

Access to Treatment for Opioid Use Disorder: A Survey of Addiction Medicine Physicians on Telemedicine and Medication-Assisted Treatment

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Background

More than 70,000 drug overdose deaths occurred in 2017, making drug overdoses a leading cause of injury-related death in the U.S. Over the last two decades, drug-affiliated deaths have increased drastically in the midst of the opioid epidemic, a nationally identified public health emergency.¹ An estimated 2.1 million people aged 12 years or older had an opioid use disorder (OUD) in 2017,² and more than 130 people die every day in the U.S. from opioid overdoses.³ In addition to this public health crisis, the expenditures associated with healthcare and other supplemental forms of OUD treatment, loss of productivity, and criminal justice involvement have cost the U.S. at least 78.5 billion dollars per year.⁴ Effective, evidence-based treatments are available, yet only an estimated 25% of people with OUD receive specialty treatment.⁵

Opioids are a class of substances, including illicit drugs (such as heroin), synthetic opioids (such as fentanyl), and legally prescribed painkillers (such as oxycodone), that can potentially relieve acute pain but also lead to OUD, an underlying illness of addiction.⁶ The Diagnostic and Statistical Manual 5th edition classifies OUD as a chronic illness characterized by a number of symptoms relating to ongoing problematic use of opioids despite serious impairments and other negative impacts.⁵

Treatment for substance use disorder (SUD) involves a range of behavioral health services and medication-assisted treatment (MAT).⁵ As the standard of care for OUD treatment, MAT includes the Food and Drug Administration–approved medications methadone, long-acting naltrexone, and buprenorphine. Naltrexone and buprenorphine can be prescribed office-based settings. Methadone can only be dispensed in U.S. Drug Enforcement Administration–licensed clinics.⁷ MAT treats OUD, fosters treatment retention, and improves health outcomes.^{8,9} Despite the clinical effectiveness of MAT, multiple barriers stand in the way of its implementation and utilization, including: scope of practice restrictions, lack of reimbursement and other funding sources, patient affordability, lack of MAT providers, and inadequate workforce training and education.^{10,11} The lack of accessibility to MAT is pronounced in rural areas, where 71.2% of counties lacked a publicly available OUD medication provider.¹²

One possible method to overcome the barriers associated with the utilization of MAT is through the use of telemedicine. Telemedicine is the delivery of healthcare services through information and communication technologies to improve patient outcomes.¹³ Telemedicine may be an effective treatment modality for MAT because it overcomes geographical barriers while maintaining the quality of care.^{14–16} However, telemedicine's clinical effectiveness as an MAT treatment modality is largely unexplored.

Even if telemedicine may be clinically effective, physicians or patients may not utilize it in practice, so it is important to understand stakeholders' perceptions about telemedicine. Physicians, registered nurses, physician assistants, and nurse practitioners tend to be satisfied and comfortable with the use of telemedicine for the diagnosis and treatment of behavioral health conditions.^{17–20} However, there has been less evidence for telehealth in treating SUD and overall use of telemedicine has been lower for SUDs compared with mental health conditions.²¹ Providers may favor certain modes of communication over others, and have expressed concerns about technological difficulties, patient satisfaction, and interruptions with normal workflow.^{18,19} Research has also shown that patients are satisfied with the use of telemedicine and may prefer Internet-based services instead of in-person services given its convenience and increased confidentiality.^{15–17} Thus, the use of telemedicine in the delivery of MAT creates an opportunity to overcome the geographical barriers and shortage of providers qualified to deliver MAT to effectively treat OUD.

This study builds upon the existing MAT prescriber surveys conducted by the Behavioral Health Workforce Research Center by surveying addiction medicine physicians to further describe the barriers and facilitators to implementing MAT via telemedicine. This study also aimed to identify if these barriers and facilitators differed based on provider characteristics or patient locations. Lastly, the study estimated nationwide access to specific OUD treatment services, and explored how access could potentially be improved via telemedicine.

Methods

This two-part study is composed of a geospatial analysis of a publicly available data set and a descriptive analysis of an online survey.

Geospatial Analysis

The Substance Abuse and Mental Health Services Administration conducts the National Survey of Substance Abuse Treatment Services (N-SSATS), an annual survey of all known public and private SUD treatment (SUDTx) facilities in the U.S.

The goal of the geospatial analysis was to determine nationwide access to specific OUD treatment services. Although the N-SSATS Public Use File (PUF) has the potential to provide a detailed understanding of the country's MAT capacity, because the data in the PUF are de-identified, it is not feasible to map these data to specific locations. As such, researchers chose to utilize the 2018 N-SSATS Directory, as it provided service category variables and geographic locations with street-level specificity.

After the 2018 N-SSATS Directory was completely transcoded into .XLS format, the new data set was uploaded to ArcGIS Online. Every address was geocoded and the data set was converted into an interactive feature layer. After geocoding all 12,074 entries of the Directory, researchers were able to filter locations based on the facilities' individual properties. Using these properties, as well as publicly available Census data,²² researchers were able to produce comprehensive maps of the availability of SUDTx facilities across the country.

Online Survey

Researchers also created an online survey in Qualtrics to gather quantitative data on addiction medicine physicians' practice habits, opinions, and concerns regarding MAT and telemedicine. A copy of the survey can be found in Appendix A. The final survey contained 31 questions across three domains:

- Demographics and practice characteristics
- Telemedicine provision
- Barriers to telemedicine provision for OUD

The survey was initially piloted by the American College of Academic Addiction Medicine (ACAAM,) a consortium partner of the BHWRC. Fifty directors of treatment centers, nationwide, were invited to participate in the pilot, of which 35 completed the survey and provided feedback. After revising the survey based on the feedback, researchers then distributed it under ACAAM's e-mail address to all physicians with a current American Board of Addiction Medicine (ABAM) certification: 2,613 physicians in total. ACAAM promoted the survey among the ABAM diplomates, and the BHWRC offered a completion incentive of \$30 to any addiction medicine physician who finished the survey.

Of the 2,613 ABAM diplomates who received an invitation to take the survey, 567 (21.7%) engaged with the instrument. Respondents were not required to answer every question, so each question's n value was reported independently. Owing to skip and display logic, many physicians were not exposed to certain questions. As such, any respondent who had accessed $\geq 91\%$ of the survey was considered to have completed the survey in its entirety. Of the 567 respondents, 104 did not meet this threshold, so their answers were excluded from analysis. The final sample size was 463 physicians, approximately 17.7% of the surveyed population.

