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Healthcare Access and Poverty Among Central Appalachian Residents

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***Abstract:** Healthcare access is an shaping force in the lives of Appalachian people. Appalachians often face both inadequate availability of medical facilities and poverty, which limits access to health insurance and, therefore, healthcare. These limitations result in reduced life expectancy and health disparity. In this study, the author examines relationships between adequate healthcare and access to healthcare among Appalachian residents. Using a convenience sample of Appalachian residents, the author finds that income, education, and being an Appalachian resident have unique impacts on healthcare access or perceptions of healthcare in general.*

Keywords: healthcare disparity, demography, medical sociology, Appalachian studies, healthcare

One of the most important difficulties for Appalachian areas is the lack of access to healthcare and, therefore, inadequate health of its residents (Bush et al., 2014; Bush, Alexander, Noblitt, Lester, & Shinn, 2015; Cohen, Scott, White, & Dignan, 2013; Denham, Wood, & Remsberg, 2010; Katz et al., 2009; Institute of Medicine, 2003; Vanderpool & Huang, 2010). This lack of adequate healthcare further leads to health disparities, inequalities, and inequities (Cohen et al., 2013). Another difficulty that continues to be prevalent for Appalachian areas is financial issues that cause the inability to afford healthcare (Institute of Medicine 2003). The disparity in Appalachia of adequate healthcare could be because of financial issues that influence residents' inability to pay for adequate healthcare (McAlearney et al., 2010; McGarvey, Leon-Verdin, Kilos, Guterbock, & Cohn, 2011). The Social Ecological Model, a theoretical model that could be applied to help understand the reasoning behind these ongoing issues, describes the impact multiple levels of organization can have on behavior and how that behavior develops social environments (Kazak, 1989).

The subject matter of this study is of significant importance because not only does a continuing problem like influence the individual level but it also impacts higher societal organizations. The lack of the access to adequate healthcare within specific areas not only impacts its residents but, according to the Social Ecological Model, this individual problem has the possibility of impacting a larger society. The continuing lack of adequate healthcare gradually manifests the belief that adequate healthcare is not a necessity, thereby devaluing healthcare.

In this study, the author considers the relationships between adequate healthcare and access to healthcare from a theoretical and statistical perspective. Specifically, the correlation between an individual's level of poverty and their access to healthcare is examined along with the individual's residential location's influence on access to healthcare. Also examined were both poverty level and residential location and their impact on the individual's physical and mental health status. The data were collected via a survey from a convenience sample of people residing in the region and were examined using descriptive statistics and t-tests. These tests will help further the knowledge of the correlation between living in Appalachian regions versus living outside of these classified regions and the impact of these factors to those residents' access to healthcare.

Literature Review

Access to healthcare and inadequate healthcare has been an ongoing complication for Appalachian areas (Bush et al., 2014; Bush et al., 2015; Denham et al., 2010; Katz et al., 2009; Institute of Medicine, 2003; Vanderpool & Huang, 2010; Cohen et al., 2013). The limitation of healthcare access plays a crucial role in access to adequate resources, causing health disparities, inequalities, and inequities among its residents (Cohen et al., 2013; Institute of Medicine, 2003). Because inadequate healthcare is a continuing issue, timely intervention is a common problem (Bush et al., 2014; Bush et al., 2015; McGarvey et al., 2011). Often, substandard health links to diagnoses in the later stages because of subsequent intervention (McGarvey et al., 2011). For example, timely intervention is crucial in congenital hearing diagnostics by performing infant hearing testing in a sufficient amount of time to identify hearing loss in early life stages (Bush et al., 2014). In Appalachia, the diagnosis and intervention for infant hearing loss are too slow and inadequate (Bush et al. 2015). This social environment of having limited access to healthcare (Katz et al., 2009) results in Appalachian residents being more likely to use complementary and alternative medicine (Institute of Medicine, 2003). Limited access to healthcare resources enacts barriers within Appalachians' healthcare beliefs, specifically insurance and finances (Institute of Medicine, 2003).

