Geographic location of buprenorphine-waivered physicians and integration with health systems

Brendan Saloner¹,⁎, LeeKai Lin¹, Kosali Simon²

¹ Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, 624 N Broadway, Room 344, Baltimore, MD 21205, United States of America
² Tunghai University, Department of Economics, No. 1727, Section 4, Taiwan Boulevard, Xitan District, Taichung City, Taiwan
³ O’Neill School of Public and Environmental Affairs, Indiana University, Bloomington, 1315 E 10th St, Bloomington, IN 47405, United States of America

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ABSTRACT

Efforts are underway to expand buprenorphine treatment for opioid use disorder (OUD) in hospitals and affiliated health systems, yet we do not know whether physicians who prescribe buprenorphine are likely to be health-system affiliated. Our study draws upon SK&A data covering primary care physicians and psychiatrists in eight states (California, Florida, Georgia, Maryland, Ohio, Rhode Island, Wisconsin, and West Virginia), which were linked to a list of waivered buprenorphine prescribers from the U.S. Drug Enforcement Agency. We calculated waivered rates stratified by patient limits, physician type, health system affiliation, and area-level characteristics. We mapped the spatial relationship between hospitals and waived physicians in four metro areas. We found that primary care physicians affiliated with hospital health systems were less likely to have waivers than unaffiliated physicians (3.6% versus 8.2%), but the reverse was true for psychiatrists (33.2% versus 26.2%). Waivered physicians affiliated with health systems were less likely to practice in high-poverty areas than unaffiliated counterparts, and affiliated physicians were also more likely to cluster near hospitals. Health systems may be able to improve access to buprenorphine treatment in their communities by creating either incentives or mandates for more affiliated physicians to obtain a waiver.

1. Introduction

Ensuring access to medication treatment is a critical public health priority to reducing the national burden of opioid use disorder (OUD) and overdose (Substance Abuse and Mental Health Services Administration [US] and Office of the Surgeon General [US], 2016). However, many people with OUD do not receive medication treatment. Buprenorphine is one of the key medications that promotes recovery and reduces overdose risk (Leshner & Dzau, 2019), and office-based clinicians can prescribe it. Federal and state initiatives have focused on increasing the pool of physicians who have the federal waiver to prescribe buprenorphine (Haffajee, Bohnert, & Lagisetty, 2018). Only 4% of all U.S. physicians have a waiver, and some rural counties lack any prescribers (Andrilla, Moore, Patterson, & Larson, 2019). The majority of buprenorphine is prescribed by primary care physicians (PCPs) and psychiatrists (Wen, Borders, & Cummings, 2019).

Ideally, community-based physicians who prescribe buprenorphine would have a seamless referral pathway with hospitals where many patients are treated for an overdose, and hospitals would likewise be able to refer patients to prescribing physicians in the community. Initiating buprenorphine in the hospital has been associated with reduced illicit opioid use (D’Onofrio et al., 2015). These efforts are intended to increase engagement with treatment after discharge (D’Onofrio et al., 2017). Several initiatives have been launched to increase the provision of buprenorphine in hospitals with the expectation that patients will continue their treatment in the community, yet we do not know whether adequate access exists after discharge to community buprenorphine prescribers who can provide maintenance treatment. Medication use after an overdose is typically low (Koyawala, Landis, Barry, Stein, & Saloner, 2019; Larochelle, Liebschutz, Zhang, Ross-Degnan, & Wharam, 2016), which may reflect barriers to care at both the hospital and community levels. Having a waivered physician nearby is likely an important factor for patients’ continuity of care after they have left a hospital, especially as many communities lack a robust supply of waivered physicians (Andrilla et al., 2019).

The trend toward vertically integrated, hospital-based health systems supports the linkage between hospitals and community buprenorphine prescribers. For example, many hospitals now own
community physician practices or are linked to them through shared payment arrangements (Bishop, Shortell, Ramsay, Copeland, & Casalino, 2016). However, we do not know whether physicians with a waiver to prescribe buprenorphine are part of this vertical integration trend. Health systems may be able to influence the availability of buprenorphine treatment within physician practices that are part of the same hospital system. For example, systems can provide incentives to their physicians to obtain waivers or they can recruit physicians who have waivers to join their system, which could help to ensure that patients have access to continued community treatment after a hospital discharge. Our objective for this study was to characterize differences in waivered rates between physicians with and without a health system affiliation and across geographic areas.

