

Fitzhugh Mullan
Institute for Health
Workforce Equity

THE GEORGE WASHINGTON UNIVERSITY

Trends and Impact of Vertical Integration of CHCs on Workforce

Authors: Qian “Eric” Luo, PhD, Ali Moghtaderi, PhD, Yoon Hoon Park MS, Hong-Lun Tiunn MPA, Avi Dor, PhD

1. Introduction

As the nation seeks to strengthen primary care and enhance health equity, we must understand how changes in the health care marketplace affect CHCs and their patients. One such trend has been vertical integration, widespread among specialty practices (Capps et al., 2018; Encinosa et al., 2022; Nikpay et al., 2018). Vertical integration of primary care providers is a relatively recent but rapidly growing phenomenon (Whaley et al., 2021). This new development is driven, in part, by the rapid proliferation of alternative payment models, which created incentives for hospitals and health systems to integrate inpatient and outpatient services by acquiring primary care practices, CHCs included. CHCs treat many Medicaid and uninsured patients, accounting for over 40% of emergency room visits and over 25% of hospitalizations nationally (Lopez-Gonzalez et al., 2014; Moore & Liang, 2020). Acquiring or partnering with CHCs allows them to shift care delivery for these patients from emergency rooms to CHCs and hopefully reduce unnecessary hospitalizations. Another benefit to systems is that governments fund CHC activities through grants and special reimbursement policies in Medicare and Medicaid. While the federal government requires the CHCs' boards to be patient-directed to be eligible for Section 330 grants, hospitals, and health systems have found novel ways to create integrated networks that include CHCs.

There has been no research on the vertical integration of CHCs or its impact on the health workforce or patient outcomes. The vertical integration of CHCs with hospitals and health systems can take shape in various forms: 1) direct employment of CHC health care providers (including direct ownership and common parent organizations), 2) direct control over the CHC board of directors, and 3) integrate CHCs in alternative payment models. Given the importance of CHCs in providing care for underserved populations, it is critical to understand the trends in vertical integration and its impact on these outcomes. One of the most important challenges in studying vertical integration among CHCs is measuring integration. This study provides a novel method to identify different forms of vertical integration among CHCs by combining publicly available data sources and assessing vertical integration's impact on CHC staffing patterns.

2. Data & Methods

2.1 Data Source

The primary database we used to identify CHCs and CHC staffing composition is the Uniform Data System (UDS) from 2014 to 2021. UDS data are maintained by the Bureau of Primary Health Care (BPHC) of the Health Resources and Services Administration (HRSA). Grantee CHCs of Section 330 under the Public Health Service Act must report health center level information, including staffing levels, patient demographic and utilization, selected diagnostic categories visits, and other information annually. We decided to start from 2014 as our UDS data starts to incorporate delivery site information beginning that year. In addition, we used the April 2023 version of the Health Center Service Delivery and Look-Alike Sites data (HRSA site data), including self-reported CHC National Provider Identifiers (NPIs). CHCs are uniquely identified by HRSA Grant Number and BHCNIS ID in UDS and HRSA site data, but each CHC might report multiple NPIs.

The second data source of our study was the Internal Revenue Service (IRS) Form 990 non-profit organization tax returns for tax years between 2014 and 2021. The electronically filed 990 Forms are publicly available from the IRS. We used address, zip code, city name, and organization name to match the 990 forms with the UDS data. CHCs are uniquely identified by Tax Identification Numbers (TINs) in the IRS Form 990 data. We also tapped into an existing hospital-related TINs networks database assembled from multiple data sources, including IRS Form 990, Department of Labor Form 5500, Securities and Exchange Commission Form 10-K, Center for

Medicare and Medicaid Services (CMS) OpenPayment teaching hospital lists (Luo et al., 2023; Yuan et al., 2023). From the IRS Form 990 of CHCs and hospital-related TINs, we will extract the names of officers, board members, and key employees.

