Response rates to the IT Supplement during our sample ranged from 52% (2021) to 64% (2017, 2018). Our analytic dataset included 5613 unique hospitals over 8 years for 25,456 hospital-year observations.

Hospitals' EHR vendor was determined via responses to the question "Which vendor below provides your primary inpatient EHR/EMR system?" For all analyses, we kept the ten most common vendors distinct and grouped others as "Other."

We calculated the number of hospitals using each EHR vendor over time. We then calculated a measure of vendor market share using number of total hospital beds using that vendor. Finally, we calculated the Herfindahl-Hirschman Index (HHI), a common measure of market concentration, using the bed-weighted market share measure, for each year. All measures used inverse probability weights to account for nonresponse bias.

Received August 8, 2022
Accepted October 28, 2022
Published online November 8, 2022

RESULTS

EHR vendor market share changed substantially from 2012 to 2021. In 2012, the most common vendor was Meditech (22.2% of hospitals), followed by Cerner (11.8%), Epic (11.4%), McKesson (10.1%), and CPSI (9.9%). In 2021, the most common vendors were Epic (32.8%), Cerner (23.2%), Meditech (16.4%), and CPSI (6.7%) (Fig. 1a).

In our measure of EHR market share by number of beds, Epic grew from 20.6% in 2012 to 46.5% in in 2021, a 25.9 percentage point increase. Cerner grew 7.5 percentage points, from 17.7 to 25.3%. McKesson saw the largest decrease, from 11.0% of beds to 0.2%, followed by Siemens, used by hospitals comprising 7.2% of beds in 2012 down to 0% by 2021 (Fig. 1b).

The EHR vendor market has become increasingly concentrated over time. In 2012, the HHI was 1452, falling in the "competitive" range per FTC and US Department of Justice standards. The market became "moderately concentrated" in 2014 and rose above the 2500 HHI threshold for "highly concentrated" after 2018 (Fig. 2).

DISCUSSION

The hospital EHR vendor market in the US has changed substantially from 2012 to 2021. Two vendors, Epic and Cerner, have increased their market share dramatically, and the market has moved from "competitive" to "highly concentrated" over time—reflected by these two vendors now covering 71.7% of hospital beds.

Increased concentration may reflect hospitals moving to the highest quality system that fits their needs—hospitals using Epic and Cerner performed better on several measures of EHR performance,[4] and these two vendors may reduce barriers to patient data sharing.[5] It may also be that EHR vendor consolidation is driven by consolidation in hospital markets, as larger health systems are more likely to use market-dominant vendors such as Epic or Cerner. However, concentration may reduce innovation or lead to higher prices for both new

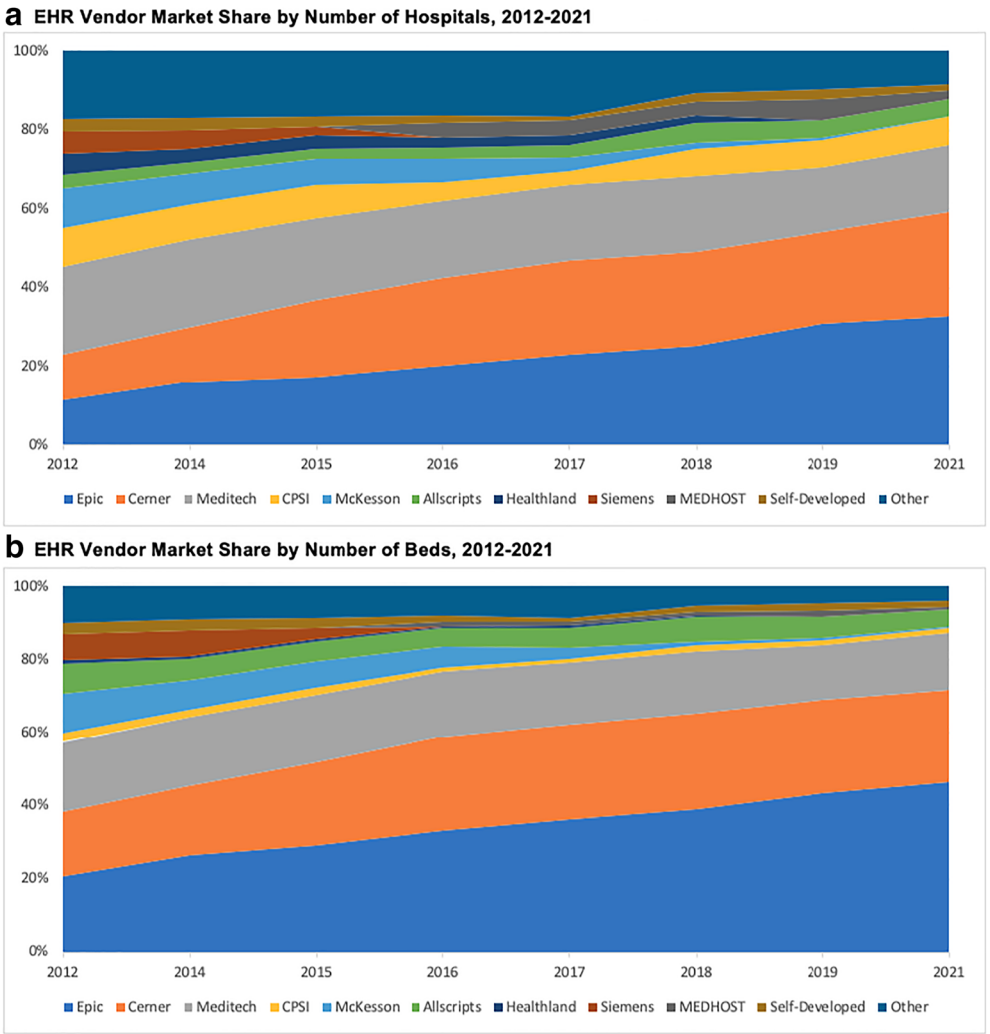

Figure 1 US Hospital EHR Vendor Market Share, 2012–2021. Note: Vendors are ordered by 2021 market share, with the largest on the bottom, with the exception of "Other Vendor" at the top.

