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CONNECTING THE SUPPLY AND NEED FOR BUPRENORPHINE TREATMENT IN
KENTUCKY COUNTIES

CAPSTONE PROJECT PAPER

A paper submitted in partial fulfillment of the
requirements for the degree of
Master of Public Health
in the
University of Kentucky College of Public Health
By
Ellen LaVonne Parker
Mt. Sterling, Kentucky

Lexington, Kentucky
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Abstract

Background: Prescription opioid drug overdose mortality rates have surpassed those of motor vehicle accidents in Kentucky. While opioid overdose plagues the state, buprenorphine is an FDA approved medication that has proven effective in treating opioid dependence. **Objectives:** This study examined the supply of licensed buprenorphine providers and community treatment centers in each county of Kentucky along with the need for treating opioid use disorder in each county. **Methods:** Licensed buprenorphine physicians and community treatment centers prescribing buprenorphine were identified through the Substance Abuse and Mental Health Services Administration online treatment locator. The need for treatment was measured by calculating the crude opioid overdose hospitalization rates in each county, year 2008 through 2012. **Results:** Results of this study conclude Eastern Kentucky has the greatest need for opioid treatment along with a small pocket of Northern Kentucky. Forty six percent of Kentucky counties (n=56) have at least one licensed buprenorphine physician and eight counties house community treatment centers prescribing buprenorphine. **Discussion:** The need for treatment is greater than the current supply of physicians and treatment centers. Figures included in this study illustrate clearly where current treatment providers are located and where need is most prevalent. **Conclusion:** Future policy must address gaps in treatment supply and treatment needs to identify treatment solutions and curb opioid dependence. Buprenorphine is the gold-star standard in opioid dependence treatment and requires significantly less resources than other types of opioid treatment.

1. INTRODUCTION

Opioid dependence is a public health concern that is causing increased mortality rates across the nation. The Centers for Disease Control reports a hundred people die every day in the United States from drug overdoses and that drug overdose death rates have tripled since 2008.¹ Prescription painkillers, known as opioid pain relievers, are the culprit of three out of four drug overdoses in the United States.¹

In 2002 the U.S. Food and Drug Administration (FDA) approved buprenorphine as a unique treatment option to combat opioid use disorder (OUD). Licensed buprenorphine physicians have the ability to prescribe buprenorphine treatment outside of substance abuse clinical settings. Buprenorphine offers a viable treatment option for individuals unable or unwilling to seek care in traditional treatment settings.² Opioid use disorder is a treatable disease: the National Institutes of Health Consensus Statement concluded in 1997, “All persons dependent on opiates should have access to opiate agonist treatment”.^{3,4} Methadone is also an FDA approved OUD treatment option. Methadone treatment is restricted to hospitals along with federal and state approved opioid replacement substance abuse programs. Research studies examining OUD patient treatment preference indicate individuals suffering from OUD prefer buprenorphine over methadone because of the length of methadone treatment; methadone maintenance treatment is a long-term indefinite treatment regimen with rigorous structure.⁵ Longitudinal studies spanning three decades indicate the majority of patients receiving methadone treatment drop out within the first year and refer to methadone as a “substitute drug” because of treatment length and structure.⁵⁻⁸ Research found OUD patients perceive methadone as a “harmful drug” and buprenorphine as “helpful medicine”.⁵ Clinical research studies suggest buprenorphine has a better safety profile and lower abuse liability than methadone.⁶ Based upon

previous research findings and patient attitudes buprenorphine treatment supply is the focus of this study.

Opioid addiction medication has continuously proved effective; however, access to medication is a public health concern. Bodies of research cite similar factors affecting the availability of buprenorphine treatment. The primary barrier preventing individuals from receiving treatment is insurance coverage. As a result of low Medicaid reimbursement rates physicians typically accept only cash or private insurance for services rendered.^{5,9} Opioid dependent populations struggle to maintain employment because of their addiction, which limits their ability to see physicians who only accept private insurance. The cost of office based opioid treatment (OBOT) in Kentucky averages \$940/month.¹⁰ Individuals suffering with OUD commonly rely upon community treatment centers for care due to insufficient insurance coverage and high medication expenses.