The third data source of our study was the National Plan and Provider Enumeration System (NPPES) between 2014 and 2021. NPPES provides information on NPIs, including mailing and practice location addresses and taxonomy codes that identify the type of organization.

The fourth data source of our study was the Medicare Provider Enrollment, Chain, and Ownership System (PECOS) public use file between 2016 and 2021. PECOS public use files provide additional specialty codes for the organization and link organization NPIs to PECOS Associate Control ID (PAC ID), which can be used to identify organizations with multiple NPIs. In addition, each NPI could have multiple enrollment IDs, each for a different organizational type (e.g., one for Federally Qualified Health Centers and one for group practice). Moreover, one organization or health system might have multiple PAC IDs and, thus, even more NPIs and enrollment IDs.

Our study's fifth and final data source was the Agency for Healthcare Quality and Research Compendium of Health System (AHRQ Compendium) group practice linkage files 2016 and 2018. AHRQ Compendium data provide a linkage between the vertically integrated organization's PAC IDs and the health systems (AHRQ, 2023).

2.2 Methods to Identify Vertically Integrated CHCs (Independent Variable)

Our research method is a three-pronged approach building on three CHC identifiers: NPI, TINs, and business names. On the NPI side, we assembled the historical UDS data from 2014 to 2021 to identify CHC delivery sites. We then used algorithms to clean up site names and addresses to correct spelling mistakes and different abbreviations of names and addresses. We further deduplicated the data to generate unique records of CHC sites. Next, we used a computer algorithm to match the sites to historical NPI records using health center delivery site addresses, health center delivery site state, health center name, and health center site name. We categorized the matches into four categories: 1) center name and address (including states) matches, 2) site name and address matches, 3) center name and state matches, and 4) site name and state matches. The matching algorithm allows for some fuzziness in the name and address matches to capture the maximum number of possible matches; thus, we manually examined the NPI match and excluded incorrect matches. Center name and state matches often capture additional sites that might not be reported in the UDS or HRSA site list. After matching CHCs with NPIs, we linked the CHC NPIs to the PECOS public use files to find the corresponding PAC IDs. Finally, we matched the NPIs to the PECOS Associate Control ID (PAC ID) using PECOS public use and via PAC ID to the AHRQ Compendium. Any CHC identified as affiliated with a hospital system through the AHRQ Compendium is considered vertically integrated. We determined the year of integration using additional searches on local news and the health center websites. If further information is unavailable, we assumed the integration happened before our study period (2014) or at the start of the Section 330 grant (if later than 2014).

On the TIN side, we built on a CHC TIN database from prior studies (Luo et al., 2021, 2022). We collected additional TINs for newer CHCs not included in the previous studies. We then matched the list of hospital-related TINs built from a separate study. Any CHC with a hospital-related TIN is considered vertically integrated. Additionally, we extracted officers, directors, and key employees (key personnel) from CHCs and hospital-related TINs. We cleaned up the names by removing known credentials (MD, DO, DDS, DMD, APRN, RN, PAC) from the end of names reported in the IRS Form 990 and IRS Form 990 EZ. Next, we matched CHC key personnel names

with hospital-related entities' key personnel names in the same state. A consistent key personnel share between a hospital and a CHC for three or more person-years is considered a match. The year of integration is determined by the first year of Form 990, which shared board members with a Form 990 from a hospital-related TIN.

On the business name, we matched the business names reported in UDS and IRS Form 990 against the Medicare ACO participant lists and the hospital business names against the same list. If a hospital-related entity and a CHC are found in the same ACO, we consider that a form of vertical integration. The year of integration is determined by the first year of CHC joining the hospital-related ACOs.

2.3 Outcome Variables

We primarily focused on staffing outcomes reported in the UDS 2021. We examined the number of FTEs and the percent of total FTEs by profession, including physicians, advanced practice clinicians, support personnel, and community health workers.