2. Data and methods

We conducted a descriptive cross-sectional study using 2018 SK&A data on PCPs (general, internal, and family medicine) and psychiatrists. Under the terms of our licensing agreement with SK&A, we were able to obtain the full list of a select set of specialists in several states. We focused on PCPs and psychiatrists in this analysis because prior studies have indicated that psychiatrists and PCPs jointly account for about 78% of all waivered physicians (Rosenblatt, Andrilila, Catlin, & Larson, 2015) and account for 69% of all office visits during which buprenorphine is prescribed (Wen et al., 2019). We draw on data from eight states: California, Florida, Georgia, Maryland, Ohio, Rhode Island, Wisconsin, and West Virginia. These states were selected for geographic diversity and to include several states with high drug overdose rates.

SK&A is a private market research firm that tracks the healthcare workforce in the United States. SK&A is considered a reliable and current sample of office-based physicians (DesRoches et al., 2015) and has been used for prior studies of access to care (Barnes, Richards, McHugh, & Martsolf, 2018; Bond, Pajerowski, Polsky, & Richards, 2017). SK&A builds its database using U.S. Drug Enforcement Agency (DEA) registration files, National Provider Identifier (NPI) files, and company and corporate directories. It calls practices to verify information, aiming to contact practices every six months. Previous research indicates that SK&A has good coverage of private office-based physicians, but tends to under-cover physicians working predominantly in hospital or other facility settings (e.g., emergency department doctors and hospitalists) (Medpac, 2017). SK&A provides a specialty code for physicians, which we used to identify PCPs and psychiatrists. SK&A also provides a street address, which we used for matching physicians to geographic areas.

SK&A defines integrated health systems based on “common ownership or management of groups, hospitals, and other health care facilities by a common corporate entity” (Cohen et al., 2017). It certifies affiliation with a health system using a proprietary database of professional-to-healthcare organization affiliations validated using provider contacts and administrative data (SK&A n.d.). This measure has also been used in prior studies tracking vertical integration between physicians and hospitals (Koch, Wendling, & Wilson, 2017; Richards, Nikpay, & Graves, 2016). To define health system affiliation, SK&A combines “bottom-up” methods of calling physician practices to ask about ownership structure and “top-down” approaches of searching the web, trade publications, and other corporate sources (Cohen et al., 2017).

We merged the SK&A database from 2018 to a 2017 list of waivered buprenorphine prescribers from the U.S. DEA using DEA prescriber identifiers. DEA data represent the complete list of all waivered prescribers at a point in time (not just those who are publicly listed). Overall, there were 10,053 listed DEA waivered physicians in our database, of which 3236 (32.2%) could be linked to a PCP or psychiatrist in the SK&A data. Roughly one-quarter of all waivered physicians in national samples are specialties other than PCP or psychiatrist, so we did not expect complete linkage. In a supplementary analysis (not shown), we found that waivered physicians that did not link to SK&A were more likely to have a waiver limit of 30 patients, to be exempt from DEA fees, and to have hospitals or medical centers listed as their primary address.

We calculated waivered rates overall and, among waivered physicians, differences by patient limits (prescribers are initially restricted to treating 30 patients, but can apply to increase their limit to 100, and ultimately 275 patients). Results were stratified between PCPs versus psychiatrists and health system affiliation. We also examined area-level characteristics based on the address of the physician office: metropolitan area was an address located in a core based statistical area (CBSA) (US Census Bureau, 2019a), high poverty community was a location in a county with a poverty rate in the top 50th percentile of our sample (US Census Bureau, 2019b), and high overdose community was a county in the top 50th percentile of drug poisoning death rates in our sample. The county-level variables were extracted from the 2019 county health rankings and were based on data collected in 2017 (Robert Wood Johnson Foundation, 2018). Using Chi-Squared tests for independent samples, we calculated p-values for differences in means between physicians who were in versus were not in a health system.

We used two approaches to visualize regional differences. First, we generated a scatterplot showing the mean share of waivered physicians by health system affiliation status in hospital referral regions (HRRs). HRRs are empirically derived measures of regions where patients are likely to go to the same hospitals (Dartmouth Atlas Project, 2019). There are 95 HRRs in total within the eight states in our study. For our scatterplot, we focused on HRRs where we could identify at least 100 physicians in each specialty type, to focus on areas unlikely to be skewed by small counts. This yielded 59 HRRs for PCPs and 21 for psychiatrists.