The healthcare access issues and inadequate healthcare in Appalachian regions may be due to material circumstances such as financial issues in paying for healthcare and/or healthcare insurance (Katz et al., 2009; McAlearney et al., 2010; McGarvey et al., 2011). Financial issues of affordability of healthcare continue to prevail in these rural areas (Institute of Medicine, 2003). Because factors like personal income, real wages, salaries per job, and market income are lower in Appalachia, financial barriers for health insurance and healthcare are a common issue (McGarvey et al., 2011). Cost is more likely to be reported as a barrier within Appalachia for people who are uninsured compared to people who claim private insurance (McAlearney et al., 2010). These financial issues

that create affordability problems could play a role in Appalachian areas having inadequate healthcare because it is difficult to overcome this barrier and be able to afford care (Institute of Medicine, 2003).

There are increased mortality and morbidity rates in rural Appalachia because there is inadequate healthcare access in addition to financial and insurance barriers for residents in this area (Blackley, Behringer, & Zheng, 2012; McAlearney et al., 2010; McGarvey et al., 2011; Vanderpool & Huang, 2010; Sergeev, 2013). Appalachian areas possess an increased risk of cancer incidence, affecting the higher mortality rates (McAlearney et al., 2010; Vanderpool & Huang, 2010). When compared to the rest of the United States and non-Appalachian states, mortality rates have continued to be higher (Blackley et al., 2012). More specifically, women in Appalachia regions have higher mortality rates (McAlearney et al., 2010). States containing Appalachia regions have a pattern of higher cancer, heart disease, stroke, and diabetes mortality rates (Blackley et al., 2012; Sergeev, 2013).

The Social Ecological Model explains the concern pertaining to healthcare services in Appalachia, including access to healthcare, inadequate healthcare, and affordability of healthcare. This model helps explain the multiple levels of social organizations affect behavior and the ways in which behavior develops social environments and vice versa (Kazak, 1989). These multiple levels of influence can be defined as individual, interpersonal, organizational, community, and public policy. These levels affect one another in that individual experiences, whether they are negative, positive, or neutral, climb up the ladder to public policy while public policy experiences trickle down to the individual level. Thus, according to the Social Ecological Model, individuals have the potential to impact larger societal values. For example, an Appalachian individual possessing the knowledge that healthcare is a necessity plays a role in the beliefs manifested in Appalachian communities that recommend healthcare, financial barriers of affordability and cost of insurance within the community as a whole, and the public policy in which healthcare is advocated. Understanding that behaviors shape the social environment and vice versa guides the development of successful ways to secure quality healthcare in rural Appalachia.

Method

Big Questions

Reading existing literature examining healthcare access and poverty in Appalachia led to several important questions about the relationship between resources, place, and healthcare. First, how do common demographic categories such as being an Appalachian resident, having more or less income, having a college degree, or gender shape how individuals understand Appalachia, their perceptions of healthcare overall, and the defining of personal physical and mental health? Next, how do these

variables shape perceptions of healthcare use, its adequacy, its availability, and self-rated physical and mental health?

Two analyses were assembled for this paper. The first consists of a Pearson Chi-Square examining the paired relationships (if any) between five demographic variables (coded dichotomously where one equals the presence of the trait and zero equals the absence) and five dichotomous measures of perceptions of health and healthcare. Next, using the same five demographic variables, t-tests were conducted to examine the relationships (if any) these demographic variables may have with six Likert item statements about perceptions of health and healthcare.

Data Collection

As no single dataset existed that would answer the complex questions described above, original data collected for this study. A convenience sample with a range of individuals who currently reside inside and outside Appalachia was used to gather data. A convenience sample was necessary because this study was specifically focused on the healthcare aspects of Appalachian individuals. These participants were used for this sample because responses of individuals who live in Appalachia will directly represent whether or not there is a correlation between residing in Appalachia and receiving adequate healthcare and perceived health status. The surveys were administered to individuals during the fall of 2017 in Kentucky, Tennessee, and Virginia. In all, 47 individuals completed the survey out of a potential of 50 respondents completing the survey.

