

Vermont Baseline Needs Assessment

Rural and Non-Rural Practitioners



Center on
Rural Addiction
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Executive Summary

The mission of the University of Vermont (UVM) Center on Rural Addiction (CORA) is to expand addiction treatment capacity in rural counties by providing consultation, resources, training, and evidence-based technical assistance to healthcare practitioners and other staff. With our baseline needs assessment, we aim to identify current and future addiction treatment needs and barriers in rural Vermont counties with direct input from practitioners, policymakers, and other stakeholders working in rural communities. The online survey was conducted in two rounds: April 28 – May 31, 2020 and July 27 – August 31, 2020. The first round focused primarily on practitioners and community stakeholders working in Health Resources & Services Administration (HRSA)-designated rural counties in Vermont, and the second focused primarily on practitioners working in non-rural counties. This report compares the responses of rural and non-rural practitioners.

Our respondents included 332 practitioners: 188 working in rural counties and 144 working in non-rural counties. Most respondents were primary care (rural 45%, non-rural 37%) and specialist physicians (rural 28%, non-rural 47%). Rural practitioners most often worked in a community hospital (27%) or Federally Qualified Health Center or Rural Health Clinic (24%), while most non-rural practitioners worked in an academic medical center (56%). Among rural practitioners, 41% reported having a waiver to prescribe buprenorphine, while 30% of non-rural practitioners reported having a waiver. Among practitioners who reported either having a waiver or being able to treat opioid use disorder (OUD), 63% of rural and 59% of non-rural practitioners reported currently prescribing medication for opioid use disorder (MOUD) for patients.

When asked about their concerns regarding substance use among their patients, both rural and non-rural practitioners' greatest concerns included tobacco, opioids with alcohol, and alcohol alone. Non-rural practitioners' top concerns also included prescription opioids and opioids with sedatives. Rural practitioners reported greater average levels of concern than non-rural practitioners for nearly all substances. Controlling for buprenorphine waiver status, rural practitioners had significantly greater concerns than non-rural practitioners about use among their patients of heroin, fentanyl, cocaine, methamphetamine, opioids with alcohol, and opioids with stimulants.

Rural practitioners reported slightly greater comfort levels than non-rural practitioners in addressing and treating OUD in their patients. In addition, rural practitioners reported being more comfortable with treating SUD in older adults and providing family-based interventions or support for families of individuals struggling with addiction compared to non-rural practitioners. Each of these differences persisted when controlling for buprenorphine waiver status. When controlling for buprenorphine waiver status, there was no difference between the average comfort level of rural and non-rural practitioners in providing SUD treatment to pregnant patients and adolescents.

A majority of both rural (58%) and non-rural (52%) practitioners identified time/staffing constraints as a top barrier to treating patients with OUD. Additionally, a majority of rural practitioners (54%) identified concerns about medication diversion as a top barrier to patient treatment initiation, while a majority of non-rural practitioners (53%) identified training as a top barrier. When asked about barriers to their patients receiving treatment for OUD, most rural (84%) and non-rural (77%) practitioners identified patient time/transport/other supports as a top barrier. A majority of rural (55%) and non-rural (54%) practitioners also identified stigma of OUD as a top barrier faced by patients.

Given that our Vermont baseline needs assessment was conducted concurrently with the COVID-19 pandemic, we also examined the impact of the pandemic on substance use and treatment availability. Rural and non-rural practitioners had similar levels of concern (mean > 7, scale 0–10) related to how COVID-19 had affected the health of their patients. Slightly more non-rural practitioners believed that access to substance use treatment had decreased (66%) during the COVID-19 pandemic compared to rural practitioners (50%). The majority of both rural (69%) and non-rural (75%) practitioners believed that substance use had increased during the pandemic.

When asked which CORA resources and trainings they would prioritize, rural practitioners most often (70%) ranked trainings on vulnerable population management as high priority. The highest ranked resource among non-rural practitioners (67%) was mentoring from champion providers, which was also ranked as a high priority by rural practitioners (64%).

Please visit uvmcora.org to find more information about our baseline needs assessments in Vermont, Maine, New Hampshire, and Northern New York, as well as resources and technical assistance on substance use treatment.

Abbreviations Used Throughout This Report

UVM CORA: University of Vermont Center on Rural Addiction

MOUD: Medications for opioid use disorder

OUD: Opioid use disorder

SUD: Substance use disorder

HRSA: Health Resources and Services Administration

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Responses and Inclusion Criteria

We invited 1,462 Vermont practitioners to participate in our Vermont baseline needs assessment survey, which we administered in two rounds: the first (April 28 – May 31, 2020) reached mainly practitioners working in HRSA-designated rural counties¹ (Figure 1) and the second (July 27 – August 31, 2020) reached mainly practitioners working in non-rural counties. This report compares responses from rural and non-rural practitioners from both rounds of survey administration.

To identify practitioners to recruit for the survey, we received a list of all practitioners licensed in the state from the Vermont Department of Health. We then used the National Plan and Provider Enumeration System database to identify practitioners in roles with the opportunity to directly serve patients with OUD. Surveys were sent via email with reminders sent weekly over the course of data collection. A total of 381 practitioners responded to the survey (response rate = 26%). This sample of practitioners was not selected at random; rather, it was a convenience sample in which practitioners self-selected to participate. Twelve practitioners who reported being retired, three practitioners practicing only outside of Vermont, and 34 practitioners who did not provide responses aside from general demographic information were excluded from analyses. Our final cohort of practitioners included 332 respondents, 188 working in rural Vermont counties and 144 working non-rural Vermont counties, with 170 responses from the first round of surveys and 162 from the second round of surveys (Table 1).



Figure 1. Map of HRSA-designated rural counties in Vermont (HRSA rural counties are depicted in green).

Table 1. Practitioner responses by HRSA-designated rural area and survey round.

	April-June		July-August		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Rural	165	97.1	23	14.2	188	56.6
Non-rural	5	2.9	139	85.8	144	43.4
Total	170	100	162	100	332	100

¹ <https://www.hrsa.gov/sites/default/files/hrsa/ruralhealth/resources/forhpeligibleareas.pdf>

The details of the practitioner groups are shown in Table 2, with practitioners categorized based on their survey responses. Skip logic within the survey was based on practitioner responses regarding their buprenorphine waiver status and other characteristics (e.g., whether they reported currently treating patients with OUD). Percentages in subsequent tables and figures in this report are calculated as a percent of those who responded to the question, while the percentages in Table 2 indicate the percent of the total sample of practitioners.

Table 2. Sample sizes of subsets of rural and non-rural practitioners, based on practitioner survey responses.

	Rural		Non-rural		Total
	N	Percent of Total	N	Percent of Total	N
Total sample	188	56.5	144	43.2	332
Prescribers (i.e., MD, DO, NP, PA)	166	57.2	124	42.8	290
Able to treat opioid use disorder (OUD)	70	61.9	43	38.1	113
Have buprenorphine waiver	66	64.1	37	35.9	103
Currently treating patients with medications for OUD (MOUD)	58	63.0	34	37.0	92

Rural and Non-rural County Location

Our final cohort included 332 practitioners working in 13 of the 14 counties in Vermont (Table 3). If an individual worked in multiple counties (n=16), and at least one county was rural (n=15), they were designated as working in a rural area. While there was good representation from most rural counties, we received only one response from a practitioner serving Essex County, not including two practitioners who said they served clients statewide. However, Essex County has the smallest population of any rural county in the state, which may account for the low representation in this survey. Among practitioners working in non-rural counties, most (90%) worked only within Chittenden County. There were no practitioner responses from Grand Isle County which is part of the Burlington metropolitan area but has a small population (~7,000 residents).

Table 3. Rural and non-rural practitioner responses by Vermont county.

VT county in which practitioner works	Rural		Non-rural		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
<i>Rural Counties</i>						
Addison	14	7.5			14	4.2
Bennington	22	11.7			22	6.6
Caledonia	14	7.5			14	4.2
Essex	1	0.5			1	0.3
Lamoille	9	4.8			9	2.7
Orange	6	3.2			6	1.8
Orleans	9	4.8			9	2.7
Rutland	25	13.3			25	7.5
Washington	30	16.0			30	9.0
Windham	17	9.0			17	5.1
Windsor	26	13.8			26	7.8
<i>Non-Rural Counties</i>						
Chittenden			130	90.3	130	39.2
Franklin			13	9.0	13	3.9
Grand Isle			0	0	0	0
<i>Multiple counties*</i>	15	8.0	1	0.7	16	4.8
Total	188	100	144	100	332	100

*15 multiple county responses included practitioners working in at least one rural county

Work Setting and Role

Table 4 shows the distribution of work settings among practitioners working in rural (n=188) and non-rural (n=144) counties (hereafter referred to as “rural practitioners” and “non-rural practitioners”) that responded to the baseline needs assessment survey. Rural practitioners most often worked in community hospitals (27%) or Federally Qualified Health Centers/Rural Health Clinics (24%), while non-rural practitioners most often worked in academic medical centers (56%). In contrast, only 2% of rural practitioners reported working in academic medical centers.

Table 4. Rural and non-rural practitioner work settings.

	Rural		Non-rural		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Academic medical center	4	2.1	81	56.3	85	25.6
Addiction specialty treatment provider	7	3.7	0	0	7	2.1
Community hospital	51	27.1	4	2.8	55	16.6
Community mental health center	2	1.1	3	2.1	5	1.5
Federally Qualified Health Center or Rural Health Clinic	45	23.9	9	6.3	54	16.3
Hospital-owned practice	29	15.4	8	5.6	37	11.1
“Hub” opioid treatment program	1	0.5	1	0.7	2	0.6
Private practice	26	13.8	30	20.8	56	16.9
Other	23	12.2	8	5.6	31	9.3
Total	188	100	144	100	332	100

Table 5 shows the professional roles of practitioner respondents working in rural (n=187) and non-rural (n=144) counties. The highest proportion of rural practitioners were primary care physicians (46%), while specialist physicians (47%) had the highest representation among non-rural practitioners. Nurse practitioners comprised 7% of survey respondents working in rural counties, while no nurse practitioners working in non-rural counties responded to the survey.

Table 5. Rural and non-rural practitioner professional roles.

	Rural		Non-rural		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Nurse	2	1.1	0	0	2	0.6
Nurse practitioner	13	7.0	0	0	13	3.9
Primary care physician	85	45.5	53	36.8	138	41.7
Physician assistant	29	15.5	22	15.3	51	15.4
Specialist physician*	53	28.3	67	46.5	120	36.3
Other	1	0.5	0	0	1	0.3
Multiple	4	2.1	2	1.4	6	1.8
Total	187	100	144	100	331	100

*e.g., addiction medicine, psychiatrist

Table 6 shows the distribution of specialties among rural (n=161) and non-rural (n=124) practitioners. The highest proportion of both rural practitioners (39%) and non-rural practitioners (21%) reporting specialties were in family medicine or general practice. Four percent of rural and two percent of non-rural practitioners reported working in addiction medicine.

Table 6. Rural and non-rural practitioner specialties.

	Rural		Non-rural		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Addiction medicine	7	4.4	2	1.6	9	3.2
Family medicine/general practice	63	39.1	27	21.8	90	31.6
Obstetrics/gynecology	8	5.0	10	8.1	18	6.3
Internal medicine	18	11.2	23	18.6	41	14.4
Emergency/urgent care	17	10.6	10	8.1	27	9.5
Pediatrics	17	10.6	14	11.3	31	10.9
Psychiatry	14	8.7	14	11.3	28	9.8
Multiple/other	17	10.6	24	19.4	41	14.4
Total	161	100	124	100	285	100

Practitioner Waiver and Ability to Treat OUD

Among practitioners that can prescribe medications (i.e., MD, DO, NP, PA; rural n=162, non-rural n=123), 41% of rural practitioners reported having a waiver to prescribe buprenorphine, compared to 30% of non-rural practitioners (Table 7).