The inequality of buprenorphine treatment extends beyond insured and uninsured individuals; it also exists among publicly funded treatment centers and private treatment providers.¹¹ Buprenorphine is an evidence-based program and considered the gold standard in opioid agonist therapy but research has continuously found the use of buprenorphine more prevalent in accredited, for-profit facilities.¹¹⁻¹⁴ A contributing factor in the difference of buprenorphine usage among publicly funded treatment centers and private provider treatment revolves around the adoption of evidence-based programs. Publicly funded community based treatment programs face barriers when adopting evidence-based programs because of financial factors and limited connections with research institutions.^{9,13,15-18} The majority of community center patients do not have private insurance, therefore community centers do not have the funds to be able to employ licensed buprenorphine physicians. Without licensed buprenorphine

physicians, community centers are not able to prescribe buprenorphine to patients in need. A limited amount of publicly funded buprenorphine treatment centers threatens the supply of feasible treatment options for vulnerable OUD users and creates a market for street buprenorphine and buprenorphine diversion.

Previous studies examining Kentucky buprenorphine diversion suggest diversion may be a direct result of limited access to treatment and an increase in access may be an effective response in curbing diversion.¹⁰ The most frequent barrier preventing physicians from obtaining licensure is physician attitudes; physicians express concern about the lack of financial reimbursement for behavioral health and substance abuse services.^{6,19} Requirements for physicians to become buprenorphine licensed consist of verifying physicians are certified addiction specialists, have participated as principal investigators in clinical trials with buprenorphine for the treatment of opioid dependence, or received eight hours of approved training on the appropriate use of buprenorphine for the treatment of opioid dependence.²⁰ Most physicians become licensed through the eight hour training. An estimated twenty-three thousand physicians out of eight hundred thousand physicians in the United States (2.9%) have the necessary credentials to prescribe buprenorphine.²¹ Physicians are not permitted to treat more than thirty patients concurrently during their first year of prescribing. After one year physicians can choose to increase their patient load to one hundred patients.

As Kentucky and the United States struggle with growing opioid mortality rates it is beneficial to understand the supply of buprenorphine treatment providers and centers compared to treatment demand among the OUD population. National ratios suggest that for every one prescription pain-pill death there are ten treatment admissions for abuse, thirty-two emergency department visits for misuse or abuse and one-hundred thirty people who are drug

dependent.¹The objective of this study is to examine if the supply of buprenorphine treatment providers and centers in Kentucky meets the need for treatment need. Previous research has identified barriers preventing buprenorphine treatment expansion, but to our knowledge, no study in Kentucky has examined the current supply and need for buprenorphine treatment options in Kentucky. This study will recognize service gaps that may exist across the state and encourage policy recommendations to increase accessible buprenorphine treatment options for Kentucky's suffering OUD population.

2. METHODS

Variables

The dependent variable of this study is the number of buprenorphine treatment providers in each county. The independent variable of this study is the crude county rates of drug overdose hospitalizations per 10,000 populations. The purpose of this study is to determine whether a relationship exists between the variables and whether the supply of buprenorphine providers is meeting the need for OUD treatment.

Measures

The purpose of this study is to examine the supply of buprenorphine treatment in relation to need for treatment. Supply of buprenorphine treatment was measured by totaling the number of physicians and treatment center programs available in all one hundred and twenty Kentucky counties. To illustrate the supply of buprenorphine treatment, physicians and treatment centers were mapped according to the geographic location of the facility. Physicians located at the same address located within the same practice were counted individually. Need for buprenorphine treatment was measured according to the individual county crude opioid overdose hospitalization rates per 10,000 population for the years 2008 through 2012. Hospitalization rates

were calculated according to the geographic location of a patient's address, not the address of the facility visited. Need calculations only included Kentucky residents treated in Kentucky acute care hospitals.

