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Ballad Health: Understanding Appalachia's Regional Healthcare Monopoly

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Ballad Health:

Understanding Appalachia's Regional Healthcare Monopoly

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by

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Jacob Watkins, Faculty Advisor

ABSTRACT:

The Ballad Health merger of 2018, which combined the now 21 hospitals in the region under one organization, has impacted the healthcare landscape in Northeast Tennessee and Southwest Virginia. Historically, Appalachia has had to persevere through primary physician shortages, a lack of specialty care, geographic obstacles to accessing healthcare, challenges related to substance abuse, and much more. Since the merger of Mountain States Health Alliance and Wellmont Health System, little research has been done to assess the perceived impact the aggregation of providers has had on the population it serves. This study utilizes an online survey to better understand the perceived changes in quality and delivery of healthcare provided by Ballad Health in the Tennessee counties of Greene, Washington, Sullivan, Unicoi, Hawkins, Carter, Hancock, and Johnson. After survey data was collected, researchers analyzed participant responses to try to quantify the impact on quality and delivery of healthcare services after the Ballad Merger. The 683 completed surveys showed an almost 2 point difference in overall quality between the two time periods, and a negative trend for every dependent variable that seeks to measure delivery. The data not only shows dissatisfaction with the quality and delivery of services offered by Ballad Health, but a clear negative impact on individuals' perception of healthcare in general

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INTRODUCTION: APPALACHIAN HEALTHCARE AND CHALLENGES

To many Americans, the Appalachian region is characterized by sprawling mountainous landscapes. However, the 26 million Americans who reside in this region experience the unique challenges that exist between each mountain and valley. Appalachia as a whole has historically been an underserved region by policymakers in Washington. This disregard has manifested itself in several ways, most notably shown through the current status of socioeconomic and healthcare disparities.

The healthcare landscape and socioeconomic status are closely intertwined. Individuals who have higher incomes are more likely to be more healthy, and this is increasingly true as people age[1]. Achieving a positive outcome on this gradient is difficult for rural Appalachian communities. In September 2022, it was reported that the median household income for rural Appalachians was $42,403[2], as compared to the 2021 national median of $70,784[3]. Within this framework, the wide gap in these figures lends itself to suggest the challenges of obtaining and maintaining quality health outcomes in rural Appalachia.

As a whole, the Appalachian region experiences several deviations from the norm of the national healthcare landscape. Access to primary care physicians is fundamental to accessing primary and necessary healthcare services. A 2017 Appalachian Regional Commission report notes that Appalachia's supply of primary care physicians per 100,000 individuals is 12 percent

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[1] Darcy Jones McMaughan, Oluyomi Oloruntoba, and Matthew Lee Smith, "Socioeconomic Status and Access to Healthcare: Interrelated Drivers for Healthy Aging," *Frontiers in Public Health* 8, no 231: (June 2020), doi:10.3389/fpubh.2020.0023.

[2] Kelvin Pollard and Linda A. Jacobsen, "Appalachia Data Report Identifies Economic Gains, Key Gaps Heading Into COVID 19 Pandemic," Population Reference Bureau, Accessed 2 April 2023, https://www.prb.org/resources/appalachia-data-report-identifies-economic-gains-key-gaps-heading-into-covid-pandemic/

[3] "Median Household Income," United States Census Bureau, Accessed 2 April 2023, https://www.census.gov/library/visualizations/2022/comm/median-household-income.html

lower than the national average[4]. Additionally, when this is examined by subregion, the numbers become even more dire– Central and Southern Appalachia sit at 33 and 21 percent lower than the national average, respectively[5]. The challenge of obtaining healthcare in rural Appalachia is also impacted by this obstacle. Compared to their urban counterparts, rural Appalachia's supply of primary care physicians "is 20 percent lower than the supply in the region's large metro counties."[6] When this challenge is coupled with the aforementioned rural median household income, it contextualizes the difficulties of simply assessing a general physician in parts of Appalachia. Travel to areas that have more healthcare options is costly in terms of time and money.

Furthermore, the Appalachian healthcare landscape struggles to provide specialty care and health outcomes that are on par with non-Appalachian counties. Specialty physicians are few and far between for most Appalachian residents, resulting in longer drive times for care. In practice, this means that residents must incur an increased cost for their time: longer drive time means more time taken off work and wages forgone. In its 2017 Health Disparities report, the Appalachian Regional Commission identified that the supply of specialty physicians was 28 percent lower than the national average and mental health providers rested at 35 percent below the benchmark.[7] This burden is disproportionately felt by Appalachia's rural residents, making simply accessing the care they need an obstacle that must be overcome.

The ARC's Health Disparities report identifies 41 key health indicators, of which Appalachia performs worse than the rest of the United States on 33 of them. Several risk factors

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[4] Julie L. Marshall, et al. "Health Care Systems," Appalachian Regional Commission, Accessed 2 April 2023, https://www.arc.gov/wp-content/uploads/2021/02/Health_Disparities_in_Appalachia_Health_Care_Systems_Domain.pdf
[5] "Health Disparities in Appalachia," Appalachian Regional Commission, Accessed April 6, 2023,https://www.arc.gov/report/health-disparities-in-appalachia/
[6] "Health Disparities," Appalachian Regional Commission
[7] "Health Disparities," Appalachian Regional Commission

for negative health outcomes are extremely prevalent throughout the region, including obesity, smoking, and physical inactivity.[8] These factors lead to a higher probability of mortality, which is evident through Appalachia's rankings on some of the US's leading causes of death. The report includes 7 of the 10 leading causes of death in America as of 2017, and Appalachian counties had higher mortality rates for all 7 of these than the rest of the nation (heart disease, cancer, chronic obstructive pulmonary disease (COPD), injury, stroke, diabetes, and suicide).[9] Appalachia's healthcare landscape is progressing, but it is not keeping pace with the rest of the nation. The statistics presented in the ARC report characterize the wide health gap between Appalachia and the rest of the United States. This evaluation provides context for the research question that has motivated this project and the importance of having quality healthcare options in Northeast Tennessee.

Over the past two decades, the Appalachian region has experienced the worst prescription pill epidemic in American history. In the early 21st Century, Appalachian communities were directly targeted by pharmaceutical sales representatives to create demand for their products. Appalachia is home to a lack of public health infrastructure, making it a prime target for aggressive marketing to physicians. This strategy was extremely successful. This success is characterized by the fact that the Department of Health and Human Services reported that in 2017, Appalachian counties posted a 72 percent higher opioid overdose rate than counties outside Appalachia.[10] Moreover, the consequences of this issue touch more than just the primary individual using the pills. The overall public health epidemic the issue creates, coupled with high

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[8] "Health Disparities," Appalachian Regional Commission
[9] "Health Disparities," Appalachian Regional Commission
[10] Office of Inspector General, "Opioids in Medicaid: Concerns About Opioid Use Among Beneficiaries in Six Appalachian States in 2018," US Department of Health and Human Services, Accessed 6 April 2023, https://oig.hhs.gov/oei/reports/OEI-05-19-00410.pdf

rates of poverty and lack of treatment in rural Appalachian communities, creates a far reaching, multifaceted epidemic within Appalachia.

After years of sustained effort to combat the Opioid Epidemic, the prescription of the physical pain pills have subsided only to reveal new challenges. Local communities are seeing a resurgence in methamphetamine and fentanyl is flooding the market. Synthetic opioids like fentanyl began to rise in 2013.[11] Fentanyl is 50 to 100 times more potent than morphine[12], and its contents are extremely more concentrated than traditionally prescribed opioid painkillers. This highly addictive substance is Appalachia's newest public health challenge that is threatening health and law enforcement institutions across rural Appalachia. Ultimately, this threat to the stability of public health and the presented existing health challenges exemplify how crucial healthcare availability, quality, and options are in the Appalachian region.

INTRODUCTION: BALLAD HEALTH

The Ballad Health System serves rural Appalachian counties in Northeast Tennessee, Southwest Virginia, Northwest North Carolina, and Southeast Kentucky. The organization operates 21 hospitals in Northeast Tennessee and Southwest Virginia and 13 urgent care clinics. Ballad Health was formed in a 2018 merger between two competing healthcare systems: Mountain States Health Alliance and Wellmont Health Systems. The merger was initiated in 2014 when Wellmont Health Systems CEO began looking for a partner, citing that the search was financially motivated due to downstream challenges such as "significant reimbursement cuts that continue to come and...the penalties that will also continue to increase, year over year, for

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[11] "Understanding the Opioid Overdose Epidemic," Centers for Disease Control and Prevention, Accessed April 6, 2023, https://www.cdc.gov/opioids/basics/epidemic.html
[12] "Fentanyl Drug Facts," National Institutes of Health, Accessed April 6, 2023, https://nida.nih.gov/publications/drugfacts/fentanyl

failure to meet certain standards."[13] Furthermore, the argument presented by system executives

was that "the business model for operating a hospital in the Tri-Cities was failing,"[14] resulting in

fear of diminished quality at a higher cost for services. This threat alone placed immense

pressure on the already delicate healthcare that existed.

Wellmont Health Systems and Mountain States Health Alliance were the only full service

systems in Northeast Tennessee and Southwest Virginia before 2018. By definition, when the

two systems filed their letter of intent in September 2015, red flags went up to draw attention to

the fact that a merged system would create a near total monopoly. The Federal Trade

Commission was aware of the proposed merger and initiated its own investigation into the

process. For two hospital systems to bypass federal antitrust legislation, the merger must be

granted a Certificate of Public Advantage (COPA) by the state. At its most basic level, a COPA

in the state of Tennessee is "the written approval by the Tennessee Department of Health (TDH)

that governs a Cooperative Agreement (a merger) among two or more hospitals."[15] A COPA is

granted if the Tennessee Department of Health determines that the proposed benefits of the

merger will outweigh the ensuing disadvantages or consequences that would result from a loss in

competition. The Federal Trade Commission determined from its investigation that if the

proposed merger were to go through, "the transaction would substantially lessen competition in

relevant healthcare markets and that the benefits claimed…would not exceed the likely harm to

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[13] Zach Vance, "Ballad of Ballad Health: What 'unique factors' led to this conglomerate?" *Johnson City Press,* February 2, 2018, https://www.johnsoncitypress.com/ballad-of-ballad-health-what-unique-factors-led-to-this-conglomerate/article_90f d464c-9379-5dda-af1a-7288190ae113.html

[14] Vance, "Ballad of Ballad Health"

[15] "Certificate of Public Advantage (COPA)," Tennessee Department of Health, accessed 4 April 2023, https://www.tn.gov/health/health-program-areas/health-planning/certificate-of-public-advantage.html

competition."[16] This decision was supported by economic research that substantially reduced competition effectively results in increased prices for a diminished quality of care.[17]

It should also be noted that the COPA granted for the Ballad Health merger is unique. In order for this merger to happen, a COPA had to be granted by both the state of Tennessee and the state of Virginia. Ballad Health cites the recent trend in rural hospital closures in support of the merger[18]. Subsequently, Ballad Health reported that the merger would generate savings that could be reinvested into the region, and created binding agreements with the states of Tennessee and Virginia that promise to keep the hospitals in Ballad's region open.[19] This agreement is crucial to the wellbeing of the region, as Ballad Health hospitals serve over one million people.

