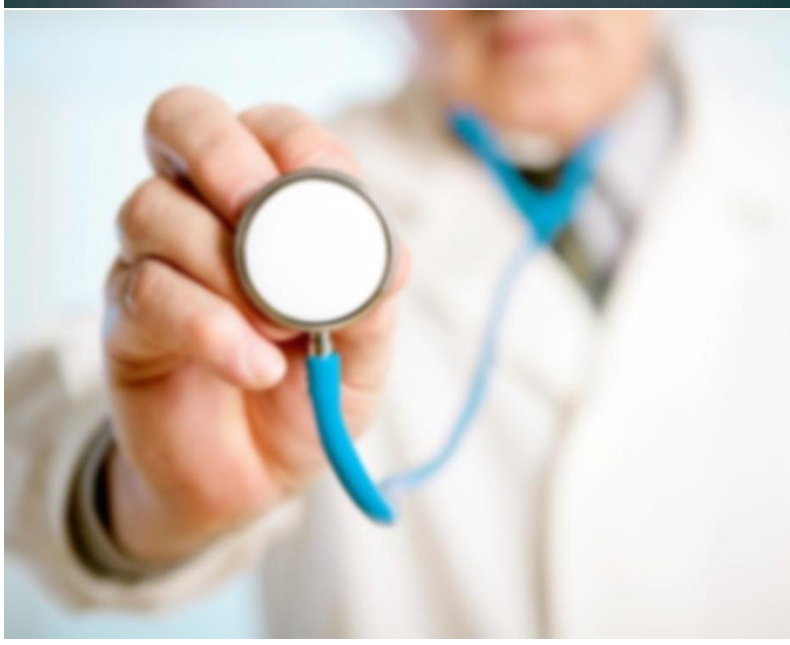


Certificate of Public Advantage: Index Reports

Population Health, Access to Health Services, and Other Measures

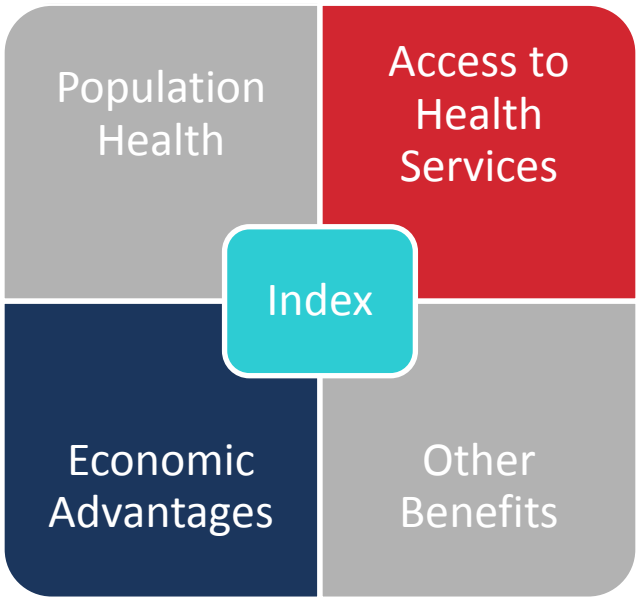
Tennessee Department of Health| COPA Report | March 2019

Certificate of Public Advantage

A Certificate of Public Advantage (COPA) is the written approval by the Tennessee Department of Health (TDH) which governs a Cooperative Agreement, or merger, among two or more hospitals. A COPA is granted when the Commissioner of Health determines that the likely benefits to the public outweigh any disadvantages attributable to a reduction in competition that may result from the merger.

By issuing a COPA, TDH in concurrence with the Attorney General's Office effectively offers protection to the new merged system from federal antitrust laws by agreeing to replace competition with state regulation and active supervision.

The COPA Index is a set of measures used to evaluate the ongoing benefits to the public in four categories: population health, access to health services, economic advantages, and other benefits.



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Executive Summary

On January 31, 2018, the Tennessee Department of Health (TDH) issued a Certificate of Public Advantage (COPA) to Mountain States Health Alliance and Wellmont Health System, allowing them to merge under the name Ballad Health. With the issuance of the COPA, TDH and the Attorney General's Office became responsible for regulating and actively supervising Ballad Health to ensure the merger benefits the interests of the public.

A Terms of Certification document was also created as part of the COPA process and outlines the procedure for active supervision by the state of the new, merged entity. One critical piece of Active Supervision is tracking and evaluating the impact of the COPA that governs the merger of Mountain States Health Alliance and Wellmont Health System through an index of measures. The purpose of this Index is to objectively determine whether there is a continuing Public Advantage and to protect the interests of the public in the region by tracking progress in four categories: 1) Population Health; 2) Access to Health Services; 3) Economic; and 4) Other.

Pursuant to the Terms of Certification, TDH is required to provide annual reports on Population Health, Access to Health Services, and Other measures. These combined reports will include updated values of each of the measures, as available, and will be used to assess the performance of Ballad Health and determine if a Public Advantage is evident. This first combined report includes the baseline values for each measure available as of January 31, 2018.

COPA Index Reports: Population Health, Access to Health Services, and Other Measures

Background

On January 31, 2018, the Tennessee Department of Health (TDH) issued a Certificate of Public Advantage (COPA) to Mountain States Health Alliance and Wellmont Health System, allowing them to merge under the name Ballad Health.

The application for these two (formerly) competing health systems to form a Cooperative Agreement was first filed with TDH February 15, 2016. With a combined market share of over 75% in a geographic service area (GSA) that spans 10 counties in northeast Tennessee and 11 counties in southwest Virginia (covering a total square mile area equal to the size of New Jersey) and impacting a population of nearly 960,000 residents, (roughly equivalent to the population of Montana,) Mountain States Health Alliance and Wellmont Health System applied to the state to sanction the largest COPA-governed merger in the country to date.

Prior to granting the COPA, the state engaged in a lengthy application review process that involved conducting an extensive internal review, engaging consultants, and listening to community members. As a result, Terms of Certification were developed to aid the state in protecting the interests of the public in the region and the interests of the state should the decision be made to grant the COPA.

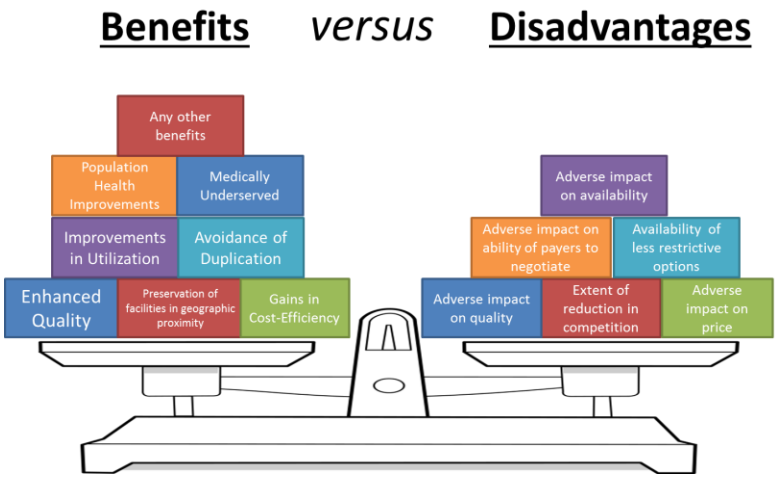
Terms of Certification

TDH, in coordination with the Attorney General and Reporter, drafted Terms of Certification (TOC) to govern the COPA. The TOC outlines the regulatory role of the State and its duty to provide Active Supervision throughout the COPA term. This document also details the conditions of reporting and operations required by TDH to demonstrate a Public Advantage and serves to mitigate the disadvantages that could result from the elimination of competition. Within the TOC is a detailed description of the measures and methodology by which TDH will

objectively track the progress of the Cooperative Agreement and evaluate whether or not a Public Advantage is demonstrated for each Fiscal Year during the COPA Term. These measures comprise the COPA Index.

Index

According to the Permanent Rules 1200-38-01-.01 et seq., effective January 4, 2016, implementing Tenn. Code Ann. § 68-11-1301 – 68-11-1309, which govern the COPA process, an Index of measures is to be used to objectively track the ongoing Public Advantage of a Cooperative Agreement. The COPA Index will be used to determine if the **disadvantages** caused by a reduction in competition of health care and related services continues to be outweighed by clear and convincing evidence of **benefits** of the Cooperative Agreement.



Index Development

To develop the Index, TDH engaged its internal experts, hired consultants, and considered input, comments, and concerns expressed by the public. TDH sought public feedback and welcomed comments directly through six public hearings as well as by phone, email, mail, and online.

TDH also employed an Index Advisory Group, comprised of citizens and stakeholders from Northeast Tennessee, which was charged with recommending measures to be considered for inclusion in the Index. Through an extensive process that included holding five public listening sessions where input was received from internal stakeholders (such as employees of either health system, contractors, vendors, or staff clinicians), external stakeholders (such as

competing health care providers, payers, or governmental agencies), and current or potential patients, the Index Advisory Group developed an Index design and a list of measures. Their work concluded with a recommendation of measures of population health, access to health services, economic, and other factors to the Commissioner of TDH.

Sub-Indices

The COPA Index consists of four categories of measures, or Sub-Indices, that correspond to the potential benefits and disadvantages of the affiliation for which the COPA was issued:

- Population Health Sub-Index – consisting of measures to track improvements in population health;
- Access Sub-Index – consisting of measures to track increased access to healthcare and prevention services;
- Economic Sub-Index – consisting of measures to verify a minimization of economic disadvantages resulting from a reduction in competition or degree of compliance with the Terms of Certification
- Other Sub-Index – consisting of other benefits, including without limitation enhancement of quality of care, patient satisfaction, medical research and education.

Annual Review

Pursuant to COPA Rule 1200-38-01-.03 and the Terms of Certification, as part of its exercise of active supervision, TDH will annually use an Index to track the demonstration of ongoing Public Advantage. The Annual Review will include: 1) the determination of a Final Score and Pass/Fail Grade, 2) Ballad's degree of compliance with the Terms of Certification, 3) trends of Ballad's performance subsequent to the Issue Date, and 4) other factors relevant to TDH's determination of the likely benefits and disadvantages of the affiliation.

Data reported in the Population Health, Access to Health Services, and Other Report(s) as well as Ballad's Annual Report and other sources as deemed appropriate, will be used to calculate the Population Health, Access, and Other Sub-Index scores.

Two distinct scores will be applied to the Sub-Indices. The Economic Sub-Index will stand alone and receive a simple Pass or Fail grade. If the Economic Sub-Index calculation results in a "Fail" grade, TDH will determine the impact on continuing Public Advantage and the COPA may be revoked. If the Economic Sub-Index results in a "Pass" grade, then the remaining three Sub-Indices, Population Health, Access to Health Services, and Other measures will undergo a

separate calculation to produce a Final Score. Each of the three Sub-Indices will produce a numerical score ranging from 1 to 100. The three scores will be assigned the following weights: 50% for Population Health; 30% for Access to Health Services; and 20% for Other. After each Sub-Index is multiplied by its assigned weight, the resulting three numbers will be added together to produce a Final Score.

(Population Health X 50%) + (Access to Health Services X 30%) + (Other X 20%) = Final Score

The COPA can be denied or terminated if the likely benefits of the Cooperative Agreement fail to outweigh any disadvantages attributable to a potential reduction in competition resulting from the Cooperative Agreement by clear and convincing evidence. The Final Score produced by the Index will be the basis for determining, on an annual basis, if ongoing Public Advantage has met that standard of clear and convincing evidence.

Baselines

This COPA Index Report includes TDH's first Population Health Report, Access to Health Services Report, and Other Report. These Sub-Index reports include baseline values for each measure with the most recent Calendar or School Year data, as appropriate, available in 2018.

Some of the measures in the COPA Index require data that are not yet available, either generally or specifically to TDH and/or Ballad as of the date the COPA was issued. While Ballad Health is responsible for leading those data collection efforts, Ballad and TDH will cooperate to adjust the measures or determine alternative sources if the data required are not available at the time or at the level of detail needed. According to the TOC, Ballad will provide baseline data on the measures for which they are responsible for data collection.

Active Supervision

In addition to a robust evaluation system, by which TDH will track the progress of the Cooperative Agreement, there are several other elements of the state's active supervision work. The state's regulatory work includes ongoing monitoring, auditing, and enforcement.

To complete regulatory functions specific to the COPA and the TOC, an active supervision structure was established. The active supervision roles and functions as outlined in the TOC's Exhibit F include:

- A COPA Compliance Office – Seeks to resolve compliance issues; reviews, logs, and investigates complaints; recommends corrective action; and prepares an Annual Report.

- A Local Advisory Council – Processes public feedback and comments; hosts an annual public hearing; prepares an Annual Report on public comments; and makes recommendations to TDH on how the Public Health Initiative Fund should be spent.

- A COPA Monitor - Reviews COPA Compliance Office complaints; conducts audits; reviews reports from the Compliance Office, LAC, and Ballad; and makes recommendations to the Commissioner of Health and TDH.