Table 7. Current waiver status for prescribing buprenorphine among rural and non-rural practitioners that can prescribe medications (i.e., MD, DO, NP, PA).

	Rural		Non-rural		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Waivered	66	40.7	37	30.1	103	36.1
Not waived	96	59.3	86	69.9	182	63.9
Total	162	100	123	100	285	100

Among practitioners who reported having a waiver to prescribe buprenorphine (rural n=66, non-rural n=37) or who did not have a waiver but considered themselves able to treat patients with OUD using MOUD (e.g., with naltrexone; rural n=26, non-rural n=22), 63% of rural practitioners and 59% of non-rural practitioners reported currently treating patients with OUD using U.S. Food and Drug Administration-approved medications (e.g., methadone, buprenorphine, naltrexone; Table 8).

Table 8. Rural and non-rural practitioners currently treating patients using U.S. Food & Drug Administration-approved medications for opioid use disorder (MOUD).

	Rural		Non-rural		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Treating OUD with medications	58	63.0	34	58.6	92	61.3
Not treating OUD with medications	34	37.0	24	41.4	58	38.7
Total	92	100	58	100	150	100

Among rural (n=55) and non-rural (n=33) practitioners responding to the question, “**In the last year, which medication do you primarily prescribe to treat patients with opioid use disorder? Select the one best response,**” the majority (rural=89%, non-rural=79%) reported primarily prescribing buprenorphine (Table 9). The remaining 11% of rural practitioners reported primarily prescribing naltrexone, whereas 12% of non-rural practitioners reported primarily prescribing methadone, 6% reported primarily prescribing naltrexone, and 3% reported primarily prescribing other medications (e.g., clonidine).

Table 9. Primary medication prescribed by rural and non-rural practitioners currently treating patients using U.S. Food & Drug Administration-approved medications for opioid use disorder (MOUD).

Primary medication	Rural		Non-rural		Total	
	Freq	Percent	Freq	Percent	Freq	Percent
Methadone	0	0	4	12.1	4	4.6
Buprenorphine	49	89.1	26	78.8	75	85.2
Naltrexone	6	10.9	2	6.1	8	9.1
Other medications (e.g., clonidine)	0	0	1	3.0	1	1.1
Total	55	100	33	100	88	100

Practitioner Concern about Treatment Adherence

There was no significant difference in concern levels (scale 0–10) between rural (n=56, mean=4.9) and non-rural (n=29, mean=4.4) practitioners currently treating patients using MOUD regarding patients’ non-adherence to their recommended treatment regimen (mean difference=0.5, $t(83)=-0.9$, $p=0.358$; Figure 2). The lack of significant difference persisted when using a multiple linear regression controlling for the buprenorphine waiver status of the practitioner ($\beta=0.68$, 95% CI: -.32, 1.69 $p=0.177$).

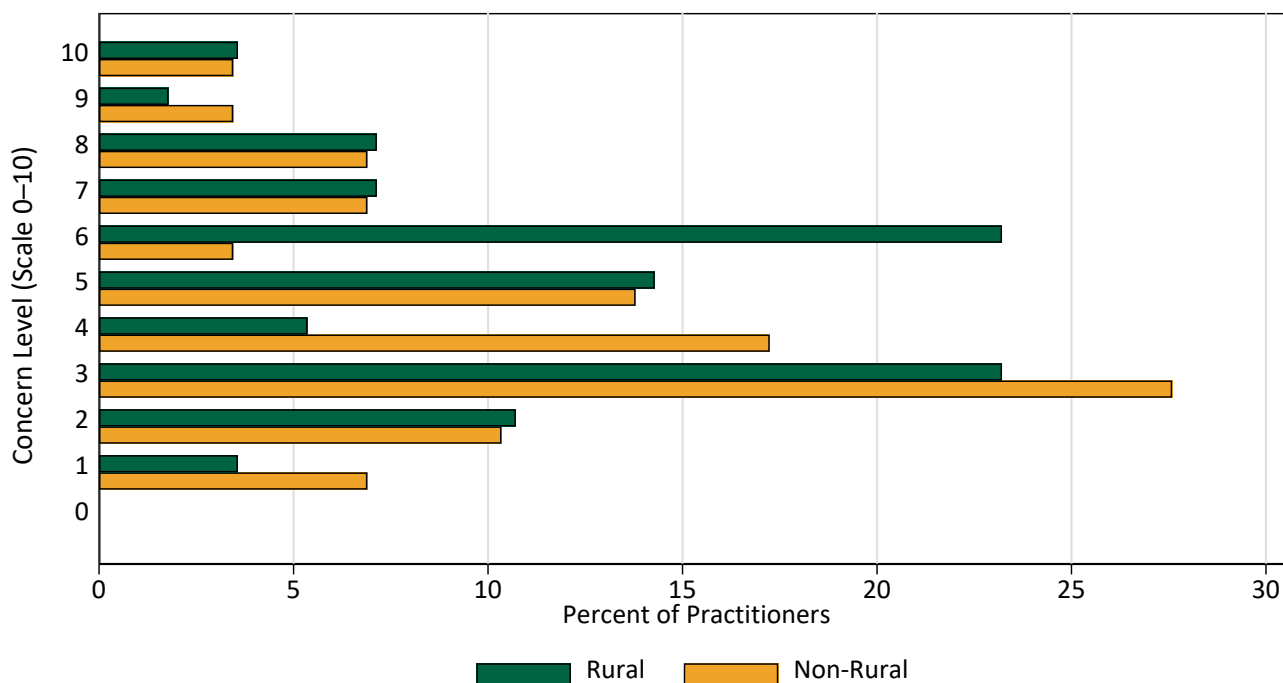


Figure 2. Concern regarding patient non-adherence to their recommended medication for opioid use disorder (MOUD) treatment regimen, among practitioners treating patients with MOUD (rural n=56, non-rural n=29).

Number of Patients: Total and OUD Treatment

Table 10 shows the total number of patients cared for each week for all reasons by rural and non-rural practitioners, stratified by buprenorphine waiver status. Rural waived practitioners served significantly more patients per week (mean=50.0) than non-rural non-waivered practitioners (mean=38.5, p=0.005). Therefore, on average, rural waived practitioners reported serving nearly 30% more patients each week than non-rural non-waivered practitioners.

Table 10. Number of unique patients cared for each week for all reasons among rural and non-rural practitioners, by buprenorphine waiver status.

	N	Mean	Median	Min	Max	Standard Deviation
Rural – Waivered	66	50.0	46.5	5	125	26.4
Rural – Non-waivered	94	46.4	50	0	150	27.2
Non-rural – Waivered	36	46.6	50	0	100	22.6
Non-rural – Non-waivered	86	38.5	30	5	110	23.9

Table 11 shows the average number of patients currently treated with MOUD by rural and non-rural practitioners. There was not a statistically significant difference between the mean number of patients currently treated with MOUD between rural (mean=47.0) and non-rural practitioners (mean=26.3, p=0.255). It is notable that some practitioners are treating as few as one patient using MOUD.

Table 11. Number of patients treated by rural and non-rural practitioners using medications for opioid use disorder (MOUD).

	N	Mean	Median	Min	Max	Standard Deviation
Rural	54	47.0	20	1	400	67.6
Non-rural	28	26.3	4	1	500	93.8

Concern About Substances

Practitioners were asked about their level of concern (scale 0–10) regarding a variety of different substances and substance combinations (Table 12). Rural practitioners were most concerned about tobacco (mean score=7.5), the combination of alcohol and opioids (mean score=7.1) and alcohol alone (mean score=7.0). Non-rural practitioners were most concerned about tobacco (mean score=6.9), alcohol (mean score=6.5), prescription opioids (mean score=6.1), the combination of opioids and sedatives (mean score = 6.1) and opioids with alcohol (mean score=6.0). Sample sizes vary between substances, as not all practitioners provided a level of concern for every substance.

Table 12. Practitioners' mean level of concern (scale 0–10) about use of substances among patients in their practice (ordered by rural practitioner concern).

	Rural		Non-rural	
	N	Mean	N	Mean
Tobacco/e-cigarettes	183	7.5	141	6.9
Opioids + alcohol	178	7.1	135	6.0
Alcohol	185	7.0	141	6.5
Opioids + benzodiazepines	180	6.8	133	6.1
Prescription opioids	179	6.5	137	6.1
Fentanyl	175	6.3	129	5.1
Heroin	180	6.3	130	5.1
Opioids + stimulants	176	6.0	128	5.0
Benzodiazepines and other sedatives	179	5.6	134	5.4
Prescription stimulants	177	5.5	131	4.7
Cocaine	178	5.4	128	4.2
Methamphetamine	172	5.1	126	4.0
Marijuana	181	5.0	137	5.3
Other street drugs	175	4.7	123	3.9

Figure 3 shows the comparison of levels of concern regarding the use of different substances among rural (sample size range: n=64–66) and non-rural (sample size range: n=33–37) practitioners with buprenorphine waivers. Figure 4 shows the comparison of levels of concern among rural (sample size range: n=84–94) and non-rural (sample size range: n=73–85) practitioners without buprenorphine waivers. Generally, practitioners with waivers had higher concern levels about the use of substances compared to practitioners without waivers. Rural practitioners had higher average concern levels than non-rural practitioners for nearly all substances among both waived and non-waivered practitioner groups (additional detail below and in Table 13).

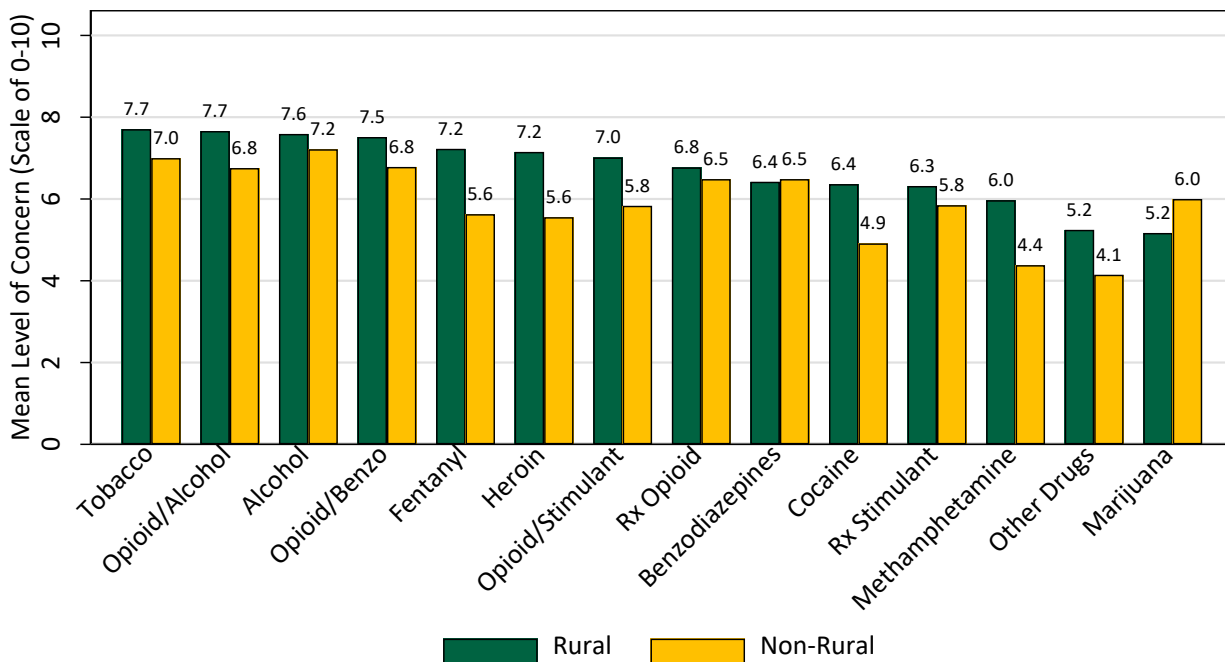


Figure 3. Average level of concern among rural (sample size range n=64–66) and non-rural (sample size range n=33–37) practitioners with buprenorphine waivers regarding their patients’ use of substances, ordered by rural practitioner concern.