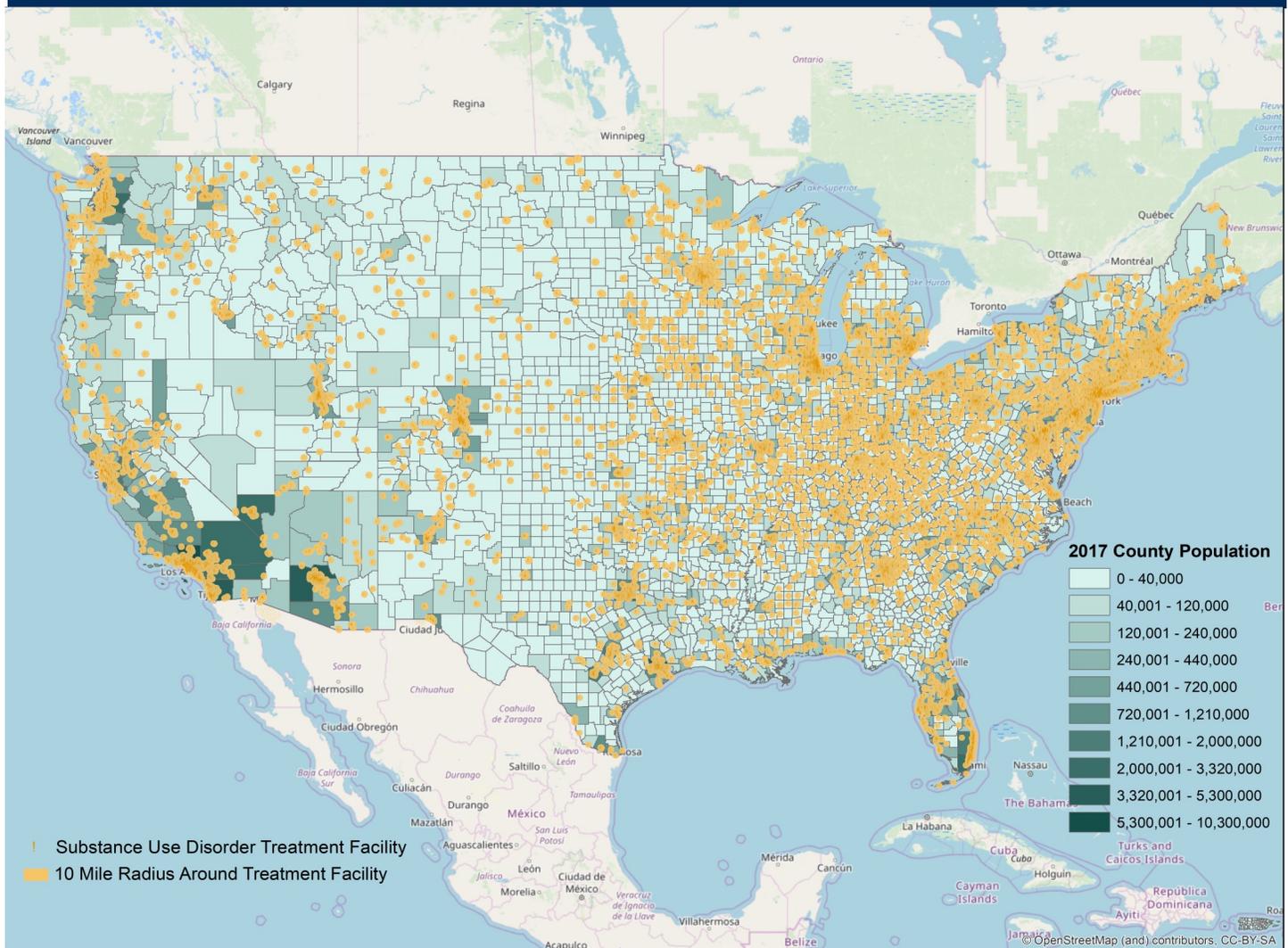
Findings

Geospatial Analysis

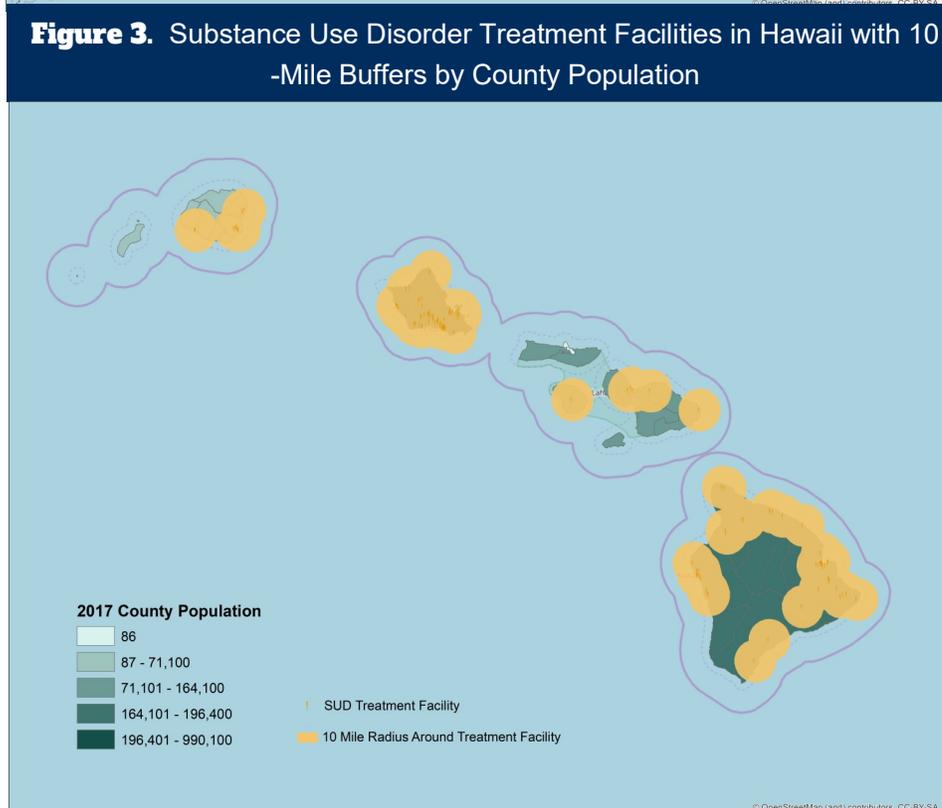
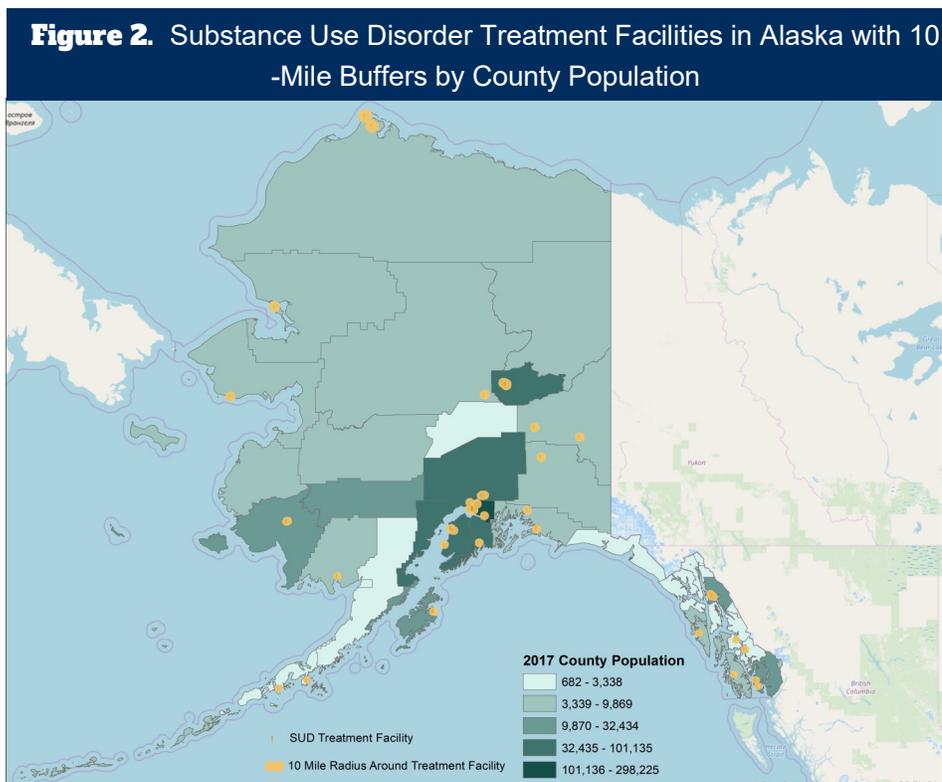
For the continental U.S., coverage of SUDTx facilities seemed almost unbroken along the east coast. A lower density of coverage was observed in southern states and among predominantly rural states. Some pockets along the west coast had dense coverage, but these seemed concentrated in metropolitan areas. Alaska's limited coverage was centered in its metropolitan centers. Hawaii, by contrast, appeared to have at least one facility on each of its major islands, with the exception of Molokai and Nihau.

To better understand the association between population density and treatment facility prevalence, another three maps were generated that color coded counties by their 2017 total population, as reported by the U.S. Census Bureau. In the continental U.S., counties with greater density of treatment facilities also tended to have higher population counts, illustrated in the maps by a darker gradient (Figure 1). Counties in the middle of the country that had no treatment facilities typically had <40,000 population, the smallest population band. Some exceptions are noted, like some more densely populated counties along the Texas–Mexico border without any treatment facilities, and several such counties in the state of Washington.

Figure 1. Substance Use Disorder Treatment Facilities in the Continental U.S. with 10-Mile Buffers by County Populations



Outside of the continental U.S., this same pattern remains: Counties with greater population in Alaska also had more SUDTx facilities (Figure 2), same as islands with greater population in Hawaii (Figure 3). Treatment facilities in Alaska and Hawaii seem better distributed than in the continental U.S. in terms of population density. However, given the massive area that Alaska covers, the vast majority of the state does not have geographic access to these facilities. The same may be said about Hawaii: Despite having treatment facilities on most of its major islands, Hawaii has smaller inhabited islands without SUDTx facilities.



When focusing on treatment facilities offering specific pharmacological interventions for OUD, the disparities between population and treatment availability worsen. For maps of nationwide methadone and buprenorphine access, please refer to Appendix 1.

Methadone, given its strictly regulated nature, is unavailable in much of the continental U.S., with pronounced absences in central, western, and northern states. Unlike SUDTx facilities more generally, methadone clinics are absent from many counties outside of the lowest population band.

Buprenorphine, which is not as strictly regulated as methadone, is also not readily available across much of the continental U.S. Counties outside of the lowest population band usually have at least one facility offering buprenorphine treatment, but some counties do not follow this trend. A possible limitation of this analysis is the N-SSATS survey population, which focuses specifically on SUDTx facilities. Buprenorphine is commonly dispensed from independent physician outpatient practices that may not specifically be SUDTx facilities. These instances are not as rigorously tracked by the N-SSATS, potentially resulting in an undercount.

