

Payer Policy Behavior Towards Opioid Pharmacotherapy Treatment in Ohio

Todd Molfenter, PhD, Carol Sherbeck, BA, Sandy Starr, MSW, Jee-Seon Kim, PhD, Mark Zehner, MS, Andrew Quanbeck, PhD, Nora Jacobson, PhD, and Dennis McCarty, PhD

Objective: Few studies examine how payers address the need for improved access to pharmacotherapy for opioid use disorders and the influence of environmental variables on access to opioid agonist and antagonist medications.

Method: The 52 Ohio Addiction Drug Abuse and Mental Health Services (ADAMHS) Boards that disburse funds for treatment services for the uninsured and underinsured were surveyed to assess coverage for opioid agonist and antagonist treatment medications. Analyses examined public health data on regional opioid addiction patterns, characteristics of the local health insurance market, and their associations with coverage for opioid addiction pharmacotherapy.

Results: Most (70%) of the 44 participating ADAMHS Boards paid for opioid treatment medications. For payment policy, all Boards required behavioral therapy to be provided in conjunction with opioid agonist or opioid antagonist therapy, and 27% of the Boards limited length of a buprenorphine therapy regimen. Higher local opioid treatment admission rates were associated with higher rates of Board funding for opioid treatment pharmacotherapy. Environmental variables (eg, overdose fatality rates or the behaviors of private

insurance payers) were not associated with ADAMHS support for opioid agonist or antagonist medication.

Conclusions: The analysis highlights the policy preferences of these payers. Follow-up studies should examine the payer decision-making processes, preferences, and attitudes that affect support for pharmacotherapy for opioid dependence.

Key Words: addiction payer policy, medication-assisted treatment, opioid addiction

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Opioid use disorder is the second leading cause of substance use disorder (SUD) treatment admissions in the United States (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014), forcing health-care payers and stakeholders to address treatment needs. The rise in opioid use and opioid use disorders coincided with a movement to make pain relief standard medical practice. From 1999 to 2013, the amount of prescription pain medication dispensed and opioid-related deaths in the United States quadrupled (Centers for Disease Control and Prevention [CDC], 2015). Federal, state, and local government agencies are seeking strategies to treat opioid use disorders and reduce overdose deaths. The CDC lists expanding access to addiction treatment services as an essential component in the response to the growing opioid overdose epidemic (U.S. Department of Health and Human Services [US DHHS], 2014). The most effective approach to the treatment of opioid disorders, based on addiction treatment retention rates, is opioid agonist and antagonist pharmacotherapy (Fudala et al., 2003; Comer et al., 2006; Mattick et al., 2014).

Opioid agonist therapy with methadone or buprenorphine enhances retention in treatment and reduces self-reported use of opioids, criminal activity, and mortality (Mattick et al., 2014). Unlike buprenorphine, methadone is not provided by prescription, but dispensed through licensed opioid treatment programs under federal guidelines. An opioid antagonist medication, extended-release naltrexone (Vivitrol), improved retention rates when compared with placebo (Krupitsky et al., 2011). Extended-release naltrexone is typically injected at the prescriber location. While these opioid use disorder treatment pharmacotherapies hold great promise,

From the Ohio Department of Mental Health and Addiction Services (OhioMHAS), Columbus, OH (TM, SS); University of Wisconsin-Madison, Center for Health Enhancement System Studies (CHESS), Madison, WI (CS); University of Wisconsin-Madison School of Education, Madison, WI (J-SK); UW-Center for Tobacco Research and Intervention, Madison, WI (MZ); Department of Family Medicine and Community Health, University of Wisconsin-Madison, Madison, WI (AQ); University of Wisconsin-Madison, Institute for Clinical and Translational Research, Madison, WI (NJ); Oregon Health & Science University, Portland, OR (DM).

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Send correspondence to Todd Molfenter, PhD, University of Wisconsin-Madison, 1513 University Avenue, Madison, WI 53706. E-mail: todd.molfenter@chess.wisc.edu.