Second, using geocoded office addresses associated with physician offices, we created maps showing the locations of PCPs and psychiatrists in four mutually exclusive groups: with/without waivers stratified by affiliated/unaffiliated with health systems. We show these office locations in relation to acute care, nonfederal hospitals obtained from the Healthcare Cost Report Information System (HCRIS). We focus on four HRRs: Providence, Rhode Island; Atlanta, Georgia; Charleston, West Virginia; and Los Angeles, California. These four HRRs have different patterns of hospital concentration and urban clustering. Charleston is in the state with the highest drug overdose rate in the U.S. Providence has an especially high rate of waivered physicians and Rhode Island has been hard-hit by the opioid epidemic, but has a comprehensive statewide opioid response plan (Rhode Island Governor’s Overdose Prevention and Intervention Task Force, 2015).

3. Results

Only 3.6% of PCPs in health systems (311 out of 8598) had a buprenorphine waiver compared to 8.2% of PCPs practicing outside of health systems (1049 out of 12,784); p < .001. Conversely, psychiatrists in health systems were more likely to have a waiver than those outside of health systems: 33.2% (571 out of 1719) versus 26.2% (1305 out of 4989); p < .001 (see Table 1). Among waivered PCPs, those in health systems were much more likely to have only a 30-patient limit than those outside systems: 70.4% versus 54.0%; p < .001. Similarly, waivered psychiatrists in health systems were more likely to have a 30-patient limit than those outside health systems: 76.5% versus 62.8%; p < .001.

A higher percentage of waivered PCPs unaffiliated with health systems practiced in high poverty communities than waivered PCPs affiliated with health systems: 47.5% versus 33.1%. Among waivered PCPs, > 70% practiced in high overdose communities and > 92% practiced in metropolitan areas (percentages were similar for those affiliated and unaffiliated with health systems). The same were found among waivered psychiatrists (Table 1).

Fig. 1 provides a scatterplot illustrating the relationship between the
percentage of waivered physicians affiliated with a health system in each HRR compared to the waivered percentage of unaffiliated physicians practicing in the same HRR. A 45-degree line is overlaid on the figure to show where equal percentages would fall. Consistent with the physician-level data, the percentage of waivered PCPs is much lower in health systems (median: 3.07%, SD 4.07%) than outside health systems (median: 6.67%, SD 6.13%). Indeed, in 12 of the 59 HRRs, there were no PCPs affiliated with health systems with a waiver, but there were just 2 HRRs where there were no unaffiliated PCPs with a waiver. By contrast, for psychiatrists, the percentage with a waiver was much higher in health systems (median: 37.96%, SD 13.31%) than outside health systems (median: 24.80%, SD 9.56%).

Several geographic patterns emerge across the four geographic areas for PCPs (Fig. 2). First, particularly in Los Angeles, Charleston, and Atlanta, PCPs with waivers (as opposed to unwaivered PCPs) appear more likely to cluster in urban areas and are less likely to be found in outlying suburban and rural areas of the HRRs. In these HRRs, many suburban communities have no proximate waivered PCPs. Relatedly, there are many hospitals outside of core urban areas that do not have any waivered physicians nearby. For example, most of the hospitals in Atlanta have nearby PCPs, but rarely PCPs with a waiver. While there is also clustering in Rhode Island around the Providence hospitals, it is

Table 1

<table>
<thead>
<tr>
<th>Characteristics of primary care physicians (PCPs) (N = 21,382)</th>
<th>Psychiatrists (N = 6708)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a health system</td>
<td>Not in a health system</td>
</tr>
<tr>
<td>DEA waivered</td>
<td>311 (3.62%)</td>
</tr>
<tr>
<td>DEA waivered PCPs (N = 1360)</td>
<td>219 (70.42%)</td>
</tr>
<tr>
<td>Patient waiver limit</td>
<td>70 (22.51%)</td>
</tr>
<tr>
<td>County Socioeconomic characteristics</td>
<td></td>
</tr>
<tr>
<td>High poverty community</td>
<td>103 (33.12%)</td>
</tr>
<tr>
<td>High overdose community</td>
<td>228 (73.31%)</td>
</tr>
<tr>
<td>Metropolitan area</td>
<td>286 (91.96%)</td>
</tr>
</tbody>
</table>

* PCPs and psychiatrists practice in high (top 50 percentile) poverty HRR crosswalked from percent of county population living in poverty.