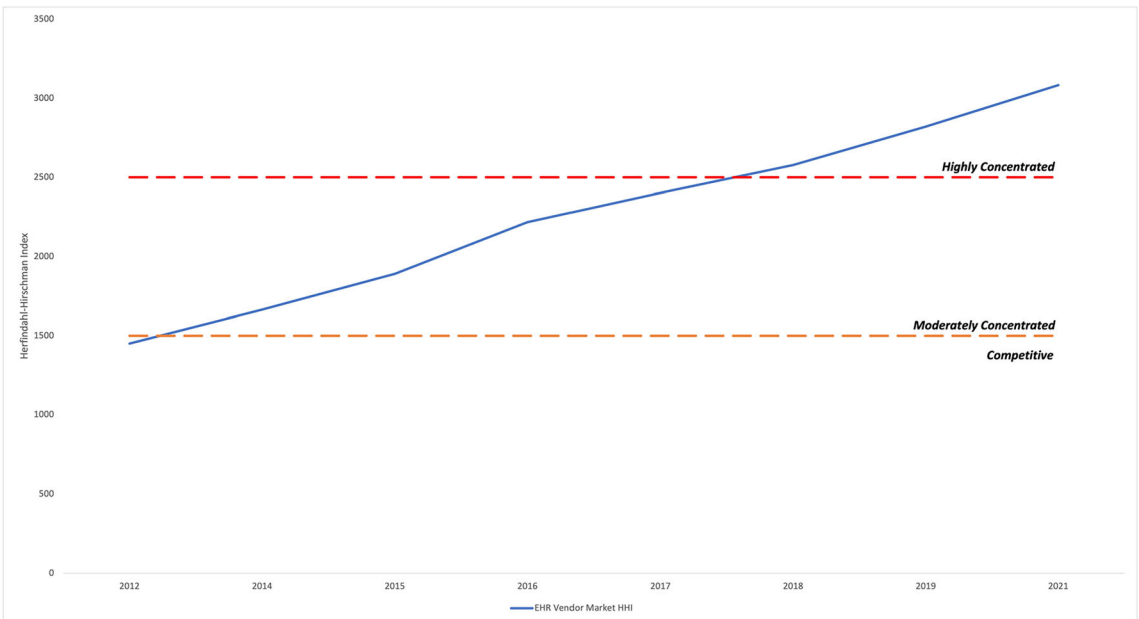

Figure 2 Concentration in US Hospital EHR Vendor Market, 2012–2021.

customers and ongoing support. Additionally, hospitals with non-Epic and Cerner EHRs may face increased pressure to switch to a leading vendor as the market consolidates, incurring significant operational disruptions. Future research should investigate the drivers of EHR vendor consolidation and the impacts of a highly concentrated EHR market on patients and care delivery organizations.

Our study's strengths include the use of timely national data to capture a full picture of the hospital EHR vendor market unavailable in existing public use files from federal agencies. Our limitations include using self-reported survey data and lack of data on the office-based physician EHR vendor market, although more than 85% of the hospitals in our sample used the same EHR vendor for outpatient care.

A. Jay Holmgren, PhD MHI[1]
Nate C. Apathy, PhD[2]

[1]Center for Clinical Informatics and Improvement Research, University of California, 10 Koret Way, Office 327A, San Francisco, CA 94131, USA
[2]MedStar Health Research Institute, Washington, DC, USA

Corresponding Author: *A. Jay Holmgren, PhD MHI; Center for Clinical Informatics and Improvement Research, University of California, 10 Koret Way, Office 327A, San Francisco, CA 94131, USA (e-mail: a.holmgren@ucsf.edu).*

Declarations:

Conflict of Interest: *Dr. Apathy reports previously holding stock in Cerner Corporation and being a former employee. No other conflicts were reported.*

REFERENCES

1. **Adler-Milstein J, Jha AK.** HITECH Act drove large gains in hospital electronic health record adoption. Health Affairs. 2017;36(8):1416-1422.
2. **Sorace J, Wong HH, DeLeire T, et al.** Quantifying the competitiveness of the electronic health record market and its implications for interoperability. Int J Med Inf. 2020;136:104037. https://doi.org/10.1016/j.ijmedinf.2019.104037
3. **Colicchio TK, Cimino JJ, Del Fiol G.** Unintended consequences of nationwide electronic health record adoption: challenges and opportunities in the post-meaningful use era. J Med Internet Res. 2019;21(6):e13313. https://doi.org/10.2196/13313
4. **Holmgren AJ, Adler-Milstein J, McCullough J.** Are all certified EHRs created equal? Assessing the relationship between EHR vendor and hospital meaningful use performance. J Am Med Inform Assoc. 2018;25(6):654-660. https://doi.org/10.1093/jamia/ocx135
5. **Pylypchuk Y, Meyerhoefer CD, Encinosa W, Searcy T.** The role of electronic health record developers in hospital patient sharing. J Am Med Inform Assoc. 2022;29(3):435-442. https://doi.org/10.1093/jamia/ocab263
6. **Classen DC, Holmgren AJ, Co Z, et al.** National trends in the safety performance of electronic health record systems from 2009 to 2018. JAMA Network Open. Published online 2020:10.