After the completion of the merger in 2018, Ballad has initiated several changes to the local healthcare landscape. In the interest of cost effectiveness, Ballad Health consolidated all Level 1 Trauma services at Johnson City Medical Center in Johnson City, Tennessee. Holston Valley Medical Center in Kingsport, Tennessee was downgraded from a Level 1 Trauma Center to a Level 3 Trauma Center and their NICU was downgraded from a Level 3 (highest) to a Level 1. Bristol Regional Medical Center was downgraded from a Level 2 Trauma Center to a Level 3. Ballad Health CEO noted in 2019 that the changes were made in the interest of achieving the best possible healthcare outcomes for the region, stating that "'you don't want a trauma center on every corner and you don't want a NICU on every corner because it dilutes volume and hurts quality.'"[20] Additionally, Ballad Health merged two existing hospitals in Greeneville, Tennessee

[16] Shoshana Speiser, "Tennessee Approves Ballad Health COPA over FTC Protests," *JD Supra,* October 25, 2017, https://www.jdsupra.com/legalnews/tennessee-approves-ballad-health-copa-42927/
[17] Speiser, "COPA over FTC Protests"
[18] "COPA," Ballad Health, accessed 4 April 2023, https://www.balladhealth.org/copa
[19] Ballad Health, "COPA"
[20] Anita Wadhwani, "Medical monopoly: An unusual hospital merger in rural Appalachia leaves residents with few options," *The Tennessean,* June 23, 2019, https://www.tennessean.com/story/news/health/2019/06/23/ballad-health-merger-rural-hospital-closures/134260800 1/

to allow for further investment and concentrated health expertise in Greeneville.[21] In Virginia, Emergency Room services were eliminated at Mountain View Regional Hospital in Norton, Virginia on January 5, 2020 to better sustain emergency services at other nearby hospitals.[22] In total, Ballad Health operates 271 healthcare facilities (hospitals, urgent care, and physician practices) across 17 counties in 3 states. A map of the 21 hospital locations is shown in Figure 1.
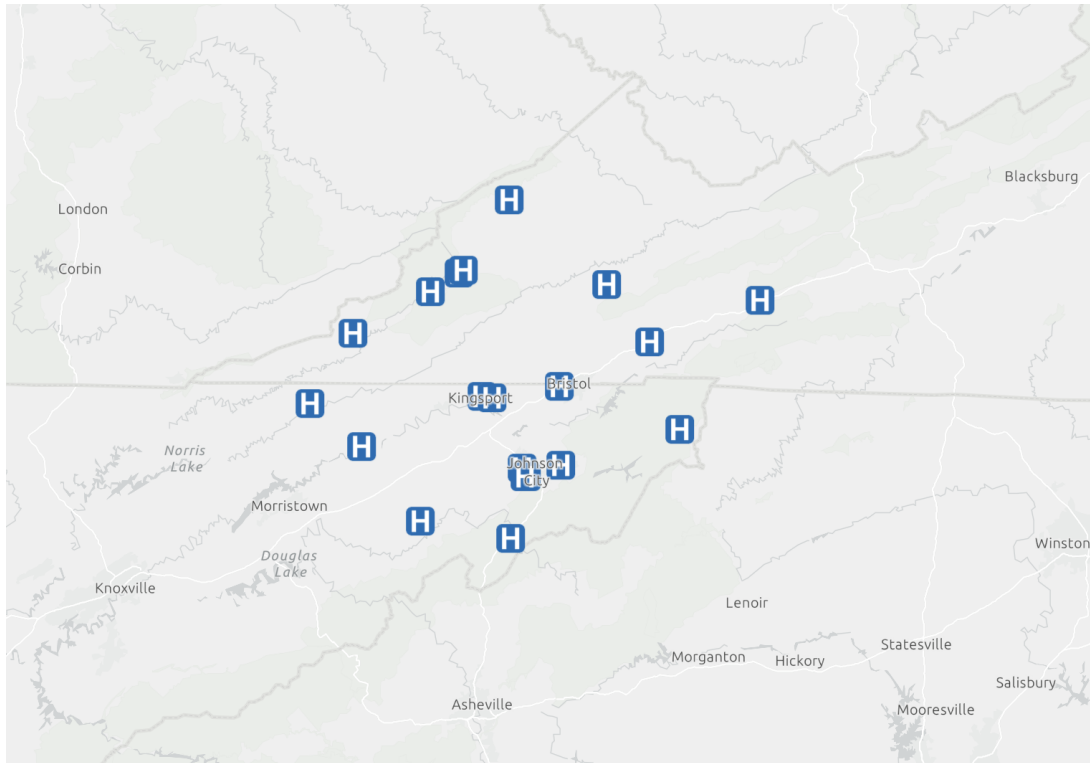

Figure 1. Map of all Ballad Health hospitals

RESEARCH QUESTIONS

Given the status of Appalachian healthcare and the background of the Ballad Health merger, this research project seeks to answer the question of how the Ballad Health merger has

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[21] "Greeneville Community Hospital," Ballad Health, Accessed 4 April 2023, https://www.balladhealth.org/locations/hospitals/greeneville-community

[22] John Engel, "Ballad Health ending emergency services at Mountain View Regional Hospital Jan. 5," *WCYB,* December 30, 2019, https://wcyb.com/news/local/ballad-health-ending-emergency-services-at-mountain-view-regional-hospital-jan-5

changed the perception of quality and delivery of healthcare in the Tennessee counties of Greene, Washington, Sullivan, Unicoi, Hawkins, Carter, Hancock, and Johnson. These 8 Northeast Tennessee counties are within the Ballad coverage area and are situated within the subregions of Central and South Central Appalachia. Based on the available research on topics surrounding this question, this project seeks to explore the following set of questions: 1) how has the aggregation of providers affected quality and delivery of care and 2) will this aggregation negatively impact individuals perception on healthcare as a whole? Variables under consideration include the independent variable, the Ballad Health merger of 2018, and the dependent variables, changes in quality, delivery, and perception of healthcare. The study utilized an individual unit of analysis via an individual survey of the study population.

METHODS

Primary data was collected through an online Qualtrics survey. The survey link and informed consent were shared on the researcher's personal Facebook page, posted in community Facebook groups of the survey population, and shared on personal Facebook pages by users who chose to do so independently. Using Facebook as a distribution tool allowed for the greatest coverage and access to the intended survey population.

Survey questions were broken down into five primary sections: Introduction, Healthcare Baseline, Interaction with Mountain States Health Alliance (MSHA) and Wellmont Health Systems (WHS), Interaction with Ballad Health System, and Open Ended Response. The survey was structured so that participants would encounter filter questions at the beginning of the survey to ensure they are a part of the survey population. Participants then transitioned to baseline questions which sought to establish healthcare demographics and generalized healthcare choice

information. The body of the survey was subdivided into two sections to allow for a comparison of the pre and post merger rankings. Participants were first asked to rank MSHA and WHS from 1-7 throughout a series of questions asking about the quality, cost, delivery, and trust in the care they received. Respondents were then asked the rank Ballad Health from 1-7 for the same set of questions. On the scale, a ranking of "1" was the worst and a ranking of "7" was the best. The last section of the survey allowed participants to leave open-ended comments regarding information presented in the survey, Ballad Health, or healthcare in Northeast Tennessee.

RESULTS

Responses were included in the sample if participants completed the survey in full. The sample (n=683) comprised of 7 out of the 8 desired counties. There were no responses from Hancock County. The distribution of respondents is shown below in Figure 2.
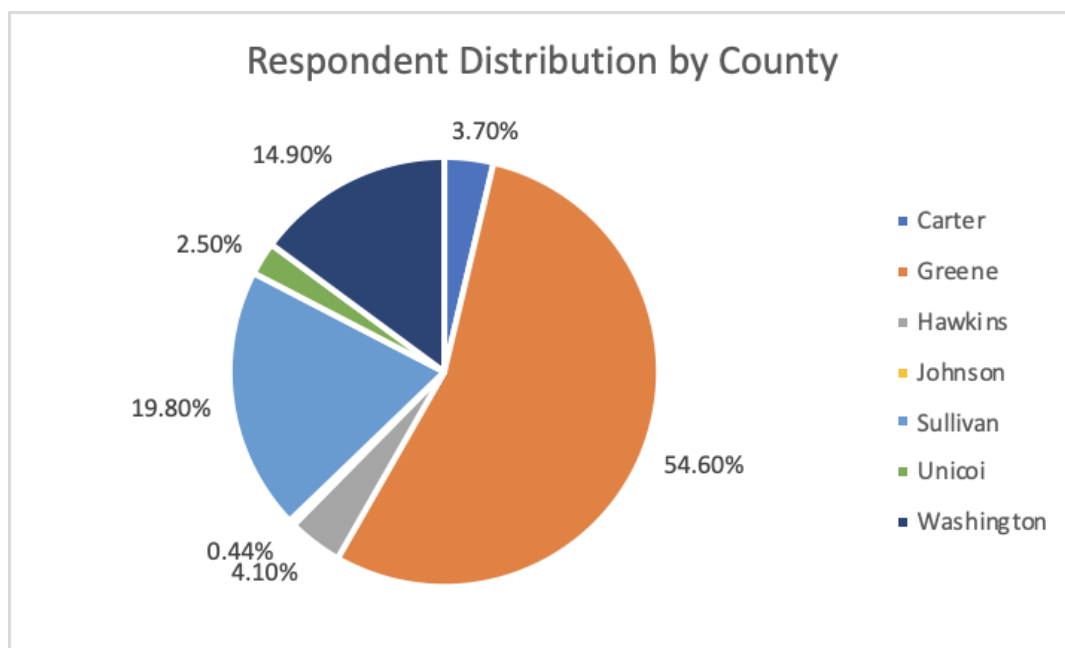