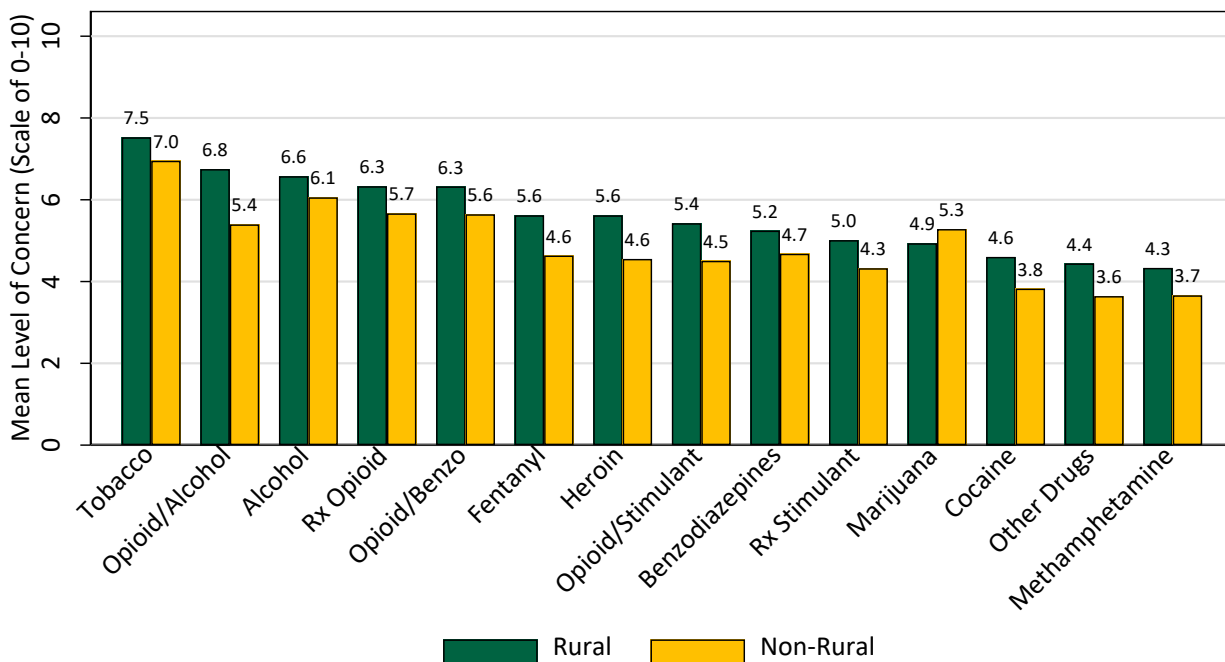


Figure 4. Average level of concern among rural (sample size range: n=84–94) and non-rural (sample size range: n=73–85) practitioners without buprenorphine waivers regarding their patients’ use of substances, ordered by rural practitioner concern.

Table 13 shows the results of multivariable linear regression of the association between practitioners’ rural vs. non-rural status and their mean concern level (scale 0–10) about the use of various substances among their patients, adjusted for practitioner buprenorphine waiver status. We used a conservative cutoff of $p < 0.01$ for statistical significance in our reporting to account for the large number of comparisons. Adjusting for buprenorphine waiver status, rural practitioners reported significantly higher average levels of concern than non-rural practitioners about use among their patients of cocaine ($\beta=1.02$, 95% CI: 0.39, 1.74, $p=0.006$), fentanyl ($\beta=1.21$, 95% CI: 0.43, 2.00, $p=0.003$), heroin ($\beta=1.26$, 95% CI: 0.49, 2.02, $p=0.001$), methamphetamine ($\beta=1.00$, 95% CI: 0.25, 1.76, $p=0.009$), opioids with alcohol ($\beta=1.19$, 95% CI: 0.51, 1.87, $p=0.001$), and opioids with stimulants ($\beta=1.02$, 95% CI: 0.27, 1.77, $p=0.008$). On average, rural practitioners reported concern levels 1 point higher (scale 0–10) than non-rural practitioners about the use of cocaine, fentanyl, heroin, methamphetamine, and the combinations of opioids with stimulants and with alcohol.

Table 13. Multivariable linear regression of practitioner concern regarding their patients' use of substances (scale 0–10) by rural vs. non-rural, adjusted for buprenorphine waiver status.

	N		Coef.	St.Err.	p-value	95% Confidence Interval	
						Lower	Upper
Alcohol	282	Rural practitioner	0.47	0.25	0.064	-0.03	0.96
		Waivered	1.07	0.26	<0.0005*	0.57	1.58
Benzodiazepines	269	Rural practitioner	0.34	0.31	0.278	-0.28	0.95
		Waivered	1.43	0.32	<0.0005*	0.80	2.06
Cocaine	264	Rural practitioner	1.02	0.37	0.006*	0.30	1.74
		Waivered	1.50	0.37	<0.0005	0.77	2.23
Fentanyl	259	Rural practitioner	1.21	0.40	0.003*	0.43	2.00
		Waivered	1.37	0.40	0.001*	0.57	2.16
Heroin	267	Rural practitioner	1.26	0.39	0.001*	0.49	2.03
		Waivered	1.33	0.40	0.001*	0.55	2.11
Methamphetamine	258	Rural practitioner	1.00	0.38	0.009*	0.25	1.76
		Waivered	1.28	0.39	0.001*	0.52	2.05
Marijuana	275	Rural practitioner	-0.52	0.31	0.094	-1.13	0.09
		Waivered	0.43	0.32	0.179	-0.20	1.05
Opioids/alcohol	268	Rural practitioner	1.19	0.35	0.001*	0.51	1.87
		Waivered	1.09	0.35	0.002*	0.40	1.79
Opioids/sedatives	268	Rural practitioner	0.70	0.36	0.054	-0.01	1.41
		Waivered	1.17	0.37	0.002*	0.45	1.89
Opioids/stimulants	261	Rural practitioner	1.02	0.38	0.008*	0.27	1.77
		Waivered	1.49	0.39	<0.0005*	0.73	2.25
Other street drugs	258	Rural practitioner	0.91	0.39	0.019	0.15	1.67
		Waivered	0.69	0.39	0.079	-0.08	1.46
Prescribed opioids	272	Rural Practitioner	0.53	0.33	0.113	-0.13	1.18
		Waivered	0.60	0.34	0.080	-0.07	1.26
Prescribed stimulants	266	Rural Practitioner	0.61	0.32	0.054	-0.01	1.23
		Waivered	1.39	0.32	<0.0005*	0.75	2.03
Tobacco/e-cigarettes	280	Rural Practitioner	0.62	0.27	0.024	0.08	1.16
		Waivered	0.13	0.28	0.653	-0.43	0.68

*Statistically significant; p<0.01

Comfort Treating Substance Use Disorders

When asked about their comfort in treating patients with OUD, rural (n=178) practitioners had slightly higher average comfort levels (mean score=6.1) compared to non-rural (n=131) practitioners (mean score=5.0) ($t(30)=-3.73$, $p<0.0005$) (Figure 5). This difference persisted when controlling for buprenorphine waiver status. On average, rural practitioners reported 0.8 points (scale 0–10) greater comfort treating patients with OUD using MOUD than non-rural practitioners, controlling for buprenorphine waiver status (95% CI: 0.22, 1.30, $p=0.006$).

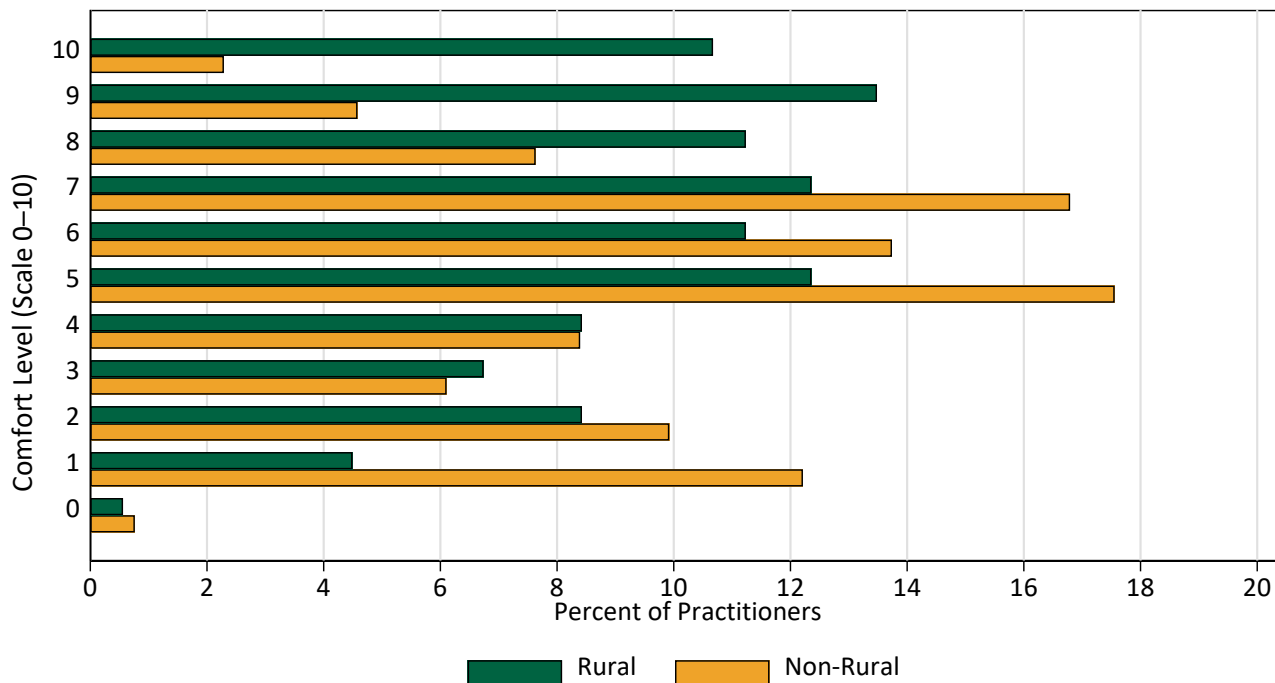


Figure 5. Comfort level in treating opioid use disorder among rural (n=178) and non-rural (n=131) practitioners.

Figure 6 shows the average comfort levels of rural (sample size range: n=155–166) and non-rural (sample size range: n=100–115) practitioners in treating SUD in patients belonging to special populations. Sample sizes vary somewhat because not all practitioners provided a comfort level for each special population.

In **treating older adults**, rural practitioners reported higher average comfort levels (n=161, mean score=5.6) than non-rural practitioners (n=104, mean score=4.3) ($t(263)=-3.7$, $p<0.0005$). This difference persisted when using multiple linear regression and controlling for buprenorphine waiver status; rural practitioners reported one point greater average comfort in providing SUD services to older adults than non-rural practitioners ($\beta=1.04$, 95% CI: 0.34, 1.74, $p=0.004$).