The 2018 N-SSATS Directory data also included information about ancillary support services offered at many clinics, including housing services, social skills development, assistance with obtaining social services, transportation assistance, and

child care. Some of these services may make it easier for patients to seek treatment (i.e. transportation assistance), and others may help patients secure more stable living accommodations, which could decrease their propensity of drug misuse (i.e. housing services). Researchers calculated the proportion of total treatment facilities offering each of these support services across all states (Table 1). States consistently in the top 10th percentile of these support service proportions include Alaska, Ohio, Vermont, and Wyoming. States consistently in the 90th percentile include Illinois, Montana, North Carolina, North Dakota, and New Hampshire.

Table 1: Proportion of Total Treatment Facilities Offering Select Ancillary Support Services by State

State	Facility Total	% Housing	% Social Skills	% Social Services	% Transport	% Child Care	% Any
AK	84	63.10	86.90	83.33	58.33	7.14	95.24
AL	118	44.07	76.27	49.15	37.29	5.93	80.51
AR	100	50.00	69.00	45.00	32.00	2.00	81.00
AZ	302	66.23	82.78	61.92	65.56	3.64	88.41
CA	1,107	65.31	84.46	62.96	51.22	13.73	92.59
CO	347	37.18	74.93	38.33	30.26	3.17	82.42
CT	200	56.00	75.00	77.50	44.50	7.00	91.50
DC	24	66.67	83.33	79.17	62.50	0.00	87.50
DE	26	57.69	69.23	57.69	30.77	0.00	76.92
FL	535	49.72	74.21	49.91	40.19	4.11	84.67
GA	254	61.42	86.61	61.02	37.80	4.33	91.34
HI	145	24.14	89.66	25.52	57.24	20.69	94.48
IA	142	52.82	69.01	66.90	47.89	4.93	86.62
ID	106	69.81	80.19	66.04	39.62	2.83	91.51
IL	580	33.79	67.59	43.45	27.24	3.79	76.90
IN	277	48.38	79.78	61.37	26.71	3.61	85.20
KS	166	48.80	70.48	59.04	31.33	2.41	81.33
KY	335	49.85	74.63	50.45	26.27	4.78	82.69
LA	107	62.62	77.57	67.29	45.79	5.61	90.65
MA	333	54.95	74.47	66.37	48.05	4.80	89.19
MD	360	53.06	69.17	63.61	43.06	5.00	83.33
ME	174	48.85	67.24	53.45	27.59	1.72	78.74
MI	431	47.10	70.07	54.52	44.08	6.96	81.90
MN	337	59.35	79.53	59.35	47.77	5.34	88.13
MO	236	62.29	79.24	71.61	48.73	7.63	86.44
MS	69	56.52	84.06	68.12	42.03	5.80	94.20
MT	60	55.00	61.67	61.67	36.67	1.67	88.33
NC	428	47.43	67.99	46.50	38.08	7.24	75.23

State	Facility Total	% Housing	% Social Skills	% Social Services	% Transport	% Child Care	% Any
ND	62	40.32	69.35	40.32	29.03	4.84	75.81
NE	116	39.66	75.86	45.69	37.07	3.45	81.90
NH	67	38.81	70.15	46.27	23.88	7.46	74.63
NJ	321	46.11	81.00	63.86	48.29	7.17	90.34
NM	120	62.50	82.50	74.17	37.50	4.17	94.17
NV	61	65.57	80.33	72.13	45.90	8.20	86.89
NY	769	60.08	75.55	76.46	56.31	5.20	93.50
OH	359	71.03	78.27	79.39	60.45	13.09	92.48
OK	164	71.34	84.15	78.66	49.39	5.49	96.35
OR	202	67.33	82.67	68.81	57.92	10.89	88.12
PA	488	57.38	68.03	72.54	50.20	7.58	89.34
RI	46	76.09	78.26	73.91	58.70	6.52	93.48
SC	91	46.15	71.43	58.24	25.27	7.69	84.62
SD	52	53.85	82.69	53.85	55.77	7.69	88.46
TN	199	62.81	78.89	51.26	38.69	4.02	89.45
TX	385	52.21	77.92	49.61	36.10	5.45	88.83
UT	216	48.15	84.72	44.91	37.50	6.48	88.89
VA	187	57.22	73.80	57.22	39.57	7.49	85.03
VT	40	75.00	85.00	85.00	52.50	12.50	92.50
WA	362	60.77	79.28	56.63	45.58	8.29	89.23
WI	247	39.68	69.64	48.99	31.58	4.86	79.35
WV	90	70.00	70.00	76.67	56.67	1.11	90.00
WY	47	82.98	87.23	87.23	72.34	19.15	95.74
TOTAL	12,074	54.56	76.35	59.78	43.66	6.63	87.04

*Cells highlighted in green are in the top decile. Cells highlighted in orange are in the bottom decile.

Not only does access to MAT vary by state, but so does access to key ancillary services that may be the deciding factor for whether a patient can take the time to receive OUD treatment. Researchers should continue focusing on high-need areas while taking into account the often limited availability of psychosocial support services within these areas.

With less-densely populated non-metropolitan counties having less access to SUDTx facilities than metropolitan counties, rural populations may be lacking access to MAT services. One intervention to address this disparity is MAT through telemedicine. The online survey assessed addiction medicine providers' current opinions and experience with telemedicine to determine if telemedicine may be a viable alternative for patients in non-metropolitan areas.

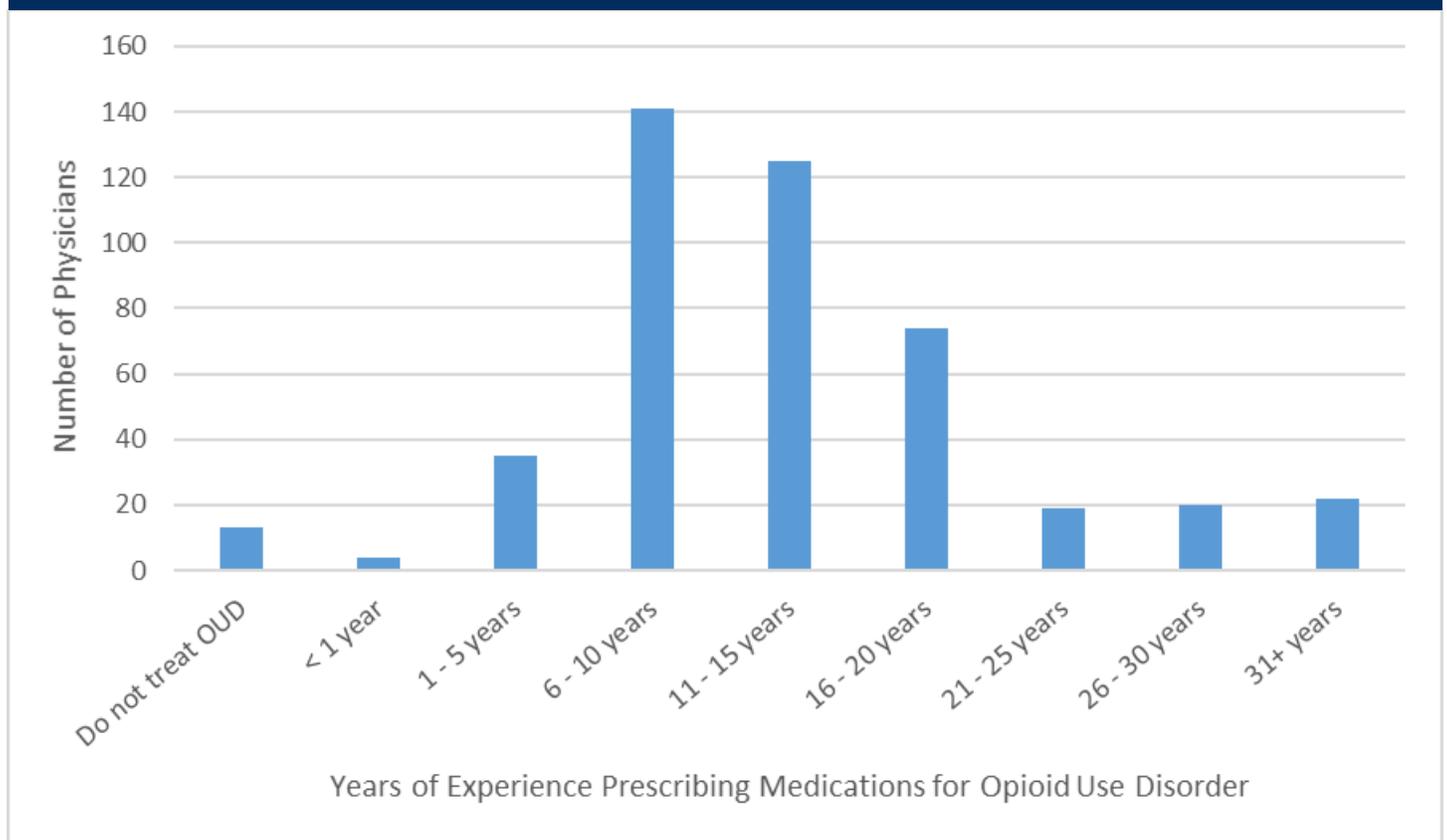
Online Survey

Demographics and Practice Characteristics

Most of the sample was composed of allopathic physicians (n=403, 88.4%), and the remainder were osteopathic physicians. The most predominant specialties among the sample were addiction medicine (n=210, 45.4%), psychiatry (n=68, 14.6%), and family medicine (n=61, 13.2%). All respondents were certified in addiction medicine by ABAM, but some respondents had more than one certification; 29 (6.3%) were also certified in addiction medicine by the American Board of Preventive Medicine, and 23 were also certified in addiction psychiatry by the American Board of Psychiatry and Neurology (5.0%). Respondents most commonly practiced in outpatient medical practices (n=164, 39.0%), followed by opioid treatment programs (n=69, 16.4%), and other SUDTx programs (n=63, 15.0%)