The survey included variables designed to explore the study's two main questions. The demographic measures (all coded dichotomously) included the respondent's self-identification as an Appalachian resident, the respondent making \$29,000 or less per year in personal income, the respondent making \$75,000 or more per year in personal income, the respondent obtaining a four-year college degree or more, and the respondent's identification as male.

Next, I paired these demographic variables with five more dichotomous measures of perceptions of health and healthcare. These include asking if the respondent feels the Appalachian region is deprived, if they believe most insurances provides satisfactory coverage, if they regularly utilize healthcare, if they self-describe themselves as physically healthy, and if they self-describe themselves as mentally healthy. For my t-tests, I used six Likert items (rated 1-5 where 5 indicates strongly agreeing with the item): (1) I feel that at least once I have not received adequate healthcare; (2) I prefer to travel out of Appalachian regions to receive adequate healthcare; (3) I feel that having healthcare insurance betters access to adequate healthcare; (4) I feel there is a suitable variety of physicians in Appalachian regions; (5) I feel that I am physically healthy overall; (6) and, I feel that I am mentally healthy overall. Once collected,

the data was entered into Excel and then uploaded into SPSS for analysis.

Analysis

Table 1 summarizes all of the variables in this study. Of the respondents, 38% of the sample described themselves as Appalachian residents. Approximately one in five made less than \$29,000 per year in income while almost 1/3 made \$75,000 or more per year in income. Over one-third had college degrees, and the majority of respondents were males. Over half considered Appalachia as being deprived. Over 40% felt that most insurance provides satisfactory coverage and 70% regularly utilized healthcare. A notable 80% self-described as being both mentally and physically healthy, although it should be noted that the answers were not consistently the same people having the same responses.

Table 1

Descriptive Statistics of Study's Variables

	N	Mean	SD	Min	Max
Is an Appalachian Resident	47	.380	.491	0	1
Respondent Makes \$29K or Less	40	.200	.405	0	1
Respondent Makes \$75K or More	40	.300	.464	0	1
Has Less Than College Degree	47	.361	.485	0	1
Is Male	47	.620	.491	0	1
Considers Area Deprived	47	.600	.496	0	1
Believes Most Insurance Provides Satisfactory Coverage	44	.430	.501	0	1
Regularly Utilizes Healthcare	47	.700	.462	0	1
Self Describes as Physically Healthy	47	.808	.397	0	1
Self Describes as Mentally Healthy	47	.808	.397	0	1
I feel that at least once I have not received adequate healthcare.	47	3.68	1.270	2	5

I prefer to travel out of Appalachian regions to receive adequate healthcare.	47	3.770	1.306	1	5
I feel that having healthcare insurance betters access to adequate healthcare.	47	4.400	.742	2	5
I feel there is a suitable variety of physicians in Appalachian regions	47	2.490	1.317	1	5
I feel that I am physically healthy overall	47	3.870	1.115	1	5
I feel that I am mentally healthy overall.	47	4.110	1.088	1	5

Turning to the Likert items in Table 1, respondents were mixed on their perceptions of health and healthcare. For example, the mean response was largely neutral when asked if the respondent had at least once received inadequate healthcare or traveling out of Appalachia to receive better care, but respondents generally agreed that traveling outside of Appalachian regions gave better access to healthcare. Respondents disagreed that there are a suitable variety of physicians in Appalachian regions. There was a neutral to weak agreement on being physically healthy, but overall identified as being mentally healthy.

In Table 2, the dichotomous variables were examined in pairs using Pearson Chi-Square tests. Three results were significant or marginally significant. First, being an Appalachian resident is correlated with the perception of Appalachia being a deprived area ($p=.001$). Next, making more than \$75,000 per year is correlated with self-identifying as being mentally healthy ($p=.001$). Finally, having a college degree is marginally correlated with self-identifying as mentally healthy ($p=.09$).