Active supervision is a fundamental requirement of the COPA Act in order to ensure continuing Public Advantage. TDH has put into place a structure along with measurable goals and terms and conditions to ensure that there is a clear public benefit to the health and well-being of residents of the region.

Population Health Report

Population Health Sub-Index of Measures

Tennessee Department of Health| March 2019

Population Health

Introduction

Population Health is commonly defined as the health outcomes of a specific group of people, and the distribution of such outcomes within the group[1]. The health of the population residing in Ballad's Tennessee Geographic Service Area, or TN GSA, is the focus of the Population Health Sub-Index and this COPA Population Health Report. The following ten counties comprise the TN GSA: Carter, Cocke, Greene, Hamblen, Hancock, Hawkins, Johnson, Sullivan, Unicoi, and Washington.

The region currently served by Ballad is part of the Appalachian Region and includes ten counties in Northeast Tennessee and eleven counties and two independent cities in Southwest Virginia (the GSA). This region has a number of health, economic, and other issues, which when combined, present a unique and challenging environment for the improvement of the quality and access of health care and health outcomes in the region. These unique challenges were reaffirmed in a recent report issued by the Appalachian Regional Commission, Robert Wood Johnson Foundation and the Foundation for a Healthy Kentucky (Health Disparities in Appalachia), which found that the performance in the Appalachian Region is worse than the performance in the United States as a whole in seven of the ten leading causes of death: heart disease, cancer, chronic obstructive pulmonary disease (COPD), injury, stroke, diabetes, and suicide. Additionally, the study found the "years of potential life lost" (YPLL), a measure of premature mortality, is 25% higher in the Appalachian Region than in the nation as a whole.

Through an analysis of Tennessee's health rankings and measures TDH identified four priority health factors that directly influence six of the top ten leading causes of death in Tennessee including heart disease, cancer and diabetes. These factors, labeled the "Big Four", are smoking, obesity, physical inactivity, and substance abuse.

Smoking: Approximately 443,000 premature deaths in the United States annually can be attributed to smoking. Studies have also demonstrated that smoking is the cause of various cancers, cardiovascular disease and respiratory conditions, as well as low birthweight and other

[1] Kindig, D. and G. Stoddart. 2003. What is population health? *American Journal of Public Health* 93(3):380-383 http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.93.3.380

adverse health outcomes. The percentage of adults who are current smokers is higher in all twenty-one counties in the GSA than in the United States as a whole. Smoking is more common in fifty percent of the TN GSA counties than in Tennessee and more common in fifty percent of the Virginia GSA counties than in Virginia.

Obesity: Obesity increases the risk for health conditions such as coronary heart disease, type 2 diabetes, cancer, hypertension, dyslipidemia, stroke, liver and gallbladder disease, sleep apnea and respiratory problems, and osteoarthritis. Two-thirds of the counties in the GSA have a higher percentage of adults who are obese compared with the nation. Moreover, compared to their respective states, 80 percent of the counties in Tennessee and 100 percent of the counties in Virginia have a higher percentage of adults who are obese.

Physical Inactivity: Evidence indicates physical activity, independent of its effect on weight, has substantial benefits for health. Decreased physical activity has been associated with an increased risk for several disease conditions including type 2 diabetes, cancer, stroke, hypertension, cardiovascular disease and premature mortality. Physical inactivity at the county level is directly related to health care expenditures for circulatory system diseases. Compared with the nation, fewer adults report any physical activity in each of the counties in the GSA; compared with their respective states, fewer adults report any physical activity in 90 percent of the counties in Tennessee and 100 percent of the counties in Virginia.

Substance Abuse: Drug overdose deaths are a leading contributor to premature death and are largely preventable. Since 2000, the rate of drug overdose deaths has increased by 137 percent nationwide, and there has been a 200 percent increase in deaths involving opioids (opioid pain relievers and heroin). The State of Tennessee, overall, has seen a statistically significant increase in the drug overdose death rate, with a 13.8 percent increase from 2014 to 2015. Additionally, Tennessee has one of the highest opioid prescription rates with 96-143 prescriptions per 100 people; Virginia is not far behind with a rate of 72-82.1 per 100 people. Tennessee has seen a 43.5 percent increase in heroin usage from 2014 to 2015 and Virginia has seen a 38.7 percent increase for the same period. Additionally, Tennessee has seen a 90.5 percent increase in synthetic opioid encounters from 2014-2015 and Virginia has seen a 57.1 percent increase during that same period. The substance abuse statistics for the 21 counties in the GSA are particularly compelling. Over 50 percent of the counties in Tennessee exceed the state average, with Hancock County having the highest rate in the state. Additionally, Sullivan County has one of the highest rates of Neonatal Abstinence Syndrome (NAS) births in the state. Moreover, the rate of NAS births in the TN GSA is almost four times the rate of the rest of

Tennessee. One hundred percent of the counties in Virginia exceed the state rate, with two counties having rates more than three times the state rate, and four counties with rates more than two times the state rate.

This merger provides a unique opportunity to improve population health for the people in Ballad Health's GSA. Ballad expects the merger to generate substantial savings by reducing duplication of services and improving efficiencies, and it is committed to reinvest a portion of that savings, 75 Million dollars over ten years, to address the region's most vexing health problems and improve the overall health of the population. Confirming that these investments are made and monitoring population health changes in the area are functions of the state's active supervision role. This Population Health Sub-Index serves to objectively track population health changes and assess if measurable improvements are achieved.

Sub-Index Design

The purpose of this Population Health Sub-Index is to measure and evaluate the progress of various population health outcomes in Ballad Health's Tennessee Geographic Service Area (TN GSA), also referred to as the TN COPA Region. While this first report establishes the baseline values for the Population Health Sub-Index measures by reporting data available in 2018, subsequent annual reports will include updated values that will be used to measure on-going changes in the health of TN COPA Region residents. The clear and convincing Public Advantage of the Cooperative Agreement will be demonstrated by comparing the rate of change in a population health priority measure level in the TN COPA Region post-merger to the rate of change prior to the merger. The measures' rates of change in Ballad's TN GSA will also be compared to three comparison geographies, 1) TN Peer Counties; 2) the State of Tennessee; and 3) the United States.

The design of the Population Health Sub-Index is a blend of the State Health Plan[2] objectives, TDH's Vital Signs work[3], the National Academy of Medicine population health efforts[4], and the

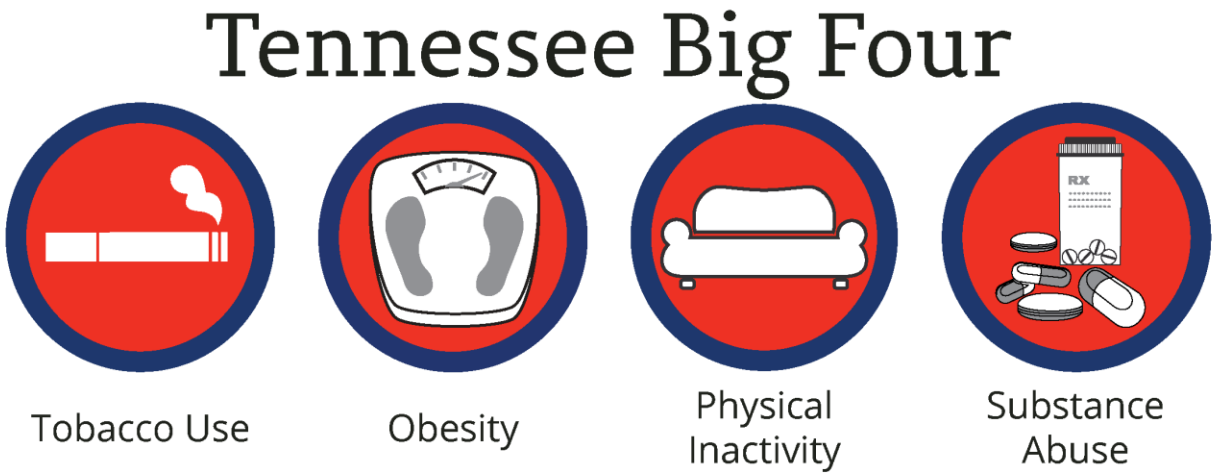
[2] State of Tennessee, 2015 Edition of the State Health Plan, Division of Health Planning, Tennessee Department of Health, 2015

[3] Tennessee's Vital Signs are a set of metrics meant to measure the pulse of Tennessee's population health. Inspired by the National Academies of Medicine's Vital Signs, TDH began a process in 2015 of identifying Tennessee-specific metrics to measure health and progress at the state level. Through an extensive state-wide public engagement process, 12 metrics were ultimately selected to provide an at-a-glance view of Tennessee's leading indicators of health and prosperity.

[4] National Academies of Sciences, Engineering, and Medicine. 2016. Metrics that matter for population health action: Workshop summary. Washington, DC: The National Academies Press. doi: 10.17226/21899.

models of health used in United Health Foundation's America's Health Rankings (AHR)[5] and the Robert Woods Johnson Foundation's County Health Rankings (CHR)[6]. AHR has been published for 28 years and CHR for seven years and both are widely recognized as providing fair assessments of the overall health of a population.

The Population Health Sub-Index measures are comprised of four broad categories: 1) Health Behaviors; 2) Immunizations; 3) Community & Environment; and 4) Outcomes. Within each of these categories there are multiple metrics, as shown in the table below and in the appendix. The "Big Four", the priority factors identified by the TDH as behaviors directly influencing six of the top ten leading causes of death in Tennessee, are within the Health Behaviors category. The Big Four are: smoking, obesity, physical inactivity, and substance abuse.



Comparison Geographies

In order to show that changes in health outcomes are likely a result of the merger and not a result of other external factors, it is critical to compare the changes in health outcomes in the TN COPA Region to those in other geographies. Controlling for external factors affecting health outcomes can best be achieved with a comparison region consisting of counties whose characteristics are similar to those of the TN COPA Region.

TDH selected 12 Tennessee counties to serve together as a comparison region, based on their similarities in income, age distribution, educational attainment, population density, and

[5] United Health Foundation. America's Health Rankings. https://www.americashealthrankings.org

[6] University of Wisconsin Population Health Institute. County Health Rankings & Roadmaps 2017. www.countyhealthrankings.org.

geographic proximity to the TN COPA Region. The Tennessee Peer Counties are: Anderson, Cannon, Claiborne, Cumberland, Jefferson, McMinn, Marion, Monroe, Putnam, Roane, Sevier, and White. Details of the methodology used in selecting the Tennessee Peer Counties can be found in the Population Health Report Appendix.

Health Equity

For the merger of Wellmont Health System and Mountain States Health Alliance to show an on-going clear and convincing Public Advantage, improvements in population health should be present in all segments of the population. Since aggregate data can obscure differences within populations, demographic measures to monitor health inequity and identify disparities are included. The population Health Sub-Index includes measures on smoking by educational attainment (less than high school graduate/high school graduate or more). There are also measures that separate data according to county population density (higher density county residents/lower density county residents). Some measures are also looked at by age of the population, such as smoking among adults and smoking among youth.[7]

Scoring

While 56 Population Health Measures were selected by TDH and determined important for objectively tracking the impact of the COPA on Population Health, only 25 measures comprise the Population Health Sub-Index Score. Those 25 Priority Population Health Measures have been identified by the Department as being closely related to the Department's health planning goals set out in the State Health Plan. Ballad Health will be evaluated on improvement in these 25 measures. They are identified in Table 1, below, with an asterisk ("*"). The remaining 31 measures are considered the Population Health Monitoring Measures and will be tracked by TDH for monitoring purposes only.

[7] Black/white differences were not analyzed since the black population is represents less than 5 percent of the total population in any of the ten counties in the TN GSA.

Population Health Baseline Data Table

The following 56 Population Health Measures include the 25 Priority Population Health Measures that will be used for the Population Health Sub-Index portion of the Final Score as well as the 31 additional Population Health Monitoring Measures that will be tracked by the Department for monitoring purposes only.