Data Collection

Licensed buprenorphine physicians were identified through the online buprenorphine treatment program locator funded by the Center for Substance Abuse Treatment (CSAT) and Substance Abuse Mental Health Services Administration (SAMHSA), which also provides the address and location of each licensed physician.²² We acknowledge the CSAT provider treatment data is not an entirely inclusive list of providers; however this is the most accessible public information that patients and families of patients suffering from OUD have access to. It would be difficult to identify every buprenorphine treatment provider and facility as we recognize physicians may become licensed while we complete this study and others may cease practice. As of December 2013, CSAT identified three hundred and three physicians and twenty-three treatment center programs offering services in Kentucky. Physician and treatment center program data used for the purpose of this study includes physicians that are authorized to prescribe buprenorphine along with treatment programs that are authorized to dispense buprenorphine. Buprenorphine prescribing physicians in this study have met qualifications under the Drug Addiction Treatment Act of 2000 (DATA 2000) and authorized the use of their names to appear in the buprenorphine treatment locator.

The present study utilizes a statewide report produced by the Kentucky Injury Prevention Research Center (KIPRC), which counted the number of opioid overdose hospitalizations from years 2008 through 2012. The KIPRC report presents drug overdose morbidity and mortality data for Kentucky residents. KIPRIC used multiple data sources to report hospitalization rates;

including Kentucky Inpatient Hospitalization Discharge Files from the Cabinet for Health and Family Services, Office of Health Policy, 2000-2012. A hospitalization was considered a drug overdose if any of the ICD-9-CM codes in the range of 960-979 were listed in any diagnoses (principal or secondary) fields.¹⁹ Overdose hospitalizations of years 2008 through 2012 were combined and stratified by Kentucky county ($n=120$). Combining individual counties' five year opioid overdose hospitalization counts produced large enough counts to support statistically significant analyses. The Kentucky data management policy requires suppression of counts less than five; no counties in Kentucky had less than five observations. Five year hospitalization counts were calculated into crude county rates of drug overdose hospitalizations per 10,000 populations. Data used in this study is statistically significant; however, Kentucky residents receiving treatment in neighboring states are not considered in this study. Opioid overdose hospitalizations measure the need for buprenorphine treatment. Individuals who have been hospitalized as a result of opioid overdose represent a population that has the opportunity to be served through treatment though we realize hospitalizations underestimate demand as not every OUD user ends up in the hospital.

3. RESULTS

Opioid Hospitalizations

Every county in Kentucky saw hospitalizations as a result of opioid overdose. The lowest crude rate of opioid hospitalizations between 2008 and 2012 was 5 hospitalizations per 10,000 people. The counties with the greatest crude opioid overdose hospitalizations between 2008 and 2012 in Kentucky were Owsley County (41/10,000ppl), Perry County (35/10,000ppl), and Wolfe County (32/10,000ppl). Counties with the fewest hospitalizations per ten-thousand people were Meade County (5/10,000ppl) followed by Spencer and Robertson Counties both with 6

hospitalizations per 10,000 individuals. The mean crude rate of opioid hospitalizations per 10,000 people in Kentucky years 2008 through 2012 was 15 per 10,000 population and the total number of hospitalizations statewide between 2008 and 2012 was over twenty-nine thousand (29,413). Figure 1.0 illustrates regionally Eastern Kentucky and a pocket of Northern Kentucky experienced the most hospitalizations as a result of opioid overdose. Owsley, Perry, and Wolfe counties experienced more than double the statewide average of hospitalizations per 10,000 people. Kentucky's largest counties, Jefferson County (Louisville) and Fayette County (Lexington) both experienced a crude hospitalization rate of 12 individuals per 10,000, which is less than the state average.

Total opioid overdose hospitalization counts were most frequent in Jefferson, Fayette, Boone and Kenton counties for years 2008 through 2012. Each county experienced more than nine-hundred hospitalizations over the five years. Counties with the fewest number of hospitalizations were Robertson, Hickman, Menifee, and Elliott counties where there were less than fifty hospitalizations in the combined five years. Calculating rates per 10,000 populations removes the variance of population among counties, however; hospitalization frequencies represent the actual number of cases in each county. Understanding the frequency of hospitalizations is important to calculate the ratio of patients per provider considering physicians are licensed to only treat up to one hundred patients.