Figure 2. County distribution of survey respondents

Figure 3 shows the age distribution of survey respondents. The modal category was ages 40-64.
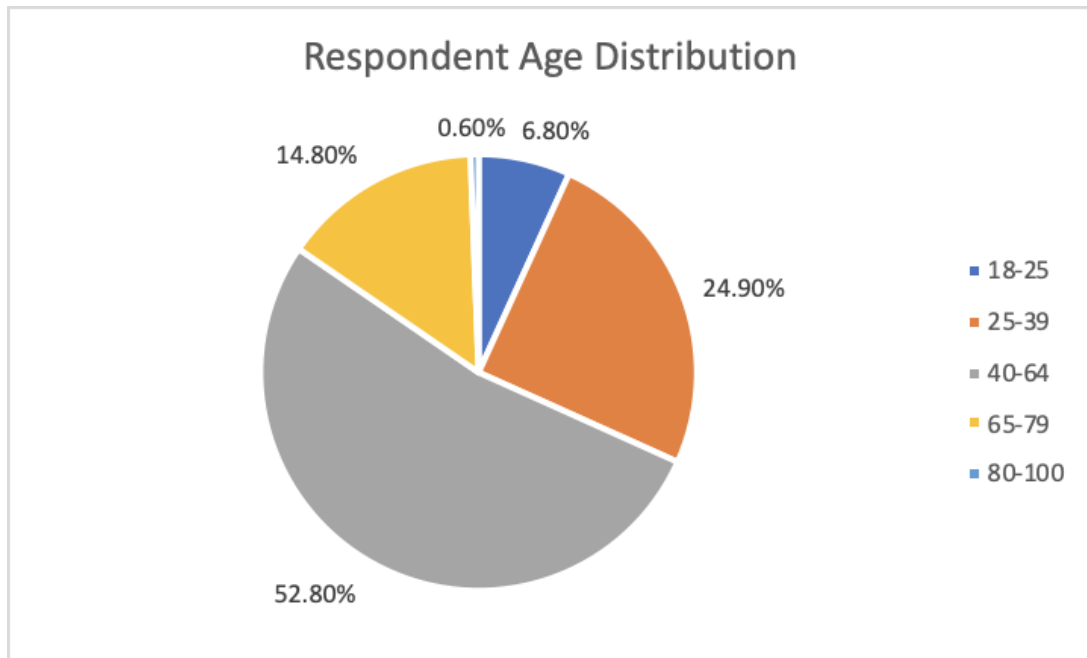

Figure 3. Age distribution

79% of the respondents have private insurance (n=543), 14% subscribe to a form of public health insurance such as Medicaid or TennCare (n=94), and 7% of respondents did not know their insurance type or had another option (n=51).

Healthcare baseline questions also established a basis for respondent's positions on healthcare expense, choice, trust, and general accessibility in Northeast Tennessee. Figure 4 shows the distribution of how often respondents seek healthcare services. The histogram is left skewed, meaning that most of the sample utilize healthcare services either Monthly, Quarterly, or Annually. Almost 50% of respondents report utilizing health services Quarterly.
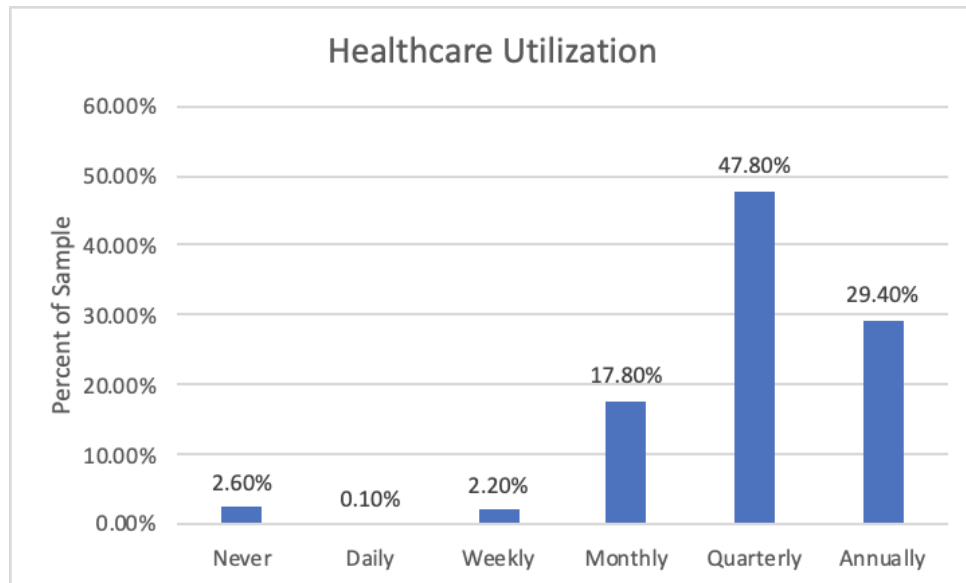
Figure 4. Frequency of healthcare utilization

Over 50% of respondents reported that the expense of a healthcare visit "Always" or "Occasionally" affects their decision to seek out services. Figure 5 shows the bimodal distribution of this answer, with answers trending towards "Always, Very Frequently, and Occasionally," rather than the "Rarely" side of the graph.
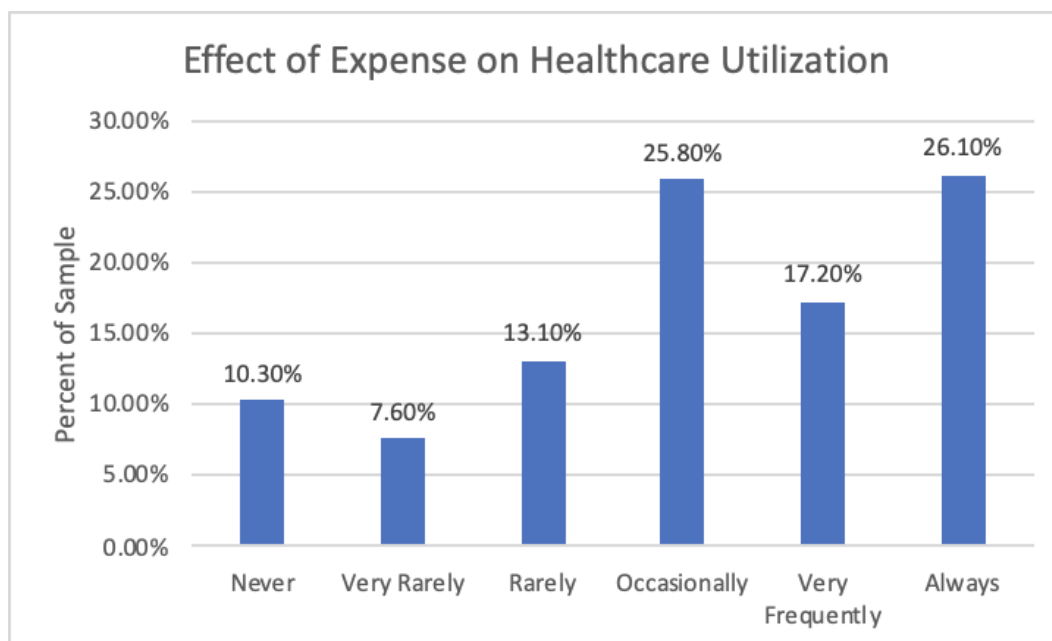

Figure 5. Expense effect on decision to seek out healthcare

Additionally, a baseline was established for respondents' preferred method of care. Figure 6 represents the distribution of respondents, with the most popular options being privately owned clinics (49.7%) and urgent care facilities (26.8%).
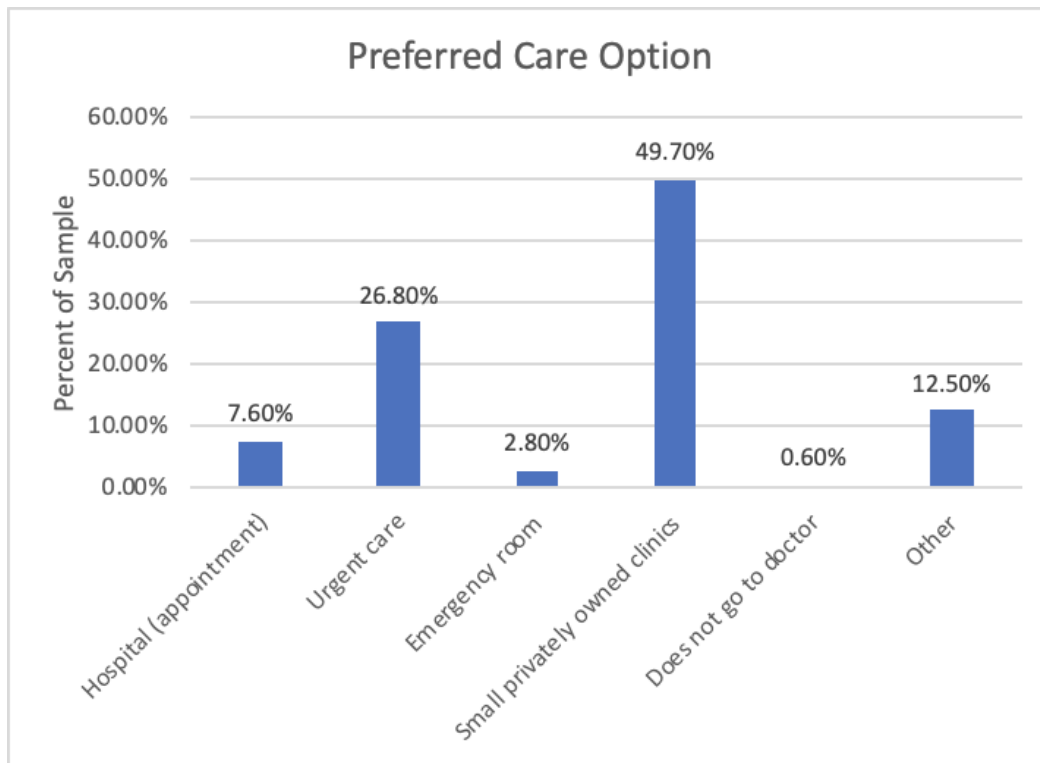