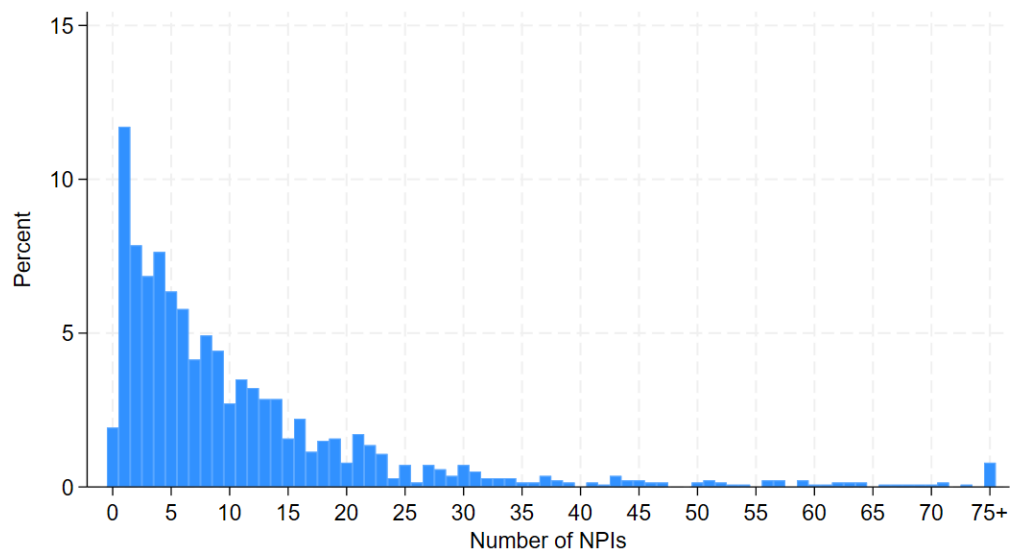
2.4 Statistical Analysis

We conducted a descriptive analysis of CHC staffing characteristics between the vertically integrated and non-integrated CHCs using two sample t-tests, with α at 0.05. Statistical analysis is performed using Stata 18 MP.

Results

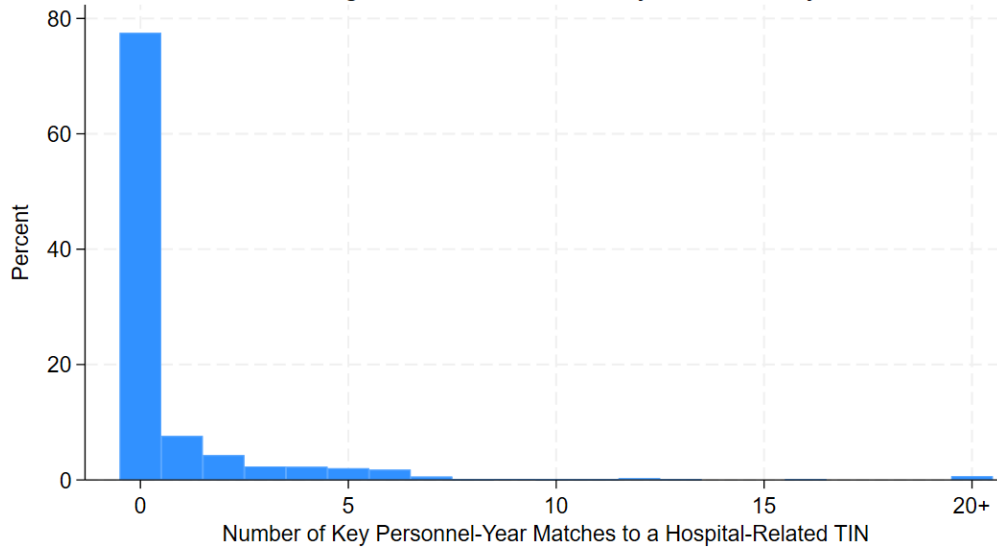
From all sources combined, we identified 1,401 community health centers in 50 states and DC. We found NPIs for 1,374 (98.1%) and 15,412 CHC unique NPIs. The average number of NPIs per CHC is 11.54 (SD 16.55). Figure 1 shows the distribution of the number of NPIs per CHC. Of the CHCs we found with some NPIs, the minimum NPI per CHC is one, and the maximum NPI per CHC is 258. Many of the 27 CHCs we found no NPI were no longer grantee CHCs by the end of our study period.