TABLE 1

		TN COPA Value	TN Peer Counties Value	TN Value	U.S. Value
BIG FOUR / Behaviors					
	Tobacco Use	COPA	PEER	TN	US
1*	Smoking (*% of adults*)	†††	†††	22.6%	17.13%
2	Smoking in higher density counties (*% of adults)*	†††	†††	n/a	n/a
3	Smoking in lower density counties (*% of adults)*	†††	†††	n/a	n/a
4	Smoking among those with less than a high school education (*%)*	n/a	n/a	43.7%	27.0%
5	Smoking among those with a high school education or more *(%)*	†††	†††	19.3%	14.8%
6*	Mothers who smoke during pregnancy *(%)*	22.6%	20.6%	12.7%	6.9 %†
7*	Youth tobacco use (*% of high school students currently using tobacco)*	*New*	*New*	20.3%	19.5%
8	Youth - Ever tried cigarette smoking (*% of high school students)*	*New*	*New*	31.6%	28.9%
9	Youth electronic vapor product use – ever used electronic vapor products (%)	*New*	*New*	40.3%	42.2%
	Physical Activity	COPA	PEER	TN	US
10*	Physically active adults (%)	†††	†††	69.5%	73.4%
11*	Physically active students *(% of high school students)*	*New*	*New*	44.1%	46.5%
	Obesity	COPA	PEER	TN	US
12	Obesity (*% of adults)*	†††	†††	32.8%	31.3%
13	Obesity in higher density counties (*% of adults*)	†††	†††	n/a	n/a
14	Obesity in lower density counties (*% of adults)*	†††	†††	n/a	n/a
15	Obesity among those with less than a high school education (*% of adults)*	n/a	n/a	35.6%	35.6%
16	Obesity among those with a high school education or more (*% of adults)*	†††	†††	32.4%	29.3%
17*	Physician office visits that include counseling or education related to weight and physical activity (%)	*New*	*n/a*	*n/a*	n/a
18*	Overweight and obesity among TN public school students (%)	43.6%	42.3%	39.2%	n/a
	Breastfeeding Measures	COPA	PEER	TN	US
19*	Average mPINC (Maternal Practices in Infant Nutrition and Care) score	74	72	72	79
20*	Breastfeeding initiation *(% of live births)*	73.5%	72.5%	78.0%	83.2%††
21*	Infants breastfed at six (6) months (%)	*New*	*New*	57.6%	57.6%
	High School Student Healthy Eating	COPA	PEER	TN	US
22	Fruit consumption among high school students (*% of students who eat fruit*)	*New*	*New*	91.5%	94.4%
23	Vegetable consumption among high school students (*% of students who eat vegetables*)	*New*	*New*	90.0%	92.8%
24	Soda consumption among high school students (*% of students who drink soda*)	*New*	*New*	26.0%	18.7%

	Substance Abuse	COPA	PEER	TN	US
25*	NAS (Neonatal Abstinence Syndrome) births (*per 1,000 live births*)	49.7	26.2	13.5	n/a
26*	Drug deaths *(deaths per 100,000 population)*	27.9	29.6	26.4	21.7
27	Drug overdoses *(non-fatal overdoses per 100,000 population)*	374.4	389.7	345.0	n/a
28	Painkiller prescriptions (*per 1,000 population*)	1293.4	1299.6	1025.2	585.0
29	Prescription drugs among high school students (*% of high school students using prescription pain relievers not prescribed by the doctor)*	*New*	*New*	13.2%	14.0%
30*	MME for Pain (Total morphine milligram equivalents (MME) opioids for pain per capita*)*	1211.2	1316.9	912.71	511.1
IMMUNIZATIONS		COPA	PEER	TN	US
31*	On-time vaccinations – children *(% of children that are up-to-date on immunizations at the time of kindergarten entry).*	97.3%	96.4%	95.3%	95%
32*	Ballad Entity participation in TennIIS *(% of active Ballad entities in Tennessee)*	*New*	n/a	n/a	n/a
33	Entity participation in TennIIS *(# of active TennIIS entities)*	*new*	*new*	*new*	n/a
34	Vaccinations – HPV Females *(% of HPV shots administered for females aged 11 to 17 years, either quadrivalent or bivalent)*	*new*	*new*	*new*	n/a
35	Vaccinations – HPV Males *(% of HPV shots administered for males aged 11 to 17 years, either quadrivalent or bivalent)*	*new*	*new*	*new*	n/a
36*	Vaccinations – Tdap *(% of Tdap shots administered for patients aged 11 to 17 years)*	*new*	*new*	*new*	n/a
37*	Vaccination - Flu, Older Adults *(per 100 adults aged 65+)*	48.7	52.3	51.0	49.2
38	Vaccinations - Flu, Adults *(% of adults aged 18+)*	†††	†††	37.8%	40.2%
COMMUNITY / ENVIRONMENT		COPA	PEER	TN	US
39*	Teen births (*per 1,000 females aged 15-19 years*)	28.7	33.9	26.6	18.8
	Third Grade Reading	COPA	PEER	TN	US
40*	Third grade reading level (% of *3rd graders who score "on-track" or "mastered" on TNReady reading assessment*)	34.9%	32.5%	34.7%	n/a
41	Third grade reading level - Higher density counties (*% of students)*	37.4%	32.4%	n/a	n/a
42	Third grade reading level - Lower density counties (*% of students)*	31.0%	32.6%	n/a	n/a
	Oral Health	COPA	PEER	TN	US
43	Fluoridated water (*% of population on community water systems receiving fluoridated water*)	91.8%	93.4%	88.1%	74.4%
44*	Dental sealants – children *(% aged 6–9 years)*	*10.7%*	*11.8%*	*11.8%*	n/a
45	Dental sealants - adolescents *(% aged 13-15 years)*	*4.8%*	*5.3%*	*5.2%*	n/a
OUTCOMES		COPA	PEER	TN	US
46*	Frequent mental distress *(% of adults)*	†††	†††	13.7%	11.7%
47	Frequent physical distress *(% of adults)*	†††	†††	15.0%	11.7%
48*	Infant mortality *(deaths per 1,000 live births)*	9.4	5.3	7.4	5.8
49*	Low birthweight *(% of live births)*	8.7%	8.8%	9.1%	8.3%
50	Child mortality *(deaths per 100,000 population for children aged 1-19 years)*	35.1	31.3	34.1	26.1
51	Cardiovascular deaths (*deaths per100,000 population)*	317.2	287.7	238.4	165.0
52	Cancer deaths *(deaths per 100,000 population)*	260.5	263.4	212.8	152.5
53	Diabetes deaths *(deaths per 100,000 population)*	29.6	37.9	28.5	21.5
54*	Diabetes adverse events (*% of adults identified with prediabetes who are referred to a qualifying diabetes prevention program*)	*New*	n/a	n/a	n/a
55	Suicide deaths *(deaths per 100,000 population)*	18.1	22.2	17.3	14.0
56*	Premature death ratio *(ratio of years lost before age 75 per 100,000 population for higher to lower density counties)*	0.834	0.899	n/a	n/a

* These measures are the Priority Population Health Measures. The Population Health Sub-Index score will be calculated based on the changes tracked on these 25 measures.

† National data on Mothers who smoke during pregnancy is an aggregate of 46 reporting states and the District of Columbia.

†† Breastfeeding initiation = National data are the result of a survey conducted on a sample of the population, whereas the other three values are from full population via birth certificates.

††† - Data were not available as of the date of publication.

NEW – Data are not yet collected at this level, but are expected for future reports.

n/a – Data will not be compared at this level.

The most recent Calendar or School Year data, as appropriate, available in 2018 were used for this report. For measures for where there is no current data source, a new baseline will be established based upon first year data from the TN COPA Region.

Data reported in future Department Population Health Reports and the Ballad Health Annual Report and other sources as deemed appropriate by the Department will be used to calculate the Sub-Index Score, Index Score, and trends that will be a part of TDH's Annual Review and determination of continuing Public Advantage.

Population Health Appendix:

Population Health Methodology Notes

Selection of TN Peer Counties

For each metric, comparison geographies are established to permit a comparison of the health in the TN COPA Region to the Peer Counties, the state of Tennessee, and the United States. For Population Health Sub-Index evaluation purposes, Peer Counties are established that reflect the data source and its availability across various geographic units. Peer Counties are selected at the beginning of the project and held constant.

With the TN COPA Counties together considered as a single community, the following process was used to establish a peer reference group.

a. Select counties based upon five primary factors[8]
    i. Income/Poverty
        1. Income is represented by the median household income.
        2. Poverty is represented equally by the estimated percentage of the population whose income is below the poverty level in two vulnerable groups, those younger than aged 18 and those aged 65 and older.
    ii. Age distribution
        1. Age distribution is represented equally by the percentage of the population younger than aged 18 and the percentage aged 65 and older.
    iii. Educational attainment
        1. Education is represented equally by the percentage of adults aged 25 and older without a high school diploma and the percentage of adults aged 25 and older with a bachelor's degree.
    iv. Population density
        1. Population is represented equally by the population density (population/square mile) and percent rurality

[8] The selection of categories is based upon the model used for establishing peer counties for Community Health Status Indicator project, https://wwwn.cdc.gov/CommunityHealth/info/HowtoUseReport. Measures were selected based upon availability and appropriateness to the GSA.

v. Geographic proximity to TN GSA (used 570 Bowmantown Rd, Telford, TN 37690 as center of TN GSA, approximately 55 air miles from three corners of TN GSA)

b. All data except for the distance are standardized using the average of the sample data points and the standard deviation of the sample data points. All z-scores are limited to +/-2 standard deviations from the mean.
    i. To normalize the geographic proximity to the TN GSA, the standard deviation of the distance between each county and the center of the TN GSA is approximated by the standard deviation of each state (Hawaii and Alaska are excluded) from center of the TN GSA
c. Calculate the difference of each metric from the TN GSA
    i. The value for each metric for the TN GSA is the population weighted prevalence for the ten counties in the TN GSA.
    ii. The difference is the mathematical difference between the normalized value for the TN GSA and the normalized value for each county included in the analysis.
d. Select the counties by minimizing the square root of the sum of the square of the normalized distances each of the metrics are from the TN GSA
    i. All of the five primary factors have equal weight. For Income/Poverty, income is weighted equally with overall poverty. Overall poverty is the equal weighting of the two categories of poverty: under 18 and age 65+. For all other primary factors, the two metrics are weighted equally.
e. Continue selecting counties until the total population of the selected counties is at least equal to the total population in the TN COPA Region AND there are at least ten counties.

TN COPA Region - Population Density Stratification

To allow for stratification of the TN GSA by population density, the TN GSA was divided into a higher density region (TN COPA Region-Higher density) and a lower density region (TN COPA Region – Lower density). The higher density counties consist of the three most densely populated TN COPA counties: Hamblen, Sullivan, and Washington. The lower density counties are the remaining seven counties in the TN COPA Region: Carter, Cocke, Green, Hancock, Hawkins, Johnson, and Unicoi.

Some demographic differences between the TN COPA higher density and lower density regions are below:

Characteristic	TN COPA Region - Higher density	TN COPA Region - Lower density
Population per square mile, 2010	375-390	<170
Median HH income	$37,617-$42,817	$26,898-$36,927
Average median HH income of counties within group	$40,260	$32,485
Median Age	44.2 years	43.1 years
Percent with college degree	15.5% - 30.6%	9.2% - 12.6%
Percent in poverty	16.4% - 19.0%	18.0% - 31.0%
YPLL-75[9] (years lost before age 75 per 100,000)	9,124	10,726

[9] Population-weighted YPLL-75, based upon County Health Rankings, 2016, accessed Sept, 2016

TN Peer Counties - Population Density Stratification

Method 1: Considering all Tennessee counties

If all Tennessee counties, except those within the service area, were considered possible peer counties, the following would be considered peer counties[10].

Lower Population Density Peer Counties	Higher Population Density Peer Counties
Claiborne Granger Monroe Campbell Meigs McMinn Roane	Anderson Sevier Jefferson Blount

The parameters for determining fit were child poverty, elder poverty, less than HS diploma, college graduate, household income and distance to service area; identical to those used to select overall peer counties except that population density and rurality were removed. In addition, a population density of 150 persons/square mile was used to stratify counties into higher and lower density groups. The number of counties was selected such that the total population in the peer counties was roughly equal to the population in the service area counties.

Method 2: Considering only Service Area counties

For this analysis, only peer counties identified in the COPA (Anderson, Cannon, Claiborne, Cumberland, Jefferson, McMinn, Marion, Monroe, Putnam, Roane, Sevier, and White) were used as options for the peer county comparison set.

The peer counties were sorted by population density from Cannon (52 persons per square mile) to Anderson (225 persons per square mile). The most population dense counties were then selected as the comparison set for the higher population density counties in the service area and the lower ones to compare to the lower population density counties in the service area.

[10] Counties are listed in order of "fit" with service area counties, that is those on the top of the list are most similar to the service area counties.

County	Population Density (#/Sq.Mi.)
Cannon	52
Marion	57
White	70
Monroe	72
Claiborne	73
Cumberland	86
McMinn	122
Roane	146
Sevier	162
Putnam	186
Jefferson	194
Anderson	224

These 12 counties were then modeled (using poverty, age distribution, education and distance) to see which are closest in terms of being peer counties. The result was a different ordering of the counties than listed above, but one that supported using the more dense counties as comparison for the higher density columns in the service area. And the simple listing by population density is much simpler. The modeling suggests that the cutoff should be 150 persons per square mile making Sevier, Putnam, Jefferson and Anderson counties as the comparison group for the more densely populated counties within the service area.

Yet, the initial modeling indicates that these counties, even with lower population densities, closely resemble the higher population density counties in the service area. Therefore, the decision was made that the comparison group for higher-density counties in the service area consist of Sevier, Putnam, Jefferson and Anderson. All other counties from the original peer county list are considered the peer group for lower population density counties.