Figure 6. Preferred care option of respondents

Respondents were asked to rank their overall trust in medical professionals in the United States. Like in other sections, a 1-7 scale was provided with 1 being the worst and 7 being the best. Figure 7 shows the distribution of response counts for each answer choice. The average trust reported in US medical professionals was 4.11.
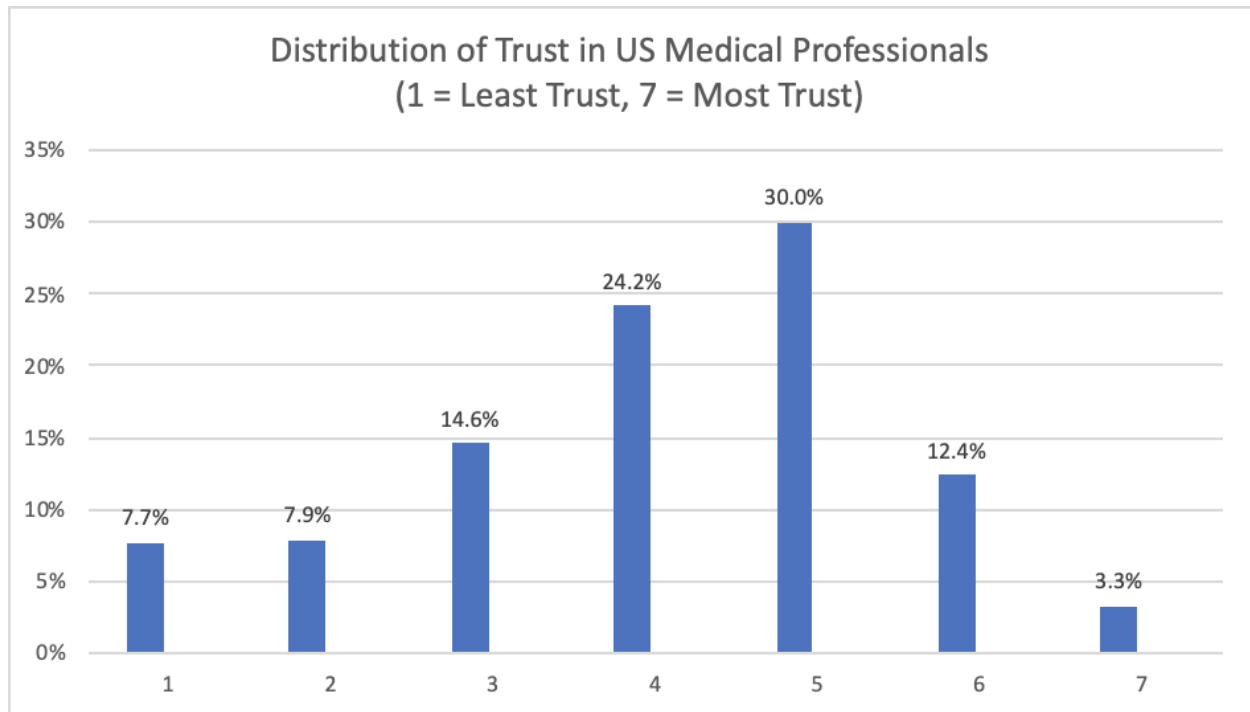
Figure 7. Overall trust in US medical professionals

The baseline section concluded with an inquiry into respondents' description of the level of difficulty of receiving healthcare services in Northeast Tennessee. Over 66% of respondents ranked the level of difficulty at "Somewhat difficult," "Difficult," or "Very difficult." A visual distribution of responses is shown below in Figure 8.
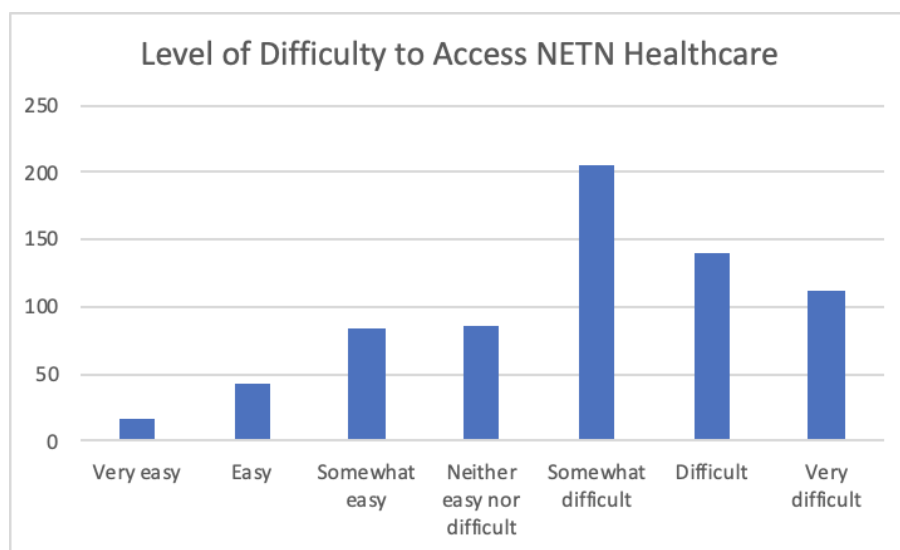
The body of the survey sought to compare pre and post merger experiences. Each question asked

respondents to rate the variable on a scale of 1 to 7. Respondents ranked the "confidence in

knowledge and training" of healthcare providers at Mountain States Health Alliance and

Wellmont Health Systems an average of 4.91 and providers at Ballad Health an average of 3.48.

The distributions are shown in Figure 9.

Figure 9. Distribution of knowledge and training variable

Respondents ranked medical professionals at Mountain States Health Alliance and Wellmont

Health Systems "responsiveness to needs" an average of 4.87 and professionals at Ballad Health

an average of 3.31. The distributions are shown in Figure 10.

Figure 10. Distribution of responsiveness variable

Respondents ranked efficiency (i.e. wait time) at Mountain States Health Alliance and Wellmont Health Systems an average of 4.40 and efficiency at Ballad Health an average of 2.74. The distributions are shown in Figure 11.
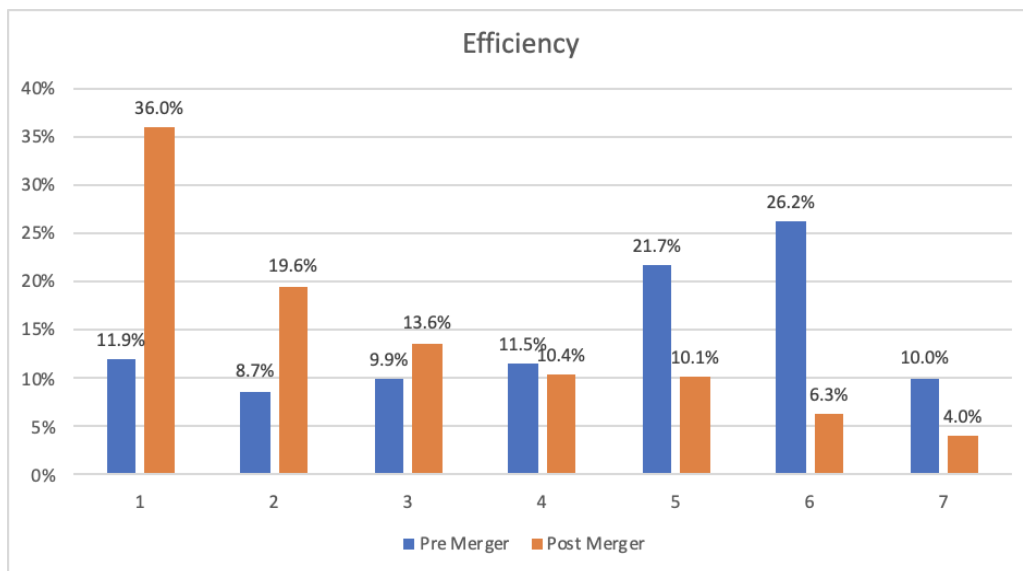
Figure 11. Distribution of efficiency variable

Respondents ranked effectiveness of care Mountain States Health Alliance and Wellmont Health Systems an average of 4.80 and effectiveness at Ballad Health an average of 3.25. The distributions are shown in Figure 12.
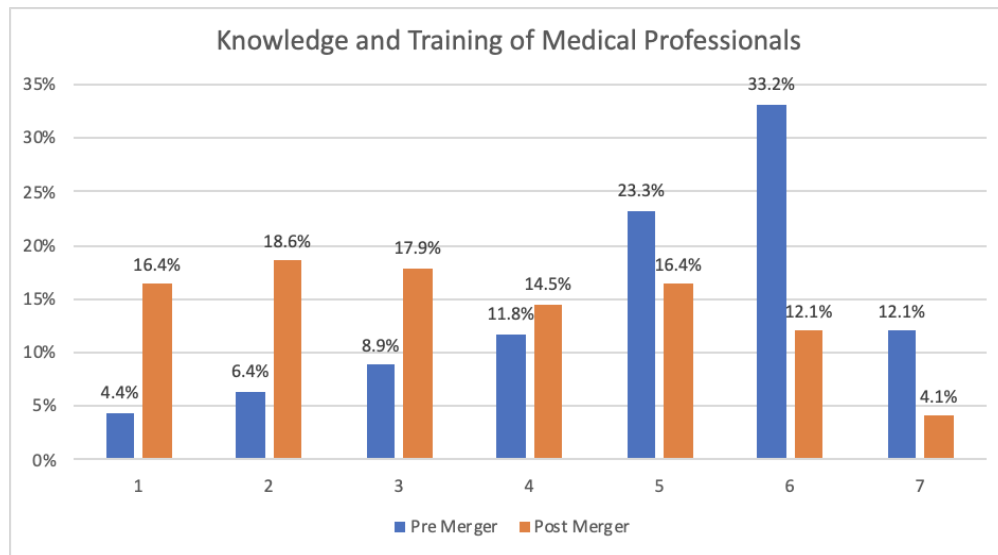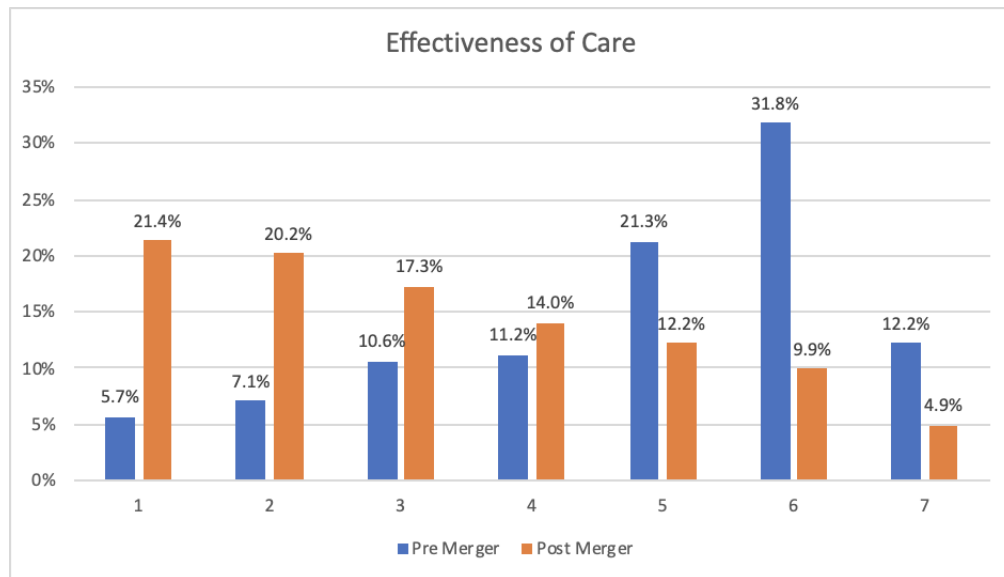