Figure 1. Distribution of the Number of NPIs per CHC



We identified TIN for 1,262 CHCs that have filed at least IRS Form 990 electronically between 2014 and 2021. The remaining CHCs are owned by a U.S. government or tribal organization that does not need to file an IRS Form 990.

Figure 2. CHC Vertical Integration as Identified by Shared Key Personnel



Of the 1,401 federally funded CHCs between 2014 and 2021, we identified that 258 (18.4%) had some form of vertical integration. The vertically integrated CHCs grew from 162 (13.0% of 1,243 CHCs) in 2014 to 235 (17.6% of 1,338 CHCs) in 2021. While direct ownership, board member control, and integration identified by the AHRQ compendium are considered stable as they entered into integration, ACO participation can be quite fluid. Figure 4 presents CHC ACO participation and vertical integration through ACOs. The participation in ACOs peaked in 2018 and has been declining since then. Yet, the percentage of CHCs vertically integrated through ACOs steadily increased throughout our study period.

Figure 3. % of Vertically Integrated CHCs

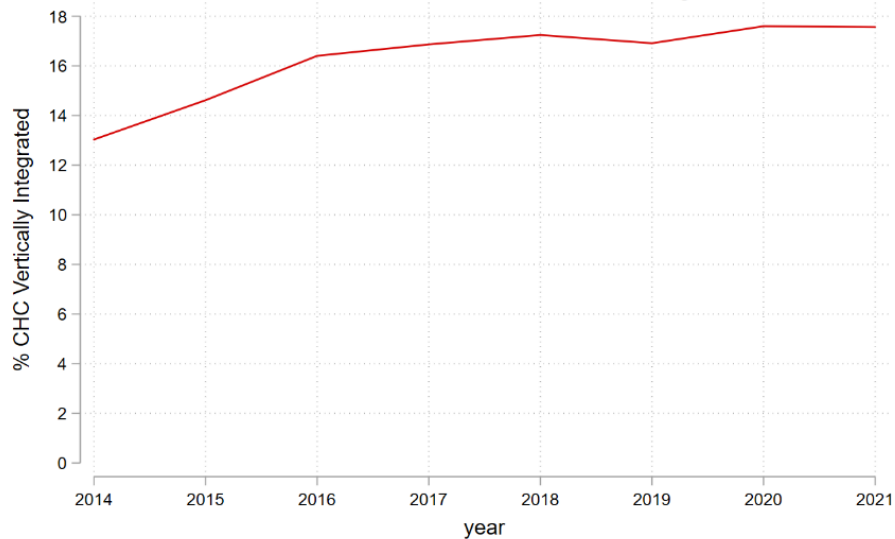


Figure 4. CHC ACO Participation and Vertical Integration through ACOs