In **providing SUD care to pregnant patients**, rural practitioners reported higher average comfort levels (n=155, mean score=4.1) than non-rural practitioners (n=100 mean score=3.4). However, this difference was not statistically significant ($t(253)=-1.65$, $p=0.097$). When controlling for buprenorphine waiver status in a multiple linear regression, there was no significant difference between rural practitioners and non-rural practitioners in their comfort providing SUD services to pregnant patients ($\beta=0.122$, 95% CI:-0.69, 0.94, $p=0.768$). Therefore, there are no apparent differences in the comfort levels of rural and non-rural practitioners in providing SUD treatment to pregnant patients.

In **providing family-based SUD interventions and support for families of individuals with SUDs**, rural practitioners reported higher average comfort levels (n=116, mean score=4.2) than non-rural practitioners (n=115, mean score=3.2) ($t(279)=2.99$, $p=0.003$). This difference persisted when controlling for buprenorphine waiver status in a multiple linear regression; rural practitioners scored 0.7 points higher in their comfort in providing family-based SUD services than non-rural practitioners ($\beta=0.68$, 95% CI: 0.01, 1.36, $p=0.047$).

In **providing SUD care or counseling for adolescents or minors**, rural practitioners reported higher average comfort levels (n=161, mean score=3.9) than non-rural practitioners (n=107, mean score=3.1; $t(266)=-2.4$, $p=0.018$). This difference did not persist when using multiple linear regression and controlling for buprenorphine waiver status ($\beta=0.55$, 95% CI:-0.16, 1.262, $p=0.129$). Therefore, there are no apparent differences in the comfort levels of rural and non-rural practitioners in providing SUD treatment to adolescents.

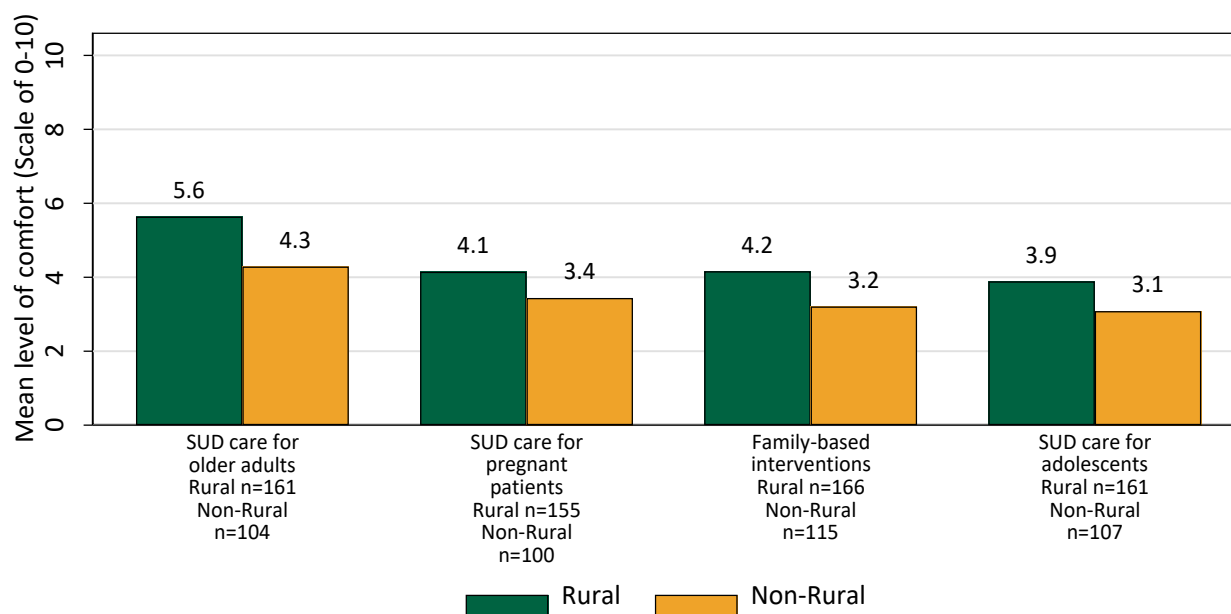


Figure 6. Average comfort level of treating substance use disorder in special populations among rural and non-rural practitioners.

Training and Supports

Practitioners who reported having a waiver to prescribe buprenorphine or who considered themselves “able to treat” OUD using MOUD (n=132) were asked if they felt they had the training, experience, and supports to induct patients on opioid treatment medication (Figure 7). On average, rural practitioners (n=81) reported a slightly higher training level (mean score=5.9) compared to non-rural practitioners (n=51, mean score=4.9). However, when using multiple linear regression and controlling for buprenorphine waiver status, this difference was not statistically significant ($\beta=0.64$, 95% CI: -.25, 1.54, $p=0.156$). Therefore, there are no apparent differences between rural and non-rural practitioners in self-reported training, experience, and support levels for treating patients using MOUD.

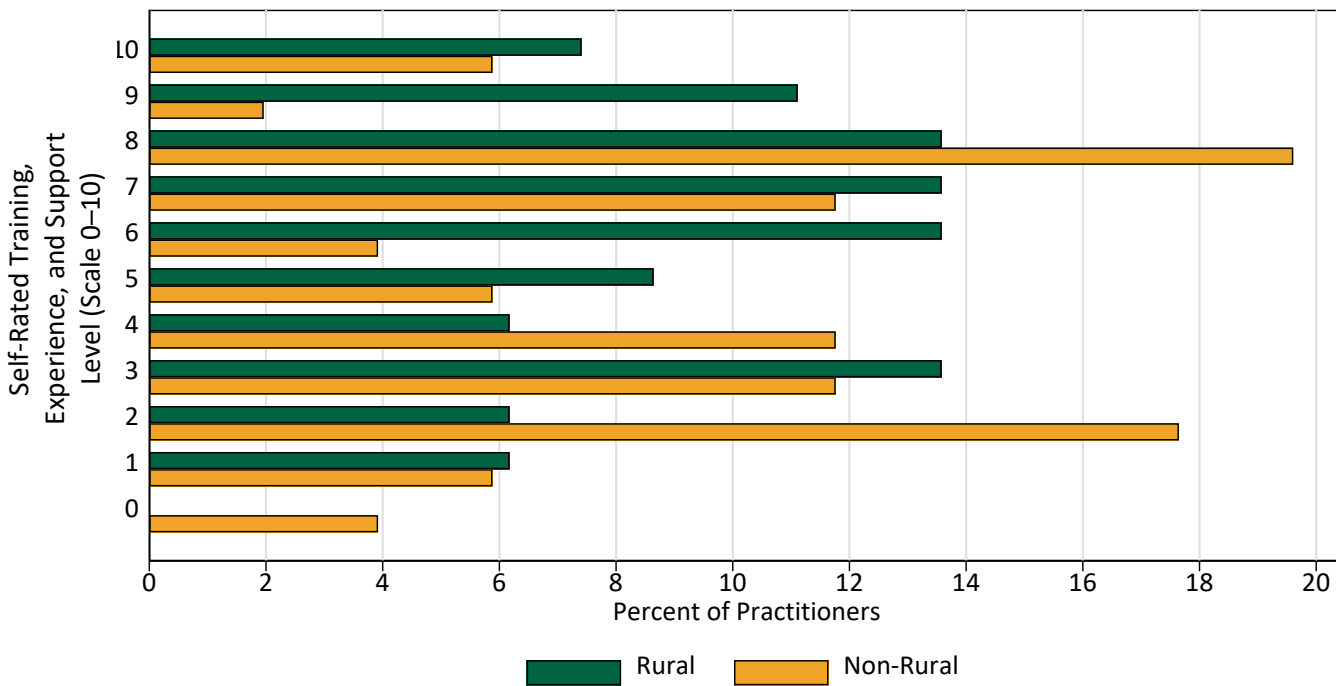


Figure 7. Perceptions of having adequate training, experience, and supports to induct patients on medications for opioid use disorder (MOUD), among rural (n=81) and non-rural (n=51) practitioners.

Treatment Barriers

Practitioners were asked about their beliefs regarding practitioner- and patient-related barriers to treating and retaining patients in OUD treatment. Over half of rural practitioners (n=176) identified time/staffing constraints (59%) and concern about medication diversion (55%) among their top three barriers, while over half of non-rural practitioners (n=133) identified training (53%) and time/staffing constraints (51%) among their top barriers (Figure 8).

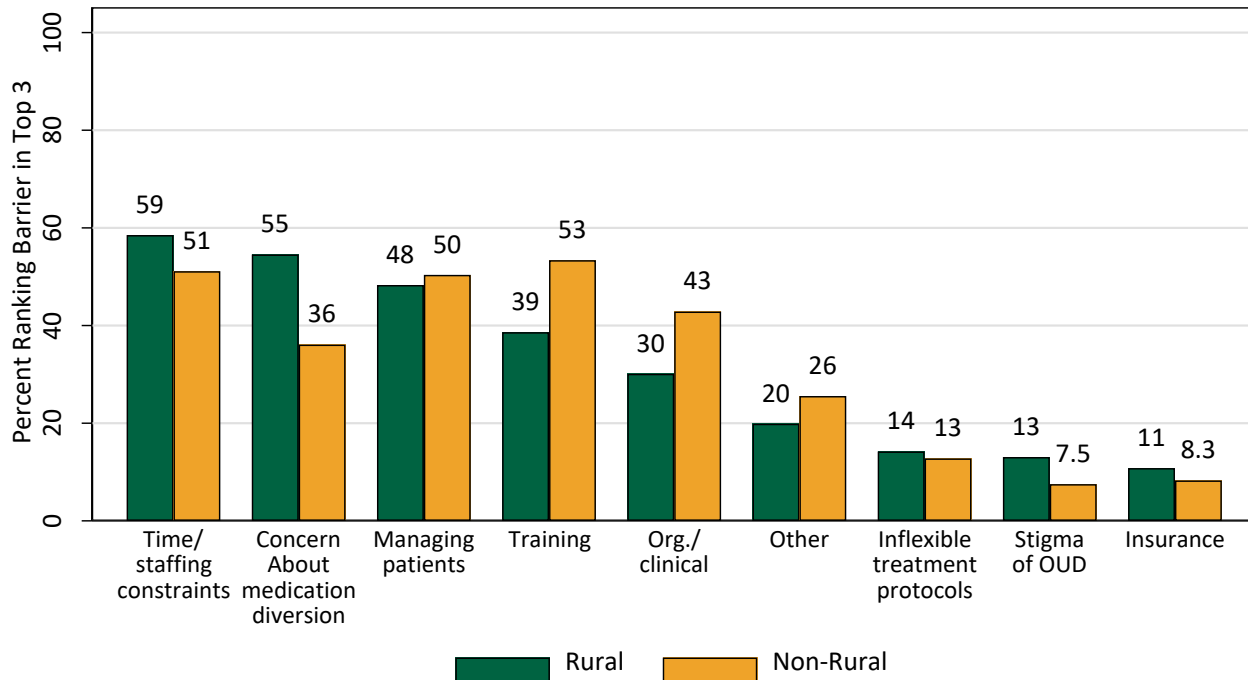


Figure 8. Rural (n=176) and non-rural (n=133) practitioner-identified top barriers to treating patients' opioid use disorder (OUD).

Using multivariable logistic regression analyses, we examined the association between practitioner-related barriers to patient treatment initiation and practitioner rurality, adjusted for whether the practitioner reported currently treating patients with OUD (Table 14). There were no significant associations between the rurality of the practitioner and the practitioner-related barriers that they reported. Therefore, there are no apparent differences in the barriers to providing treatment across rural and non-rural areas of Vermont.

Table 14. Multivariable logistic regression of the association between practitioner-related barriers to patient treatment initiation and practitioner rurality, adjusted for whether the practitioner reported currently treating patients with OUD.