* PCPs and psychiatrists practice in high (top 50 percentile) overdose mortality HRR crosswalked from county overdose mortality. Data from County Health Rankings 2018.

* PCPs and psychiatrists practice in metropolitan area defined in Core Based Statistical Area (CBSA).

Fig. 1. Scatterplot of average waivered rates in hospital referral regions by health system affiliation status.

Note: Each point represents the mean percentage of buprenorphine waivered physicians in the hospital referral region (HRR), comparing those with and without health system affiliation. Primary care physicians are represented by circles and psychiatrists are represented by diamonds. The analysis is restricted to HRRs where there are at least 100 physicians in the relevant specialty (N = 59 for primary care and N = 21 for psychiatrists). The 45-degree line represents a hypothetical line of equality within an HRR, where the waivered rate would be the same for affiliated and unaffiliated physicians.
notable that there are also waivered PCPs located in outlying areas. Perhaps unsurprisingly, regardless of waiver status, PCPs affiliated with health systems cluster around hospitals to a greater extent than unaffiliated PCPs in all four HRRs.

Compared to PCPs, across all areas there were fewer psychiatrists, and they tended to be more closely clustered around urban areas than PCPs. Interestingly, however, psychiatrists in more suburban areas often have waivers. Particularly in Atlanta, there is a wider spread of psychiatrists with waivers than PCPs, meaning that many suburban communities are more likely to have an accessible waivered psychiatrist than a waivered PCP. Similar to PCPs, psychiatrists with health system affiliations tended to cluster around hospitals (Fig. 3).

4. Discussion

Outpatient physicians are increasingly affiliated with hospital health systems, but relatively little is known about inclusion of buprenorphine-waivered physicians specifically in these health systems. In this study of office-based PCPs and psychiatrists in eight states, we found that PCPs practicing in health systems are waivered at less than half the rate of PCPs outside health systems. By contrast, psychiatrists practicing in health systems were more likely than those outside health systems to have a waiver. However, compared to PCPs and psychiatrists who practiced outside of health systems, those with waivers who practiced in health systems were more likely to be limited to the 30 patient cap
This finding suggests that waived physicians in health systems are treating fewer patients than their counterparts practicing outside of health systems.

Consistent with prior literature, our study suggests that many communities are very likely to have a limited pool of providers waived to prescribe buprenorphine (Andrilla et al., 2019). Our study adds the new insight that buprenorphine-waivered PCPs are more likely to be practicing outside integrated health systems, though the reverse is true for psychiatrists. Improving integration between outpatient providers and health systems has several practical implications. First, it could augment efforts to provide a full continuum of care for patients with OUD. Health systems can potentially provide care management tools to ensure that patients are less likely to destabilize in their treatment and overdose, potentially reducing hospitalizations. In the event that patients are hospitalized for overdose, integration can help to improve the availability of medication treatment in the post-discharge period. Particularly in an era of episode-based payments, hospitals seek to contain post-discharge referrals to physicians in their network (Lau et al., 2014). Second, if buprenorphine-prescribing physicians are integrated with health system networks, they may be better able to refer patients to other providers in the community. There is a growing emphasis on ensuring that patients being treated for addiction disorders have access to specialists in other areas of medicine that manage other chronic diseases (Gerrity, 2016).

Our study does not indicate why differences exist between PCPs versus psychiatrists. PCPs who are waived to prescribed
buprenorphine are a more self-selected group (as evidenced by their lower average waivered rates), and it may be that factors that cause them to adopt a waiver also make it less likely that they will be part of an integrated health system. Moreover, patients with OUD are likely to form a higher share of a typical psychiatrists’ panel than that of a PCP. Physicians affiliated with health systems tend to be in group practice, serve more publicly insured patients, and engage in more frequent referring of patients to other physicians than those not affiliated with health systems (Forlines, 2017). Physicians who prescribe buprenorphine disproportionately serve paying patients, which may be a population that seeks care in nontraditional settings (Lagisetty, Ross, Bohnert, Clay, & Maust, 2019). There may also be specific financial incentives for providers that lead to their greater integration with health systems, including capitalizing on favorable reimbursement for certain forms of care (Forlines, 2017). Whether physicians join health systems likely depends on their particular business model.