Table 2

Pearson Chi-Square Tests Examining Demographic Variables and Perceptions of Health and Healthcare

	Considers Area Deprived	Believes Most Insurance Provides Satisfactory Coverage	Regularly Utilizes Healthcare	Self Describes as Physically Healthy	Self Describes as Mentally Healthy
Is Appalachian Resident	10.409***	1.112	.798	1.217	.178
Respondent Makes \$29K or less	.000	.852	.256	1.765	1.429
Respondent Makes \$75K or More	.127	1.284	.005	1.345	6.803**
Has Less Than College Degree	.291	.343	.499	.039	3.028^
Is Male	.196	1.095	1.155	.178	.116

*=.05, **=.01, ***=.001, ^=.09

In Table 3, the demographic variables are examined using t-tests. Six significant or marginally significant variables stood out. For example, being Appalachian correlated with different mean responses in models three, four, and five. Here, those identifying as Appalachians (when compared to those who did not) had a different mean agreement about insurance providing better access to healthcare ($p=.051-.09$), there being a suitable variety of physicians in Appalachia ($p=.01$), and being physically healthy ($p=.051-.09$). It is interesting that Appalachians are, on average, more readily self-rated as being physically healthy and were neutral that there are a suitable variety of physicians in Appalachia.

Table 3

Independent t-Tests of Demographic Variables and Perceptions of Health and Healthcare (=.05, **=.01, ***=.001, ^=.09)*

HEALTHCARE ACCESS AMONG CENTRAL APPALACHIA

	Model One: I feel that at least once I have not received adequate healthcare.	Model Two: I prefer to travel out of Appalachian regions to receive adequate healthcare.	Model Three: I feel that having healthcare insurance betters access to adequate healthcare.	Model Four: I feel there is a suitable variety of physicians in Appalachian regions.	Model Five: I feel that I am physically healthy overall.	Model Six: I feel that I am mentally healthy overall.
Is Appalachian Resident (equal variances assumed)						
Is Not (n=29)	Mean: 3.83	Mean: 3.76	Mean: 4.24	Mean: 2.10	Mean: 3.66	Mean: 4.03
Is (n=18)	Mean: 3.44 t: 1.005	Mean: 3.78 t: -.048	Mean: 4.67 t: -1.969^	Mean: 3.11 t: -2.722**	Mean: 4.22 t: -1.731^	Mean: 4.22 t: -.571
Respondent Makes \$29K or Less (equal variances assumed)						
Is Not (n=32)	Mean: 3.66	Mean: 3.78	Mean: 4.44	Mean: 2.56	Mean: 3.91	Mean: 4.16
Is (n=8)	Mean: 3.63 t: .059	Mean: 3.25 t: 1.012	Mean: 4.38 t: .231	Mean: 2.88 t: -.579	Mean: 4.25 t: -.825	Mean: 4.50 t: -.916
Respondent Makes \$75K or More (equal variances assumed on all models except Model Six)						
Is Not (n=28)	Mean: 3.96	Mean: 3.86	Mean: 4.46	Mean: 2.43	Mean: 4.07	Mean: 4.46
Is (n=12)	Mean: 2.92 t: 2.419*	Mean: 3.25 t: 1.338	Mean: 4.33 t: .557	Mean: 3.08 t: -1.421	Mean: 3.75 t: .885	Mean: 3.67 t: 2.106^
Has Less Than College Degree (equal variances assumed)						
Is Not (n=30)	Mean: 3.57	Mean: 3.70	Mean: 4.40	Mean: 2.60	Mean: 3.73	Mean: 3.87
Is (n=17)	Mean: 3.88 t: -.816	Mean: 3.88 t: -.456	Mean: 4.41 t: -.052	Mean: 2.29 t: .762	Mean: 4.12 t: -1.139	Mean: 4.53 t: -2.077*
Is Male (equal variances assumed)						
Is Not (n=18)	Mean: 3.44	Mean: 4.00	Mean: 4.44	Mean: 2.39	Mean: 3.78	Mean: 4.22
Is (n=29)	Mean: 3.83 t: -1.005	Mean: 3.62 t: .967	Mean: 4.38 t: .290	Mean: 2.55 t: -.408	Mean: 3.93 t: -.454	Mean: 4.03 t: .571