		OR	St. Err.	p-value	95% Confidence Interval	
					Lower	Upper
Time/staffing constraints	Rural vs. non-rural	0.80	0.29	0.551	0.39	1.64
	Currently treating OUD (Yes vs. No)	1.26	0.45	0.518	0.63	2.54
Concern about medication diversion	Rural vs. non-rural	1.96	0.70	0.059	0.98	3.96
	Currently treating OUD (Yes vs. No)	1.03	0.37	0.939	0.51	2.08
Managing patients	Rural vs. non-rural	1.15	0.42	0.694	0.57	2.34
	Currently treating OUD (Yes vs. No)	0.51	0.18	0.056	0.26	1.02
Training	Rural vs. non-rural	0.82	0.33	0.623	0.38	1.78
	Currently treating OUD (Yes vs. No)	0.41	0.16	0.022	0.20	0.88
Organizational/clinical barriers	Rural vs. non-rural	0.81	0.29	0.551	0.40	1.64
	Currently treating OUD (Yes vs. No)	1.18	0.43	0.651	0.58	2.42
Other barriers	Rural vs. non-rural	0.56	0.24	0.176	0.24	1.30
	Currently treating OUD (Yes vs. No)	1.11	0.50	0.813	0.46	2.67
Concern over effectiveness of MOUD	Rural vs. non-rural	0.43	0.21	0.082	0.16	1.11
	Currently treating OUD (Yes vs. No)	0.76	0.38	0.579	0.29	2.00
Stigma of OUD	Rural vs. non-rural	2.93	1.96	0.107	0.79	10.84
	Currently treating OUD (Yes vs. No)	3.14	2.09	0.086	0.85	11.60
Insurance/reimbursement issues	Rural vs. non-rural	1.48	0.78	0.457	0.53	4.14
	Currently treating OUD (Yes vs. No)	2.98	1.75	0.063	0.94	9.41

Figure 9 shows the proportion of rural (n=55) and non-rural (n=28) practitioners currently treating patients with OUD who selected each barrier among their top three most important barriers to retaining patients in OUD treatment. Nearly two-thirds of rural practitioners identified concerns about medication diversion (64%) and time/staffing constraints (62%) among their top three barriers, while over half of non-rural practitioners identified organizational/clinical issues (54%) among their top three barriers. There were no significant differences in rural and non-rural practitioners' reported top barriers (p-value range = 0.13–0.96)² to retaining patients in OUD treatment.

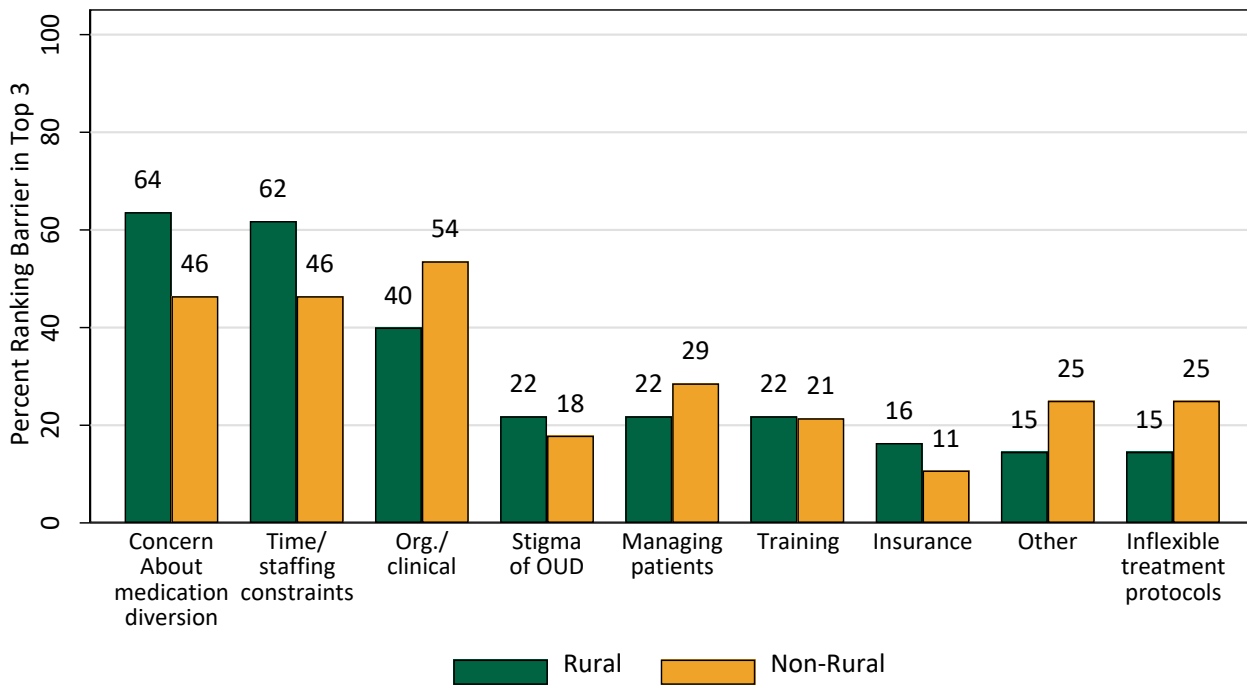


Figure 9. Provider-related barriers to retaining patients in opioid use disorder (OUD) treatment identified by rural (n=55) and non-rural (n=28) practitioners currently treating patients using medications for opioid use disorder (MOUD).

²Using Pearson’s chi-square test (or Fisher’s exact test where cell count <5)

Figure 10 shows patient-related barriers to starting OUD treatment, as identified by rural (n=178) and non-rural (n=132) practitioners. Most rural (81%) and non-rural (73%) practitioners identified time/transport/other supports as a top three barrier to patients receiving OUD treatment, and a majority of both groups (52%) identified stigma of OUD as a top barrier.

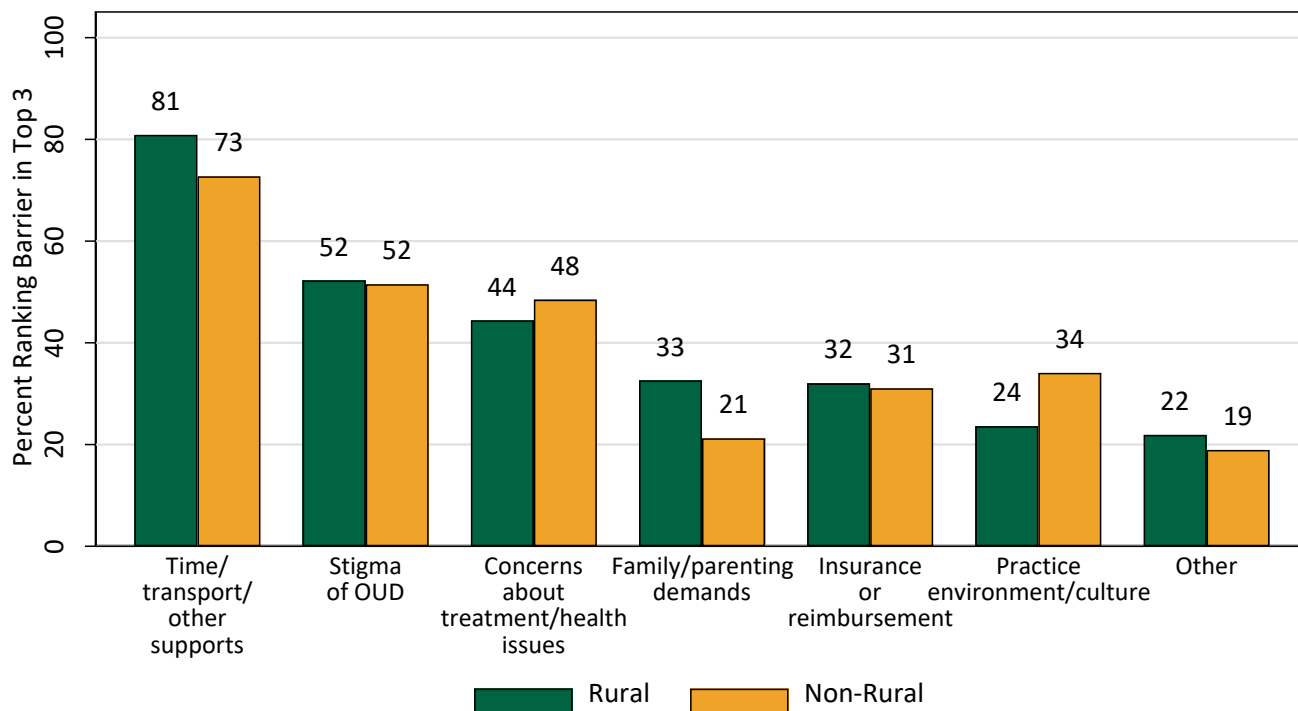


Figure 10. Patient-related barriers to receiving opioid use disorder (OUD) treatment identified by rural (n=178) and non-rural (n=132) practitioners.

Table 15 shows the results of multivariable logistic regression analyses of the association between a practitioner working in a rural county and that practitioner identifying a barrier to a patient receiving OUD treatment among their top three barriers, adjusted for whether or not that practitioner reported currently treating patients for OUD. Rural practitioners did not have significantly higher odds of ranking any patient-related barrier as a top three barrier compared to non-rural practitioners (Table 15). Therefore, this survey did not identify any differences in top barriers to patients receiving OUD treatment in rural and non-rural areas of Vermont, as reported by practitioners.

Table 15. Multivariable logistic regression of the association between patient-related barriers to treatment initiation and practitioner rurality, adjusted for whether the practitioner reported currently treating patients with opioid use disorder (OUD).

		OR	St. Err.	p-value	95% Confidence Interval	
					Lower	Upper
Time/transport/other supports	Rural	1.40	0.69	0.495	0.53	3.66
	Currently treating OUD	1.80	0.88	0.228	0.69	4.68
Stigma of OUD	Rural	0.87	0.30	0.680	0.44	1.71
	Currently treating OUD	1.12	0.39	0.741	0.57	2.22
Concerns about treatment/health issues	Rural	1.16	0.42	0.674	0.57	2.36
	Currently treating OUD	0.59	0.21	0.140	0.30	1.19
Family/parenting demands	Rural	1.62	0.62	0.205	0.77	3.43
	Currently treating OUD	1.20	0.45	0.627	0.58	2.51
Insurance or reimbursement	Rural	1.02	0.37	0.959	0.51	2.06
	Currently treating OUD	1.02	0.37	0.959	0.51	2.06
Practice environment/culture	Rural	0.60	0.25	0.216	0.27	1.34
	Currently treating OUD	0.86	0.36	0.722	0.38	1.94
Other	Rural	1.42	0.66	0.457	0.57	3.53
	Currently treating OUD	1.13	0.52	0.790	0.46	2.76

Figure 11 shows patient-related barriers to remaining in OUD treatment, as identified by rural (n=178) and non-rural (n=132) practitioners. Similar to the most commonly identified patient-related barrier to starting OUD treatment (Figure 13), most rural (84%) and non-rural (78%) practitioners identified time/transport/other supports as one of the top three barriers to patients remaining in OUD treatment. A smaller proportion of rural (39%) and non-rural (38%) practitioners selected stigma of OUD as a top barrier to remaining in treatment as compared to starting treatment (52% for both groups).