Population Health Sub-Index Data Source Table

TABLE 2

	Measure Definition	TN Data Source	US Data Source
	BIG FOUR (BEHAVIORS)		
	Tobacco Use		
1*	Smoking (*Percentage of adults who are self-reported smokers (smoked at least 100 cigarettes in their lifetime and currently smoke).)*	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	Centers for Disease Control, Behavioral Risk Factor Surveillance System, 2017
2	Smoking in higher density counties (*TN COPA Value: Percentage of adults in Hamblen, Sullivan, and Washington counties who are self-reported smokers (smoked at least 100 cigarettes in their lifetime and currently smoke); TN & U.S. Values: Not stratified by population density.)*	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	n/a
3	Smoking in lower density counties (*TN COPA Value: Percentage of adults in Carter, Cocke, Greene, Hancock, Hawkins, Johnson, and Unicoi counties who are self-reported smokers (smoked at least 100 cigarettes in their lifetime and currently smoke); TN & U.S. Values: Not stratified by population density.)*	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	n/a
4	Smoking among those with less than a high school education (*Percentage of adults with less than a high school education who are self-reported smokers (smoked at least 100 cigarettes in their lifetime and currently smoke).)*	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	CDC, BRFSS, 2017
5	Smoking among those with a high school education or more (*Percentage of adults with high school education or more who are self-reported smokers (smoked at least 100 cigarettes in their lifetime and currently smoke).)*	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	CDC, BRFSS, 2017
6*	Mothers who smoke during pregnancy (*Percentage of mothers who report smoking during pregnancy (%).)*	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Birth Statistical System, 2017	CDC WONDER, 2017
7*	Youth tobacco use (*Percentage of High School Students who self-reported currently using tobacco (current cigarette, smokeless tobacco, cigar, or electronic vapor products use on at least 1 day during the 30 days before the survey).)*	Tennessee Department of Education (TDOE), Office of Coordinated School Health, Youth Wellness Survey, YRBS 2018 / YRBS 2015	CDC, Youth Risk Behavior Survey, 2017
8	Youth ever tried cigarette smoking (*Percentage of High School Students who self-reported ever trying cigarette smoking, even one or two puffs.)*	TDOE, Office of Coordinated School Health, Youth Wellness Survey, YRBS 2018 / YRBS 2015	CDC, YRBS, 2017
9	Youth electronic vapor product use (*Percentage of High School Students who self-reported using an electronic vapor product within the 30 days before the survey).*	TDOE, Office of Coordinated School Health, Youth Wellness Survey, YRBS 2018 / YRBS 2015	CDC, YRBS, 2017

	Physical Activity		
10*	Physically active adults (*Percentage of adults who reported participating in physical activity such as running, calisthenics, golf, gardening, or walking for exercise over the past month.)*	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	CDC, BRFSS, 2017
11*	Physically active students (*Percentage of High School Students who were physically active 60+ minutes per day for 5 or more days in last 7 days.)*	TDOE, Office of Coordinated School Health, Youth Wellness Survey, YRBS 2018 / YRBS 2015	CDC, YRBS, 2017
	Obesity		
12	Obesity (*Percentage of adults with a body mass index of 30.0 or higher based on reported height and weight.*)	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	CDC, BRFSS, 2017
13	Obesity in higher density counties (*TN COPA Value: Percentage of adults in Hamblen, Sullivan, and Washington counties with a body mass index of 30.0 or higher based on reported height and weight; TN & U.S. Values: Not stratified by population density.*)	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	n/a
14	Obesity in lower density counties (*TN COPA Value: Percentage of adults in Carter, Cocke, Greene, Hancock, Hawkins, Johnson, and Unicoi counties with a body mass index of 30.0 or higher based on reported height and weight; TN & U.S. Values: Not stratified by population density*.)	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	n/a
15	Obesity among those with less than a high school education (*Percentage of adults with less than a high school education with a body mass index of 30.0 or higher based on reported height and weight*.)	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	CDC, BRFSS, 2017
16	Obesity among those with a high school education or more (*Percentage of adults with a high school education or more with a body mass index of 30.0 or higher based on reported height and weight*.)	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	CDC, BRFSS, 2017
17*	Obesity counseling and education *(Percentage of physician office visits that include counseling or education related to weight and physical activity.*)	(Data collection to be led by Ballad Health)	n/a
18*	Overweight and obesity among TN public school students (*Percentage of public school students in grades Kindergarten, 2, 4, 6, 8, and one year of high school found to be overweight or obese during the school year.*)	TDOE, Office of Coordinated School Health, 2017	n/a
	Breastfeeding Measures		
19*	Average mPINC score (*Maternity Practices in Infant and Nutrition Care survey score based on seven birth facility policies and practices with higher scores denoting better maternity care practices and policies*.)	CDC Survey of Maternal Practices in Infant & Nutrition & Care (mPINC), 2015	CDC Survey of Maternal Practices in Infant & Nutrition & Care (mPINC), 2015

20*	Breastfeeding Initiation (*TN COPA, Peer, and TN Values: Percentage of live births whose birth certificates report that baby is breastfed.* *US Value: Proportion of infants who are ever breastfed.*)	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Birth Statistical System, 2017	CDC, National Immunization Survey, 2015
21*	Infants breastfed at six (6) months (*Percentage of infants aged six (6) months whose guardians report at well-child visits they continue to be breastfed.*)	(Data collection to be led by Ballad Health)	CDC, National Immunization Survey, 2016-2017 among 2015 births
	High School Student Healthy Eating		
22	Fruit consumption among high school students - (*Percentage of high school students who reported eating fruit during the past 7 days.*) Note: Pre-2017 data include drinking 100% fruit juice	TDOE, Office of Coordinated School Health, Youth Wellness Survey 2018 / YRBS, 2017	CDC, YRBS, 2017
23	Vegetable consumption among high school students - (*Percentage of high school students who reported eating vegetables during the past 7 days.*)	TDOE, Office of Coordinated School Health, Youth Wellness Survey 2018 / YRBS, 2017	CDC, YRBS, 2017
24	Soda consumption among high school students – (*Percentage of high school students who reported drinking one or more sodas per day for the past 7 days.*)	TDOE, Office of Coordinated School Health, Youth Wellness Survey 2018 / YRBS, 2017	CDC, YRBS, 2017
	Substance Abuse		
25*	NAS (Neonatal Abstinence Syndrome) Births (*Number of reported cases with clinical signs of withdrawal per 1,000 live births.*)	TDH, Division of Family Health and Wellness, Neonatal Abstinence Syndrome Surveillance, 2017	n/a
26*	Drug deaths (*All drug overdose deaths caused by acute poisonings, regardless of intent per 100,000 population.)*	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Death Statistical System, 2016	CDC, 2017
27	Drug overdoses (*Non-fatal overdoses caused by acute poisonings, regardless of intent per 100,000 population.)*	TDH, Division of Population Health Assessment, Office of Health Statistics, Hospital Discharge Data System, 2016	n/a
28	Painkiller prescriptions (*Number of opioid prescriptions for pain per 1,000 population*)	TDH, Office of Informatics and Analytics, Controlled Substance Monitoring Database, 2017	CDC Annual Surveillance Report of Drug-Related Risks and Outcomes, 2017
29	Prescription drugs among high school students (*Percent of high school students who report ever taking prescription drugs without a doctor's prescription (such as codeine, Vicodin, OxyContin, Hydrocodone, and Percocet one or more times during their life).*	TDOE, Office of Coordinated School Health, Youth Wellness Survey, YRBS 2018 / YRBS 2017	CDC, YRBS, 2017
30*	MME for Pain (Total morphine milligram equivalents (MME) opioids for pain per capita*)*	TDH, Office of Informatics and Analytics, Controlled Substance Monitoring Database, 2017	CDC, 2017
IMMUNIZATIONS			
31*	On-time vaccinations – children *(Percentage of children that are up to date on state-required vaccines at the time of kindergarten entry.)*	Kindergarten Immunization Compliance Assessment, 2017	CDC, 2017

32*	Ballad entity participation in TennIIS (*Percentage of Ballad Health entities in Tennessee participating in TennIIS*.)	Ballad Health / TennIIS	n/a
33	Entity participation in TennIIS (*Number of entities in Tennessee participating in TennIIS*.)	Tennessee Immunization Information System (TennIIS)	n/a
34	Vaccinations - HPV females (*Percentage of human papillomavirus (HPV) vaccine shots administered to females aged 11 to 17 years, either quadrivalent or bivalent.*	TennIIS	n/a
35	Vaccinations - HPV males (*Percentage of human papillomavirus (HPV) vaccine shots administered to males aged 11 to 17 years, either quadrivalent or bivalent..)*	TennIIS	n/a
36*	Vaccinations - Tdap (*Percentage of tetanus-diphtheria-acellular pertussis (Tdap) vaccine shots administered to males aged 11 to 17 years.*)	TennIIS	n/a
37*	Vaccination Rate - Flu, Older Adults (*Rate of Medicare fee-for-service beneficiaries aged 65 and over with a flu vaccine claim*.)	Flu Vaccination Map, Centers for Medicare and Medicaid Services, 2017-2018 Season	Flu Vaccination Map, Centers for Medicare and Medicaid Services, 2017-2018 Season
38	Vaccinations - Flu, Adults (*Percent of adults aged 18 and over who self-reported receiving a flu shot or flu vaccine sprayed in nose in the past 12 months.*)	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	CDC, BRFSS, 2017
COMMUNITY / ENVIRONMENT			
39*	Teen births (*Rate of births per 1,000 females aged 15-19 years*.)	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Birth Statistical System, 2017	CDC, 2017
	Third Grade Reading		
40*	Third grade reading level (*Percentage of 3rd graders scoring "on-track" or "mastered" on TNReady reading assessment*.)	Tennessee Department of Education, 2017	n/a
41	Third grade reading level - Higher density counties (*TN COPA Value: Percentage of 3rd graders in Hamblen, Sullivan, and Washington counties scoring "on-track" or "mastered" on TNReady reading assessment ; TN & U.S. Values: Not stratified by population density*)	Tennessee Department of Education, 2017	n/a
42	Third grade reading level - Lower density counties (*TN COPA Value: Percentage of 3rd graders in Carter, Cocke, Greene, Hancock, Hawkins, Johnson, and Unicoi counties scoring "on-track" or "mastered" on TNReady reading assessment; TN & U.S. Values: Not stratified by population density*.)	Tennessee Department of Education, 2017	n/a
	Oral Health		
43	Fluoridated water (*Percent of population on community water systems (CWS) receiving fluoridated water*.)	CDC My Water's Fluoride, 2017	CDC My Water's Fluoride, 2017
44*	Children receiving dental sealants (*Percentage of Medicaid enrollees aged 6-9 years receiving dental sealants on permanent first molar teeth.)*	DentaQuest, 2016-2017	n/a

45*	Adolescents receiving dental sealants (*Percentage of Medicaid enrollees aged 13-15 years receiving dental sealants on their first and second molar teeth.)*	DentaQuest, 2016-2017	n/a
OUTCOMES			
46	Frequent mental distress (*Percentage of adults who reported their mental health was not good 14 or more days in the past 30 days*.)	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	America's Health Rankings 2017 Annual Report, BRFSS 2016
47	Frequent physical distress (*Percentage of adults who reported their physical health was not good 14 or more days in the past 30 days*.)	TDH. Tennessee Behavioral Risk Factor Surveillance System. Nashville, TN. Tennessee Department of Health, Office of Population Health Surveillance, 2017.	America's Health Rankings 2017 Annual Report, BRFSS 2016
48*	Infant mortality (*Number of infant deaths (before age 1) per 1,000 live births*.)	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Death Statistical System, 2017	CDC, 2017
49*	Low birthweight (*Percentage of infants weighing less than 2,500 grams (5 pounds, 8 ounces) at birth*.)	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Birth Statistical System, 2017	CDC, 2017
50	Child mortality *(Number of deaths per 100,000 children aged 1 to 18 years*.)	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Death Statistical System, 2017	CDC WONDER, 2017
51	Cardiovascular deaths (*Number of deaths due to diseases of the heart per 100,000 population*.)	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Death Statistical System, 2017	CDC WONDER, 2017
52	Cancer deaths (*Number of deaths due to all causes of cancer per 100,000 population*.)	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Death Statistical System, 2017	CDC WONDER, 2017
53	Diabetes deaths (*Number of deaths due to diabetes per 100,000 population.*)	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Death Statistical System, 2017	CDC WONDER, 2017
54*	Diabetes adverse events (*Percentage of adults identified with prediabetes who are referred to a qualifying diabetes prevention program*.)	(Data collection to be led by Ballad Health)	n/a
55	Suicide deaths (*Number of deaths due to intentional self-harm per 100,000 population*.)	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Death Statistical System, 2017	National Institute of Mental Health, NIH, 2017
56*	Premature death ratio (*Ratio of years lost before age 75 per 100,000 population for higher density counties to lower density counties*.)	TDH, Division of Vital Records and Statistics, Office of Vital Statistics, Death Statistical System, 2017	n/a

* These measures are the Priority Population Health Measures. The Population Health Sub-Index score will be calculated based on the changes tracked on these 25 measures.

n/a – Data will not be compared at this level.