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they are underutilized in addiction treatment. Of the 2.5 million Americans 12 years of age or older with opioid use disorders (SAMHSA, 2015), fewer than 128,000 had treatment plans that included pharmacotherapy (SAMHSA, 2016). The limited use of opioid medications in specialty treatment contributes to this gap: just 25% of specialty addiction treatment centers provide buprenorphine care, 17% provide extended-release naltrexone, and 8% provide methadone (SAMHSA, 2017). Workforce capacity limitations, reimbursement policy, and stigma towards addiction disorders all have been reported to affect this gap (Molfenter et al., 2015a, b). In Ohio, 39.7% of admissions to specialty treatment providers were for opioid use disorders (SAMHSA, 2016); only a minority of the specialty treatment facilities, however, provided buprenorphine (24%), methadone (20%), or extended-release naltrexone (10%) (SAMHSA, 2015).

Pharmacotherapy use rates have been significantly associated with pharmacotherapy reimbursement (Ducharme and Abraham, 2008; Heinrich and Cummings, 2014). Knudsen and Abraham (2012) found that treatment programs were more likely to adopt pharmacotherapy for addiction if they perceived greater support for medications from payers such as Medicaid or the Substance Abuse and Prevention Treatment State block grant. The payers' role is not limited to the payment of services. The regulatory requirements payers place on expected standards of care, their preauthorization requirements, and the amount of service they will pay for also influence access to and use of clinical therapies (Molfenter et al., 2013). Payer support for opioid treatment varies (Heinrich and Cummings, 2014). Despite payers' instrumental role in the adoption of pharmacotherapy to treat opioid use disorders, their role has been understudied in the health services literature (Ducharme and Abraham, 2008; Knudsen and Abraham, 2012; Andrews et al., 2014). Data on how payers address opioid use disorders, their provider practice expectations as exhibited by what medications they include in formularies, their preauthorization criteria, and restrictions they place on duration of care may provide insight into the barriers to pharmacotherapy treatment for opioid use disorders. Data on the influence of community environmental variables (eg, related public health crises, provider support, and patient needs) on payment policy may offer additional understanding of the barriers to pharmacotherapy treatment for opioid use disorders.

Underlying the role and impact of payers is the need for knowledge of what influences payer behavior and coverage decisions. Yet, theories attempting to explain payer behavior are missing from the literature. Factors believed to play a role in payer decisions are economic (Drummond et al., 2015), evidence-base of practices (Garber, 2001; Trosman et al., 2010), and opinions of key stakeholders, such as medical societies. Lacking from the research on payer behavior is the study of a broadly reported public health issue such as the opioid epidemic in the United States. This study reviewed public payer policy in Ohio towards the use of the opioid agonist and antagonist therapy for opioid use disorders, and also assessed the behavior of commercial payers in the local geographic area.

Study Description

This study examined how Ohio's 44 county Alcohol and Drug Addiction and Mental Health Services (ADAMHS) Boards varied in payment policy for pharmacotherapy for opioid use disorders. The study also examined how selected community variables and the presence of other payers influenced payer policy. The presence of multiple payers in a local market is thought to be better able to respond to beneficiary needs, and the presence of multiple insurers in a local market is thought to influence payer behavior (Hussey and Anderson, 2003). This analysis will be among the first to study payer influences on each other in a behavioral health setting.

We surveyed the ADAMHS Boards regarding their payment policy towards medications proven effective in the treatment of opioid use disorders. These medications included buprenorphine/naloxone combination therapy, buprenorphine tablets, methadone, and extended-release naltrexone. The descriptive analysis explored the payment methods and Board expenditures for the medications, along with the regulations that accompany their use. An additional analysis assessed the associations between opioid use disorder public health measures and types of health insurance coverage for buprenorphine and the ADAMHS Boards' payment for opioid use disorder pharmacotherapies.

METHODS

Study Setting and Population

In Ohio, the ADAMHS Boards contract with local public addiction treatment providers. These regional boards serve between 1 and 5 counties, and services do not overlap. Boards provide and disburse funds from the state's Substance Abuse and Prevention Treatment block grant, local tax levy funds, and other state and federal awards. They do not manage Medicaid reimbursement. They pay for services using grants-in-aid rather than the fee-for-service or capitation arrangements usually used in the health insurance market. The patients they typically serve are the uninsured—11% of Ohio's population in 2013 (Smith and Medalia, 2014). Since Ohio is a Medicaid Expansion state, those up to 138% of the federal poverty level are eligible for Medicaid coverage, where buprenorphine, buprenorphine/naloxone combinations, and extended-release naltrexone are covered services (The Ohio Department of Medicaid, 2017).