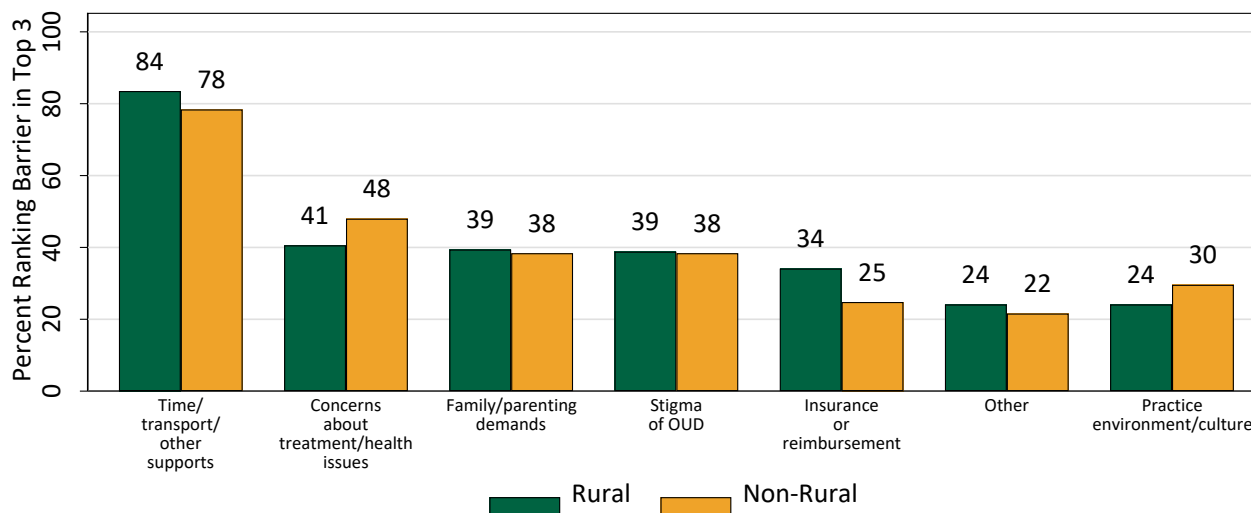


Figure 11. Patient-related barriers to remaining in opioid use disorder (OUD) treatment identified by rural (n=170) and non-rural (n=125) practitioners.

Table 16 shows the results of multivariable logistic regression analyses of the association between a practitioner working in a rural county and whether that practitioner identified a patient-related barrier as a top three barrier to remaining in OUD treatment. All models were adjusted for whether the practitioner reported currently treating patients for OUD. There was no significant association between whether a practitioner worked in a rural county and whether they identified any of the listed barriers as a top barrier. Therefore, there is no apparent difference in patient barriers to remaining in OUD treatment between rural and non-rural areas as perceived by practitioners. However, practitioners currently treating patients with OUD had over four times greater odds than practitioners not currently treating patients with OUD of reporting a lack of time, transportation, or other supports as one of the top three barriers for patients remaining in OUD treatment (OR=4.4, 95% CI: 1.6, 12.6).

Table 16. Multivariable logistic regression of the association between practitioner-related barriers to patient treatment retention and practitioner rurality, adjusted for whether the practitioner currently treats patients with OUD.

		OR	St. Err.	p-value	95% Confidence Interval	
					Lower	Upper
Time/transport/other supports	Rural	1.23	0.64	0.692	0.44	3.41
	Currently treating OUD	4.44	2.36	0.005*	1.57	12.59
Stigma of OUD	Rural	0.98	0.37	0.960	0.47	2.04
	Currently treating OUD	1.09	0.40	0.827	0.52	2.25
Concerns about treatment/health issues	Rural	0.85	0.31	0.650	0.41	1.73
	Currently treating OUD	0.55	0.20	0.092	0.27	1.11
Family/parenting demands	Rural	0.82	0.29	0.569	0.40	1.65
	Currently treating OUD	1.59	0.57	0.197	0.79	3.21
Insurance or reimbursement	Rural	1.75	0.68	0.150	0.82	3.77
	Currently treating OUD	1.04	0.39	0.910	0.50	2.18
Practice environment/culture	Rural	1.03	0.45	0.955	0.44	2.41
	Currently treating OUD	0.43	0.18	0.045	0.19	0.98
Other	Rural	1.69	0.72	0.219	0.73	3.89
	Currently treating OUD	0.76	0.30	0.482	0.35	1.65

*Statistically significant (p<0.01)

Beliefs

Rural (sample size range: n=144–167) and non-rural (sample size range: n=102–121) practitioners also were asked about the degree to which they agreed with statements about addiction and addiction treatment. Samples sizes varied somewhat between questions because some respondents did not answer every question.

In response to the statement **“People in the community where I work have adequate access to an effective form of addiction treatment when they need it,”** approximately half of both rural (53%) and non-rural (53%) practitioners who responded agreed or strongly agreed ($\chi^2(1, N=283) = 0.00, p=0.995$) (Figure 12). There was no difference in agreement with this statement between rural and non-rural practitioners.

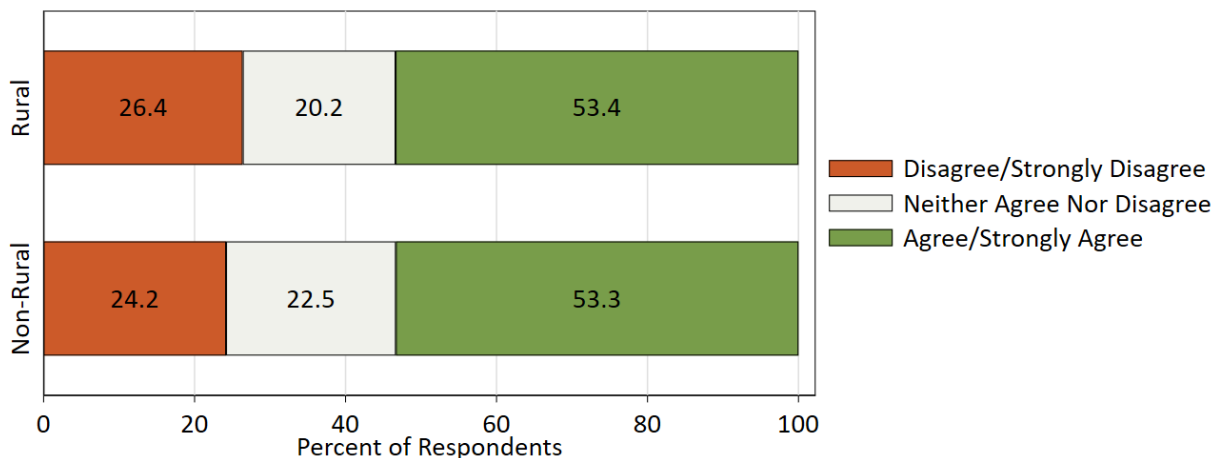


Figure 12. Distribution of agreement among rural (n=163) and non-rural practitioners (n=120) to the statement, “People in the community where I work have adequate access to an effective form of addiction treatment when they need it.”

In response to the statement, **“If a person came to me and confided that they were suffering from opioid addiction, I feel confident that I would know where to refer them for treatment,”** the majority of rural (79%) and non-rural (69%) practitioner respondents agreed or strongly agreed (Figure 13). While there was a trend toward greater confidence among rural providers, this difference was not statistically significant ($\chi^2(1, N=286) = 3.79, p=0.052$).

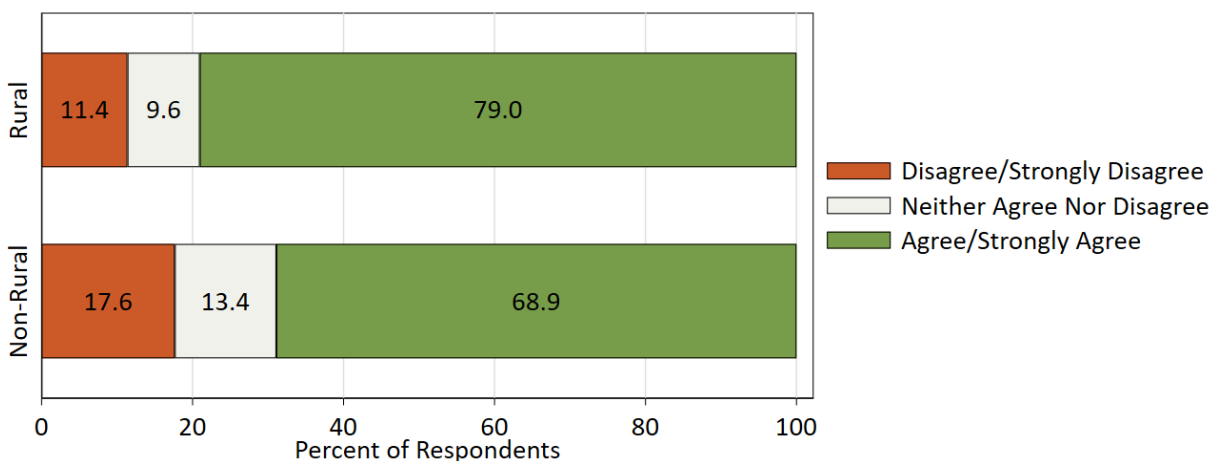


Figure 13. Distribution of agreement among rural (n=167) and non-rural practitioners (n=119) to the statement, “If a person came to me and confided that they were suffering from opioid addiction, I feel confident that I would know where to refer them for treatment.”

In response to the statement, **“Medications (like methadone and buprenorphine) are the most effective way to treat people with opioid use disorder,”** over two-thirds of rural (68%) and non-rural (72%) practitioner respondents agreed or strongly agreed (Figure 14). This difference was not statistically significant ($\chi^2(1, N=288) = 0.44, p=0.507$).

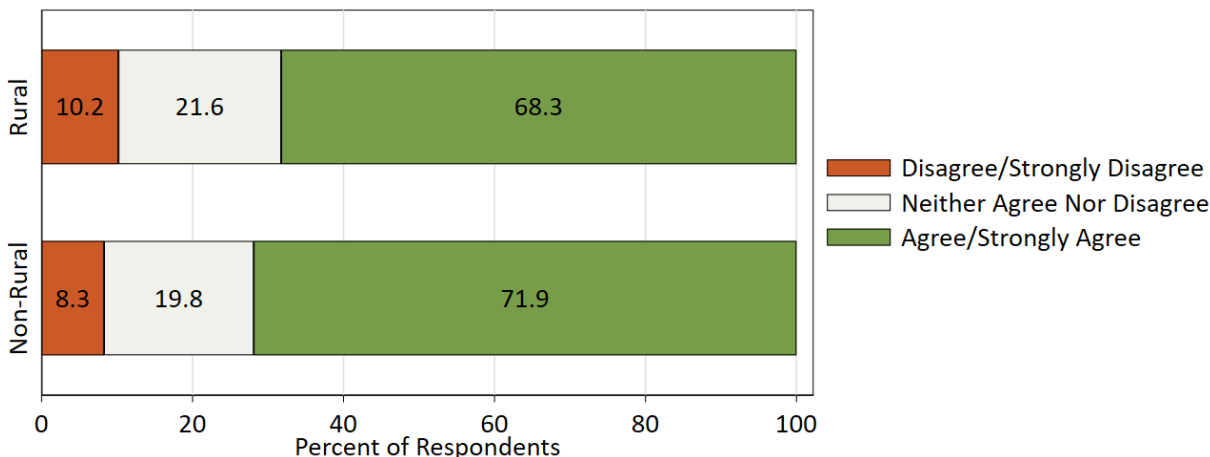


Figure 14. Distribution of agreement among rural (n=167) and non-rural practitioners (n=121) to the statement, “Medications (like methadone and buprenorphine) are the most effective way to treat people with opioid use disorder.”

In response to the statement **“Medications given to treat people with opioid use disorder (such as methadone or buprenorphine) replace addiction to one kind of drug with another,”** nearly half of rural practitioner respondents (49%) disagreed or strongly disagreed, and over half (59%) of non-rural practitioner respondents disagreed or strongly disagreed (Figure 15).³ This difference was not statistically significant ($\chi^2(1, N=246) = 1.22, p=0.269$).