Figure 12. Distribution of effectiveness variable

Respondents ranked their "trust in medical professionals" at Mountain States Health Alliance and Wellmont Health Systems an average of 4.82 and trust in professionals at Ballad Health an average of 3.30. The distributions are shown in Figure 13.
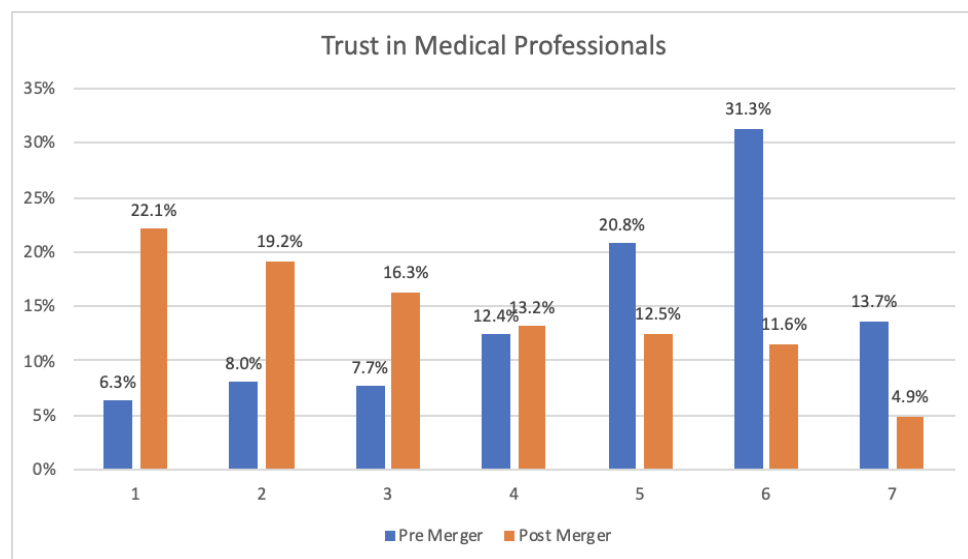
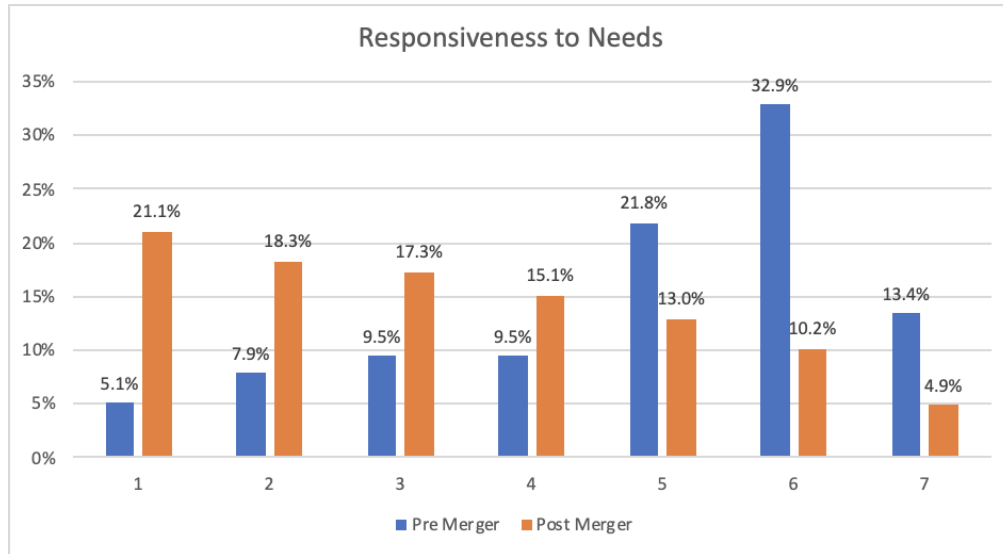Respondents ranked the availability of healthcare services at Mountain States Health Alliance and Wellmont Health Systems an average of 4.75 and availability of services at Ballad Health an average of 3.05. The distributions are shown in Figure 14.
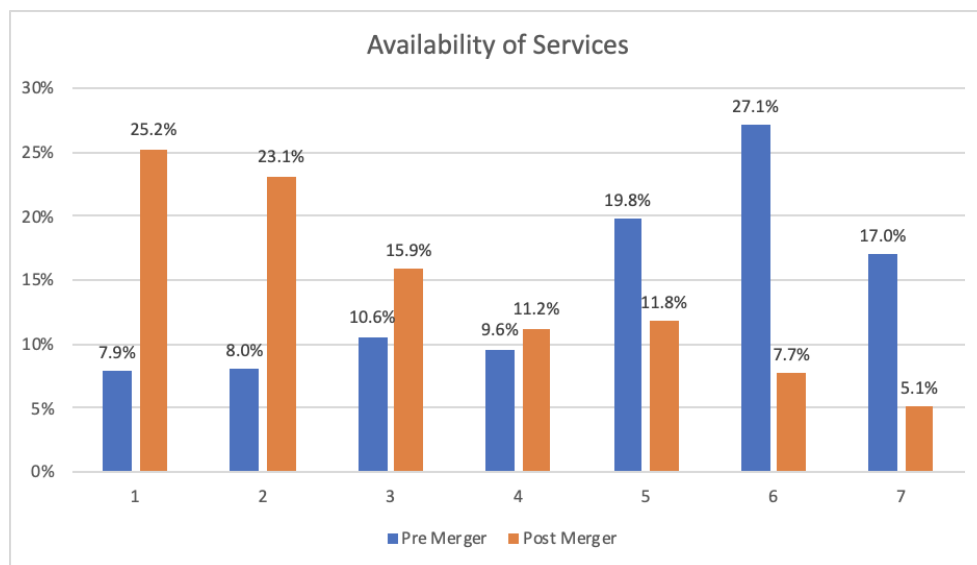
Figure 14. Distribution of availability variable

Respondents ranked the overall quality of their experience Mountain States Health Alliance and Wellmont Health Systems an average of 4.65 and overall quality at Ballad Health an average of 2.66. The distributions are shown in Figure 15.
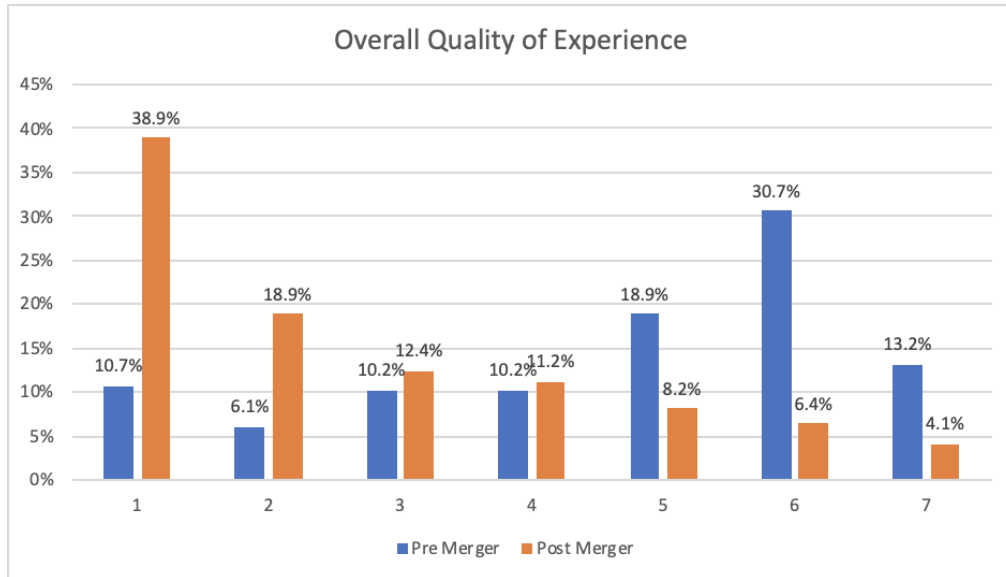
Figure 15. Distribution of overall quality variable

Finally, respondents were asked to report their experience with the cost of services. As shown in Figure 16, participants leaned toward "Average" and "Expensive" for services from Mountain States Health Alliance or Wellmont Health Systems. Respondents leaned toward "Expensive" and "Very expensive" for services from Ballad Health.

Figure 16. Distribution of affordability variable

There were 406 qualitative comments left in the open ended portion of the survey.