Table 3 also indicates that both income and education impact individual beliefs on perceptions of health and healthcare. First, respondents making \$75,000 or more per year had, on average, different mean responses than those who did not. Those making \$75,000 or more disagreed that they felt at least once they had not received adequate healthcare ($p=.05$), whereas those who did not fall in this income category were closer to agreement. Likewise, those making \$75,000 or more had different mean responses regarding mental healthcare, notably falling in the neutral category while those not in the income category strongly agreed with being mentally healthy. Second, education had a similar effect: those with college degrees had different mean responses to the mental health item. In general, those with college degrees strongly agreed they were mentally healthy, whereas those without college degrees did not.

Discussion

Although this study has a small convenience sample, it identifies interesting trends that more than likely represent the population. First, the findings confirm a relationship between adequate healthcare services and individuals who classify as having a lower income. This supports the extensive literature on the topic has found in this study. It also demonstrates an ongoing issue for Appalachia, particularly its high concentration of poverty in Central Appalachia. However, the finding in the current study is that the significant relationship links to having a higher income. Recall in Table 3 that persons making \$75,000 or more per year weekly disagreed with experiencing inadequate healthcare, whereas those not in the category were close to weak agreement. As such, even when income may or may not manifest itself in terms of access to care, it could certainly happen in terms of the quality of care.

The second surprising finding in Table 3 was the correlation between having \$75,000 or more in annual income and mental healthcare. Recall that those in lower income categories had a strong agreement that they were mentally healthy, whereas those with the highest income category were closer to neutral. Mental healthcare is an important element of healthcare overall, and those with more income (and ostensibly, therefore, better insurance) would plausibly have better access to mental healthcare, even as they self-report as having worse mental health.

Finally, being Appalachian certainly is an important consideration in healthcare, but the results in this study are somewhat counterintuitive. For example, again, Table 3 reported that Appalachians had higher significant or marginally significant means (and stronger agreement) that they believed

health insurance equated better access, that Appalachia had a suitable variety of physicians, and that they were physically healthy. One possible explanation here could tie back to social capital networks. Appalachian residents (particularly lifelong residents of the region) may have less sense of what medical care looks like in other areas. Likewise, they may think that the distribution of physicians in Appalachia is comparable to other areas. Conversely, it could also be that non-Appalachians are more aware of the differences in terms of healthcare by location, explaining the difference.

Conclusion

Three main questions were asked to study the relationship between poverty level and residing in Appalachian regions on healthcare and access to adequate healthcare. Using those questions, the author hypothesized that impoverished individuals will report having less access to adequate healthcare, individuals residing in Appalachian areas will report having less access to adequate healthcare, and that individuals residing in Appalachian areas will perceive themselves as not being physically or mentally healthy. After running t-tests, it was found that there was a statistically significant correlation between being impoverished and having healthcare services excluded from the hospital in their region and between Appalachian residents being deprived of access to adequate healthcare, while there was no significance between Appalachian residents and their physical or mental health state.

It would be useful for future studies to change the process of administering the surveys to an online process. Rather than distributing the surveys by hand, an online survey could be created and distributed to sustain complete anonymity and allow for easier access for participants. The creation of an online survey would also allow for a wider sample, increasing the number of participants. Finally, an online survey also allows for better recruitment of participants for the survey, thus leading to a greater diversity of potential participants.

More work is also needed in exploring the statistical relationships (or absence thereof) in my hypothesis testing. For example, it would be useful to add in additional controls and models to examine relationships via regression analysis. It would also be useful to establish specific healthcare variances between Appalachia (and other similar areas) and other outside regions. Additionally, analyzing the difference in the access to adequate healthcare impact on an individual's health status and its role in social organizations higher than the individual level could further this research.

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