The ADAMHS Board areas vary in percent of opioid admissions for SUD treatment, density of buprenorphine prescribers, and age-adjusted unintentional overdose death rates. Ohio has the fifth highest age-adjusted drug overdose mortality rate in the United States (CDC, 2016) and has implemented many of the same opioid prescription misuse and treatment policies tested in other states (CDC, 2016). In 2013, 65.6 doses of prescription opioids were purchased per Ohio citizen, and 4.2 Ohioans died per day due to unintentional opioid overdoses (Ohio Department of Health, 2013). The rapid increase in opioid use and opioid use disorders creates an appropriate environment for use of evidence-based pharmacotherapies to treat opioid addiction. Buprenorphine and other opioid treatment pharmacotherapies are seen as a

key strategy for treating opioid use disorders in Ohio (Sherba et al., 2012).

Measures/Data Collection

The Ohio County Behavioral Health Module database for State Fiscal Year 2014 (7/1/2013–6/30/2014) provided data describing the demographic characteristics of individuals served by the ADAMHS Boards and the percentage of SUD treatment admissions with an opioid diagnosis. Analyses examined 4 environmental variables by Board area: opioid admission rates (Ohio Department of Health, 2013), unintentional overdose death rates per 1000 (Ohio Department of Health, 2014), waived buprenorphine prescriber rates per 10,000 population (Buprenorphine Physician Locator), and days of buprenorphine prescribed per person (from the Ohio Pharmacy Board 2014 data). ADAMHS Boards' purchasing practices allocated for opioid use disorder treatment pharmacotherapy in FY 2015 (7/1/2014–6/30/2015) were assessed through an online survey, using pharmacotherapy purchasing policies and practices' measures definitions from the study by Rinaldo and Rinaldo (2013). The online survey was administered between November 1, 2014 and January 28, 2015 to ADAMHS Board Executive Directors recruited through direct e-mail that contained the survey link. Board payment amounts were collected for FY 2015 to determine how these variables influenced funding amounts. Data on the percentage of buprenorphine prescriptions paid in each county by private insurance, Medicaid, Medicare, self-pay, and workers' compensation were accessed using Ohio Pharmacy Board data (ie, the Ohio prescription drug monitoring program). Because opioid treatment medications paid for by the boards are usually dispensed within the treatment agencies, they are not recorded in the pharmacy claims database. Thus, the pharmacy claims data represent only the private insurance claims in a County Board area. The Ohio Pharmacy Board data were limited to opioid treatment medications containing buprenorphine and approved for treatment of opioid dependence; methadone is dispensed (not prescribed), and naltrexone is not a controlled medication.

The online survey also collected data on the regulatory practices of the ADAMHS Boards, requiring counseling to accompany opioid treatment pharmacotherapy, preauthorization for opioid treatment pharmacotherapies, and setting time limits on opioid treatment pharmacotherapies.

The study received approval from the Institutional Review Boards at the University of Wisconsin–Madison and the Ohio Department of Health.

Data Analysis

Three sets of analysis were conducted: descriptive analysis; a bivariate analysis of environmental variables and non-ADAMHS Board payer percentages, and an analysis of the associations between ADAMHS Board payment policy and environmental variables, and also non-ADAMHS Board payment policy obtained from pharmacy claims. The different descriptive data analyses describe a summary of patient demographics (by Board) for State Fiscal Year 2014 (7/1/2013–6/30/2014) (Table 1); the environmental variables of the mean opioid admission rate, the unintentional overdose

death rate, and the number of buprenorphine providers per 100,000 (by Board) (Table 2); and the ADAMHS Board payment (Table 3) and regulatory practices (Table 4). The bivariate analysis of the environmental settings used Spearman rank-order test to assess associations between the environmental variables of per cent opioid admissions, overdose death rates, and buprenorphine prescriber capacity, and also percentage of non-ADAMHS payers by private insurance, Medicaid, and self-pay (Table 5). This analysis was conducted to establish the associations that exist between environmental variables and payer types, and how these associations could explain the nature of the opioid epidemic in these Board areas. The associations between ADAMHS Board opioid addiction pharmacotherapy treatment payment policy and the environmental factors, and also non-ADAMHS Board payment policy, were examined and statistically tested using Fisher exact test.