DATA ANALYSIS

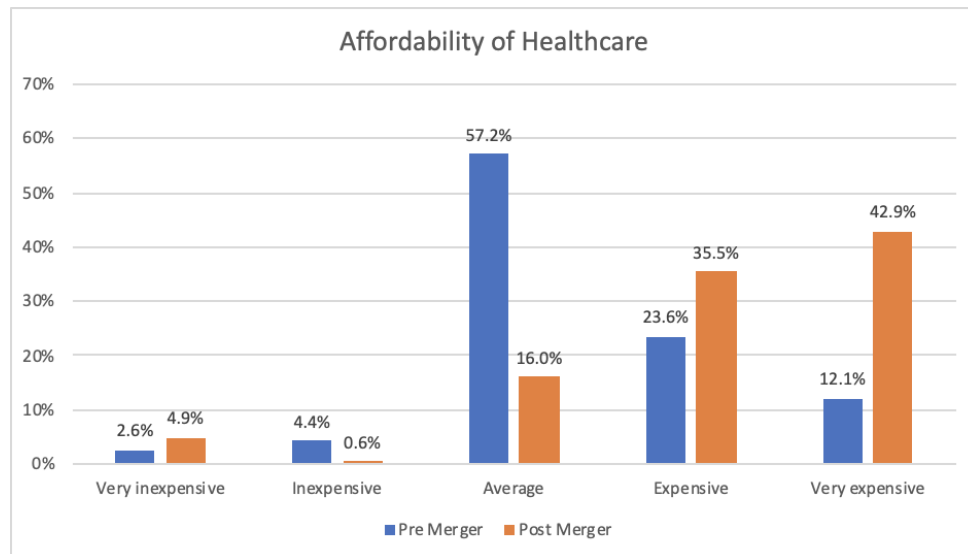|	block1responsiveness_output	block2responsiveness_output	block1cost_output	block2cost_output	block1training_output	block2training_output
timelived_binary	0.401	-0.720*	-0.204	0.303	0.460	-0.351
	(0.333)	(0.259)	(0.190)	(0.169)	(0.326)	(0.250)
age	0.144	0.182*	0.034	-0.076	0.078	0.136
	(0.075)	(0.074)	(0.042)	(0.047)	(0.074)	(0.071)
2.insurancetype	-0.450*	0.113	-0.122	-0.229*	-0.283	0.108
	(0.177)	(0.173)	(0.099)	(0.112)	(0.174)	(0.166)
3.insurancetype	0.196	0.077	-0.193	-0.195	0.127	0.071
	(0.243)	(0.237)	(0.136)	(0.154)	(0.239)	(0.229)
4.insurancetype	-0.732	0.958	-0.211	-0.123	-0.954	-0.073
	(0.674)	(0.664)	(0.376)	(0.427)	(0.661)	(0.640)
healthcareutilization	0.012	-0.000	-0.020	-0.086	-0.049	0.054
	(0.073)	(0.071)	(0.041)	(0.046)	(0.072)	(0.069)
expenseofcare	-0.081*	-0.041	0.055*	0.080*	-0.011	-0.018
	(0.040)	(0.038)	(0.022)	(0.025)	(0.039)	(0.037)
UStrustrate	0.422*	0.334*	-0.040	0.012	0.377*	0.396*
	(0.042)	(0.041)	(0.024)	(0.027)	(0.042)	(0.040)
NETNhealth	-0.136*	-0.491*	0.048*	0.200*	-0.118*	-0.459*
	(0.042)	(0.041)	(0.024)	(0.026)	(0.041)	(0.039)
Constant	3.354*	4.668*	3.263*	2.951*	3.497*	3.959*
	(0.527)	(0.476)	(0.297)	(0.310)	(0.517)	(0.459)
r2	0.235	0.367	0.040	0.146	0.183	0.382
N	652.000	672.000	650.000	671.000	652.000	673.000

* $p<0.05$

	block1waittime_output	block2waittime_output	block1effectiveness_output	block2effectiveness_output	block1trust_output	block2trust_output	block1availability_output	block2availability_output
timelived_binary	0.257	-1.026*	0.349	-0.720*	0.310	-0.571*	0.346	-0.483
	(0.389)	(0.267)	(0.338)	(0.253)	(0.341)	(0.257)	(0.372)	(0.253)
age	0.172	0.119	0.099	0.167*	0.061	0.072	0.075	0.022
	(0.088)	(0.074)	(0.077)	(0.072)	(0.077)	(0.073)	(0.084)	(0.072)
2.insurancetype	-0.352	0.180	-0.279	0.100	-0.282	0.140	-0.401*	0.103
	(0.207)	(0.172)	(0.180)	(0.169)	(0.182)	(0.171)	(0.198)	(0.168)
3.insurancetype	0.629*	0.361	0.405	0.088	0.518*	0.127	0.524	0.162
	(0.284)	(0.237)	(0.248)	(0.232)	(0.250)	(0.237)	(0.275)	(0.234)
4.insurancetype	-0.641	1.520*	-0.640	0.387	-0.908	-0.172	-0.992	-0.092
	(0.788)	(0.663)	(0.686)	(0.648)	(0.692)	(0.656)	(0.754)	(0.647)
healthcareutilization	0.119	0.138	0.013	-0.010	0.011	0.034	-0.013	0.027
	(0.085)	(0.071)	(0.074)	(0.069)	(0.075)	(0.070)	(0.082)	(0.069)
expenseofcare	-0.074	-0.044	-0.070	-0.043	-0.083*	-0.032	-0.046	-0.063
	(0.046)	(0.038)	(0.040)	(0.037)	(0.041)	(0.038)	(0.044)	(0.037)
UStrustrate	0.347*	0.193*	0.392*	0.351*	0.454*	0.453*	0.361*	0.218*
	(0.050)	(0.041)	(0.043)	(0.040)	(0.043)	(0.041)	(0.047)	(0.040)
NETNhealth	-0.142*	-0.571*	-0.152*	-0.496*	-0.128*	-0.457*	-0.242*	-0.598*
	(0.049)	(0.041)	(0.043)	(0.040)	(0.043)	(0.040)	(0.047)	(0.040)
Constant	2.925*	5.131*	3.591*	4.654*	3.421*	4.023*	4.156*	5.621*
	(0.616)	(0.479)	(0.537)	(0.465)	(0.542)	(0.471)	(0.590)	(0.465)
r2	0.151	0.361	0.208	0.390	0.234	0.401	0.198	0.389
N	652.000	669.000	651.000	672.000	653.000	672.000	652.000	672.000

* $p<0.05$

The above output represents a regression analysis performed on the dependent variables before the Ballad Health merger and after the merger. The analysis distinguishes between residents who have lived in Northeast Tennessee for less than 5 years and more than 5 years (timelived_binary). Additionally, the variable insurance type has also been isolated to better understand the impact having public or private insurance has on the dependent variables. This analysis produced several notable relationships between variables.

Overall, the underlying difference between the data for responsiveness in the Pre Merger vs. Post Merger that explains there is a large difference in between the two periods. Respondents reported a 1.56 point higher ranking for responsiveness on average for the Pre Merger period. However, the above regression shows the relative effect that different variables in the dataset have on each other. In terms of responsiveness of medical professionals, the data shows that before the merger there is no difference between new arrivals (>5 yrs residency) and longer term residents, but that after the merger individuals who have lived in the region longer are more likely to rate the responsiveness of Ballad Health professionals lower. This result was statistically significant. The data shows that individuals with public insurance ranked the Post Merger Ballad Health as having more responsive medical professionals, while individuals with private insurance ranked responsiveness better in the Pre Merger period. The data shows a relationship between the ranking of Northeast Tennessee healthcare (NETNhealth) access and responsiveness for both time periods. Ultimately, the easier a respondent believes it is to access healthcare in NETN, the higher they rated responsiveness of medical providers. This relationship is especially true of the post merger period. In the Pre Merger period, there is a statistically significant relationship that exists between expenseofcare and responsiveness. The less often the cost of a healthcare visit affects an individual's decision to receive medical care, they ranked their medical

care as more responsive to their needs (higher on the scale) in the Pre Merger period. There was no difference Post Merger.

While individuals with public insurance found the Ballad system to be more responsive to their needs, the data shows a parallel relationship with cost. The overall results show that survey respondents find the Ballad system to be more expensive as a whole, but respondents who have public insurance tend to find the Ballad system to be less expensive relative to those with private insurance. This result was statistically significant. Additionally, the relationship between accessibility of Northeast Tennessee healthcare and cost of services is no different between the two time periods: the more difficult respondents report healthcare access to be, the more costly they perceive services to be.

The relationship between training and the constant variables was also consistent between both time periods, showing no real differences. There is a positive relationship between trust of US medical professionals and perceived training of medical professionals Pre and Post Merger. Additionally, the relationship between access to NETN health and training both before and after the merger shows no difference. The relative effect suggests that as individuals believe access to healthcare in NETN is easier, training of medical professionals will be ranked higher.

The general trend of the effectiveness variable, which seeks to measure things like wait time, is negative Post Merger with a right skewed distribution. When examined relative to other variables, the data shows no difference between individuals who have lived in the area >5 years and long term residents before the merger, but shows a major difference after the merger. Individuals who have lived in the region more than 5 years are very likely to rank the effectiveness/wait time of Ballad Health lower. This is a significant finding, as individuals who took the survey who have lived in the area less than 5 years would have nothing to compare the

Pre Merger effectiveness to. The longer respondents have lived in the area, the worse respondents ranked the effectiveness of Ballad Health.

The underlying difference between the trust in medical professionals in the Pre Merger and Post Merger periods is that the trust in professionals before the merger trends positively, while after the merger it trends negatively. For this variable, there is a significant difference present between short term and long term residents. There was no difference between short term and long term residents in the Pre Merger subset, but after the merger, long term residents show a negative relationship with trust. In short, the longer someone has lived in Northeast Tennessee, the less trust they have in the medical professionals they see at Ballad Health facilities.

Finally, like the other dependent variables, the overall trend for availability of services before the merger is positive, and the trend after the merger is negative. The analysis of the data allows for greater exploration of the relative effects of different variables, and insurance type most affected a respondents relationship to service availability. Individuals with private insurance tended to rank service availability higher in the Pre Merger period, while individuals with public insurance preferred the Ballad Health system. This observation, along with the data from the response variable, suggests that individuals with public insurance have a more positive perception of Ballad Health, its services, and its delivery.

DISCUSSION

The focus of this project is to understand how the Ballad Health merger has affected the perception of quality and delivery of healthcare in Northeast Tennessee. The knowledge and training, effectiveness, trust in medical professionals, and overall quality of experience variables sought to quantify the changes in quality of care. From the raw data, it is very clear that the

survey population believes there has been a significant decrease in quality of care following the Ballad Merger. Every dependent variable trends negatively after the merger in 2018– the effectiveness of care and trust in professionals variable see a difference of 1.5 points between their averages. The overall quality of experience, however, experienced the most stark difference between their average scores at almost 2 points. The conglomeration of all the variables in the survey had a significant impact on the overall quality of an individual's experience, and this is represented by the steep negative trend in the response distribution.

Because Ballad Health is effectively a medical monopoly, having good healthcare quality is essential. Residents do not have additional inpatient health options unless they travel outside the Ballad Health region. Additionally, quality was a primary concern of the Federal Trade Commission prior to the merger, who found in their own investigation that the merger would cause competitive harm and result in diminished quality. [23] The data presented in this survey supports the FTC's stance on quality, as every dependent variable that seeks to measure quality has a clear negative trend.

Respondents elaborated on the merger's effect on quality in the qualitative response section of the survey. Individual's concerns mirror those of the FTC, citing that prices are going up and quality is going down due to the lack of systems to compete with and the fact there is "...no competition in physician recruiting, nurse recruiting, etc. so when adequate compensatory contracts are not offered, we are dredging the bottom of the barrel in terms of physician recruitment and employment." This statement brings light to secondary concerns regarding the quality of experience that patients are having: recruitment of professionals. Citizens expecting "bottom of the barrel" employees is a major concern for long term trends in quality of care. If the community cannot invest in the system and expect a certain quality level of care, that system's

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[23] Speiser, "COPA over FTC Protests"

operational capacity is endangered. This is extremely dangerous for the region Ballad Health

serves, as the Appalachian region as a whole lacks access to basic services and primary care

physicians as compared to other areas of the United States. Gutting services means that residents

truly have no other place to turn.