Increased hospitalizations result in increased medical spending for taxpayers. According to a 2012 report funded by the U.S. Department of Health and Human Services, over twelve thousand individuals received some type of substance abuse treatment through Medicaid, whether it was inpatient or outpatient.²³ In an eight county region of the Northern Kentucky pocket (Boone, Campbell, Carroll, Gallatin, Grant, Kenton, Owen and Pendleton Counties),

sixty-five percent of patients treated in hospitals for opioid addiction were self-pay (that is, uninsured).²⁴ A vast majority of self-pay patients are not able to pay for their medical services because of the effects addiction has had on their income and relationships with families. Hospitals and taxpayers are left to absorb the costs of patients with unpaid hospital bills.

Buprenorphine Provider Trends

The state of Kentucky has one hundred-twenty counties, forty six percent (n=56) of Kentucky counties have at least one licensed buprenorphine physician and fifty four percent (n=64) do not have a licensed buprenorphine physician within their county. The number of licensed buprenorphine practitioners as of December 2013 was three-hundred and three and the number of treatment centers prescribing buprenorphine was twenty-three. Fayette County has the greatest number of licensed buprenorphine providers with sixty-one. Jefferson County is the largest county in Kentucky and has the second most licensed buprenorphine providers with fifty-three. The vast majority of buprenorphine treatment is available in Central Kentucky.

Buprenorphine physicians are able to treat thirty patients during their first year of licensure and up to one hundred patients total after their first year of licensure. A problem that counties without licensed physicians or only a few licensed physicians face is that there is a greater need for treatment than providers are able to provide. An extreme example of this is in Campbell County, where there were seven hundred and seventy three hospitalizations occurred, but there is only one licensed physician within the county. It is not possible for one physician to treat the number of Campbell County opioid overdose hospitalizations. Twenty seven counties have rates of patients per physician over one hundred.

Regionally, Eastern Kentucky is where the greatest need for treatment lies despite providers being located in these areas. The population of Wolfe County is less than eight

thousand people and five licensed buprenorphine physicians are located in the county along with a community treatment program, yet Wolfe County still experiences the third highest opioid hospitalization rates per ten-thousand people. Perry County has a population of roughly twenty-eight thousand people and the county is equipped with five licensed providers along with two community treatment centers but still deals with the second largest opioid overdose hospitalizations per ten-thousand people. Future studies should seek to understand why these areas are experiencing the highest rate of hospitalizations if providers are available.

Furthermore, consider Owsley County with a crude hospitalization rate of forty-one people per ten thousand. The population of Owsley County is just over fourteen thousand meaning at a minimum, forty-one individuals were hospitalized; Owsley County has one licensed physician. The supply of physicians is not evenly dispersed among the state to meet the needs of each county. The twenty-three community treatment centers able to prescribe buprenorphine are spread among sixteen counties. Access to community treatment programs requires travelling a significant distance for the majority of Kentucky's suffering OUD population.

Research suggests that nationwide buprenorphine licensure is on the rise despite physician hesitation due to medication costs and lack of financial reimbursement. The number of buprenorphine providers has increased in Kentucky, and may continue to do so if an ethical financial reimbursement system is established that presents neither a financial incentive nor a financial hardship for physicians deciding to pursue buprenorphine licensure. As opioid addiction continues to be rampant in the state of Kentucky it may be useful that the number of buprenorphine licensed physicians increase, especially around counties and regions lacking sufficient access; however, new clinics and physicians should be managed and monitored closely to ensure ethical practices are operating and benefitting OUD patients.