Population Health Sub-Index Data Notes

DentaQuest

- Dental Sealant 2016-2017 data were collected from 10/1/2016-9/30/2017.

Behavioral Risk Factor Surveillance System (BRFSS)

- All estimates are weighted using demographic information from each of the four geographies: 1) The TN COPA Region; 2) TN Peer Counties region; 2) the State of Tennessee, and 4) the US.
- US data include data from the U.S. Virgin Islands, Puerto Rico, and Guam.

Tennessee Immunization Information System (TennIIS)

- A Participating facility is an entity in TennIIS Production that has submitted or entered an administered and/or historical vaccination during the year of evaluation.
- Vaccinations are evaluated as being administered by the entities in each county group (the TN COPA Region, TN Peer Counties region, and the State of Tennessee) during the year of evaluation.
- The entity can report administered and/or historical vaccinations and the entity can submit these vaccines manually or electronically. The number of participating entities are summed for: 1) Ballad, 2) the TN COPA Region; 3) TN Peer Counties region; and 4) the State of Tennessee.
- Vaccination CVX codes identified were pulled for each county group; these may not include all CVX codes associated with those vaccination families as some CVX codes are not relevant.
- Population data source: 2017 Population Data Files, Division of Population Health Assessment, Tennessee Department of Health

Vital Statistics

For Death Statistical Data System: Rates are age adjusted per 100,000

ICD-10 Coding for Tennessee Mortality Data, 2013-2016

Underlying Cause of Death	ICD-10 Codes or UCD Group Codes Used
Diseases of the Heart	UCD Group Codes 049-059
Cancer	UCD Group Codes 018-040
Diabetes	UCD Group Code 043
Suicide	UCD Group Codes 105 and 106
All Drug Overdoses	ICD-10 codes for underlying cause of death: X40-X44, X60-X64, X85, Y10-Y14

Youth Wellness Survey

- The *Youth Wellness Survey* is an online survey on health behaviors administered annually in Tennessee's public high schools.
- The *Youth Wellness Survey* consists of a limited number of *Youth Risk Behavior Survey (YRBS)* questions and follows the same sampling and analysis methodology used for the *YRBS*.
- Schools are selected with probability proportional to the size of student enrollment in grades 9-12 and then a specific period of the school day (e.g., 2nd period) is randomly selected to participate. Within selected classes, all students are eligible to participate.
- Data that are weighted are representative of all COPA & PEER school students in grades 9-12.

Mothers who smoke during pregnancy, U.S. Value:

Each birth record represents one living baby. Maternal Tobacco Use data have been recoded to "Not Reported" for births to mothers residing in a reporting area that used the 1989 U.S. Standard Certificate of Live Birth or did not report Tobacco Use in the specified data year. All reporting areas, except California, routinely collect information on Maternal Tobacco Use, but information from the 2003 revision of the birth certificate is not comparable to the information based on the earlier certificate. The following reporting areas have Maternal Tobacco Use data coded to "Not Reported": Connecticut and New Jersey. To read more, visit http://wonder.cdc.gov/natality-current.html.[11]

[11] To read more, visit http://wonder.cdc.gov/natality-current.html.

Data acknowledgment: United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Division of Vital Statistics, Natality public-use data 2007-2016, on CDC WONDER Online Database, February 2018. Accessed at http://wonder.cdc.gov/natality-current.html

Overweight and obesity prevalence among students, Tennessee Values :

The statewide value presents weight status results from 307,270 students enrolled in Tennessee public schools during the 2016-17 school year in grades kindergarten, 2, 4, 6, 8, and any one year of high school. This report includes measurements submitted by 141 public school districts in Tennessee.

Body Mass Index (BMI) is calculated based on the height and weight measurements collected during screening in the current school year. BMI measurements are age and sex specific for children and teens. Some counties and school districts require an active opt-in informed consent for BMI student data collection. This requirement can have a significant impact on the number of students screened.

Overweight/obese was defined as body mass index (BMI) greater than or equal to the 85th percentile for children of the same age and sex. Data were collected by the Tennessee Department of Education's Office of Coordinated School Health in partnership with TDH.[12]

Breastfeeding Initiation, U.S. Value

- The Breastfeeding Report Card for 2018 reflects responses in 2016-2017 to the CDC National Immunization Survey (NIS) for births in 2015.
- Data sources and estimates for the U.S. value differ slightly from the TN values but the data are still useful for the purpose of comparing trends.
    - The CDC NIS estimate is the proportion of infants born in 2013 who were ever breastfed. The 2015 estimate for TN was 75.7 percent of infants were ever breastfed.

[12] For additional information, please refer to The Tennessee Public Schools Summary of Weight Status Report 2016-17 prepared by the Tennessee Department of Health, Division of Policy, Planning and Assessment, Office of Healthcare Statistics. Available at https://www.tn.gov/content/dam/tn/education/csh/csh_bmi_school_summary_2016-17.pdf

- The vital statistic estimate comes from the birth certificate that asks if the infant was breastfed.

Theory: Babies who will ever be breastfed will be breastfed in the first few days of life, which is the same time period captured by the birth certificate. As such, estimates of "ever breastfed" and "breastfeeding initiation" should be similar.

Non-Fatal Drug Overdose, Tennessee values:

- All drug overdose *inpatient* hospitalizations of Tennessee residents caused by non-fatal acute poisonings due to the effects of drugs, regardless of intent.
- All drug overdose *outpatient* visits by Tennessee residents caused by non-fatal acute poisonings due to the effects of drugs, regardless of intent.
- Count/rate suppressed in accordance with TDH Data Suppression Guidelines

Morphine milligram equivalents (MME) opioids for pain per capita, Tennessee values:

MME is calculated as the quantity multiplied by the strength of the drug per unit multiplied by a conversion factor provided to the Tennessee Department of Health by the CDC.
The population used for rates is pulled from CDC Wonder from the year in which it was first calculated. (i.e., The 2015 population estimate comes from the first estimate provided mid-year 2016, not the updated population estimates that were produced later.)

Additional notes and exclusions:

- Only Tennessee residents were considered;
- Only drug schedules II, III, and IV were included;
- Only drugs identified in the CDC's 2017 MME Conversion Table were considered;
- Only opioid prescriptions FDA label indicated for pain (analgesics) contribute to the MME calculation;
- Prescriptions with zero or implausibly high quantities were excluded;
- Prescriptions with zero or implausibly high days' supply were excluded.

Third Grade Reading Level, Tennessee Values

- Reflects proficiency TNReady English I, English II, and English III.
- Results are suppressed where the number of valid test scores is less than ten. In these files, suppression also occurs where any individual proficiency level is less than 1

percent or greater than 99 percent at the state and district level, or less than 5 percent or greater than 95 percent at the school level.

- As of 2016-2017 school year, the definition of Third Grade Reading Level changed to "Third graders scoring 'mastered' or 'on-track' on TNReady reading assessment".[13]

**All data are subject to limitations as explained in the data source.*

Table of Weights for Population Health Sub-Index

TABLE 3

	Priority Measure	Weight
1	Smoking	4.0%
2	Mothers who Smoke During Pregnancy	4.0%
3	Youth Tobacco Use	6.0%
4	Physically Active Adults	2.0%
5	Physically Active Students	6.0%
6	Obesity – Counseling or Education	4.0%
7	Overweight and Obesity Prevalence among TN Public School Students	6.0%
8	Average mPINC Score	4.0%
9	Breastfeeding Initiation	4.0%
10	Infants Breastfed at Six (6) Months	4.0%
11	NAS Births	6.0%
12	Drug Deaths	4.0%
13	MME for Pain	4.0%
14	Children - On-time vaccinations	4.0%
15	Ballad participation in TennIIS	2.0%
16	Vaccinations – Tdap	4.0%
17	Vaccinations - Flu Vaccine, Older Adults	2.0%
18	Teen Birth Rate	4.0%
19	Third Grade Reading Level	6.0%
20	Dental Sealants	4.0%
21	Frequent Mental Distress	2.0%
22	Infant Mortality	4.0%
23	Low Birthweight	4.0%
24	Adults identified with pre-diabetes who are referred to a qualifying diabetes prevention program.	2.0%
25	Ratio of Premature Deaths (Higher Density / Lower Density Counties)	4.0%
	TOTAL	**100%**

[13] To read more, visit https://www.tn.gov/content/tn/education/assessment/tnready.html

Population Health Sub-Index Scoring Structure

Scores for the Priority Population Health Measures and related investment and planning processes will be calculated by the Department annually according to the following schedule:

For Year 1, the period that begins with the Issue Date, January 31, 2018, and concludes on June 30, 2019, the Population Health Sub-Index will be calculated as follows:

Population Health Investment	25%
Implementation of the Population Health Plan	35%
Achievement of Process Measures Identified in Population Health Plan	40%
TOTAL:	**100%**

For year 2, the Population Health Sub-Index will be calculated as follows:

Population Health Investment	25%
Achievement of Process Measures Identified in Population Health Plan	75%
TOTAL:	**100%**

For year 3, the Population Health Sub-Index will be calculated as follows:

Population Health Investment	25%
Achievement of Process Measures Identified in Population Health Plan	65-75%
Improvement in Priority Measures as compared to Tennessee Geographic Service Area Baseline	0-10%
TOTAL:	**100%**

For year 4, 5, 6, and 7, the Population Health Sub-Index will be calculated as follows:

Achievement of Process Measures Identified in Population Health Plan	0-25%
Improvement in Priority Measures as compared to Tennessee Geographic Service Area Baseline	75-100%
TOTAL:	**100%**

Note:

- Improvement for a given measure will be determined by comparing the Rate of Change in the Tennessee Geographic Service Area prior to the Issue Date to the Rate of Change in the Tennessee Geographic Service Area between Baseline and the respective year, as determined by the Department.

- A credit of between 0-1 percent may be given per measure, at the discretion of the Department, for up to 10 measures that improve over the Baseline Tennessee and/or US measures, for a maximum of 5 percent total available extra credit. Geographic Service Area measures that are better than existing Tennessee and/or US numbers at Baseline do not qualify for extra credit consideration.

For years 8, 9, and10, the Population Health Sub-Index will be calculated as follows:

Achievement of Process Measures Identified in Population Health Plan	0-25%
Improvement in Priority Measures as compared to Tennessee Geographic Service Area Baseline	37.5-50%
Improvement in Priority Measures as compared to Tennessee Peer Counties	37.5-50%
TOTAL:	**100%**

The same Extra Credit opportunity described above, for years 4, 5, 6, and 7, will be available for years 8, 9, and 10.

Access to Health Services Report

Access Sub-Index of Measures

Tennessee Department of Health| March 2019

Access to Health Services

Introduction

According to the Institute of Medicine, access to health care means "the timely use of personal health services to achieve the best health outcomes."[14] Access to health services for those residing in Ballad's Tennessee Geographic Service Area, or TN GSA, is the focus of the Access to Health Services Sub-Index and this COPA Access to Health Services report.

The region currently served by Ballad is part of the Appalachian Region and includes ten counties in Northeast Tennessee and eleven counties and two independent cities in Southwest Virginia (the GSA). This region has a number of health, economic, and other issues, which when combined, present a unique and challenging environment for the improvement of the quality and access of health care in the region. These unique challenges were reaffirmed in a recent report issued by the Appalachian Regional Commission, Robert Wood Johnson Foundation and the Foundation for a Healthy Kentucky (Health Disparities in Appalachia), which found that the performance in the Appalachian Region is worse than the performance in the United States as a whole in seven (7) of the ten (10) leading causes of death: heart disease, cancer, chronic obstructive pulmonary disease (COPD), injury, stroke, diabetes, and suicide. The region also faces economic challenges, with the Appalachian Region performance in incomes, poverty rates, unemployment rates, and postsecondary education lagging behind the performance at the national level, which is relevant, as the study noted, because socioeconomic and health improvement are often interrelated, if not interdependent. Work force shortages and transportation issues are additional factors that add to the challenges of improving health care access for those residing in the Appalachian Region.

The Tennessee Department of Health (TDH) believes that all Tennesseans should have reasonable access to health services. Access to health care is vital to overall physical, social, and mental health; prevention of disease; detection and treatment of illnesses; quality of life; preventable death; and life expectancy. The 2009 National Health Disparities Report (NHDR), states that attaining good access requires:

- Gaining entry into the health care system
- Getting access to sites of care where patients can receive needed services

[14] Institute of Medicine, Committee on Monitoring Access to Personal Health Care Services. Access to Health Care in America. Millman M, editor. Washington, DC: National Academies Press; 1993.

- Finding providers with whom patients can develop a relationship based on mutual communication and trust.