The culture of diminished quality extends beyond community members. The survey was

intentionally constructed as anonymous so the opinions of Ballad employees and medical

professionals could be captured. Primary concerns at the intersection of quality and recruitment

are cost of services and employee pay. This was repeatedly mentioned by the survey population,

as it is detailed by this respondent:

> As a medical professional myself, I feel compelled to speak out against threats to my
> community and colleagues. Ballad Health has the unfortunate distinction of being both.
> The quality of care offered to residents in this area is not only extremely limited and poor
> quality, it is also prohibitively expensive. Ballad chooses to pay healthcare workers in our
> region significantly less than their counterparts employed outside our region, which
> drives their low staffing crisis and increases patient wait times, as well as preventing
> qualified, competent specialists from offering services in our area. The limited services
> that are offered are billed at rates substantially higher than other healthcare systems with
> no clarity or explanations offered to patients about these billing practices. Unfortunately,
> for many residents in the Tri Cities, it is both cheaper and faster to travel to Knoxville or
> Asheville for care. Sadly, for our most vulnerable residents, this is not an option.

If professionals feel that Ballad is not offering competitive contracts, there is little to no

incentive for quality, non local professionals to relocate and serve the Ballad Health system when

they can be paid higher rates elsewhere. Additionally, recruitment has a major bearing on the

staffing strain within hospitals. Less nurses and staff results in increased wait time for residents.

This affects the overall quality of care and diversity of services the system is equipped to

provide.

Parallel with FTC concerns, diminished care being offered at a "prohibitively expensive"

price is a dangerous intersection. This was measured in the survey by the effect of expense on

healthcare utilization, in which over 65% of respondents reported that the expense of a healthcare visit "Always, Very frequently, or Occasionally" affects their decision to see a medical professional. Cost being a major barrier to care contradicts the mission of healthcare to improve the wellbeing of a community. If people cannot access the care in the first place, they will forgo attention from medical professionals and measurements of community health will continue to be stagnant.

Residents in the Ballad region have no other options for inpatient hospital services, and many cite a frustration with diminished care at high costs. To circumvent this system, many respondents cite traveling extensive distances for care outside the Ballad region. Most commonly, individuals cited traveling to Asheville, North Carolina or to the University of Tennessee Medical Center in Knoxville, Tennessee to receive care. This is an option for those who do not want to utilize the Ballad Health system; however, this is only true for those in which cost is not a barrier. Accessible care is affordable care, and for those who cannot afford to travel outside the Ballad system or afford services within the Ballad system, care is not accessible. The average median household income for the 8 surveyed counties in 2020 was $45,461,[24] and the state of Tennessee reported a median household income of $58,516 in 2021.[25] The income disparity present in Northeast Tennessee restricts its most vulnerable residents from traveling to receive services outside the Ballad region. Traveling to receive care is a privilege and for many residents this privilege is not an option. The only available choice is the system that exists, and if that system is not offering an adequate level of care, then residents are ultimately at risk.

The variables responsiveness to needs, efficiency, and availability of services sought to quantify the delivery portion of the research question. Each of these dependent variables had a

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[24] Economic Research Service, *Unemployment and Median Household Income Data,* (2020), distributed by US Department of Agriculture, https://data.ers.usda.gov/reports.aspx?ID=17828
[25] "Tennessee," QuickFacts, US Census Bureau, https://www.census.gov/quickfacts/fact/table/TN/PST040221

negative trend after the merger, with the biggest impact on availability of services (a difference of ~1.7) and the lowest average ranking in efficiency (2.74). From the raw data, a decrease in the perception of delivery of care is clear.

The negative trend in wait time is due to two factors: ER wait time and wait time to get an appointment to see a specialist. Several communities have moved forward after ER closures in their hospitals, and the strain on staffing in nearby facilities results in little to no improvement in the efficiency of an ER visit. Many respondents offered personal experiences in Ballad ER facilities, citing double digit wait times for services and observations that "at any given time the ER is over run with patients spilling out into the hall ways."[26] The lack of staff and available beds make receiving care in the emergency department extremely difficult for residents. In turn, these deficits make receiving care in a true emergency equally difficult, to the point community members feel that "staff are so busy it makes care dangerous."[27] Staffing shortages are a concern of those who work or have worked in these hospitals as well. A Pre Merger nurse observed that "the turnover rate is so great that there are very few familiar faces"[28] and wait times are exponentially higher. Turnover in these situations is attributed to staff moving to other hospital systems, quitting to do travel nursing, retiring early, or changing careers altogether.[29] If a hospital lacks the staff to serve individuals who need care, it is difficult to improve the delivery of services.

Complications with extensive wait times can unintentionally bleed into the perception of the availability of services a facility can offer. Ultimately, if community members are waiting an excessive amount of time to see a medical professional in the emergency room or for a specialty

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[26] Anonymous, comment left on survey
[27] Anonymous, comment left on survey
[28] Anonymous, comment left on survey
[29] Anonymous, comment left on survey

appointment, that service becomes effectively unavailable to them. If a community member believes a service is unavailable, it can influence their decision to seek medical care in the first place, no matter the cost. This was expressed by several community members, who feel that "the wait time alone, the lack of an available room, and the debt I owe after insurance always makes me delay seeking treatment."[30] At this point, to seek treatment means an individual is seriously ill and waiting until health deteriorates to this point is very dangerous. The decision to receive medical care should be an easy one– if an individual requires medical attention, one should not have to labor over the decision on if care is accessible enough. These observations, coupled with the quantitative data from the survey, exhibit a perceived decrease in delivery of care, with a primary concern being the availability of emergency services.

Another major factor in assessing the delivery of care is its cost. After the merger, Ballad Health has few or no competitors in the area which has an adverse impact on price. If prices are inflated because of a lack of competition, residents are cornered into paying this price unless they drive to another region or state. Many residents expressed that Ballad Health's services are "very overpriced and have cornered the market leaving few choices for healthcare."[31]One of the few choices left in the market is Holston Medical Group, an "independent, physician-owned and led organization"[32] that serves Northeast Tennessee and Southwest Virginia. HMG operates three outpatient diagnostic centers in Bristol, Johnson City, and Kingsport, Tennessee. These centers provide diagnostic imaging including MRI, ultrasound, X-ray, and CT scans. HMG provides a "Diagnostic Price Transparency" table that compares the cost of their services with Ballad

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[30] Anonymous, comment left on survey
[31] Anonymous, comment left on survey
[32] "Diagnostic Price Transparency," Holston Medical Group, accessed April 20, 2023, https://www.holstonmedicalgroup.com/diagnostic-cost-comparison

Health's services. Figure 17 shows a few examples of the price comparisons Holston Medical

Group reports residents can expect between the two service providers.

MRI	Description	*Ballad Health	**HMG
76700	Ultrasound Abdominal	$625	$241
71550	Chest w/o Contrast	$3,560	$936
70551	MRI Brain w/o Contrast	$3,560	$857
71101	X-ray Chest & Ribs	$406	$81
70450	CT Head	$3,129	$370

Figure 17. HMG price comparison chart

For many of these services, the Ballad price is several times higher than the HMG cost.

This phenomenon is in line with predictions by the Federal Trade Commission on the dangers of

a medical monopoly. Furthermore, within the context of quality of care, residents reported that

the "cost of services in comparison to the service you actually receive do not equate."[33] While

this is detrimental to the quality of care available to residents of the Ballad region as a whole, its

effects are again disproportionately felt by those who cannot afford to travel outside the region to

receive care. If individuals do not have the means to access care elsewhere, they are cornered

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[33] Anonymous, comment left on survey

into utilizing what's geographically available within their county. This can contribute to an accepted community culture of underutilizing healthcare services and not seeing a medical professional when needed, which ultimately impacts the Appalachian region's health outcomes as a whole.

A recurring theme addressed by survey respondents was the desire to travel extensive distances to receive care outside of the Ballad region. In the surrounding region of Eastern Kentucky, Southwest Virginia, and Western North Carolina, Johnson City Medical Medical Center is the only Level 1 Trauma Center. Nationally, Medicare rates hospitals for their overall performance across 5 key areas of quality and assigns hospitals a rating from 1 to 5. These measures include mortality, safety of care, readmission, patient experience, and timely and effective care. [34] As of January 25, 2023, Medicare ranks Johnson City Medical Center an overall ranking of 1 out of 5. UT Medical Center, a Level 1 Trauma Center in Knoxville, Tennessee that is not part of the Ballad system, is ranked a 4 out of 5. Bristol Regional Medical Center and Holston Valley Medical Center, Level 3 Trauma Centers in the Ballad Health system, both earned overall rankings of 2 out of 5. These rankings, which are decided by a national entity, further raise the issue of the detrimental impact to quality and delivery of care to residents in the Ballad Health region.

When the two systems merged, the difficulty of operating a business model for the Tri Cities was cited as a motivating factor for the monopoly. Because of the merger, new concerns on the continued sustainability of healthcare facilities have emerged. Personal experiences have seriously affected the level of trust individuals have in their local hospitals, as a recurring statement left in the open ended portion of the survey notes the unfortunate frequency of which

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[34] "Overall star rating for hospitals," Medicare, accessed April 20, 2023, https://www.medicare.gov/care-compare/resources/hospital/overall-star-rating

residents choose to "travel to different states just to get care and will continue to do so until we have better care locally."[35] If residents continue to feel that it is cheaper and faster to travel to Knoxville, TN or Asheville, NC to receive care rather than a hospital within their own county, the model that was created will not be sustainable for those who have no other choice.

While this project demonstrates a decline in the quality and delivery of healthcare following the Ballad merger, there are also limitations to the findings. The survey used to gather the data could only reach individuals who saw the Facebook post. If the post was not shared to their feed or if individuals do not have Facebook they could not be surveyed. Additionally, because it was a voluntary survey, there is a selection bias associated with the results. Participants self selected to be a part of the project, leading to responses from individuals who likely feel very positively or negatively about the topic. The topic of the impact of COVID-19 on hospital systems both locally and nationally was not addressed in this project. However, this does not mean the results are not valid. If the study was reproduced , a more concerted effort should be executed to reach all demographics of the population in Northeast Tennessee.