RESULTS

Forty-four of the 52 ADAMHS Boards (84.6%) completed the survey of opioid pharmacotherapy purchasing practices. The 44 participating ADAMHS Boards and 8 nonparticipating ADAMHS Boards were not significantly different with respect to the percent of opioid admissions and unintentional age-adjusted overdose death rates. Patients with an opioid diagnosis included women (51%) and men (49%). Most were White non-Hispanic (88%) and were served in treatment centers with more than 500 admissions per year (62%) (Table 1). The percentage of White non-Hispanic overdose deaths in Ohio in 2015 was 88% (US DHHS, 2016).

Community Environmental Variables

During period the study period, the mean opioid admission rate was 29.1%; unintentional overdose death rate was 15.9/10,000; and the number of buprenorphine providers per 100,000 was 5.8 (Table 2). The most common form of non-ADAMHS payment for buprenorphine was private insurance, representing 75% of pharmacy claims, with the second most common form of payment being Medicaid at 12%.

A bivariate correlation analysis of the environmental conditions found that opioid admissions were positively associated with overdose death rates, buprenorphine prescribers per 10,000 population, days supplied of buprenorphine per person, and percentage of Medicaid pharmacy claims. The only negative correlation with per cent of opioid admissions was with per cent of private insurance coverage from pharmacy claims (Table 5). Unintentional overdose death rates were positively associated with days supplied of buprenorphine by non-ADAMHS payer sources and negatively associated with the percentage of private insurance coverage.

Payer Policy: Purchasing

Seven of 10 (71%, $n = 31$) ADAMHS Boards provided coverage for pharmacotherapy for opioid use disorders. Over half of all the Boards (52.3%, $n = 23$) paid for pharmacotherapy using tax levy funds, and for those that provide at least 1 opioid treatment pharmacotherapy, 74.2% ($n = 23$) use tax levy funds. Most Boards covered extended-release naltrexone (61%, $n = 27$) and buprenorphine-naloxone film (59%,

TABLE 1. Participating ADAMHS Board Area Characteristics for Opioid Admissions

	Patient Demographics (n = 22,201)	Participating ADAMHS Boards (n = 44)	Nonparticipating ADAMHS Boards (n = 8)
Sex	Male	49.14%	48.62%
	Female	50.86%	47.62%
*Nonsignificant difference between Board areas ($P = 0.503$)			
Ethnicity served	Black/African American	7.7%	6.9%
	American Indian	<1%	<1%
	Hawaiian/Pacific Islander	<1%	<1%
	White Caucasian	87.5%	90.3%
	Hispanic	2.2%	2.2%
	More than 1 race	<1%	<1%
*Nonsignificant difference between Board areas ($P = 0.433$)			
Treatment agency size (by admissions)	Agencies in Board areas (n = 116)		
	<100	5.4%	52.6%
	100–499	32.4%	26.3%
	500–999	43.2%	21.1%
	1000+	19.0%	0%
*Significant difference between Board areas ($P = 0.000$)			
% of Opioid admissions (based on total SUD admissions by county)*	<10%	0%	12.5%
	10%–19%	25.0%	25.0%
	20%–29%	34.1%	25.0%
	30%–39%	22.7%	12.5%
	40%–59%	13.6%	12.5%
	60+%	2.4%	12.5%
*Nonsignificant difference between Board areas ($P = 0.742$)			
Unintentional age-adjusted overdose death rates		1.59/10,000	1.15/10,000
	Nonsignificant difference between Board areas ($P = 0.126$)		

ADAMHS, Addiction Drug Abuse and Mental Health Services; SUD, substance use disorder.

n = 26). Seven (16%) of the ADAMHS Boards supported only 1 medication (Table 3): extended-release naltrexone (n = 6) or buprenorphine (n = 1). Nineteen per cent of ADAMHS Boards provided 4 of the 5 medications, and 15% of the boards provided all 5 of the medications. ADAMHS Board funds provided for opioid pharmacotherapy ranged from \$0 to \$373,600 total funds (mean = \$50,043) and \$0 to \$17,345 per 10,000 population (mean = \$2,948). The overall funding breakdown of Board funding for each medication was buprenorphine (59.1%), methadone (22.7%), and extended-release naltrexone (61.4%). Boards that fund more than 1 medication are accounted for in these statistics.