4. DISCUSSION

Between years 2008 and 2012, hospitalization rates surpassed typical Kentucky averages. While it appears the number of licensed buprenorphine providers is increasing, findings of this study suggest areas of Kentucky with the highest rates of opioid hospitalizations do not have a sufficient supply of buprenorphine providers to make an impact towards reducing opioid hospitalizations. Eastern Kentucky suffers with the greatest number of hospitalizations; two of the three counties with the highest hospitalization rate per ten-thousand people border one another, and the third county is located within fifty miles. Moreover, findings in this study reveal a lack of community treatment centers. Prior research suggests OUD users most commonly seek treatment from community treatment centers. A lack of community treatment centers in Eastern Kentucky may factor into the high opioid hospitalizations in this region along with greatly impacting the overall supply of accessible treatment options throughout the state. The majority of Kentucky's community treatment programs able to prescribe buprenorphine are located in larger, more populous counties. Future considerations should include building community treatment center capacities in regions where opioid overdose hospitalizations per ten-thousand populations are the highest. Increasing access to community treatment programs will minimize or remove barriers that currently prevent OUD users from seeking treatment.

Limitations

There are limitations to the findings. This study only analyzed the supply of licensed buprenorphine physicians and community treatment centers currently prescribing buprenorphine. As we previously mentioned, buprenorphine is not the only effective treatment for opioid addiction. Other limitations include using the SAMHSA buprenorphine treatment locator to

count physicians. The SAMHSA treatment locator may underestimate the number of physicians as it only includes physicians who have authorized their name to be listed and does not provide information regarding whether physicians are able to treat thirty or one-hundred patients. The Drug Enforcement Administration - National Technical Information Service (DEA NTIS) data base provides buprenorphine physician data as well, but risks over estimates of licensed physicians as not all physicians who are licensed treat patients. A drawback of the DEA NTS data base is that it must be purchased and is costly. This study aimed to examine the supply of physicians through easily accessible public information that OUD users are more likely to use. This study explored the aggregate number of physicians as of December 2013, but did not examine the increase of buprenorphine licensure from year to year.

Other potential limitations include overestimates or underestimates of opioid hospitalizations. Patients may be misdiagnosed as suffering from opioid overdose or misdiagnosed as not suffering from opioid overdose. Hospitalization rates used in this study relied upon ICD-9-CM codes in the range of 960-979 listed in any diagnoses (principal or secondary) fields. Relying upon hospital billing ICD-9-CM codes contributes to the risk of miscoded diagnoses and/or skewed occurrences of a specific condition.

Future studies need to examine barriers preventing treatment expansion in areas of Kentucky currently experiencing the greatest opioid overdose hospitalization rates. Interventions need to be developed that encourage general practice physicians to become buprenorphine licensed and connect with OUD patients in their area. Encompassing substance abuse into regular discussions with general practice physicians at health check-ups would be a step towards removing the stigmatization of opioid addiction. Opioid addiction carries a heavy stigmatization, often a stigma persuasive enough to deter users from seeking treatment for the fear of being

labeled a drug addict. More education needs to be available to educate communities and the public about the illness of addiction. An educational focus should be centered on removing the stigma of treatment and educate about the success of treatment to foster healthy treatment options within communities. Future policy must identify and establish an ethical structure promoting successful buprenorphine treatment and establishing a reliable financial reimbursement scale that is fair for both patient and provider. Research should continue to examine efficacious opioid addiction treatments that may be easily implemented in areas of high need.

5. CONCLUSION

Understanding the supply and need for buprenorphine providers is necessary to shape future substance abuse treatment policy and legislation. Medication-assisted treatment, residential treatment, and detoxification have all simultaneously been scrutinized and merited successful. Each type of treatment affects individuals differently and there is not one “cure all” for opioid dependent populations, therefore adequate options must be available to solve the opioid epidemic. As opioid abuse continues to engulf the state of Kentucky, policy makers and public health officials must recognize that all types of treatment have the potential to be misused, abused, or land in the wrong hands; however, the goal of public health and medical officials should be to provide enough treatment service options and education to benefit the most people. It is unlikely that opioid overdose hospitalizations will decrease unless actions are taken to increase access to treatment.