CONCLUSION

In summary, the data and analysis presented in this project exhibit a clear negative trend in the perception of quality and delivery of healthcare following the Ballad Health merger in 2018. The aggregation of providers has had a negative impact on the perception of the healthcare landscape in Northeast Tennessee. Prior to the merger, the Federal Trade Commission openly listed concerns regarding a decrease in quality of care coupled with an increase in prices if the Ballad Merger was successful. The results, commentary, and analysis presented in this project

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[35] Anonymous, comment left on survey

support the stance taken by the Federal Trade Commission. The data suggests that residents have perceived a decrease in quality of care with evidence of price increases as well.

The Ballad Merger has left dozens of communities in South Central Appalachia with few other options. Given the overarching Appalachian healthcare landscape in which the Ballad system exists, it is essential for an organization of this size to provide residents with what they perceive to be quality options for a reasonable price. Operating a network of rural hospitals is a difficult business model; however, finding a balance for the benefit of residents is essential. If no balance can be found, the future of healthcare in Northeast Tennessee is ultimately precarious.

ACKNOWLEDGEMENTS

APPENDIX A

STATA Data Management Do File

```
1   #delimit ;
2
3   import excel "/Users/meredithbailey/Downloads/Baker Scholars
    Thesis: Ballad Health and Appalachian Healthcare_March 6,
    2023_17.43.xls", sheet("Baker Scholars Thesis: Ballad H") cellrange
    (A4:AJ689) clear ;
4
5   drop A B C D E F G H I J ;
6
7   rename K county ;
8   rename L timelivedincounty ;
9   rename M age ;
10  rename N insurancetype ;
11  rename O healthcareutilization ;
12  rename P expenseofcare ;
13  rename Q primaryhealthoption ;
14  rename R UStrustrate ;
15  rename S NETNhealth;
16  rename T block1training ;
17  rename U block1responsiveness ;
18  rename V block1waittime ;
19  rename W block1effectiveness ;
20  rename X block1trust ;
21  rename Y block1availability ;
22  rename Z block1overallquality ;
23  rename AA block1cost ;
24  rename AB block2training ;
25  rename AC block2responsiveness ;
26  rename AD block2waittime ;
27  rename AE block2effectiveness ;
28  rename AF block2trust ;
29  rename AG block2availability ;
30  rename AH block2overallquality ;
31  rename AI block2cost ;
32  rename AJ openended ;
33
34  replace county = "1" if county == "Carter" ;
35  replace county = "2" if county == "Greene" ;
36  replace county = "3" if county == "Hancock" ;
37  replace county = "4" if county == "Hawkins" ;
38  replace county = "5" if county == "Johnson" ;
39  replace county = "6" if county == "Sullivan" ;
40  replace county = "7" if county == "Unicoi" ;
41  replace county = "8" if county == "Washington" ;
42  replace county = "9" if county == "Other" ;
43  destring county, replace ;
44  drop if county == 9 ;
45
```

```
46   replace age = "1" if age == "18-25" ;
47   replace age = "2" if age == "25-39" ;
48   replace age = "3" if age == "40-64" ;
49   replace age = "4" if age == "65-79" ;
50   replace age = "5" if age == "80-100" ;
51   destring age, replace ;
52
53   replace timelivedincounty = "1" if timelivedincounty == "Less than
     5 years" ;
54   replace timelivedincounty = "2" if timelivedincounty == "5-15
     years" ;
55   replace timelivedincounty = "3" if timelivedincounty == "15-30
     years" ;
56   replace timelivedincounty = "4" if timelivedincounty == "30-50
     years" ;
57   replace timelivedincounty = "5" if timelivedincounty == "50+ years"
      ;
58   destring timelivedincounty, replace ;
59
60   replace insurancetype = "1" if insurancetype == "Private health
     insurance" ;
61   replace insurancetype = "2" if insurancetype == "Public health
     insurance" ;
62   replace insurancetype = "3" if insurancetype == "Other" ;
63   replace insurancetype = "4" if insurancetype == "Don't know" ;
64   destring insurancetype, replace ;
65
66   replace healthcareutilization = "1" if healthcareutilization ==
     "Never" ;
67   replace healthcareutilization = "6" if healthcareutilization ==
     "Daily" ;
68   replace healthcareutilization = "5" if healthcareutilization ==
     "Weekly" ;
69   replace healthcareutilization = "4" if healthcareutilization ==
     "Monthly" ;
70   replace healthcareutilization = "3" if healthcareutilization ==
     "Quarterly" ;
71   replace healthcareutilization = "2" if healthcareutilization ==
     "Annually" ;
72   destring healthcareutilization, replace ;


73
74   replace expenseofcare = "6" if expenseofcare == "Always" ;
75   replace expenseofcare = "5" if expenseofcare == "Very frequently" ;
76   replace expenseofcare = "4" if expenseofcare == "Occasionally" ;
77   replace expenseofcare = "3" if expenseofcare == "Rarely" ;
78   replace expenseofcare = "2" if expenseofcare == "Very Rarely" ;
79   replace expenseofcare = "1" if expenseofcare == "Never" ;
80   destring expenseofcare, replace ;
```

```
82  replace primaryhealthoption = "1" if primaryhealthoption ==
    "Hospital (appointment)" ;
83  replace primaryhealthoption = "2" if primaryhealthoption ==
    "Urgent care" ;
84  replace primaryhealthoption = "3" if primaryhealthoption ==
    "Emergency room" ;
85  replace primaryhealthoption = "4" if primaryhealthoption == "Small
    privately owned clinics" ;
86  replace primaryhealthoption = "5" if primaryhealthoption == "I do
    not ever seek medical attention" ;
87  replace primaryhealthoption = "6" if primaryhealthoption == "Other"
    ;
88  destring primaryhealthoption, replace ;
89
90  replace NETNhealth = "1" if NETNhealth == "Very easy" ;
91  replace NETNhealth = "2" if NETNhealth == "Easy" ;
92  replace NETNhealth = "3" if NETNhealth == "Somewhat easy" ;
93  replace NETNhealth = "4" if NETNhealth == "Neither easy nor
    difficult" ;
94  replace NETNhealth = "5" if NETNhealth == "Somewhat difficult" ;
95  replace NETNhealth = "6" if NETNhealth == "Difficult" ;
96  replace NETNhealth = "7" if NETNhealth == "Very difficult" ;
97  destring NETNhealth, replace;
98
99
100
101 replace block1cost = "1" if block1cost == "Very inexpensive" ;
102 replace block1cost = "2" if block1cost == "Inexpensive" ;
103 replace block1cost = "3" if block1cost == "Average" ;
104 replace block1cost = "4" if block1cost == "Expensive" ;
105 replace block1cost = "5" if block1cost == "Very expensive" ;
106 destring block1cost, replace ;
107
108 replace block2cost = "1" if block2cost == "Very inexpensive" ;
109 replace block2cost = "2" if block2cost == "Inexpensive" ;
110 replace block2cost = "3" if block2cost == "Average" ;
111 replace block2cost = "4" if block2cost == "Expensive" ;
112 replace block2cost = "5" if block2cost == "Very expensive" ;
113 destring block2cost, replace ;
114
115 gen responsiveness_difference = block2responsiveness –
    block1responsiveness ;
116 gen timelived_binary = 1 if timelivedincounty > 1 ;
```

```
1   #delimit;
2
3   regress block1responsiveness timelived_binary age i.insurancetype
    healthcareutilization expenseofcare  UStrustrate NETNhealth;
4   estimates store block1responsiveness_output;
5
6   regress block2responsiveness timelived_binary age i.insurancetype
    healthcareutilization expenseofcare  UStrustrate NETNhealth;
7   estimates store block2responsiveness_output;
8
9
10  regress block1cost timelived_binary age i.insurancetype
    healthcareutilization expenseofcare  UStrustrate NETNhealth;
11  estimates store block1cost_output;
12
13  regress block2cost timelived_binary age i.insurancetype
    healthcareutilization expenseofcare  UStrustrate NETNhealth;
14  estimates store block2cost_output;
15
16
17  regress block1training timelived_binary age i.insurancetype
    healthcareutilization expenseofcare  UStrustrate NETNhealth;
18  estimates store block1training_output;
19
20  regress block2training timelived_binary age i.insurancetype
    healthcareutilization expenseofcare  UStrustrate NETNhealth;
21  estimates store block2training_output;
22
23
24  regress block1waittime timelived_binary age i.insurancetype
    healthcareutilization expenseofcare  UStrustrate NETNhealth;
25  estimates store block1waittime_output;
26
27  regress block2waittime timelived_binary age i.insurancetype
    healthcareutilization expenseofcare  UStrustrate NETNhealth;
28  estimates store block2waittime_output;
29



30
31  regress block1effectiveness timelived_binary age i.insurancetype
    healthcareutilization expenseofcare  UStrustrate NETNhealth;
32  estimates store block1effectiveness_output;
33
34  regress block2effectiveness timelived_binary age i.insurancetype
    healthcareutilization expenseofcare  UStrustrate NETNhealth;
35  estimates store block2effectiveness_output;
36
37
38  regress block1trust timelived_binary age i.insurancetype
```

```stata
          healthcareutilization expenseofcare  UStrustrate NETNhealth;
39  estimates store block1trust_output;
40
41  regress block2trust timelived_binary age i.insurancetype
          healthcareutilization expenseofcare  UStrustrate NETNhealth;
42  estimates store block2trust_output;
43
44
45  regress block1availability timelived_binary age i.insurancetype
          healthcareutilization expenseofcare  UStrustrate NETNhealth;
46  estimates store block1availability_output;
47
48  regress block2availability timelived_binary age i.insurancetype
          healthcareutilization expenseofcare  UStrustrate NETNhealth;
49  estimates store block2availability_output;
50
51
52
53  estout  block1responsiveness_output block2responsiveness_output
          block1cost_output block2cost_output block1training_output
          block2training_output block1waittime_output block2waittime_output
          block1effectiveness_output block2effectiveness_output
          block1trust_output block2trust_output block1availability_output
          block2availability_output using output.txt, replace style(tab)
          stats(r2  N )

54                  cells(b(fmt(3) star) se(par))
55
56                  starlevels(* 0.05) legend
57
58                  collabels(, none)
59                  varlabels(
60                              _t "Pre-Intervention Trend"
61                              _x75 "Intervention"
62                              _x_t75 "Intervention X Time"
63                              atalanta "Operation Atalanta"
64                              counteroffensive "Somalia Civil War"
65                              kenya "Linda Nchi"
66                              log_SomaliaIntensity "Somalia
    Conflict Intensity (Logged)"
67                              log_SADCConflict_Quarter "SADC
    Conflict Intensity (Logged)"
68                  _cons "Constant"
69  );
```

Lines 54 through 69 were borrowed with permission from a completed project by Dr. Jonathan

Ring. Labels were not changed, but this did not affect the data outcomes of this project.