TABLE 2. Environmental Conditions

Variable	Mean (SD)	Range
Opioid addiction public health measures		
Opioid addiction admissions, %	29.1% (12.1%)	13%–76%
Unintentional overdose death rates/10,000	15.9 (7.3)	0–35.3
Buprenorphine prescribers (per 100,000 population)	5.8 (7.5)	0–4.15
Health insurance coverage for buprenorphine		
Private insurance, %	75.3% (9.8%)	39%–92%
Medicaid, %	12.4% (9.0%)	2%–47%
Medicare, %	4.5% (2.5%)	0%–12%
Self-pay, %	7.2% (3.6%)	0%–19%
Days of buprenorphine provided/person	0.44 (0.34)	0.07–1.66

SD, standard deviation.

Payer Policy: Regulatory

All boards (100%) required counseling as part of opioid use disorder pharmacotherapy. Use of preauthorizations was not the norm, but 40% of the Boards required preauthorization for methadone. Some Boards limited days on buprenorphine (27%) and number of naltrexone injections (33%) (Table 4). There were no time limits placed on methadone.

Payer Policy: Influences of Environmental Conditions

A Fisher exact test analysis assessed the associations between the percentage of opioid admissions, the unintentional overdose death rates, and buprenorphine providers per 10,000 population with Board support for use of any opioid pharmacotherapy medication, the number of opioid pharmacotherapy medications, or the amount of opioid pharmacotherapy funds per thousand population. Two relationships were significant: Board support of methadone and number of buprenorphine prescribers per 10,000 in the community (at $P = 0.015$), and the percentage of opioid admissions and funds allocated by the ADAMHS Boards for opioid treatment pharmacotherapy (at $P = 0.042$).

Payer Practices: Influences of Other Payer Practices

A Fisher exact test assessed the association between the percentage of buprenorphine pharmacy claims paid by insurance, Medicaid, and self-pay or the overall buprenorphine days supplied through non-ADAMHS Board pharmacy

TABLE 3. ADAMHS Boards Providing Opioid Pharmacotherapy Treatment w/Payment Type

Medication (n = 44)	% That Provide	Payment Type (Note There Can Be Multiple Funding Sources/ADAMHS Board and the % of Those Who Provide That Pharmacotherapy)			
		Tax Levy Funds	SAPT Block Grant	State Grant	Local Philanthropy
Provide at least 1 opioid treatment pharmacotherapy	70.5% (n = 31)	74.2% (n = 23)	29.0% (n = 9)	16.1% (n = 5)	6.5% (n = 2)
Injectable naltrexone	61.4% (n = 27)	74.1% (n = 20)	29.6% (n = 8)	11.1% (n = 3)	7.4% (n = 1)
Buprenorphine/naloxone film	59.1% (n = 26)	76.9% (n = 20)	26.9% (n = 7)	15.3% (n = 4)	3.8% (n = 1)
Buprenorphine/naloxone generic	45.5% (n = 20)	75.0% (n = 15)	35.0% (n = 7)	10.0% (n = 2)	0.0% (n = 0)
Buprenorphine tablets	43.2% (n = 19)	78.9% (n = 15)	31.6% (n = 6)	5.3% (n = 1)	0.0% (n = 0)
Methadone	22.7% (n = 10)	90% (n = 9)	0% (n = 0)	20% (n = 2)	0% (n = 0)

ADAMHS, Addiction Drug Abuse and Mental Health Services; SAPT, Substance Abuse and Prevention Treatment.

claims and ADAMHS actions to provide medications for opioid treatment. There appeared to be no relationship between the number of medications or how much funding the ADAMHS Board provides for opioid pharmacotherapy and the percentage of claims paid or days of buprenorphine supplied by other payers.