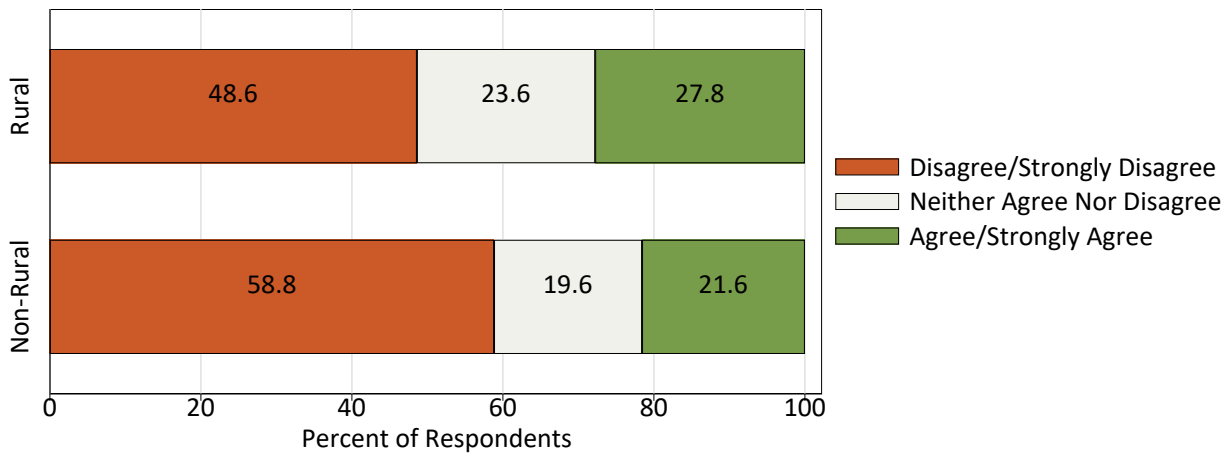


Figure 15. Distribution of agreement among rural (n=144) and non-rural practitioners (n=102) to the statement, “Medications given to treat people with opioid use disorder (such as methadone or buprenorphine) replace addiction to one kind of drug with another.”

³This analysis was grouped differently than the previously reported comparisons. In prior comparisons, the proportion of practitioners that agreed or strongly agreed (as opposed to all other responses), was compared between rural and non-rural practitioners. For this comparison, the groupings are reversed: the proportion of practitioners that disagreed or strongly disagreed (as opposed to all other responses), was compared between rural and non-rural practitioners.

COVID-19 Impact

Practitioners were asked about their level of concern (scale 0–10) regarding their patients’ health during the COVID-19 pandemic (Figure 16). There was no significant difference between the average level of concern that rural practitioners (n=166, mean concern level=7.5) and non-rural practitioners (n=121, mean concern level=7.3) had about the health of their patients during the COVID-19 pandemic (mean difference=0.15, $t(289)=-0.56$, $p=0.57$).

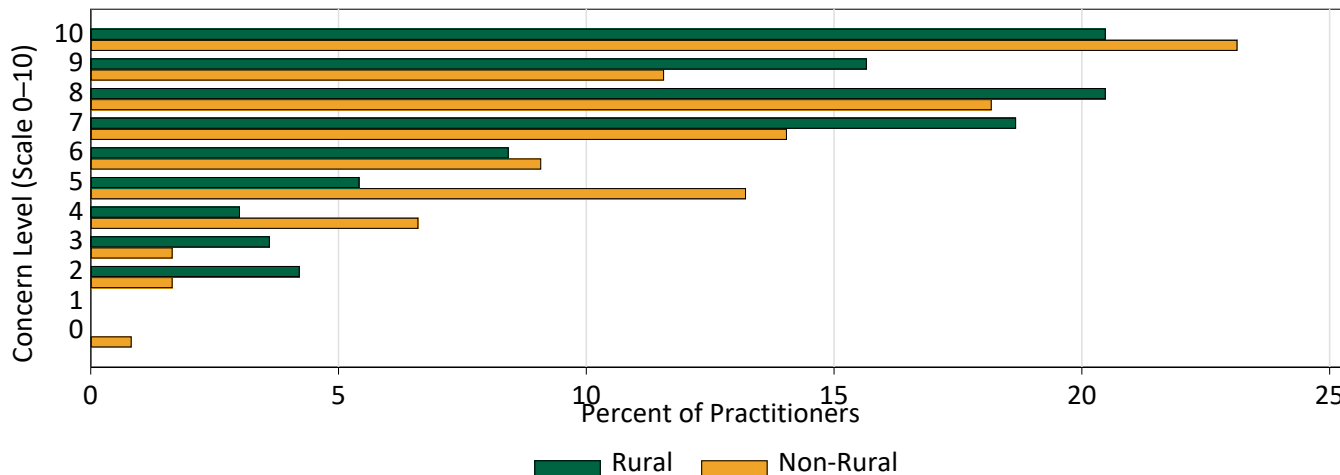


Figure 16. Distribution of levels of concern of rural (n=166) and non-rural (n=121) practitioners regarding the health of their patients during the COVID-19 pandemic.

Practitioners were asked about the effect of the COVID-19 pandemic on MOUD treatment access (Table 17). Among the rural (n=118) and non-rural (n=79) practitioners who responded to the question and did not give an “Other” or “I don’t know” response, 50% of rural respondents reported that MOUD treatment access had decreased, compared to 66% of non-rural respondents (chi-square=4.82 $p=0.028$). A greater proportion of non-rural practitioners than rural practitioners believed that MOUD treatment had decreased.

Table 17. Perceptions of MOUD treatment access during the COVID-19 pandemic.

	Rural		Non-Rural		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Access to MOUD increased	4	3.4%	3	3.8%	7	3.6%
Access to MOUD stayed same	55	46.6%	24	30.4%	79	40.1%
Access to MOUD decreased	59	50.0%	52	65.8%	111	56.3%
Total*	118	100	79	100	197	100

*Excludes responses of “I don’t know” (Rural freq.=45, Non-rural freq.=43) and “Other” (Rural freq.=6, Non-rural freq.=2)

Practitioners were also asked about their perceptions of substance use during the COVID-19 pandemic (Table 18). Among the rural (n=104) and non-rural (n=79) practitioners who responded to the question and did not give an “Other” or “I don’t know” response, nearly three quarters of both rural (69%) and non-rural (75%) practitioners reported that substance use had increased. There was no significant difference between rural and non-rural practitioners in perceived changes in substance use during COVID-19 (chi-sq=0.656, p=0.418).

Table 18. Perceptions of substance use during the COVID-19 pandemic

	Rural		Non-rural		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Substance use increased	72	69.2	59	74.7	131	71.6
Substance use stayed same	26	25.0	18	22.8	44	24.0
Substance use decreased	6	5.8	2	2.5	8	4.4
Total*	104	100	79	100	183	100

*Excludes responses of “I don’t know” (Rural freq.=58, Non-rural freq.=48) and “Other” (Rural freq.=7, Non-rural freq.=7)

CORA Resource Requests

Figure 17 shows the proportion of rural (n=171) and non-rural (n=123) practitioners that ranked various UVM CORA trainings or resources as “high priority.” The highest proportion of rural practitioners (69%) ranked trainings on vulnerable population management as high priority, compared to 60% of non-rural practitioners. The highest ranked resource among non-rural practitioners was mentoring from champion providers (67%), with 64% of rural practitioners also ranking it as a high priority resource. Table 19 shows the details of these resources.

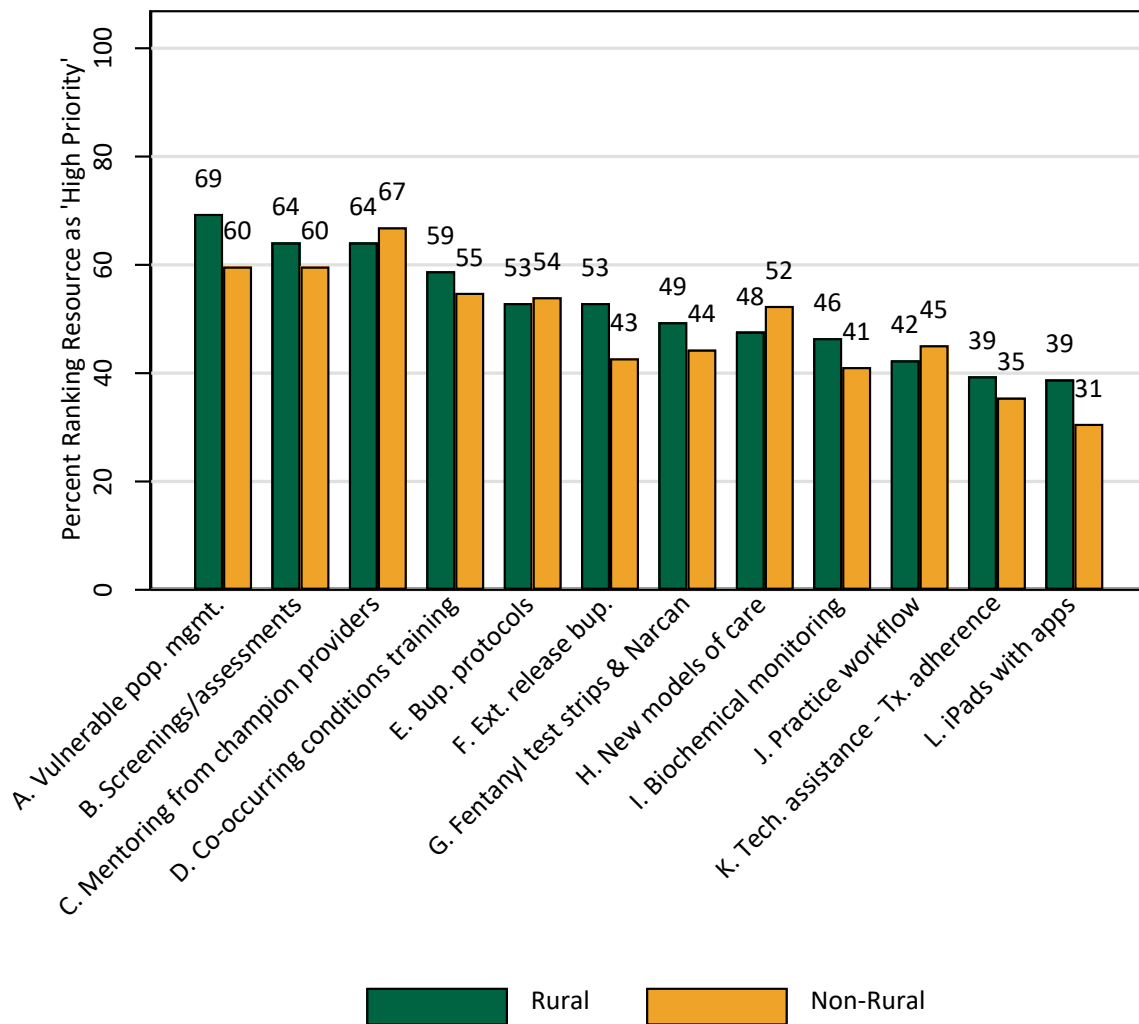


Figure 17. Percent of rural (n=171) and non-rural (n=123) practitioners indicating "high priority" interest in available UVM Center on Rural Addiction (CORA) resources.

Table 19. UVM Center on Rural Addiction (UVM CORA) resources.