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<u>County</u>	<u>Hospitalizations</u>			<u>Absolute Number of County Hospitalizations</u>
	<u>per 10,000 population</u>	<u>Number of Providers</u>	<u>Number of Treatment Centers</u>	
Owsley	42	1	0	99
Perry	35	5	2	501
Wolfe	32	3	1	116
Breathitt	30	3	1	204
Bell	29	1	0	412
Clay	28	2	0	306
Johnson	27	4	0	309
Knott	27	2	1	214
Knox	27	4	0	418
Lee	27	1	1	105
Casey	26	1	0	208
Grant	24	1	0	295
Madison	24	4	0	770
Martin	24	0	0	158
McCreary	23	0	0	145
Whitley	23	3	1	409
Floyd	22	9	0	416
Gallatin	22	0	0	93
Lawrence	22	3	0	169
Livingston	22	0	0	101
Daviess	21	4	0	991
Kenton	20	5	0	1546
Taylor	20	1	0	242
Graves	19	1	0	348
Fulton	18	0	0	60
Grayson	18	0	0	223
Harlan	18	2	0	260
Leslie	18	1	1	101
Letcher	18	1	1	213
Bath	17	0	0	99
Campbell	17	1	0	773
Clinton	17	0	0	85
McCracken	17	2	1	267
Ohio	17	0	0	194
Pendleton	17	0	0	124
Pike	17	16	0	541
Pulaski	17	3	0	507
Boone	16	4	1	958
Boyd	16	12	0	394
Butler	16	0	0	97
Carlisle	16	0	0	41
Cumberland	16	0	0	55
Powell	16	0	0	101
Carroll	15	2	0	77
Jessamine	15	2	0	345
Marion	15	0	0	68
Nicholas	15	0	0	50
Allen	14	0	0	115
Hopkins	14	1	0	329
Rockcastle	14	2	0	118
Russell	14	2	0	123
Barren	13	0	0	259
Boyle	13	16	0	174
Bracken	13	0	0	55
Carter	13	1	0	179
Laurel	13	9	0	380
Rowan	13	1	0	180
Adair	12	5	0	112
Ballard	12	0	0	50

Bourbon	12	2	0	120
Caldwell	12	0	0	75
Edmonson	12	0	0	70
Estill	12	0	0	88
Fayette	12	61	2	1728
Fleming	12	0	0	80
Franklin	12	7	0	280
Garrard	12	0	0	96
Green	12	0	2	65
Jefferson	12	53	4	4370
Lincoln	12	0	0	142
Lyon	12	0	0	50
Magoffin	12	0	0	106
Owen	12	0	0	62
Simpson	12	0	0	100
Warren	12	7	0	666
Anderson	11	1	0	110
Breckenridge	11	0	0	110
Calloway	11	0	0	190
Clark	11	0	0	186
Crittenden	11	0	0	50
Hardin	11	8	2	549
Menifee	11	0	0	34
Elliott	10	0	0	36
Greenup	10	1	0	177
Hancock	10	0	0	39
Hart	10	1	1	83
Jackson	10	0	0	68
Logan	10	0	0	135
Mason	10	2	0	97
McLean	10	0	0	83
Mercer	10	3	0	105
Montgomery	10	3	0	121
Morgan	10	0	0	67
Muhlenburg	10	1	0	149
Scott	10	4	0	217
Wayne	10	0	0	96
Webster	10	0	0	63
Bullitt	9	0	0	322
Henderson	9	0	0	191
Hickman	9	2	0	21
Larue	9	0	0	62
Metcalfe	9	0	1	41
Monroe	9	0	0	46
Woodford	9	0	0	105
Henry	8	0	0	57
Marshall	8	0	0	322
Nelson	8	0	0	162
Washington	8	0	0	42
Harrison	7	0	0	59
Todd	7	0	0	39
Trigg	7	0	0	50
Trimble	7	0	0	31
Christian	6	5	0	215
Lewis	6	0	0	42
Oldham	6	1	0	181
Robertson	6	0	0	6
Shelby	6	0	0	115
Spencer	6	0	0	44
Union	6	0	0	43
Meade	5	0	0	72

Table 1.0- Counties are arranged from highest hospitalization rates to lowest , between the years of 2008 and 2012. The absolute number of county hospitalizations is the specific number of opioid overdose hospitalizations that occurred in each county during 2008 through 2012.

Number of Licensed Buprenorphine Providers by County, 2013