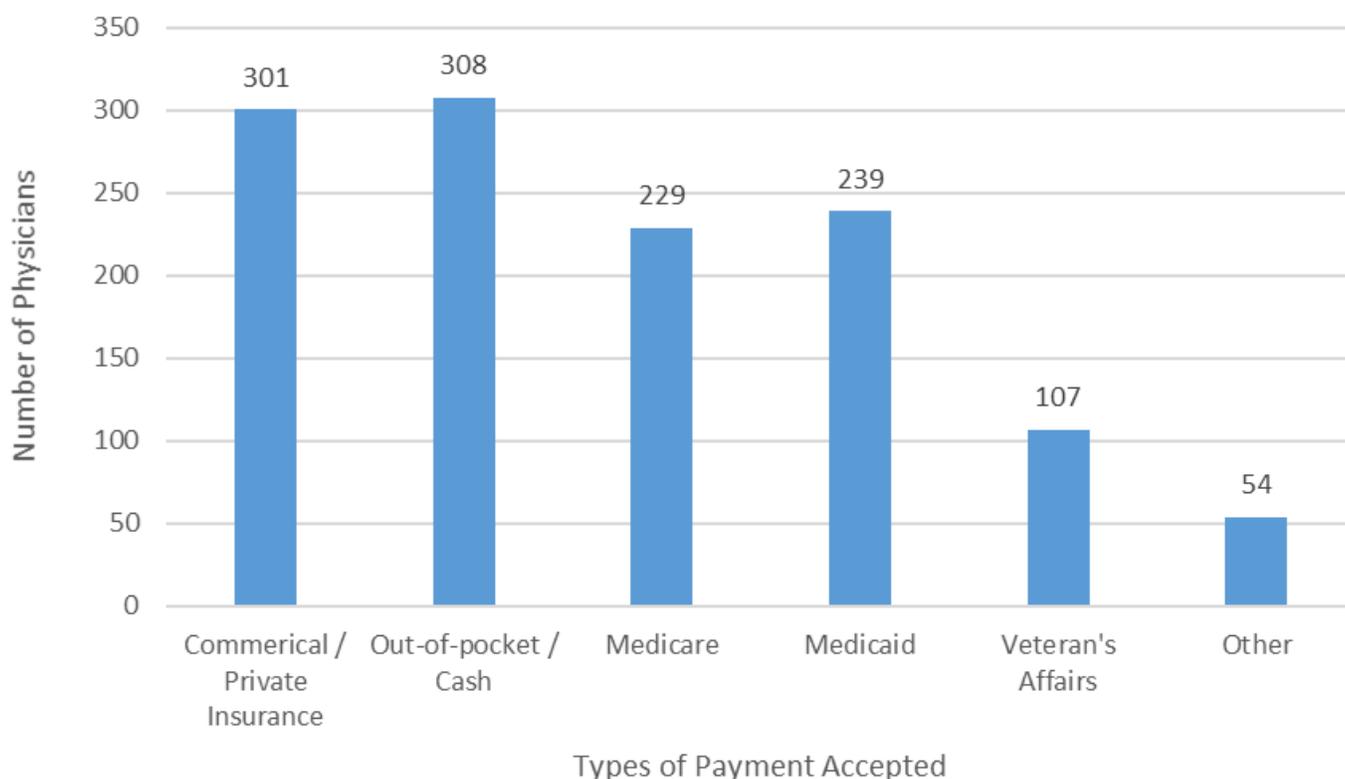
Twenty-five respondents (5.4%) did not have a Drug Enforcement Administration waiver for prescribing buprenorphine. Of those who did, more than half had a 275+ patient waiver—the largest waiver available. On average, respondents were currently prescribing buprenorphine to 77 patients (n=396). The median physician had been prescribing medications for OUD for between 11 and 15 years (Figure 4) and treated between 30 and 100 unique patients a month. Approximately 64.8% (n=456) of anonymous patients reported as having an OUD, on average, had a co-occurring SUD, and 62.3% (n=458) had a co-occurring mental health disorder.

Figure 4. Respondents' Years of Experience Prescribing Medications for Opioid Use Disorder (n=453)



The majority of respondents worked in urban or suburban settings (n=375, 81.5%), and the most common states respondents lived in California (n=60, 13.0%), New York (n=39, 8.4%), and Florida (n=34, 7.3%). Out-of-pocket payments and private insurance were each accepted by around 70 more providers than Medicare and Medicaid (Figure 5).

Figure 5. Types and Frequency of Reimbursement Accepted by Prescribing Physicians (n=442)



Telemedicine

Less than half the sample (n=177, 38.2%) currently provided telemedicine, but more than half (n=203, 61.7%) were willing to use the service and a quarter (n=83, 25.2%) were unsure. Respondents, overall, were more interested in potentially providing pharmacotherapy remotely (n=202, 70.3%) than providing non-pharmacotherapy, such as counseling services, remotely (n=174, 61.1%).

From a clinical standpoint, respondents were most likely to require Health Insurance Portability and Accountability Act of 1996 (HIPAA)–compliant technology (n=378, 81.6%), urine screening at patient site (n=370, 79.9%), and local counseling available to patients (n=320, 69.1%) before feeling comfortable providing telemedicine services for OUD. From a policy standpoint, respondents were more interested in additional information on local telemedicine and prescription policies than ongoing support from telemedicine experts (Table 2).

Most telemedicine providers responding to the survey had less than 5 years of experience doing so (n=145, 82.4%). On average, physicians who provided telemedicine had treated 164 patients via telemedicine. Telemedicine providers typically treated patients with OUD who resided within the provider's state of practice using pharmacotherapy (Table 3). Remote providers were slightly more likely to provide services to patients at another clinical site (n=84, 52.2%) than directly to patients' home (n=64, 39.8%).

Table 2: Physician Interest in Telemedicine Policy Interventions

“To what extent would the following interventions make you more comfortable/interested in using telemedicine to deliver treatment to patients with OUD?”

Telemedicine Policy Intervention	n	Mean*
Toolkit on federal and state regulations for opioid use disorder telemedicine treatment	436	3.8
Additional information on state policies for telemedicine and prescription of medications for opioid use disorder	432	3.9
Toolkit on insurance reimbursement for opioid use disorder telemedicine treatment	414	3.5
Research on the effectiveness of opioid use disorder telemedicine treatment	418	3.8
Access to consultation with addiction experts experienced with telemedicine	393	3.3
Ongoing support from telemedicine experts in providing telemedicine for opioid use disorder	400	3.5
Financial incentives to implement telemedicine for opioid use disorder at your practice	414	3.7