DISCUSSION

The percentage of admissions for opioid use disorders in the specialty treatment system in Ohio was highly associated with the public health measure of unintentional overdose death rates. The per cent of opioid admissions was also associated with the number of buprenorphine prescribers per 10,000 population and the number of days supplied of buprenorphine.

Over 7 in 10 ADAMHS Boards provide payment for at least 1 type of opioid pharmacotherapy treatment. Relationships between other external factors and non-ADAMHS payer behavior, however, were not found. Additional analysis demonstrated there were “pro-opioid pharmacotherapy” Boards, where financial support for 1 of the opioid medications was significantly associated with their support for the other opioid treatment pharmacotherapies.

The population-adjusted days supplied of buprenorphine or the percentage of pharmacy claims from the different payers was not associated with the Boards’ propensity to provide opioid treatment pharmacotherapy. Even though about 3 of 4 (74%) Boards used local tax levy funds to support opioid pharmacotherapy, there were no direct relationships between the availability of tax levy funds to the ADAMHS Board and their financial support of opioid treatment pharmacotherapies. This could suggest that the opinions of decision-makers within the Boards play a larger role than local opioid addiction public health measures, or even availability of financial resources, to support opioid treatment

pharmacotherapies. The Board propensity to support other opioid pharmacotherapies if they support 1 pharmacotherapy also suggested that Board support for addiction treatment pharmacotherapy may reside with the preferences and attitudes towards opioid treatment pharmacotherapy. In addition, when extended-release naltrexone is the only opioid treatment medication supported by ADAMHS Board, this could suggest some boards want to avoid opioid agonists, even if their intended use is therapeutic. Historically negative public opinions of methadone clinics and Boards’ concerns about the diversion of buprenorphine (Molfenter et al., 2015a) could be factors in their decision-making process for selecting opioid treatment medications.

Even though preauthorizations were not the norm with grants-in-aid from the Boards, nearly 1 in 5 (19%) of the Boards required preauthorizations for buprenorphine therapies and 30% for extended-release naltrexone.

Research studies do not consistently support the requirement to receive adjunctive counseling with buprenorphine treatment (Weiss et al., 2011; Fiellin et al., 2013; Ling et al., 2013). The Boards, nevertheless, were consistent in requirements for behavioral therapy to accompany medication therapy. Medication alone is not a standard supported by this group. This rate of 100% is much higher than the 60% (30 out of 50) of state Medicaid programs nationally that required counseling in a 2013 Medicaid survey (Rinaldo and Rinaldo, 2013).

As of May 2013, just 11 states (or 22%) had lifetime limits on buprenorphine regimens. In the Ohio survey, a similar percentage of Boards limited time on buprenorphine (26.9%, n = 7) (Rinaldo and Rinaldo, 2013). Previously collected qualitative data in Ohio has indicated that the decision to limit durations of therapy was due to concerns by the Boards regarding the funds available to pay for buprenorphine (Molfenter et al., 2015a).

TABLE 4. Regulatory Policy and Opioid Pharmacotherapy Treatment

Practice	Buprenorphine (n = 26)	Extended Release Naltrexone (n = 27)	Methadone (n = 10)
Require enrollment in behavioral therapy	100% (n = 26)	100% (n = 27)	100% (n = 10)
Preauthorizations	19.2% (n = 5)	29.6% (n = 8)	40.0% (n = 4)
Limits on length of regimen	26.9% (n = 7)	33.3% (n = 9)	10.0% (n = 1)
3 mos	11.5% (n = 3)	11.5% (n = 3)	No limits reported
12 mos	11.5% (n = 3)	18.5% (n = 5)	
24 mos	3.7% (n = 1)	3.7% (n = 1)	

TABLE 5. Bivariate Analysis of the Environmental Conditions (using Spearman rho)

	% Opioid	Overdose Death Rate	Bup. Prescriber Density	Days Supplied of Bup	Private Insurance, %	Medicaid, %	Self-pay, %
% Opioid Admissions	1.00	0.601* (0.000)	0.325 [†] (0.031)	0.544* (0.000)	−0.446* (0.002)	0.308 [†] (0.042)	0.087 (0.576)
Overdose death rate	—	1.00	285 (0.061)	678* (0.000)	−0.470* (0.001)	0.251 (0.100)	0.121 (0.435)
Bup. prescriber density	—	—	1.00	0.230 (0.133)	−0.171 (0.267)	0.056 (0.717)	0.100 (0.519)
Bup. days supplied bup	—	—	—	1.00	−0.440* (0.003)	0.211 (0.169)	0.163 (0.291)

*Indicates significance at alpha = 0.01.

