College of Public Health / The Ohio State University / Division of Epidemiology

Can more outpatient facilities lead to better diagnosis of Alzheimer's Disease and Related Dementia (ADRD) in rural Ohio?

A study of the association between drug and alcohol abuse facilities and ADRD prevalence.

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Introduction

- 6.2 million Americans age 65 and older have Alzheimer's disease.
- Rural county residents may be at increased risk for ADRD due to behavioral, occupational, and environmental factors.
- Rural residents also face more healthcare barriers vs urban residents.
- Understanding the factors that contribute to urban-rural differences in ADRD diagnosis can aid in addressing rural healthcare disparities.
- **Objective**: to provide a descriptive analysis of services offered by drug and alcohol abuse treatment facilities in Ohio and their association with ADRD prevalence in rural counties and if these associations differ by Appalachian county designation.

Methods

- **Sample:** Of the 88 counties in Ohio, 24 were defined as rural counties. Of those 24 counties 13 were defined as Appalachian, while 11 were defined as non-Appalachian. Counties were designated as rural if they had an urban population size less than 20,000. Appalachian designation was abstracted from the Appalachian Regional Commission.
- **Study Design:** A cross-sectional ecologic study of secondary data. Data was compiled from the 2020 National Directory of Drug and Alcohol Abuse Treatment Facilities, the Centers for Medicare and Medicaid Services Geographic Public Use Files, and the Robert Wood Johnson Foundation's County Health Rankings.
- **Statistical Analysis:** Descriptive analysis of services provided by Drug and Alcohol Abuse Treatment Facilities and characteristics of rural counties was performed. Linear models were developed to test the association between services and ADRD prevalence; unadjusted, adjusted for smoking and excessive drinking rates, and by Appalachian designation.

Results

		Model A			Model B (Model A + Smoking prevalence + Drinking prevalence)		
		beta	se	p-value	beta	se	p-value
Type of Care:	Substance Abuse Treatment (SA)	0.33	0.19	0.099	0.29	0.17	0.098
Service Settings (e.g. Outpatient, Residential, Inpatient, etc.)	Hospital Inpatient (HI)	0.40	0.68	0.566	0.45	0.55	0.432
	Outpatient (OP)	**0.40**	**0.19**	**0.049**	**0.37**	**0.16**	**0.034**
	Hospital Inpatient Detoxification (HID)	0.40	0.68	0.566	0.45	0.55	0.432
	Outpatient Detoxification (OD)	**0.61**	**0.32**	**0.071**	0.36	0.29	0.230
	Telemedicine/Telehealth (TELE)	0.32	0.23	0.175	0.13	0.21	0.533
Hospitals	**General Hospital (GH)**	**1.16**	**0.64**	**0.084**	0.65	0.57	0.266
Type of Alcohol Use Disorder Treatment	Facility administers/prescribes medication for alcohol use disorder (PMAT)	0.42	0.32	0.199	0.42	0.26	0.121
	Facility accepts clients using medication assisted treatment for alcohol use disorder but prescribed elsewhere (ACMA)	0.03	0.22	0.891	-0.07	0.20	0.736
External Source of Medications Used for Alcohol Use Disorder Treatment	Personal Physician/Health care provider used for alcohol use disorder treatment (AUPC)	0.11	0.22	0.616	0.00	0.19	0.990
Facility Operation (e.g., Private, Public)	Private for-profit organization, private non-profit organization (PVTP/PVTN)	0.33	0.19	0.099	0.29	0.17	0.098

	Model C (Model B + Appalachian Designation and Interaction Between Appalachian and Rural County Designation)						
	Appalachian		Non-Appalachian		Difference		
Service of Interest	beta	95% CI	beta	95% CI	beta	95% CI	p-value
Substance Abuse Treatment (SA)	0.15	(-0.26, 0.56)	0.66	(0.07, 1.24)	-0.50	(-1.20, 0.19	0.144
Hospital Inpatient (HI)	-0.44	(-2.06, 1.18)	1.34	(-0.30, 2.98)	-1.78	(-4.10, 0.54)	0.125
Outpatient (OP)	**0.18**	**(-0.23, 0.59)**	**0.73**	**(0.19, 1.27)**	**-0.55**	**(-1.22, 0.13)**	**0.104**
Hospital Inpatient Detoxification (HID)	-0.44	(-2.06, 1.18)	1.34	(-0.39, 2.98)	-1.78	(-4.10, 0.54)	0.125
Outpatient Detoxification (OD)	0.55	(-0.21, 1.30)	0.06	(-1.03, 1.16)	0.48	(-0.81, 1.77)	0.441
Telemedicine/Telehealth (TELE)	0.03	(-0.53, 0.59)	0.37	(-0.40, 1.13)	-0.34	(-1.28, 0.60)	0.454
General Hospital (GH)	0.00	(-1.74, 1.74)	1.33	(-0.32, 2.98)	-1.33	(-3.69, 1.03)	0.250
Facility administers/prescribes medication for alcohol use disorder (PMAT)	**0.00**	**(-0.62, 0.62)**	**1.41**	**(0.44, 2.38)**	**-1.41**	**(-2.59, -0.24)**	**0.021**
Facility accepts clients using medication assisted treatment for alcohol use disorder but prescribed elsewhere (ACMA)	**-0.01**	**(-0.42, 0.39)**	**-1.31**	**(-2.63, 0.02)**	**1.29**	**(-0.01, 2.60)**	**0.051**
Personal Physician/Health care provider used for alcohol use disorder treatment (AUPC)	0.02	(-0.43, 0.47)	0.03	(-0.90, 0.95)	-0.01	(-1.00, 0.98)	0.989
Private for-profit organization, private non-profit organization (PVTP/PVTN)	0.15	(-0.26, 0.56)	0.66	(0.07, 1.24)	-0.5	(-1.20, 0.19)	0.144

Discussion

- **Main Finding**: Counties with more outpatient facilities had higher ADRD prevalence
- Could indicate that more health resources allows for individuals to have more points of contact in the healthcare system, which in turn can lead to improved detection and diagnosis of ADRD.
- Existing literature establishes that individuals in rural counties face barriers in accessing care. Moreover, studies have shown the importance of access to healthcare in improving health outcomes.

Conclusion

- To reduce the urban-rural healthcare disparities in ADRD detection and diagnosis, policies that improve the healthcare infrastructure and access to healthcare resources in rural communities should be explored.
- This study used descriptive statistics to explain differences in ADRD diagnosis on the county level, future works utilizing different data sets and increased sample size should be done to confirm these findings.

References

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