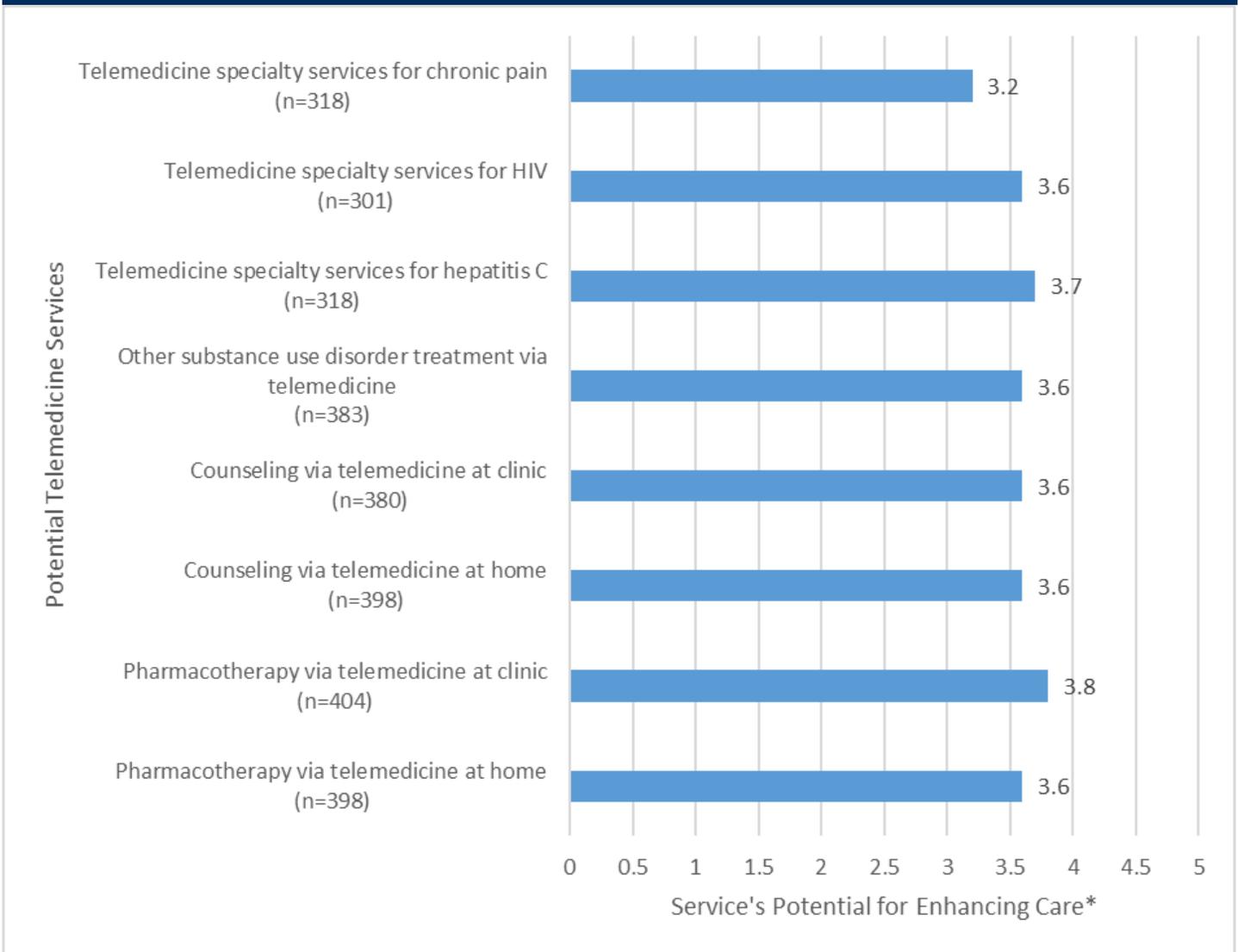
*Values ranged on a Likert scale from 1 (“Not At All”) to 5 (“A Great Deal”)

Table 3: Telemedicine Services Provided by Respondents (n=177)

“Do you provide telemedicine to patients...”	Yes	No	I Don’t Know
Residing outside of your home state of practice?	58	115	4
For treatment of opioid use disorder?	134	39	N/A
For other substance use disorders, besides opioid use disorder?	110	62	2
In the form of pharmacotherapy/medication treatment?	156	19	1
In the form of psychotherapy/counseling?	96	72	6

When asked to what extent a list of telemedicine services would enhance care for patients with OUD on a Likert scale from 1 (“Not At All”) to 5 (“A Great Deal”), respondents ranked pharmacotherapy provided via telemedicine to a remote clinical site higher than any other service (Figure 6). Respondents preferred providing medications for opioid use disorder (MOUDs) to patients at a remote clinic via telemedicine over providing counseling via telemedicine, regardless of whether the patient received counseling services in a clinic or at home.

Figure 6. Physician Beliefs About Which Telemedicine Services May Enhance Care for Patients With Opioid Use Disorder



*Values ranged on a Likert scale from 1 ("Not At All") to 5 ("A Great Deal")

Barriers to Telemedicine Provision for Opioid Use Disorder

For this final section, respondents were split into two different groups. If respondents answered in the previous section that they have experience providing telemedicine, they were then asked about their experience with the following barriers, rating them on a Likert scale from 1 ("Not a barrier") to 5 ("Strong barrier"). If respondents had not provided telemedicine, they were asked to give their opinion on the barriers, rating them on the same scale. The barriers fell into three categories: laws and regulations, clinical standards and quality of care, and logistics.

Of the three presented categories of barriers, respondents with experience providing telemedicine rated logistical barriers as lower on average than legal or clinical barriers (mean=3.03, 3.61, and 3.62, respectively) (Table 4). Across the categories of barriers, experienced telemedicine-providing respondents identified the three strongest barriers as state laws restricting telemedicine for OUD (mean=4.0, n=135), lack of urine screening or other monitoring services (mean=3.9, n=147), and variation in state laws regarding the treatment of out-of-state patients (mean=3.8, n=137).

Table 4: Telemedicine Providers' Experiences with Policy Barriers (n=177)

“How much of a barrier are each of the following? 1 = Not a barrier, 5 = Strong barrier”	n	Mean
Laws and Regulations		
1) Ryan Haight Act (initial face-to-face requirements)	133	3.2
2) Variation in state laws for out-of-state patients	137	3.8
3) State laws restricting telemedicine for opioid use disorder (home or receiving state)	135	4.0
4) Rules/regulations regarding telemedicine reimbursement	132	3.7
5) Lack of controlled substance prescribing authority in patient's state	130	3.8
6) 42 CFR Part 2 restrictions on sharing of patient's substance use disorder treatment records	121	3.5
Clinical Standards and Quality of Care		
1) Ineffectiveness of pharmacotherapy, via telemedicine, for opioid use disorder	110	2.1
2) Ineffectiveness of non-pharmacotherapy, via telemedicine, for opioid use disorder	126	2.3
3) Diversion of opioid agonist treatments	149	3.2
4) Lack of urine screening or other monitoring services in patient's location	147	3.9
5) Inability to access patient's state prescription drug monitoring program	135	3.7
6) Lack of patient's regular receipt of provider care	131	3.5
7) Reduced patient-provider rapport and trust without face-to-face contact	139	2.9
8) Time needed to address co-occurring substance use disorders	141	2.9
Logistics		
1) Lack of user-friendly HIPAA-compliant technology available (both on provider and patient sides)	134	3.3
2) Insurance barriers to provision of services (e.g., prior authorization)	135	3.7
3) Lack of general provider oversight in patient's location	135	3.2
4) Lack of training/guidelines in telemedicine provision for opioid use disorder	140	3.1
5) Lack of experience in providing telemedicine to treat patients with opioid use disorder	132	2.7
6) Insufficient patient case management	127	3.2

Responding physicians who did not have previous experience providing telemedicine held differing views on the relative strength of the presented policy barriers. Between the three categories, non-telemedicine physicians opined that legal barriers, on average, were the strongest barrier (mean=3.81) (Table 5). Across the categories, the three strongest barriers identified by these respondents were lack of urine screening or other monitoring services (mean=4.3, n=244), inability to access patients' state prescription drug monitoring program (PDMP) (mean=4.2, n=234), and lack of controlled substance prescriptive authority (mean=4.2, n=196).

Table 5: Non-Telemedicine Providers' Opinions of Policy Barriers (n=286)

“To the best of your knowledge, how much of a barrier would each of the following be? 1 = Not a barrier, 5 = Strong barrier”	n	Mean
Laws and Regulations		
1) Ryan Haight Act (initial face-to-face requirements)	200	3.3
2) Variation in state laws for out-of-state patients	216	3.9
3) State laws restricting telemedicine for opioid use disorder (home or receiving state)	208	4.1
4) Rules/regulations regarding telemedicine reimbursement	202	3.8
5) Lack of controlled substance prescribing authority in patient's state	196	4.2
6) 42 CFR Part 2 restrictions on sharing of patient's substance use disorder treatment records	188	3.8
Clinical Standards and Quality of Care		
1) Ineffectiveness of pharmacotherapy, via telemedicine, for opioid use disorder	181	3.0
2) Ineffectiveness of non-pharmacotherapy, via telemedicine, for opioid use disorder	176	3.0
3) Diversion of opioid agonist treatments	231	3.6
4) Lack of urine screening or other monitoring services in patient's location	244	4.3
5) Inability to access patient's state prescription drug monitoring program	234	4.2
6) Lack of patient's regular receipt of provider care	217	3.8
7) Reduced patient-provider rapport and trust without face-to-face contact	222	3.5
8) Time needed to address co-occurring substance use disorders	210	3.4
Logistics		
1) Lack of user-friendly HIPAA-compliant technology available (both on provider and patient sides)	224	4.1
2) Insurance barriers to provision of services (e.g., prior authorization.)	230	4.1
3) Lack of general provider oversight in patient's location	236	3.7
4) Lack of training/guidelines in telemedicine provision for opioid use disorder	235	3.7
5) Lack of experience in providing telemedicine to treat patients with opioid use disorder	235	3.4
6) Insufficient patient case management	220	3.6

When comparing the scores between the two groups of physicians, non-telemedicine providers physicians ranked barriers as being stronger than did telemedicine providers. Non-telemedicine providers, in aggregate, rated each of the 23 proposed barriers higher on the Likert scale than did telemedicine providers—by an average of 0.4 points per barrier. The largest discrepancy in scores was seen in the logistical barriers, with non-telemedicine providers, in aggregate, rating each barrier an average of 0.6 points higher than telemedicine providers.