Reasonable access should include primary and preventive care, followed closely by emergency care, maternity/prenatal care, mental health care, and care for chronic diseases. Factors that contribute to health care access in a region include: (1) the number of preventable hospital stays; (2) the ratio of population to primary care providers; and (3) the ratio of population to mental health providers.[15]

Preventable Hospital Stays: Preventable hospital stays is the hospital discharge rate for ambulatory care-sensitive conditions per 1,000 fee-for-service Medicare enrollees. Hospitalization for diagnoses treatable in outpatient services suggests that the quality of care provided in the outpatient setting was less than ideal and may also represent a tendency to overuse hospitals as a main source of care. The rate of preventable hospital stays is often used to assess the effectiveness and accessibility of primary health care. The rate of preventable hospital stays for all of the counties in the GSA exceeds the state rates for Tennessee and Virginia. The rate in one Tennessee county in the GSA is more than double the state rate. That is, preventable hospital stays occur twice as often in this county than in all of Tennessee. Similarly, two Virginia counties have rates that are three times the state rate, and another three counties with rates that double the state rate.

Primary Care Physicians: Access to care requires not only financial coverage, but also access to providers. Studies have demonstrated that sufficient availability of primary care physicians is essential for preventive and primary care, and when needed, referrals to appropriate specialty care. The statistics for the counties in the GSA reflect a compelling need for greater recruitment and retention of primary care providers. Only two counties in the Tennessee GSA have a ratio of population to primary care physicians that is better than the state. At least two counties have ratios double the statewide ratio, and one county, has a ratio that is four times the statewide ratio. In Virginia's GSA, all eleven counties have ratios substantially greater than the statewide ratio, with one county having ratios three times greater and another five counties with ratios of at least two times greater than the statewide ratio.

[15] Robert Wood Johnson Foundation and University of Wisconsin Population Health Institute, *County Health Rankings 2017: Tennessee; County Health Rankings 2017: Virginia.*

Mental Health Providers: Approximately thirty percent of the population in the United States lives in a county designated as a mental health professional shortage area. The lack of adequate access to mental health providers in the GSA is concerning. For example, the ratio of population to mental health providers in Tennessee is 780:1. Only two counties in the GSA have ratios less than this amount. Several counties have ratios four to five times greater, and one county has a ratio that is ten times greater than the statewide average. The ratio of county population to mental health providers in the eleven Virginia GSA counties is similarly troubling. Several counties have ratios four to five times greater than the statewide ratio, with one county having a ratio that is 22 times greater.

Lack of adequate access to mental health providers in especially concerning in the Appalachia region where mental health diagnoses for major depressive disorder and serious psychological distress are proportionately higher than the rest of the nation. The disparity is particularly striking in more economically distressed areas of Appalachia."[16] Mental health care is critical for the Appalachia region which suffers disproportionately from diseases of despair – alcohol and drug overdose; suicide; and alcoholic liver disease/cirrhosis of the liver. Despair diseases have been the leading driver of increased death rates for the area. According to a 2017 report from the Walsh Center for Rural Health Analysis, the combined mortality rate from the diseases of despair was 37 percent higher in Appalachia than the non-Appalachian U.S in 2015.[17]

Rural Population

The vast majority of the population in Ballad's GSA is considered to be rural, with 100% of the population in six counties classified as rural and over fifty percent of the population in eleven counties classified as rural. This factor significantly contributes to the health outcomes in a population. [18] A number of studies have demonstrated that rural residents experience many difficulties in accessing health care services, resulting in higher morbidity and mortality rates

16 Zhang, Z., Meit, M., Infante, A., English, N., Dunn, M., & Bowers, K.H. (2008) An Analysis of Mental Heatlh and Substance Abuse Disparities & Access to Treatment Services in the Appalachian Region. Retrieved from https://www.arc.gov/assets/research_reports/AnalysisofMentalHealthandSubstanceAbuseDisparities

17 Appalachian Diseases of Despair, August 2017, Michael Meit, Megan Heffernan, Erin Tanenbaum, and Topher Hoffmann. The Walsh Center for Rural Health Analysis. Retrieved from https://www.arc.gov/assets/research_reports/AppalachianDiseasesofDespairAugust2017.pdf

[18] According to a recent study done by iVantage Health Analytics, over 670 rural hospitals are in danger of closing. The National Rural Health Association reports that this number represents 1/3 of the rural hospitals in the United States. Since 2014, seven rural hospitals in Tennessee have either closed completely or have closed inpatient services. Thirteen of the New Health System's twenty-one hospitals in the GSA are considered hereunder as rural hospitals.

compared to those of their urban counterparts. For example, in addition to the lack of health care professionals in rural areas, many rural residents must travel greater distances to access different points of the health care delivery system; however, due to geographic distance, extreme weather conditions, environmental and climatic barriers, lack of public transportation and challenging roads, rural residents may be limited, and in some instances, even prohibited from accessing health care services.

Additionally, the closure of a rural healthcare facility or the interruption of services can have a negative impact on the access to care in the community. Rural health systems are fragile; when one provider leaves or a facility moves, it can impact care and access across the community. Traveling to receive services places a burden on patients that includes cost and time. For people with low incomes, no paid time off of their jobs, physical limitations, or acute conditions, these burdens can significantly affect their ability to access care.

Furthermore, rural areas often are close-knit communities where there is little anonymity. Seeking healthcare for mental health, substance abuse, sexual health, pregnancy, or even common chronic illnesses can increase social stigma and privacy issues. This may be caused by personal relationships with their healthcare provider or others that work within the healthcare facility. In addition, patients may be concerned that other residents will notice them utilizing certain services.

Competition and Access

Competition in healthcare is widely believed to benefit consumers because it helps contain costs, encourages innovation, and ultimately promotes access to high quality care.[19],[20] Indeed, while Wellmont Health System and Mountain States Health Alliance argued in their COPA application that if they were allowed to merge, they would be better able to expand access to health care, many remained concerned that a reduction in competition would lead to a reduction in health care access. It is precisely because of the concern that a monopoly of health services could have an adverse impact on the availability of healthcare services for residents in the GSA that the Access Sub-Index was developed. This Access Sub-Index is a component of the COPA Index

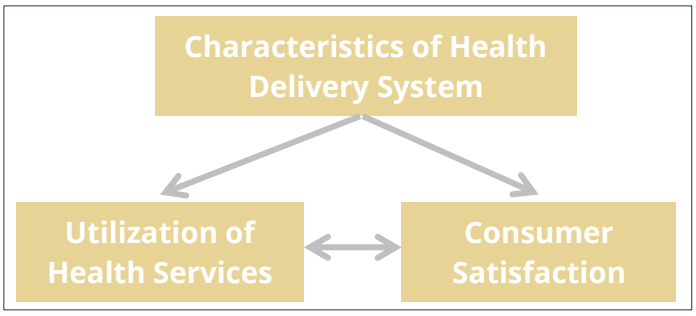
[19] Michael Porter ad Elizabeth Teisberg, Redefining competition in Heath Care, Boston: Harvard Business School Press, 2006

[20] Penelope Dash and David Meredith (Nov, 2010), When and how provider competition can improve health care delivery available at: https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/when-and-how-provider-competition-can-improve-health-care-delivery

which will track changes to access in the area and be a component of the annual evaluation and determination of the COPA's ongoing public benefits.

Sub-Index Design

The purpose of the Access to Health Services Sub-Index is to evaluate the progress of access-related measures in Ballad Health's Tennessee Geographic Service Area (TN GSA), also referred to as the TN COPA Region. While this first Access to Health Services report establishes the baseline values for the Sub-Index measures by reporting data available in 2018, subsequent annual reports will contain updated values to track on-going changes in healthcare access in the TN COPA Region. Annually, a calculation of these measures will produce an Access to Health Services Sub-Index score, which along with a Population Health Sub-Index score, and an Other (Quality) Benefits score, will produce a Final Score. Each year, the Final Score will be used to evaluate the continuing Public Advantage of the COPA.



The Access to Health Services Sub-Index measures healthcare access within three domains:

- Characteristics of Health Delivery System,
- Utilization of Health Services, and
- Consumer Satisfaction.

These domains each address a different question. The Characteristics of Health Delivery System domain seeks to address the question, "Is care available?" Measures for urgent care hours, the distance to urgent care, emergency departments, and hospitals, as well as specialist recruitment and retention are within this domain.

Utilization of Health Services measures aim to answer, "Is the right care being delivered at the right time and in the right place?" Within the utilization of health services domain, six priority

areas were identified. Those priority areas are: primary care; appropriate use of care; secondary prevention (screenings); infant and children; mental health & substance abuse; and antidepressant medication management.

The Consumer Satisfaction domain addresses the question, "Are people satisfied with the availability of care?" The measures within this domain require Ballad Health to administer patient satisfaction and access surveys and create and implement plans to address identified deficiencies.

By measuring access in these three ways, we gain a broad understanding of the current level of access is gained and future changes in the region's access to care are tracked without stifling innovation.

In total, there are 28 measures that comprise the Access to Health Services Sub-Index. Pursuant to the Terms of Certification, TDH and Ballad, as appropriate, will provide data for the TN GSA. Currently, of the 28 Access Sub-Index measures, 14 are to be supplied by Ballad. The Department Access to Health Services Report will be used by Ballad to report most recent verifiable values available for Measures in the Index. Data reported in TDH's Access to Health Services Report and in Ballad's Annual Report along with other sources as deemed appropriate by TDH will be used to calculate the Sub-Index Score and trends that will be reported in the Department Annual Report. The application of this Sub-Index will generate a numerical score that will be a component of Ballad's Final Score used by the Department to objectively track demonstration of ongoing Public Advantage.

Access to Health Services Measures will be evaluated for the population specified for each measure. If a population is not specified for an Access to Health Services Measure, the population for that Measure is the population in the GSA. For the first year of the Ten-Year Period, Ballad will be required to maintain baseline performance on each Measure. For Measures where the target is to improve, the expectation is for improvement over baseline to be achieved and maintained.[21]

[21] The Access to Health Services measures, values, and data sources are identified in Table 1.

Score

The score for the Access Sub-Index will be determined by the percentage of annual targets achieved in a given year. For some measures, improvement is required, while for other measures, no change is required.

Improve: For measures that require Ballad to improve over baseline, Ballad will provide baseline data and recommended targets that will be approved by TDH.

No change: For measures that require Ballad to maintain pre-merger performance, the target will be equal to the pre-merger performance. In other words, the goal of these measures is to confirm that access does not decline post-merger.

Each measure has been assigned weighting, ranging from 1.5 percent to 10 percent. The score for the Access Sub-Index is the aggregate of each Measure achieved multiplied by its assigned weighting. The targets and weights for each measure are identified in Table 3.

Access Baseline Data Table:

TABLE 1

	Measure	TN COPA Value	Data Source
CHARACTERISTICS OF HEALTH DELIVERY SYSTEM			
1	Population within 10 miles of an urgent care center (%)	*Ballad*	Census + Facility Address
2	Population within 10 miles of an urgent care center open nights and weekends (%)	*Ballad*	Census + Facility Address
3	Population within 10 miles of Urgent Care Facility or Emergency Department (%)	*Ballad*	Census + Facility Address
4	Population within 15 miles of an emergency department (%)	*Ballad*	Census + Facility Address
5	Population within 15 miles of an acute care hospital (%)	*Ballad*	Census + Facility Address
6	Pediatric Readiness of Emergency Department (For each ED)	*Ballad*	Ballad (Survey tool created by NEDARC)
7	Excessive Emergency Department Wait Times (%)	*Ballad*	NHAMCS, CDC/NCHS; Ballad
8	Specialist Recruitment and Retention	*Ballad*	Ballad
UTILIZATION OF HEALTH SERVICES			
	Primary Care		

9	Personal Care Provider	†††	BRFSS, 2017
	Appropriate Use of Care		
10	Preventable Hospitalizations – Older Adults (discharges per 100,000 people 65+)	*4,237.1*	HDDS, 2016
11	Preventable Hospitalizations - Adults (discharges per 100,000 people 18+)	*1,800.9*	HDDS, 2016
	Secondary Prevention (Screenings)		
12	Screening - Breast Cancer	†††	BRFSS, 2017
13	Screening - Cervical Cancer	†††	BRFSS, 2017
14	Screening - Colorectal Cancer	†††	BRFSS, 2017
15	Screening - Diabetes	*Ballad*	Ballad
16	Screening - Hypertension	*Ballad*	Ballad
	Infant and Children		
17	Asthma Emergency Department Visits Per 10,000 (Age 0-4)	*102.0*	HDDS, 2016
18	Asthma Emergency Department Visits Per 10,000 (Age 5-14)	*80.7*	HDDS, 2016
19	Prenatal care in the first trimester	66.8%	TN Vital Stats, 2017
	Mental Health & Substance Abuse		
20	Follow-Up After Hospitalization for Mental Illness (% Within 7 Days Post-Discharge)	*Ballad*	Ballad; HEDIS (Commercial HMO)
21	Follow-Up After Hospitalization for Mental Illness (% Within 30 Days Post-Discharge)	*Ballad*	Ballad; HEDIS (Commercial HMO)
	Antidepressant Medication Management		
22	Effective Acute Phase Treatment (84 days)	*Ballad*	Ballad; HEDIS (Medicaid HMO)
23	Effective Continuation Phase Treatment (180 days)	*Ballad*	Ballad; HEDIS (Medicaid HMO)
24	Engagement of AOD (Alcohol or Drug) Treatment: Adolescents and adults who initiated treatment and who had two or more additional services with a diagnosis of AOD within 30 days of the initiation visit.	*Ballad*	Ballad; HEDIS (Medicaid HMO)
25	Rate of SBIRT administration - hospital admissions	*Ballad*	Ballad
26	Rate of SBIRT administration - ED visits	*Ballad*	Ballad
CONSUMER SATISFACTION			
27	Patient Satisfaction and Access Surveys	*Ballad*	Ballad
28	Patient Satisfaction and Access Survey - Response Report	*Ballad*	Ballad

††† - Data were not available as of the date of publication.