There are cultural and financial barriers to increasing the provision of OUD treatment in hospitals and affiliated health systems. OUD is still a stigmatized disorder and patients may not be as widely accepted as those with other common chronic illnesses (Wakeman, Pham-Kanter, & Donelan, 2016). While health systems may be an important setting to systematically address stigma against OUD and to normalize its treatment, it is practically difficult to overcome longstanding perceptions that patients with addiction are “problematic” and are disruptive in hospital settings (Chan Carusone et al., 2019). Further, mental health and addiction treatment may be less remunerative to hospital health systems than other kinds of treatment, particularly since they often involve uninsured patients. For example, outpatient psychiatrists tend to bring less revenue to hospital health systems than other specialists (Merritt Hawkins, 2019).

Despite these challenges, comprehensive efforts are underway to change the culture of hospitals and to offer targeted financial incentives for improved care for OUD. For example, in Pennsylvania, hospitals across the state are now eligible to receive supplemental payments for adopting quality of care pathways for OUD and can participate in a learning action network intended to foster better practices and support culture change (Hospital Healthsystem Association of PA [HAP], 2020).

Finally, the interaction of geography and health system affiliation is important. In our county-level analysis, we found that regardless of affiliation status, waivered physicians (both PCPs and psychiatrists) were likely to be concentrated in higher overdose counties, but also overwhelmingly in metropolitan areas, which underscores that rural areas are likely to be underserved (Rosenblatt et al., 2015). However, affiliated physicians with waivers differed from unaffiliated physicians in one key respect: they were more likely to be located in high-poverty counties, which may compound access challenges for lower-income patients who are seeking care within a particular health system.

While our analysis of the four communities was by no means definitive, it also raised some interesting hypotheses for further research on geography and access to buprenorphine treatment. Particularly in areas such as Atlanta, waivered PCPs clustered in central urban areas and were less prevalent in suburban hospitals where other health system affiliated PCPs were likely to locate. By contrast, in these four communities, psychiatrists in suburban areas were also likely to have waivers, but were not commonly affiliated with health systems.

Our study is subject to some limitations. First, we focused on physicians listed in SK&A and did not include nurse practitioners and physician assistants who now have scope of practice to prescribe buprenorphine in many areas. As noted, we could not link many physicians to the DEA list. While we cannot definitively confirm reasons for nonlinkage, we expect that many of these physicians were not practicing primary care or were practicing in settings where they would not be in scope for SK&A. Additionally, the mismatch of years (the DEA data were from 2017 and SK&A from 2018) may have affected data linkage. Second, our sample is also confined to 8 states, which combined account for 30% of the U.S. population and 31% of all drug overdose deaths. Third, we focused on whether physicians have a DEA waiver, but many waivered physicians do not prescribe buprenorphine or only do so to a small number of patients (Stein et al., 2016). Accordingly, the community waivered rate overstates the pool of providers from whom patients are likely to be able to access treatment. For example, only 37% of waivered physicians in our sample of physicians had waivers to treat > 30 patients, indicating many of these practices are only facilitating treatment for a small number of patients. Fourth, we focused only on physicians who prescribe buprenorphine, but many patients are treated at methadone clinics or receive long-acting naltrexone injections.

5. Conclusion

Initiatives to start patients on buprenorphine in hospitals should also consider links to community buprenorphine prescribers who patients may want to access for follow-up care after their hospital visit by integrating buprenorphine-waivered prescribers into hospital networks. Given the low overall waivered rates in many areas among PCPs and psychiatrists, hospital systems should focus on increasing waivered rates among their system-affiliated physicians. Hospitals can achieve this goal by supporting the education required to obtain a waiver or by providing supports within the health system to encourage physicians to begin treating patients seen in hospitals with buprenorphine after discharge. Ultimately, improving access to care for patients with OUD who come into contact with hospitals will require systems that can promptly begin buprenorphine treatment in hospitals and seamlessly transition patients to continuing care in the community following hospitalization.

CRediT authorship contribution statement

Brendan Saloner:Conceptualization, Methodology, Writing - original draft, Supervision. Lee Kai Lin:Conceptualization, Writing - review & editing. Formal analysis, Visualization. Kosali Simon:Conceptualization, Writing - review & editing.

References