Conclusions

Geospatial Analysis

Researchers aimed to identify underserved communities by comparing SUDTx facility prevalence to county population. The geospatial analysis revealed SUDTx facilities were more likely to be established in densely populated locations, with more facilities available in metropolitan areas than in rural areas. Psychiatrist and psychiatric subspecialist distributions tend to follow this same distribution pattern.^{23,24} Although the geospatial analysis revealed that most counties had at least one SUDTx facility, many counties did not, and some counties were significantly larger than others and a single facility may not be accessible by the entire county's population.

The analysis did not include any need indicators and, instead, assumed the country's population needed an equal amount of care. This limitation could be addressed in future studies by mapping SUDTx facility availability against OUD disease burden in each community, as indicated by OUD-related arrests, diagnoses, expenditures, and deaths in each county. Publicly available data sets that contain these data include: the Centers for Disease Control and Prevention's WONDER data,²⁵ the Agency for Healthcare Research and Quality's Medical Expenditure Panel Survey data,²⁶ and County Health Rankings data,²⁷ to name a few.

Researchers were also unable to capture the volume of services being provided at individual SUDTx facilities, owing to the N-SSATS not including these data in its directory file and de-identifying facilities in its PUF. This could have led to imprecise measurement of the services provided for OUD across the country. Furthermore, buprenorphine and naltrexone are often administered by physicians in outpatient office visits and these offices are not tracked by the N-SSATS. This exclusion could have led researchers to underestimate the country's access to these medications. Future research could include the amount and size of buprenorphine waivers, granted by the Drug Enforcement Administration, active in each county.²⁸

Online Survey

Respondents reported greater interest in providing MOUD via telemedicine (n=202, 70.3%) than providing psychotherapy via telemedicine (n=174, 61.1%). This was also reinforced by a question on respondents' beliefs about telemedicine services that may enhance care for patients with OUD, in which providers ranked pharmacotherapy services to patients at a remote clinic via telemedicine as being more effective than any other proposed telemedicine services, including remote psychotherapy. Why addiction specialists prefer delivering MOUD over psychotherapy could be the subject of future research.

Respondents were enthusiastic about engaging with telemedicine with 61.7% (n=203) willing to provide telemedicine services but only 38.2% (n=177) currently doing so. This noted discrepancy between willingness to provide services and actual service provision suggests a significant barrier, or combination of barriers, preventing the workforce from being maximally efficient. Reducing or removing these barriers could increase the provision of specialized addiction care to patients nationwide.

The most prominent obstacles to providing telemedicine identified by respondents with experience in this method of care were legal barriers, as opposed to clinical or logistical. These legal barriers included lack of authorization to treat across state borders (mean=3.8, n=127), and lack of authorization to treat OUD via telemedicine within home states (mean=4.0, n=125). Telemedicine providers also ranked one clinical barrier highly—lack of access to out-of-state patients' state PDMP. All three of these barriers could be remedied through policy changes, possibly improving patient access to care.

By contrast, providers without experience providing telemedicine identified a clinical barrier, lack of urine screening or monitoring services, as being the strongest (mean=4.3, n=244). Unlike legal barriers requiring policy solutions, this clinical barrier has several technical solutions. Observed urine and toxicology screens can be arranged with primary care clinics or occupational health clinics. Remote monitoring can be achieved through new smartphone applications or other telemonitoring technology.

Non-telemedicine provider respondents rated every barrier as being stronger than respondents with experience providing telemedicine. Though differences in experience could explain this effect, the consistent difference in rankings across every item might also be explained by lack of education on the realities of telemedicine.

This study's generalizability may be limited by the specialized nature of its population. Findings from the online survey may not be applicable to physicians nationwide because the surveyed population contained only board-certified addiction medicine physicians.

Policy Considerations

The current patchwork of telemedicine regulations, varying from state to state, could be stymying telemedicine adoption and innovation. Some states have laws prohibiting out-of-state providers from treating patients within the state via telemedicine, potentially limiting patient access to treatment.²⁹ Other states prohibit non-local physicians from accessing the state's PDMP, which could make out-of-state providers unwilling to provide telemedical care for fear of the patients' safety regarding high-risk prescription. Telemedicine provider respondents cited this as a strong barrier to providing care (mean=3.9, n=147).

Several policy solutions are currently being implemented to standardize these regulations. One direct solution to the issue of PDMP access is sharing PDMP data across states through a third-party platform, or integrating PDMP data into patient medical records and thus allowing out-of-state providers access to patients' full health information.³⁰ Another solution is for coalitions of neighboring states, such as any of the regional Governors Associations, to work cooperatively on standardizing their regulations on telemedicine.³¹ A third solution is greater adoption of the interstate medical licensing compact, which would allow out-of-state physicians to more easily attain medical privileges within compact states, possibly bypassing the out-of-state telemedicine barrier.³²

Nearly 10% more respondents to the online survey were interested in providing remote MOUD services to patients with OUD than were interested in providing remote psychotherapy or other non-pharmacological interventions. MOUD without concurrent counseling is an effective treatment for OUD, meaning if policymakers were to encourage MOUD through telemedicine, greater access to care might be attainable. The focus going forward would then be on coordinating primary care, behavioral therapy, and support services for patients receiving MOUD via telemedicine. As primary care, master's level behavioral health clinicians, and support workers are in greater supply nationwide than addiction subspecialists,³³ this may be a viable solution.

The survey revealed opportunities for public partnerships between state governments and addiction medicine providers. Briefs explaining state/federal regulations of telemedicine, policies surrounding MOUD prescription via telemedicine, and research on the effectiveness of treating OUD via telemedicine could increase adoption of remote treatment. The National Consortium of Telehealth Research Centers is a federally funded research organization that is providing such resources to providers.³⁴ Similarly, private partnerships between telecommunications companies and providers could increase telemedicine adoption, with the companies offering guidance about HIPAA-compliant technologies. Table 4 revealed that addiction medicine specialists are interested in this information and may change how they engage with telemedicine if they receive it.

A need for more formalized education is also indicated by the survey results, given respondents unexperienced with providing telemedicine ranked each proposed barrier an average of 0.4 points higher on a Likert scale than respondents with experience. Improved education could take the form of a curriculum change by ACAAM for its accredited addiction medicine fellowships, or in the form of continuing education opportunities aimed at improving physicians' competency with telemedicine.

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Appendix 1.

N-SSATS Sites Offering MOUD Therapies

Figure 8. Methadone-Administering Facilities in the Continental U.S. by County Population