"*Ballad*" = measures where Ballad Health is responsible for data collection and baselines. Data for these measures will be reported in Ballad's Annual Report.

Access Appendix:

Access to Health Services Sub-Index Data Source Table

TABLE 2

	Measure	Description	Source
1	Population within 10 miles of an urgent care center (%)	Population within 10 miles of any urgent care center; urgent care centers may be owned by the New Health System or a competitor and may or may not be located in the geographic service area	Ballad Health
2	Population within 10 miles of an urgent care center open nights and weekends (%)	Population within ten (10) miles of any urgent care center open at least three (3) hours after 5pm Monday to Friday and open at least five (5) hours on Saturday and Sunday; urgent care center may be owned by the New Health System or a competitor and may or may not be located in the geographic service area	Ballad Health
3	Population within 10 miles of an urgent care facility or emergency department (%)	Population within 10 miles of any urgent care center or emergency room; urgent care centers and emergency rooms may be owned by the New Health System or a competitor and may or may not be located in the geographic service area	Ballad Health
4	Population within 15 miles of an emergency department (%)	Population within 15 miles of any emergency room; emergency rooms may be owned by the New Health System or a competitor and may or may not be located in the geographic service area	Ballad Health
5	Population within 15 miles of an acute care hospital (%)	Population within 15 miles of any acute care hospital; acute care hospital may be owned by the New Health System or a competitor and may or may not be located in the geographic service area	Ballad Health
6	Pediatric Readiness of Emergency Department	Average score of New Health System Emergency Departments on the National Pediatric Readiness Project Survey from the National EMSC Data Analysis Resource Center	Self-assessment performed by Ballad Health
7	Excessive Emergency Department Wait Times	Percentage of all hospital emergency department visits in which the wait time to see an emergency department clinician exceeds the recommended timeframe.	Ballad Health Records; CDC National Center for Health Statistics National Hospital Ambulatory Care Survey

8	Specialist Recruitment and Retention	Percentage of recruitment and retention targets set in the Physician Needs Assessment for specialists and subspecialists to address identified regional shortages	Ballad Health Records
9	Personal Care Provider	Percentage of adults who reported having one person they think of as a personal doctor or health care provider	Behavioral Risk Factor Surveillance System
10	Preventable Hospitalizations – Older Adults	Number of discharges for ambulatory care-sensitive conditions per 100,000 Adults aged 65 years and older	Hospital Discharge Data System, Tennessee Department of Health, Division of Policy, Planning, and Assessment
11	Preventable Hospitalizations – Adults	Number of discharges for ambulatory care-sensitive conditions per 100,000 adults aged 18 years and older	Hospital Discharge Data System, Tennessee Department of Health, Division of Policy, Planning, and Assessment
12	Screening – Breast Cancer	Percentage of women aged 50-74 who reported having a mammogram within the past two years	Behavioral Risk Factor Surveillance System
13	Screening – Cervical Cancer	Percentage of women aged 21-65 who reported having had a pap test in the past three years	Behavioral Risk Factor Surveillance System
14	Screening - Colorectal Cancer	Percentage of adults who meet U.S. Preventive Services Task Force recommendations for colorectal cancer screening	Behavioral Risk Factor Surveillance System
15	Screening – Diabetes	Percentage of overweight or obese patients who are screened for prediabetes and diabetes.	Ballad Health Records
16	Screening – Hypertension	Percentage of adults 18+ screened for hypertension by Ballad Health.	Ballad Health Records
17	Asthma ED Visits – Age 0-4	Asthma Emergency Department Visits Per 10,000 (Age 0-4)	Hospital Discharge Data System, Tennessee Department of Health, Division of Policy, Planning, and Assessment
18	Asthma ED Visits – Age 5-14	Asthma Emergency Department Visits Per 10,000 (Age 5-14)	Hospital Discharge Data System, Tennessee Department of Health, Division of Policy, Planning, and Assessment

19	Prenatal care in the first trimester	Percentage of live births in which the mother received prenatal care in the first trimester	Birth Statistics, Tennessee Department of Health, Division of Policy, Planning, and Assessment
20	Follow-Up After Hospitalization for Mental Illness	Percentage of adults and children aged 6 years and older who are hospitalized for treatment of selected mental health disorders and had an outpatient visit, and intensive outpatient encounter or a partial hospitalization with a mental health practitioner within seven (7) days post-discharge	Ballad Health Records; NCQA The State of Health Care Quality Report
21	Follow-Up After Hospitalization for Mental Illness	Percentage of adults and children aged 6 years and older who are hospitalized for treatment of selected mental health disorders and had an outpatient visit, and intensive outpatient encounter or a partial hospitalization with a mental health practitioner within thirty (30) days post-discharge	Ballad Health Records; NCQA The State of Health Care Quality Report
22	Antidepressant Medication Management – Effective Acute Phase Treatment	Percentage of adults aged 18 years and older with a diagnosis of major depression, who were newly treated with antidepressant medication and remained on an antidepressant medication for at least 84 days (12 weeks)	Ballad Health Records; NCQA The State of Health Care Quality Report
23	Antidepressant Medication Management – Effective Continuation Phase Treatment	Percentage of adults aged 18 years and older with a diagnosis of major depression, who were newly treated with antidepressant medication and remained on an antidepressant medication for at least 180 days (6 months)	Ballad Health Records; NCQA The State of Health Care Quality Report
24	Engagement of Alcohol or Drug Treatment	Adolescents and adults who initiated treatment and who had two or more additional services with a diagnosis of alcohol or other drug dependence within 30 days of the initiation visit.	Ballad Health Records; NCQA The State of Health Care Quality Report
25	SBIRT administration - hospital admissions	Percentage of patients admitted to a New Health System hospital who are screened for alcohol and substance abuse, provided a brief intervention, and referred to treatment (SBIRT)	Ballad Health Records
26	Rate of SBIRT administration - ED visits	Percentage of patients admitted to a New Health System emergency department who are screened for alcohol and substance abuse, provided a brief intervention, and referred to treatment (SBIRT)	Ballad Health Records

27	Patient Satisfaction and Access Surveys	Successful completion of patient satisfaction and access surveys, according to Section 4.02(c)(iii)	Ballad Health Records
28	Patient Satisfaction and Access Survey – Response Report	Report documents a satisfactory plan for the New Health System to address deficiencies and opportunities for improvement related to perceived access to care services and documents satisfactory progress towards the plan.	Ballad Health Records

Table of Targets and Weights for Access to Health Measures

TABLE 3

	Measure	**Target***	**Weight**
1	Population within 10 miles of an urgent care center (%)	Maintain or improve	4.0%
2	Population within 10 miles of an urgent care center open nights and weekends (%)	Maintain or improve	4.0%
3	Population within 10 miles of an urgent care facility or emergency department (%)	Maintain or improve	4.0%
4	Population within 15 miles of an emergency department (%)	Maintain or improve	4.0%
5	Population within 15 miles of an acute care hospital (%)	Maintain or improve	4.0%
6	Pediatric Readiness of Emergency Department	Improve	4.0%
7	Excessive Emergency Department Wait Times	Maintain or improve	3.0%
8	Specialist Recruitment and Retention	Improve	3.0%
9	Personal Care Provider	Maintain or improve	3.5%
10	Preventable Hospitalizations – Older Adults	Improve	2.5%
11	Preventable Hospitalizations – Adults	Improve	3.5%
12	Screening – Breast Cancer	Improve	2.0%
13	Screening – Cervical Cancer	Improve	2.0%
14	Screening - Colorectal Cancer	Improve	2.0%
15	Screening – Diabetes	Improve	3.0%
16	Screening – Hypertension	Improve	4.0%
17	Asthma ED Visits – Age 0-4	Improve	2.5%
18	Asthma ED Visits – Age 5-14	Improve	2.5%
19	Prenatal care in the first trimester	Improve	2.0%
20	Follow-Up After Hospitalization for Mental Illness	Improve	3.5%
21	Follow-Up After Hospitalization for Mental Illness	Improve	3.5%
22	Antidepressant Medication Management – Effective Acute	Improve	1.5%

	Phase Treatment		
23	Antidepressant Medication Management – Effective Continuation Phase Treatment	Improve	1.5%
24	Engagement of Alcohol or Drug Treatment	Improve	3.5%
25	Rate of SBIRT administration - hospital admissions	Improve	3.5%
26	Rate of SBIRT administration - ED visits	Improve	3.5%
27	Patient Satisfaction and Access Surveys	Successful completion of patient satisfaction and access surveys, according to Section 4.02(c)(iii)	10%
28	Patient Satisfaction and Access Survey – Response Report	Report documents a satisfactory plan for the Ballad Health to address deficiencies and opportunities for improvement related to perceived access to care services and documents satisfactory progress towards the plan.	10%
		TOTAL	**100%**

Access Data Notes

Preventable Hospitalizations:

The Prevention Quality Overall Composite is an aggregate measure of Prevention Quality Indicators (PQIs) described by the Agency for Healthcare Research and Quality (AHRQ). The composite score (rate) is used to identify quality of care for "ambulatory care-sensitive conditions." These are conditions for which early intervention and good outpatient care can potentially prevent complications and severity of disease resulting in hospitalizations. For example, patients with diabetes may be hospitalized for diabetic complications if their conditions are not adequately monitored or if they do not receive the patient education needed for appropriate self-management. Rates are calculated per 100,000 adult population of residence. For more information, see Prevention Quality Indicators Technical Specifications, Version v2018.

**All data are subject to limitations as explained in the data source.*

Other (Quality) Report

Other Sub-Index of Quality Measures

Tennessee Department of Health| March 2019

Other (Quality)

Introduction

The Other Sub-Index is comprised of measures to evaluate the quality of hospital and hospital-related care provided to residents at three levels: throughout Ballad Health's entire system, throughout Ballad Health's TN Geographic Service Area, and at the individual facility level.

The Institute of Medicine has defined the quality of health care as 'the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge'.[22]

Hospital quality is important for:

- Individual and population health: Measuring and monitoring hospital quality is essential to improving health outcomes and service delivery[23]
- Business: Positive feedback from consumers leads to the goodwill of service providers in the market, which indirectly expands their business[24]
- Cost-effectiveness: Poor quality of care, measured by medical errors in the hospital setting, account for approximately 17 Billion dollars each year [25]

Population Health

While managed care organizations support the principle that community health improvement is beneficial for society, hospital systems are often stymied from this endeavor by the need to focus on reducing patient costs. This issue is further perpetuated by a lack of business incentive to address population health needs within the hospital system. Measurements of hospital quality are being used to align efforts and resources between managed care and public health to enhance the impact on population health outcomes. For example, the US Medicare system

[22] Institute of Medicine. Medicare: a strategy for quality assurance. 1. Washington, DC: National Academy Press; 1990.

[23] Lieberthal RD, Comer DM. What are the characteristics that explain hospital quality? A longitudinal pridit approach. *Risk Manag Insur Rev.* 2013;17(1):17-35.

[24] Gupta KS, Rokade V. Importance of quality in health care sector: A review. *J Health Manag.* 2016;18(1):84-94.

[25] Van Den Bos J, Rustagi K, Gray T, Malford M, Ziemkiewicz E, Shreve J. The $17.1 billion problem: the annual cost of measurable medical errors. *Health Aff.* 2011; 30(4):596-603.

has value-based programs in which health care providers are rewarded incentive payments for the quality of care they provide to Medicare beneficiaries.[26] These incentives are in place to motivate hospitals to improve their quality and attract patients. The financial health of the organization is thus dependent on delivering high quality care and improving population health.

Competition promotes quality

Competition in health care markets benefits consumers because it helps contain costs, improve quality, and encourage innovation.[27] In recent years, health care markets have been subject to reforms introducing competition among health care providers. In addition to regulations promoting competition, there are regulations to protect competition. The Federal Trade Commission's job as a law enforcer is to stop health care markets from engaging in anticompetitive conduct that harms consumers.[28] Measuring hospital quality is important to determine if the disadvantages caused by a reduction in competition continue to be outweighed by the benefits of the Cooperative Agreement.

While competition is a strong driver for quality improvement, it is not the only driver. Internal goals for increasing population health and cost-effectiveness are strong motivating forces too. Hospitals can hold themselves accountable for achieving these goals through routine/systematic measuring and monitoring of quality performance measures.