Resource	Description
A. Vulnerable population management	Support with managing and coordinating care for vulnerable populations (e.g., pregnant patients with SUDs, families, patients with co-occurring conditions)
B. Screenings / assessments for treatment needs	Screening/assessments to help identify patients' substance use treatment needs
C. Mentoring from champion providers	Consultation & support from community "champion" providers (e.g., mentoring, coaching, consultations around complex patients, medication management)
D. Manualized trainings for co-occurring conditions	Training in manualized treatments for addressing co-occurring conditions (i.e., smoking cessation, stimulant use, PTSD)
E. Buprenorphine protocols	Protocols for buprenorphine induction, stabilization, maintenance, taper, etc.
F. Extended-release buprenorphine medication and training	Providing medication & training on extended-release buprenorphine (e.g., monthly depot formulation) for potential use with patients
G. Fentanyl testing strips and naloxone	Providing fentanyl testing strips; intranasal naloxone (NARCAN) & materials on its use
H. New models of care	Consultations on new models of care for opioid use disorder treatment (e.g., hub-and-spoke model, buprenorphine initiation in ED)
I. Biochemical monitoring assistance	Help with biochemical monitoring of recent drug use (e.g., urine toxicology support, hand-held alcohol breath monitors, hand-held smoking monitors)
J. Practice workflow consultation	Consultation or practice workflow or practical implementation opioid treatment
K. Technical assistance on treatment adherence	Technology-assisted hardware & software to support opioid use treatment adherence in patients (e.g., portable computerized medication dispensers, IVR system for making automated telephone calls to patients for clinical monitoring, random call backs, etc.)
L. iPads with apps	iPads pre-loaded with automated apps on opioid overdose, HIV, Hepatitis C prevention that can be used by patients while waiting

Figure 18 shows the responses among rural (n=168) and non-rural (n=120) practitioner respondents to the question of how they would most like to receive UVM CORA training, resources, or support to take on more patients with SUD. Both groups were most interested in provider-to-provider consultations and support (rural 66%, non-rural 71%). Rural practitioners (62%) were significantly more likely to prefer in-person workshops with continuing medical education credits and food than non-rural practitioners (38%, chi-sq=14.9, p<0.0005). This was the only apparent difference in how rural and non-rural practitioners preferred to receive UVM CORA resources.

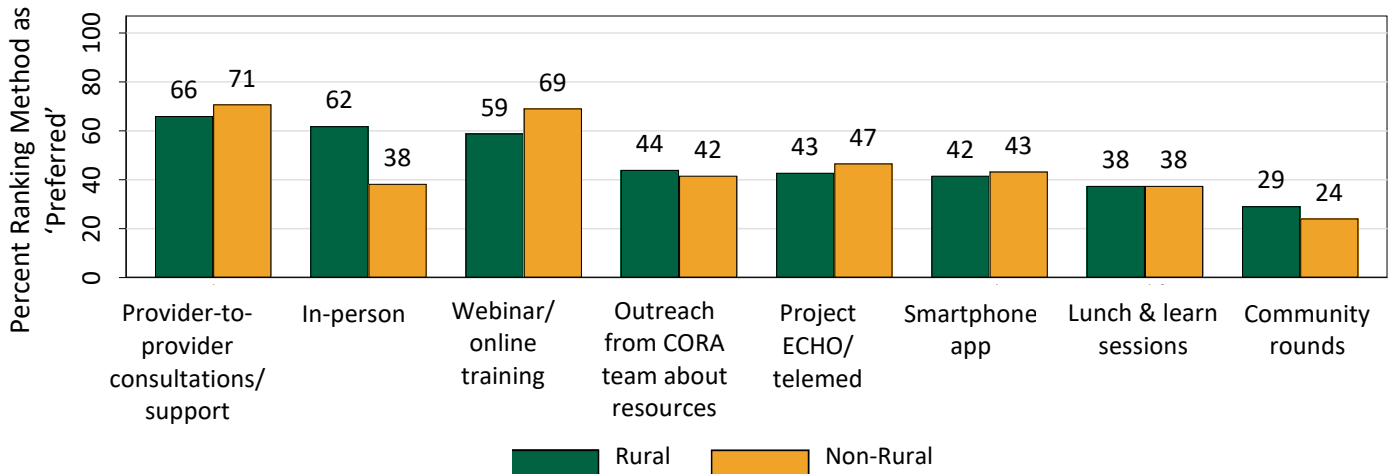


Figure 18. Preferred methods of receiving UVM Center on Rural Addiction (CORA) resources and trainings among rural (n=168) and non-rural (n=120) practitioners.

Figure 19 shows practitioner responses to the question **“What resources or services would help you to become waived to prescribe buprenorphine?”**, which was asked only of practitioners who could prescribe medication (i.e., MD, DO, NP, PA) but did not have a buprenorphine waiver at the time of the survey (rural n=81, non-rural n=67). Among rural practitioners, 47% listed waiver training workshops on-site at their practices as a high priority resource need, and 46% listed provider-to-provider support. Over one-third (36%) of practitioners listed “other” resources as high priority. “Other” responses included the need for time off from their practice and additional staff or time, as well as counseling, psychiatric, and social support for their patients.

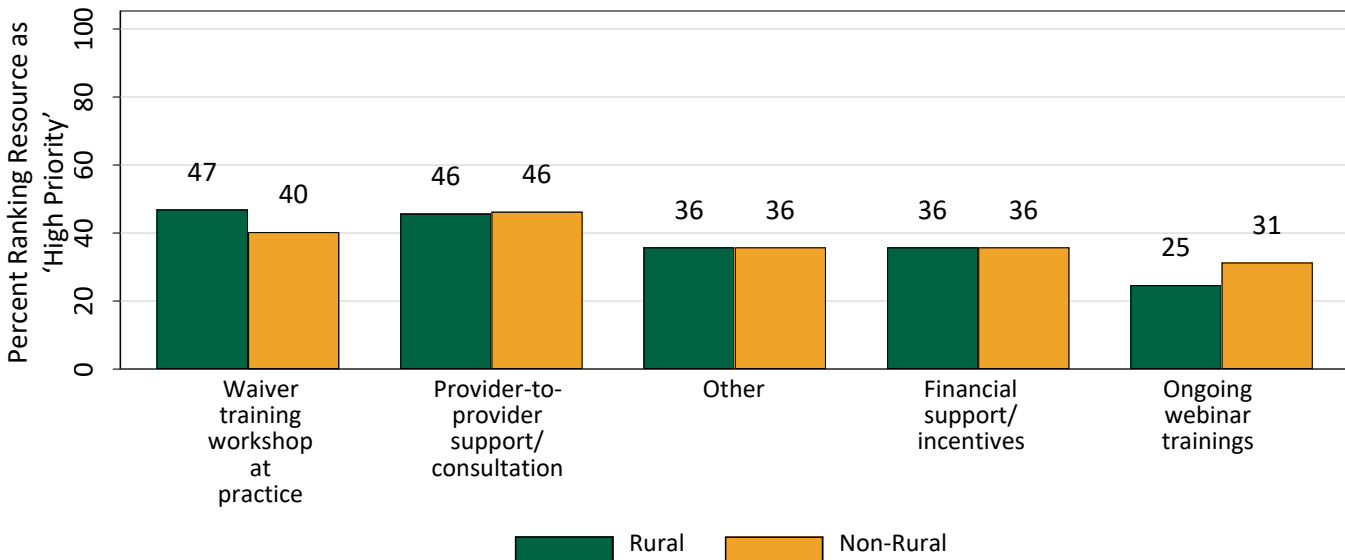


Figure 19. Selection of UVM CORA resources by rural (n=81) and non-rural (n=67) practitioners in response to the question "What resources or services would help you to become waived to prescribe buprenorphine?" among practitioners not currently waived to prescribe buprenorphine.

Ability to Provide Data for Evaluation Efforts

One of the services that UVM CORA provides is assistance with surveillance and evaluation efforts for practitioners. Among rural practitioners who responded to the question of what supports or resources they would need to be able to collect and share data with UVM CORA (n=143), 31% said data collection systems would be most helpful (Table 21). Fewer rural practitioners mentioned financial support (21%) and data entry assistance (22%) as resources that they could use in evaluation efforts. Among non-rural practitioners (n=91), 34% said data collection systems would be most helpful, and 25% responded that data entry assistance would be most helpful. In contrast to rural practitioners, only 7% of non-rural practitioners listed financial support as a helpful support or resource UVM CORA could provide.

Table 20. Supports needed to collect and share data with UVM CORA, identified by rural and non-rural practitioners.

	Rural		Non-rural		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Financial support	30	21.0	7	7.7	37	15.8
Help chart audit	7	4.9	7	7.7	14	6.0
Data entry	32	22.4	23	25.3	55	23.5
Data collection system	44	30.8	31	34.1	75	32.1
Other	30	21.0	23	25.3	53	22.7
Total	143	100	91	100	234	100

Additionally, practitioners were asked what data would be feasible for their practices to collect and share with UVM CORA. Figure 19 shows the proportion of rural (n=127) and non-rural (n=84) practitioners who reported that various data measures for UVM CORA evaluation efforts would be feasible to collect and share. The majority of practitioners reported that it would be feasible to share the number of patients treated for OUD at their practice (rural=72%, non-rural=62%), the number of providers who have prescribed MOUD (rural=65%, non-rural=67%), and the number of patients receiving MOUD per provider (rural=61%, non-rural=54%).

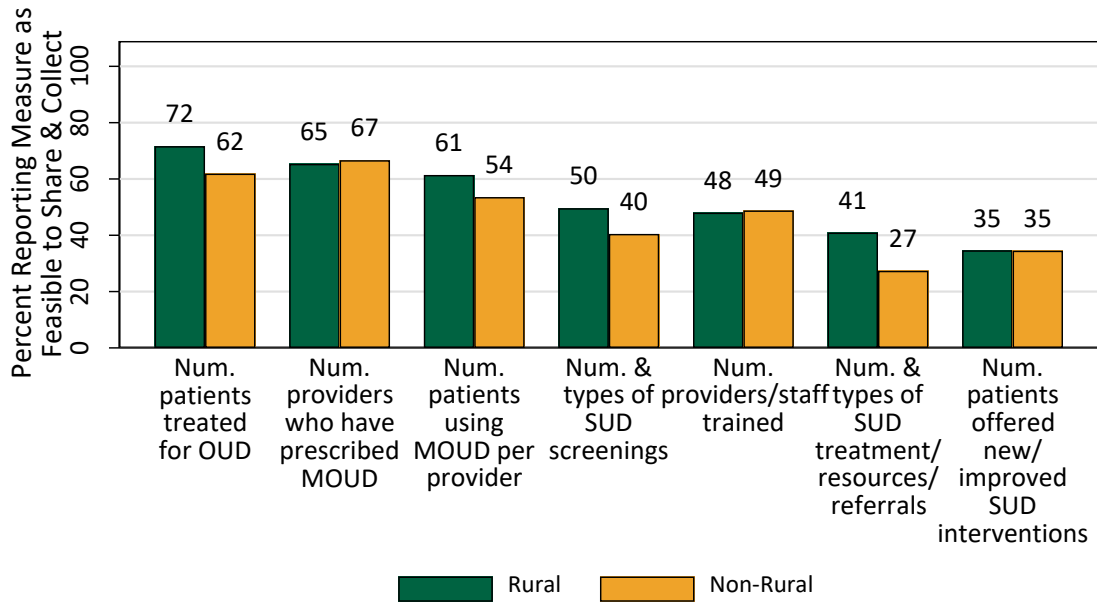


Figure 20. Percent of rural (n=127) and non-rural (n=84) practitioners reporting evaluation measures as feasible to collect & share with the UVM Center on Rural Addiction (CORA).

Acknowledgements

We would like to thank the many Vermont practitioners that participated in UVM CORA's Vermont baseline needs assessment. Their responses to our questions and their comments will directly inform our efforts to develop and improve our ability to provide services to our rural communities.

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Questions

Please direct any questions to cora@uvm.edu.

Suggested Reference

University of Vermont Center on Rural Addiction (2021). *Vermont Baseline Needs Assessment: Rural and Non-Rural Practitioners*. Retrieved from: www.uvmcora.org.



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