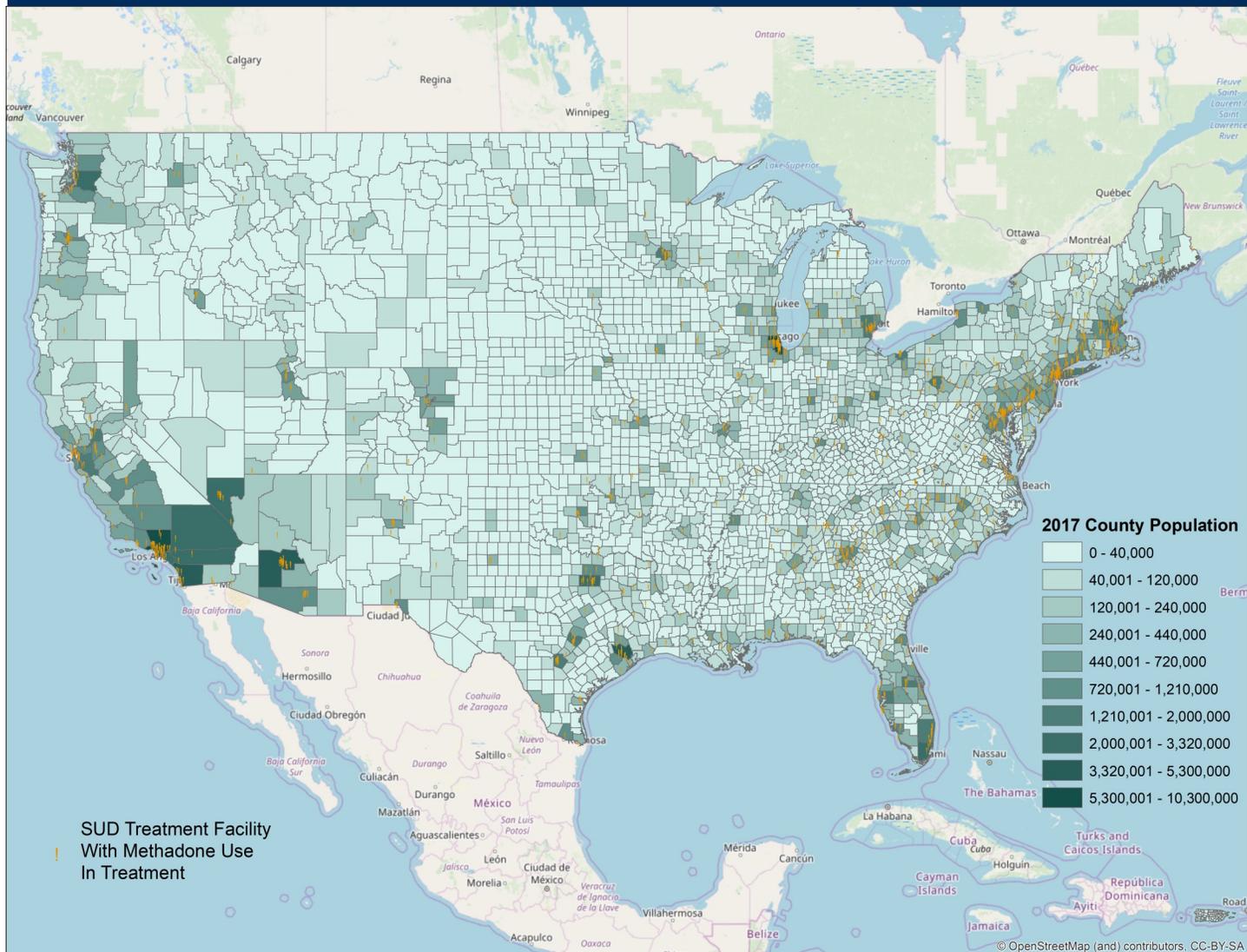


Figure 9. Methadone-Administering Facilities in Alaska by County Population

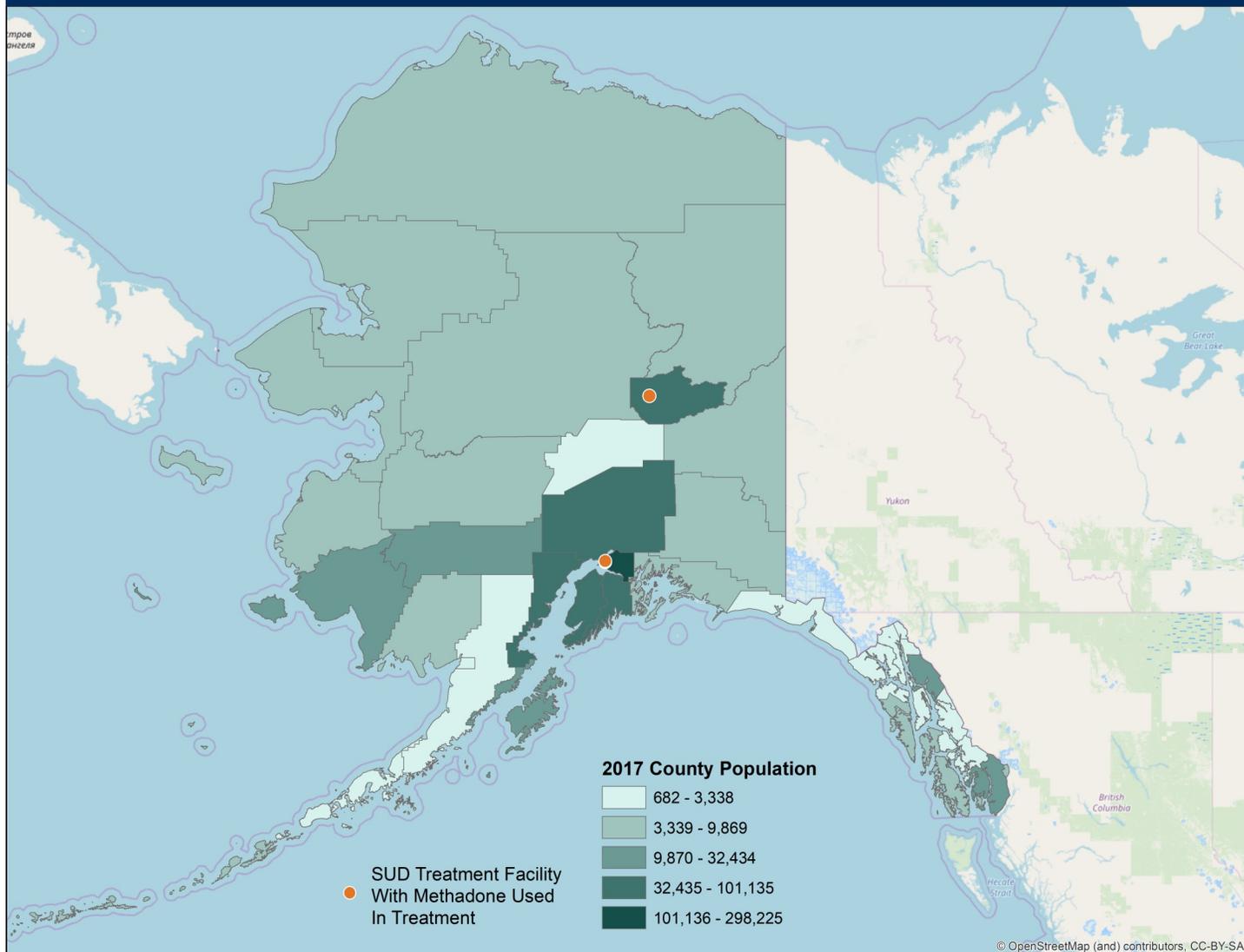


Figure 10. Methadone-Administering Facilities in Hawaii by County Population

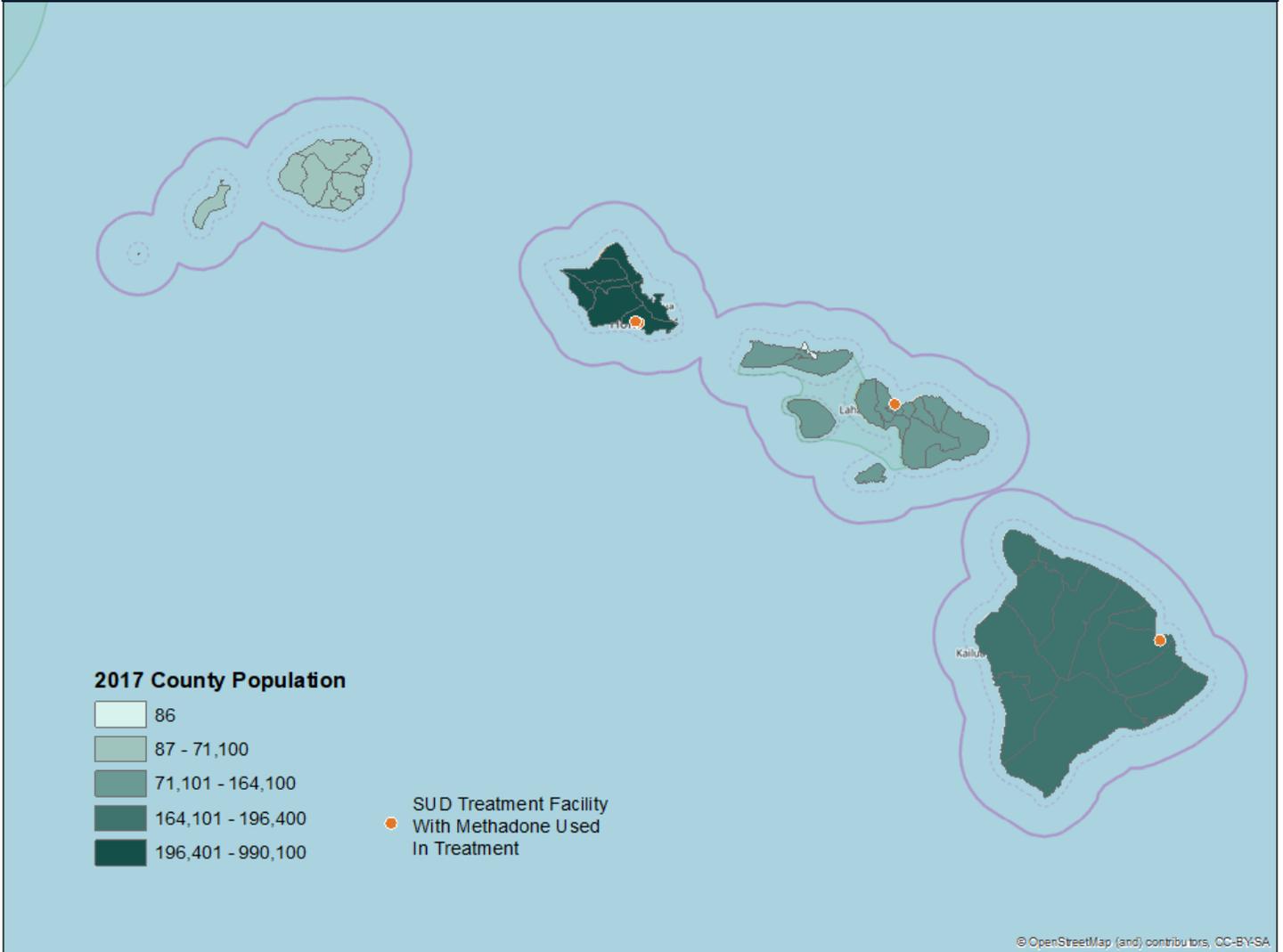


Figure 11. Buprenorphine-Administering Facilities in the Continental U.S. by County Population