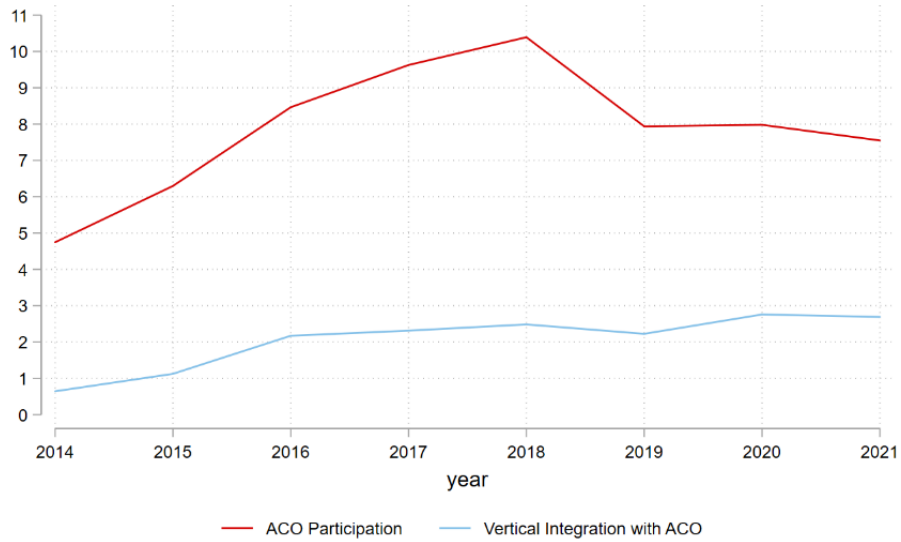
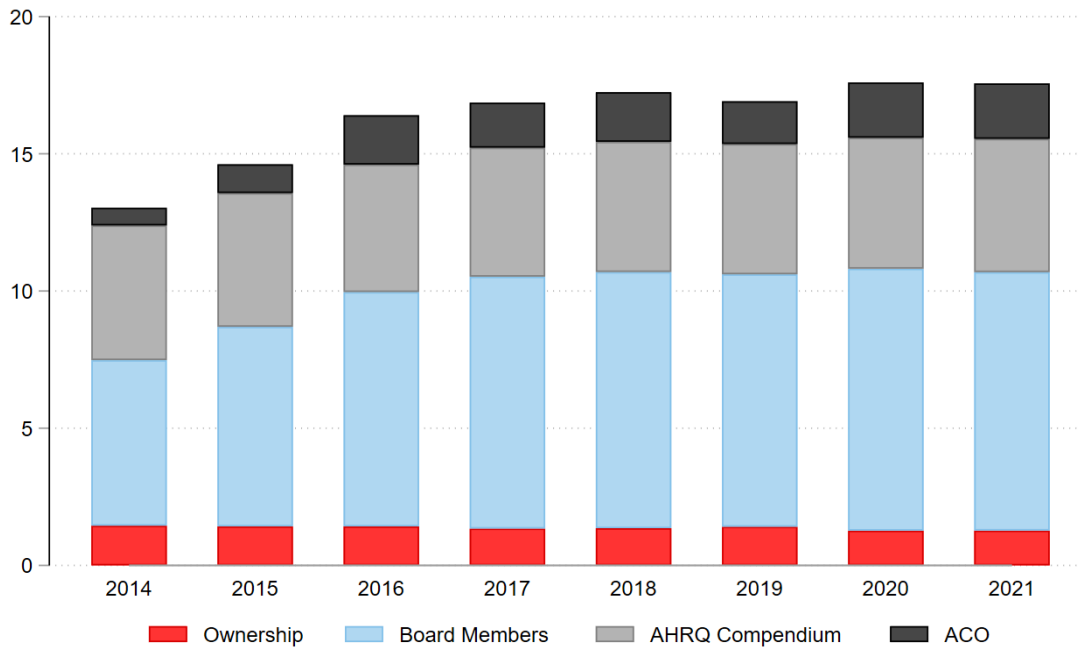


Figure 5 breaks down the integration type. Many vertically integrated CHCs were identified through multiple means. We used the following hierarchy to assign the kind of integration: confirmed ownership > shared board members > vertical integration as identified in AHRQ Compendium > vertical integration through ACOs. Two CHC integrations have increased: 1) shared board members between hospital systems and CHCs, and 2) CHC joins the ACO with hospital systems.

Figure 5. % of CHC by Type of Vertical Integration and Year



We then analyzed the difference in workforce composition of vertically integrated CHCs and their non-integrated counterparts. Table 1 presents a comparison between integrated and non-

integrated CHCs. Integrated CHCs tend to be larger having more medical services personnel, including physicians (4.84, $p=0.001$), advanced practice clinicians (4.53, $p<0.001$), nurses (9.51, $p<0.001$), and other medical personnel (7.46, $p=0.02$), behavioral health personnel (4.47, $p=0.01$), enabling services personnel (6.06, $p=0.001$), and patient support personnel (9.91, $p=0.001$).

