

Role of Healthcare Disparities in Management of Spinal Disorders: The West Virginia University Experience

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Introduction

Healthcare disparities have been well-recognized to exist in Appalachian populations for over 50 years with substantial evidence demonstrating that Appalachians have overall poorer health and worse outcomes, even when receiving healthcare insurance. How these disparities relate to the management of various spinal disorders is unclear. Of particular interest are referral patterns, workup prior to referral, timeliness of appointments once referrals are made, difficulty of access based on time/distance to appointment, and the role of socioeconomic status with regards to management of spinal disorders.

Methods

We sought to address these questions retrospectively utilizing the West Virginia University Spine Center database, which serves as a triage point for spine surgeons at West Virginia University prior to initial clinical encounter. With over 30,000 initial encounters documented in the database, this serves as an ideal tool for investigating demographic and disparity-type questions within various subpopulations of Appalachia, particularly within West Virginia. Inclusion criteria for analysis included: 1) creation of clinical encounter in the spine center database, 2) scheduling of appointment with spine center surgeon, and 3) home residence in the state of West Virginia. Exclusion criteria for analysis included residence outside of West Virginia and lack of clinical visit with spine surgeon. All statistical analysis was performed utilizing JMP (SAS Institute, Cary, North Carolina). A oneway ANOVA with post-hoc Dunnett's test was utilized for cross-county comparisons. All analysis was considered significant based upon p < 0.05.

Results

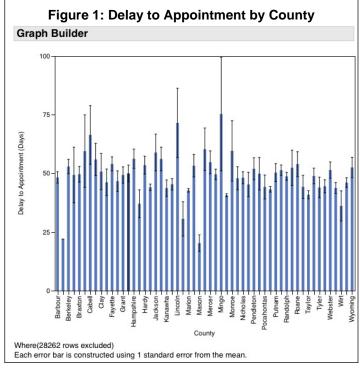
An initial analysis has demonstrated clear referral pattern differences across counties in WV with regards to referring provider (MD/DO versus mid-level providers versus others). Demographic differences with the population presenting to the spine center are also evident with regards to smoking rates, age, gender, and bodymass index.

Table 1: Association of Socioeconomics & Delay to Appointment

County County Seat Dist. (Min) Dist. (Miles) Delay to Appt (Days) Med. Income

County -	County Seat	Dist. (Min)	Dist. (Miles)	Delay to Appt (Days)	Med. Income
Barbour	Philippi	59.00	40.9	48.25	\$31,634.00
Berkeley	Martinsburg	161.00	151.5	52.89	\$50,923.00
Boone	Madison	184.00	186.3	49.31	\$38,126.00
Braxton	Sutton	93.00	91.2	49.59	\$32,606.00
Brooke	Wellsburg	83.00	69.7	59.47	\$38,197.00
Cabell	Huntington	199.00	207.2	66.38	\$36,274.00
Calhoun	Grantsville	120.00	110.5	55.89	\$29,084.00
Clay	Clay	132.00	131.3	50.75	\$31,232.00
Doddridge	West Union	68.00	64.4	46.19	\$34,444.00
Fayette	Fayetteville	147.00	147.6	54.02	\$30,856.00
Gilmer	Glenville	86.00	84.1	46.68	\$31,558.00
Grant	Petersburg	126.00	89.4	49.29	\$36,487.00
Greenbrier	Lewisburg	191.00	178.9	49.98	\$35,456.00
Hampshire	Romney	113.00	97.8	56.22	\$33,991.00
Hancock	New Cumberland	108.00	86.5	37.06	\$38,501.00
Hardy	Moorefield	128.00	106.2	53.48	\$37,002.00
Harrison	Clarksburg	43.00	38.4	44.06	\$40,441.00
Jackson	Ripley	147.00	146.4	58.88	\$38,600.00
Jefferson	Charles Town	176.00	168.5	56.14	\$63,156.00
Kanawha	Charleston	151.00	156.3	43.7	\$43,110.00
Lewis	Weston	64.00	59.1	45.31	\$34,734.00
Lincoln	Hamlin	196.00	190.8	71.5	\$34,119.00
Logan	Logan	208.00	212.8	30.6	\$33,202.00
Marion	Fairmont	25.00	19.3	42.77	\$24,133.00
Marshall	Moundsville	95.00	87.6	53.24	\$38,856.00
Mason	Kanawha	113.00	106.6	20.25	\$37,206.00
McDowell	Welch	238.00	219.4	60.29	\$36,279.00
Mercer	Princeton	209.00	207.2	54.71	\$32,366.00
Mineral	Keyser	99.00	86.5	49.57	\$38,279.00
Mingo	Williamson	230.00	237	75.25	\$31,915.00
Monongalia	Morgantown			40.67	\$42,247.00
Monroe	Union	217.00	199.1	59.57	\$34,637.00
Morgan	Berkeley Springs	125.00	116.3	47.91	\$40,636.00
Nicholas	Summersville	123.00	124.3	48.12	\$35,945.00
Ohio	Wheeling	83.00	79.1	45.25	\$38,997.00
Pendleton	Franklin	162.00	128.6	51.94	\$36,997.00
Pleasants	Saint Marys	101.00	93.7	49.85	\$40,416.00
Pocahontas	Marlinton	172.00	129.8	44.18	\$31,289.00
Preston	Kingwood	38.00	22.3	43.21	\$42,529.00
Putnam	Winfield	20.00	15.9	50.3	\$52,942.00
Raleigh	Beckley	172.00	168.5	51.35	\$37,915.00
Randolph	Elkins	91.00	65.7	48.73	\$35,176.00
Ritchie	Harrisville	91.00	84.7	52.38	\$35,170.00
Roane	Spencer	151.00	130.3	53.94	\$31,362.00
Summers	Hinton	204.00	184.3	44.21	\$29,261.00
Taylor	Grafton	36.00	25.3	40.9	\$36,846.00
Tucker	Parsons	84.00	58.3	48.88	\$33,915.00
Tyler	Middlebourne	102.00	90	43.96	\$36,122.00
Upshur	Buckhannon	69.00	60.1	44.5	\$35,893.00
Wayne	Wayne	215.00	220.8		\$36,360.00
Webster	Webster Springs	137.00	122.6	51.41	\$29,083.00
Wetzel	New Martinsville	97.00	68.4	43.73	\$36,390.00
Wirt	Elizabeth	134.00	126.5	36.12	\$36,037.00
Wood	Parkersburg	111.00	109.3	46.07	\$39,456.00
Wyoming	Pineville	210.00	201	52.51	\$35,872.00

Highlighted counties indicate statistically significant delay to visit in comparison to Monongalia county (control).



Conclusions

By exploring these questions related to healthcare disparities and how these affect management of spinal disorders in a subset of the Appalachian population, targeted systemic interventions can be applied both within our population and perhaps more broadly applied to similar care environments. A complex relationship appears to exist, at least in the WV population, between socioeconimic status, distance to clinic, and delay to clinical encounter. Similarly, referral patterns differ with regards to type of provider initiating referral (MD vs DO vs mid-level), workup completed, and interventions attempted based upon these same variables (data not shown).

References

- 1.) Kariisa M, et al. Distribution of Cardiovascular Disease and Associated Risk Factors by County Type and Health Insurance Status: Results from the 2008 Ohio Family Health Survey. 2015. Public Health Reports 130: 87-95.
- 2.) McGarvey EL, et al. Health Disparities Between Appalachian and Non-Appalachian Counties in Virginia USA. 2011. Journal of Community Health 36:348-356.