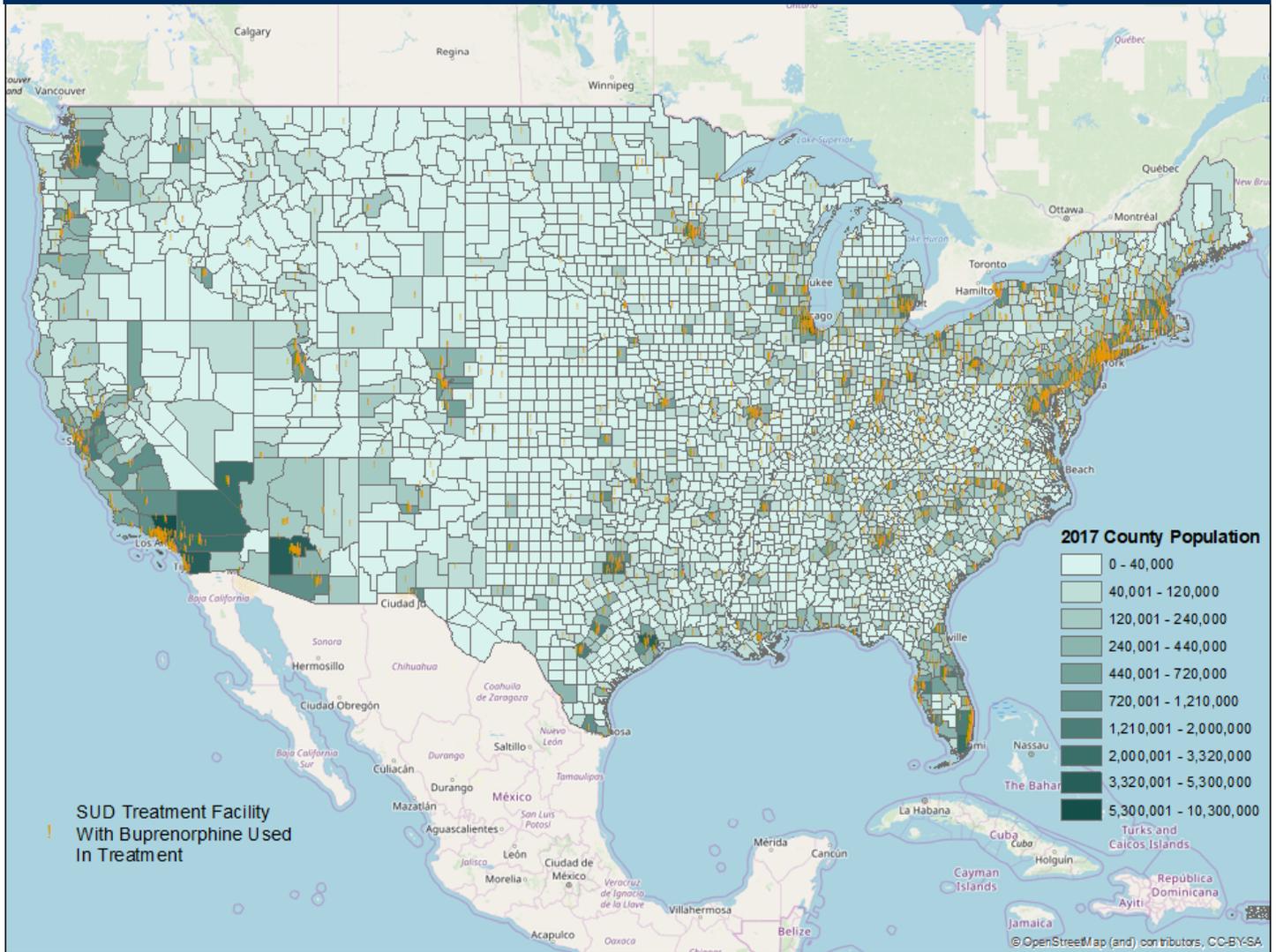


Figure 12. Buprenorphine-Administering Facilities in Alaska by County Population

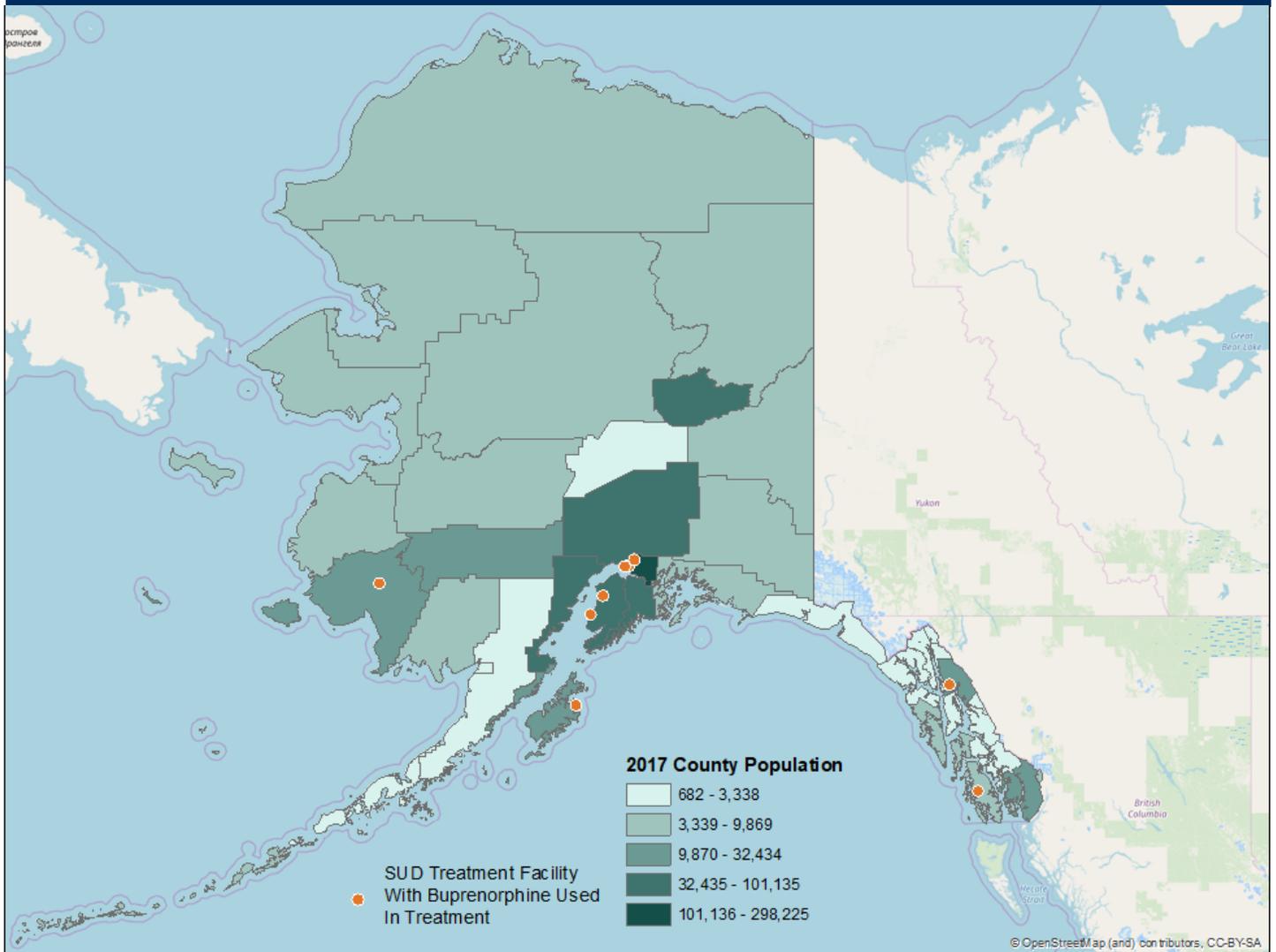


Figure 13. Buprenorphine-Administering Facilities in Hawaii by County Population