†Indicates significance at alpha = 0.05.

In instances where there is not coverage for medication-assisted therapies or the options available are limited, there needs to be a greater understanding of the role of stigma in these funding decisions. Preferences for treatment without opioid agonist medications, short-term medication-assisted therapy regimens, and also for antagonist-only (extended-release naltrexone) approaches, could reflect stigma towards addiction treatment and opioid agonist therapies.

Policy Implications

Gaps in the payment policy for providing opioid pharmacotherapy treatment persist. Nearly 30% of ADAMHS Boards surveyed did not cover medications for opioid treatment, despite the adverse impact of increased opioid use and opioid use disorders on public health. Based on this analysis, these gaps do not seem to be based on funding availability alone, because 5 of the 9 Boards that did not support opioid use disorder pharmacotherapy had a tax levy to support addiction care.

The payer mix analysis found a positive relationship between the percentage of Medicaid pharmacy claims filed by non-ADAMHS board payers and the rate of opioid admissions. The association between the proportion of Medicaid and opioid admissions may be due to a link between opioid admissions and socioeconomic status, because Medicaid insures those with lower financial resources. Supporting this potential link is the negative relationship between insurance coverage by those with greater financial resources and unintentional overdose deaths.

Limitations

Even though each ADAMHS Board represents varying demographic characteristics and unique political environments, this study was conducted in just 1 state. Many factors affecting payer behavior in this complex setting were missing, potentially limiting generalizability to other state systems, and also causality between variables. Our study focused on payer behaviors that the ADAMHS Boards could address. The impact of barriers at the provider level such as Drug Enforcement Administration (DEA) audits, federal patient limits, and availability of on-site pharmacies were not addressed in the analysis, but are important factors in accessing buprenorphine medications. In addition, this study compares data from state reporting systems with self-report data. To reduce the effects of self-report bias, a previously applied tool to assess payer policy was adopted (Rinaldo and Rinaldo, 2013) and the results of this study were compared with those results when possible. An additional limitation was that the physician

buprenorphine prescriber density data were collected through the SAMHSA buprenorphine prescriber locator. This registry includes only the physicians who want to list their information publicly. Other researchers have used these data source in their publications on buprenorphine prescribing behavior (Hutchinson et al., 2014; Stein et al., 2015).

Future Research

Similar research should be conducted longitudinally in additional states to assess the changes in policy that are occurring as the public health impact of opioid use and opioid use disorders continues at high rates. Future research would also benefit from the development of theoretical models that can provide a more thorough understanding of the existing beliefs of key decision-makers in payer organizations, what factors are considered when making payer decisions, and how new information affects their decision-making. This model would allow exploration of how payer decisions are influenced by factors such as stigma, clinical quality, economic considerations, knowledge regarding clinical research findings and lobbying by pharmaceutical companies, consumer pharmacotherapy preferences, patient motivators to seek continued care, the response to overdose deaths or Neonatal Abstinence Syndrome, and, in situations in which a payer supports only one pharmacotherapy, an understanding of what conditions and decision criteria led to the selection of an antagonist versus agonist therapy. In addition, further levels of analyses could explore how offering a single opioid pharmacotherapy affects the sequence of what other pharmacotherapies are adopted for payment; and which board and patient preferences influence the sequential adoption of additional opioid use disorder pharmacotherapies. The study of payer practices is an emerging field. These future research directions could provide a greater understanding of payer practices in general and those specific to the opioid epidemic.

CONCLUSIONS

Many questions remain as to what drives payer policy decisions related to supporting opioid treatment pharmacotherapy, and also healthcare policy in general, and why these decisions do not always follow clinical research evidence. This analysis suggests that overall concerns regarding opioid prevalence have some influence, but many other environmental conditions had no apparent effect. In the evolving context of the opioid epidemic, the payers' role deserves continued attention due to their key influential function in the healthcare system.

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