Table 1. Personnel FTE Comparison between Integrated and Non-integrated CHCs

FTE	Integrated (n=235)	Non-integrated (n=1103)	Diff. (p-value)
Medical Services Personnel			
Physicians	14.74 (19.84)	10.01 (21.03)	4.84** (0.001)
Advanced Practice Clinicians	15.79 (15.73)	11.36 (12.56)	4.53*** (<0.001)
Nurses	22.73 (30.73)	13.26 (19.06)	9.51*** (<0.001)
Other Medical Personnel	36.60 (41.57)	29.50 (44.67)	7.46* (0.02)
Behavioral Health Personnel			
Behavioral Health	16.62 (27.30)	12.36 (24.56)	4.47* (0.01)
Dental Health Personnel			
Dental Health	15.97 (18.56)	13.62 (20.66)	2.48 (0.09)
Enabling Service Personnel			
Case Management	10.17 (14.93)	8.14 (15.70)	2.14 (0.05)
Patient & Comm Educ	2.56 (5.64)	1.78 (4.97)	0.80* (0.03)
Outreach	2.54 (5.91)	1.91 (3.46)	0.66* (0.02)
Transportation	0.92 (3.54)	0.54 (1.56)	0.38** (0.009)
Eligibility Assistance	3.96 (7.75)	3.11 (5.26)	0.89* (0.03)
Interpreter	1.54 (4.36)	0.77 (2.46)	0.76*** (<0.001)

Community Health Workers	1.59 (3.05)	1.33 (3.28)	0.27 (0.24)
Other Enabling Services	0.56 (2.00)	0.44 (1.96)	0.13 (0.36)
Total Enabling Services	23.84 (31.61)	18.03 (25.30)	6.03** (0.001)
Support Personnel			
Patient Support Personnel	40.53 (43.34)	30.94 (39.65)	9.91*** (0.001)

Table 2 takes a deeper dive into the composition of medical services personnel. Vertically integrated CHCs tend to rely more on physicians (2.04%, $p < 0.001$) and less on advanced practice nurses (-2.09%, $p = 0.003$); more on nurses (2.78%, $p = 0.01$) and less on other medical personnel (-2.73%, $p = 0.03$)

% FTE	Integrated (n=235)	Non-Integrated (n=1103)	Diff. (p-value)
Medical Services Personnel			
% Physicians	15.78 (7.90)	13.82 (8.00)	2.04*** (< 0.001)
% Advanced Practice Clinicians	19.41 (7.62)	21.47 (10.12)	-2.09** (0.003)
% Nurses	25.31 (15.43)	22.34 (15.67)	2.78* (0.014)
% Other Medical Personnel	39.50 (16.44)	42.37 (16.99)	-2.73* (0.025)

Discussion

As expected, we did not find an increase in the vertical integration among CHCs in the traditional sense due to the patient-directed restrictions placed by Section 330 grants. In other words, we did not find that health systems acquire CHCs as they did with other physician practices. The health systems establish most vertically integrated CHCs under the ownership category. However, we found an increasing trend in CHCs sharing board members with health systems and CHCs joining ACOs alongside health systems. We found that vertically discovered CHCs tend to be larger in workforce, and they tend to rely more on physicians and have higher support and enabling service personnel.

Concluding Remarks

This study marked the first effort to identify vertical integration among federally funded community health centers. The vertical integration of CHCs may be counterintuitive due to the Section 330 grant restrictions. However, we found that health systems did find ways to integrate CHCs into their care delivery systems, which may have profound implications for CHC patients.

Future studies must examine the difference in service utilization and quality outcomes between patients served by vertically integrated and non-integrated CHCs.

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