Sub-Index Design

The purpose of the Other (Quality) Sub-Index is to evaluate the quality of hospital and hospital-related care provided to patients. While this first Other (Quality) report establishes the baseline values for the Sub-Index measures by reporting data available in 2018, subsequent annual reports will contain updated values to track on-going changes in healthcare quality at Ballad Health facilities. Annually, a calculation of these measures will produce an Other (Quality) Sub-Index score, which along with a Population Health Sub-Index score, and an Access to Health Services Sub-Index score, will produce a Final Score. Each year, the Final Score will be used to evaluate the continuing Public Advantage of the COPA.

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[26] Centers for Medicare & Medicaid Services. What are the value-based programs? https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/Value-Based-Programs/Value-Based-Programs.html. Accessed May 8, 2018.

[27] Brekke KR, Cellini R, Siciliani L, Straume OR. Competition and quality in health care markets: A differential-game approach. *J Health Econ.* 2010; 29(4):508-523.

[28] Federal Trade Commission. Health Care Competition. https://www.ftc.gov/news-events/media-resources/mergers-competition/health-care-competition. Accessed May 8, 2018.

The Other (Quality) measures include quality and consumer satisfaction around the following domains:

- Performance of Key Health System Divisions,
- Payer Performance,
- Employer Performance, and
- Scale, Spread, and Sustainability.

Two sets of Quality Measures are included in the Other (Quality) Sub-Index. They are Target Quality Measures and Quality Monitoring Measures.

Target Quality Measures are those for which Ballad should show improvement in quality outcomes. For the first year of the Affiliation, Ballad Health will be required to maintain performance on the Target Quality Measures. For each subsequent year, Ballad Health will be required to improve performance on Target Quality Measures. Achievement of Target Quality Measures account for 25 percent of the Other Sub-Index score.

The Quality Monitoring Measures provide a broad overview of system quality. The goal of these measures is to continually monitor Ballad's performance of with regard to quality. For hospital quality performance, Quality Monitoring Measures will include CMS Hospital Compare measures. Hospital Compare measures that are identified as Target Quality Measures and measures of payment and value of care will be excluded from Quality Monitoring Measures. Ballad will be evaluated on Quality Monitoring Measures for each applicable Ballad Health Entity. Achievement of Quality Monitoring Measures account for 75 percent of the Other (Quality) Sub-Index score.

Other (Quality) Baseline Table

TABLE 1

TARGET QUALITY MEASURES			
		Baseline Ballad Health System	Baseline TN Ballad
1	Pressure Ulcer Rate	0.71	0.44
2	Iatrogenic Pneumothorax Rate	0.38	0.40
3	Central Venous Catheter-Related Blood Stream Infection Rate	0.15	0.14
4	Postoperative Hip Fracture Rate	0.06	0.06
5	PSI 09 Perioperative Hemorrhage or Hematoma Rate	4.15	4.49
6	PSI 10 Postoperative Physiologic and Metabolic Derangement Rate	1.00	1.05
7	PSI 11 Postoperative Respiratory Failure Rate	14.79	13.08
8	PSI 12 Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate	5.42	5.52
9	PSI 13 Postoperative Sepsis Rate	8.81	8.54
10	PSI 14 Postoperative Wound Dehiscence Rate	2.22	2.22
11	PSI 15 Accidental Puncture or Laceration Rate	1.34	1.48
12	Central Line-Associated Bloodstream Infection (CLABSI) Rate	0.774	0.386
13	Catheter-Associated Urinary Tract Infection (CAUTI) Rate	0.613	0.319
14	Surgical Site Infection (SSI) Rate	-	-
	SSI Colon	1.17	1.15
	SSI HYST	1.00	1.47
15	Methicillin-Resistant Staphylococcus Aureus (MRSA) Rate	0.040	0.031
16	Clostridium Difficile Infection (CDI) Rate	0.585	0.423
QUALITY MONITORING MEASURES			

		Baseline Ballad Health System	Baseline TN Ballad
Structural Measures			
1	Participation in a systematic database for nursing sensitive care	N/A	Yes
2	Participation in a multispecialty surgical registry	N/A	Yes
3	Participation in general surgery registry	N/A	Yes
4	The Ability for Providers with HIT to Receive Laboratory Data Electronically Directly into their ONC-Certified EHR System as Discrete Searchable Data	N/A	Yes
5	Tracking Clinical Results between Visits	N/A	Yes
6	Safe surgery checklist use (outpatient)	N/A	Yes
7	Safe surgery checklist use (inpatient)	Yes	Yes
Survey of patient's experiences			
8	Communication with nurses - "nurses **always** communicated well"	82.1%	82.8%
9	Communication with nurses- "nurses **usually** communicated well"	13.1%	13.9%
10	Communication with nurses - "nurses **sometimes or never** communicated well"	4.6%	3.3%
11	Communication with doctors - "doctors **always** communicated well"	80.0%	84.1%
12	Communication with doctors - "doctors **usually** communicated well"	13.6%	12.0%
13	Communication with doctors - "doctors **sometimes or never** communicated well"	6.3%	3.8%
14	Responsiveness of hospital staff - "**always** received help as soon as wanted"	67.6%	73.5%
15	Responsiveness of hospital staff - "**usually** received help as soon as wanted"	25.8%	20.5%
16	Responsiveness of hospital staff - "**sometimes or never** received help as soon as wanted"	9.1%	6.0%
17	Pain management - "pain was **always** controlled"	68.4%	74.5%
18	Pain management - "pain was **usually** controlled"	22.7%	19.3%
19	Pain management - "pain was **sometimes or never** controlled"	9.3%	5.7%
20	Communication about medicines - "staff **always** explained medicines before giving it"	64.1%	67.8%

21	Communication about medicines - "staff **usually** explained medicines before giving it"	19.9%	17.3%
22	Communication about medicines - "staff **sometimes or never** explained medicines before giving it"	18.7%	15.7%
23	Cleanliness of hospital environment - "room and bathroom were **always** clean"	73.6%	74.5%
24	Cleanliness of hospital environment - "room and bathroom were **usually** clean"	16.4%	17.0%
25	Cleanliness of hospital environment - "room and bathroom were **sometimes or never** clean"	10.5%	8.5%
26	Quietness of hospital environment - "area around room was **always** quiet at night"	64.7%	67.4%
27	Quietness of hospital environment - "area around room was **usually** quiet at night"	24.4%	26.3%
28	Quietness of hospital environment - "area around room was **sometimes or never** quiet at night"	10.6%	6.4%
29	Discharge information - "Yes", given discharge information	85.9%	87.1%
30	Discharge information - "No", not given discharge information	14.2%	12.9%
31	Care Transition- understood their care when they left hospital - **Strongly agree**	52.1%	55.3%
32	Care Transition - understood their care when they left hospital - **Agree**	41.2%	39.0%
33	Care Transition - understood their care when they left hospital - **Disagree or Strongly disagree**	6.1%	4.8%
34	Overall rating of hospital - 9-10 rating	70.7%	75.1%
35	Overall rating of hospital - 7-8 rating	19.5%	17.4%
36	Overall rating of hospital - 0-6 rating	9.2%	7.5%
37	Willingness to recommend the hospital - definitely	71.3%	75.9%
38	Willingness to recommend the hospital - probably	22.2%	19.5%
39	Willingness to recommend the hospital - probably or definitely not	6.5%	4.6%
Timely and effective care			
40	Improvement in Patient's Visual Function within 90 Days Following Cataract Surgery	N/A	N/A
41	Endoscopy/polyp surveillance: appropriate follow-up interval for normal colonoscopy in average risk patients	73.0%	82.3%

42	Endoscopy/polyp surveillance: colonoscopy interval for patients with a history of adenomatous polyps - avoidance of inappropriate use	83.0%	76.8%
43	Median time to transfer to another facility for acute coronary intervention	47.4	67.2
44	Median time to ECG	5.22	7.1
45	Fibrinolytic therapy received within 30 minutes of emergency department arrival	N/A	N/A
46	Aspirin at arrival	97.0%	97.4%
47	Emergency department volume	N/A	not reported
48	Median time from emergency department arrival to emergency department departure for admitted emergency department patients	227.3	231.5
49	Admit decision time to emergency department departure time for admitted patient	124.5	93.6
50	Median time from emergency department arrival to emergency department departure for discharged emergency department patients	124.53	131.7
51	Door to diagnostic evaluation by a qualified medical professional	15.09	20.0
52	Median time to pain medication for long bone fractures	37.84	49.0
53	Patient left without being seen	0.9%	0.9%
54	Head CT scan results for acute ischemic stroke or hemorrhagic stroke who received head CT scan interpretation within 45 minutes of arrival	63.2%	44.4%
55	Immunization for influenza	97.4%	87.9%
56	Influenza Vaccination Coverage among Healthcare Personnel	97.0%	96.6%
57	Thrombolytic Therapy	N/A	82.2%
58	Hospital acquired potentially preventable venous thromboembolism	1.7%	1.4%
59	Warfarin therapy discharge instructions	N/A	57.8%
60	Elective delivery	0.03	0.0%
COMPLICATIONS			
Reduce Surgical complications			
61	Hospital level risk-standardized complication rate (RSCR) following elective primary total hip arthroplasty (THA) and total knee arthroplasty (TKA)	2.9%	0.0

62	Complication/patient safety for selected indicators (composite)	0.83	0.92
63	Death rate among surgical inpatients with serious treatable complications	140.6	135.72
Readmissions rates			
64	Chronic obstructive pulmonary disease (COPD) 30-day readmission rate	18.2%	17.8%
65	Acute myocardial infarction (AMI) 30-day readmission rate	12.9%	12.5%
66	Heart failure (HF) 30-day readmission rate	20.5%	19.7%
67	Pneumonia (PN) 30-day readmission rate	17.7%	17.0%
68	Stroke 30-day readmission rate	9.3%	9.4%
69	Coronary artery bypass graft (CABG) surgery 30-day readmission rate	8.7%	8.9%
70	30-day readmission rate following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA)	3.8%	3.4%
71	30-day hospital-wide all- cause unplanned readmission (HWR)	12.0%	12.3%
Death rates			
72	COPD 30-day mortality rate	1.8%	2.8%
73	Acute myocardial infarction (AMI) 30-day mortality rate	4.7%	7.1%
74	Heart failure (HF) 30-day mortality rate	3.9%	5.3%
75	Pneumonia (PN) 30-day mortality rate	4.7%	7.2%
76	Stroke 30-day mortality rate	8.2%	10.4%
77	Coronary artery bypass graft (CABG) surgery 30-day mortality rate	2.0%	2.0%
Use of medical imaging - Outpatient imaging efficiency			
78	MRI Lumbar Spine for Low Back Pain	38.0%	40.7%
79	Mammography Follow-Up Rates	8.0%	8.3%
80	Abdomen CT - Use of Contrast Material	6.0%	7.1%
81	Thorax CT - Use of Contrast Material	1.0%	0.9%
82	Cardiac Imaging for Preoperative Risk Assessment for Non-Cardiac Low-Risk Surgery	3.0%	3.5%

83	Simultaneous Use of Brain Computed Tomography (CT) and Sinus CT	2.0%	1.4%

Target Quality Measures								
				TN	TN	TN	TN	TN
		Baseline Ballad Health System	Baseline TN Ballad	Franklin Woods Community Hospital	Johnson City Medical Center	Hancock County Hospital	Hawkins County Memorial Hospital	Holston Valley Medical Center
1	Pressure Ulcer Rate	0.71	0.44	0.3	0.26	N/A	0.45	1.07
2	Iatrogenic Pneumothorax Rate	0.38	0.4	0.38	0.26	N/A	0.4	0.57
3	Central Venous Catheter-Related Blood Stream Infection Rate	0.15	0.14	0.15	0.1	N/A	0.17	0.16
4	Postoperative Hip Fracture Rate	0.06	0.06	0.06	0.06	N/A	N/A	0.06
5	PSI 09 Perioperative Hemorrhage or Hematoma Rate	4.15	4.49	4.37	3.6	N/A	N/A	4.04
6	PSI 10 Postoperative Physiologic and Metabolic Derangement Rate	1.00	1.05	1.09	1.08	N/A	N/A	0.87
7	PSI 11 Postoperative Respiratory Failure Rate	14.79	13.08	12.09	11.98	N/A	N/A	16.84
8	PSI 12 Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate	5.42	5.52	4.36	5.85	N/A	N/A	6.14
9	PSI 13 Postoperative Sepsis Rate	8.81	8.54	--	14.88	N/A	N/A	9.47
10	PSI 14 Postoperative Wound Dehiscence Rate	2.22	2.22	2.15	2.35	N/A	N/A	2.42
11	PSI 15 Accidental Puncture or Laceration Rate	1.34	1.48	1.45	1.34	N/A	1.36	1.62
12	Central Line-Associated Bloodstream Infection (CLABSI) Rate	0.774	0.386	0	1.08	N/A	0.000	0.682

13	Catheter-Associated Urinary Tract Infection (CAUTI) Rate	0.613	0.319	0.428	0.997	N/A	0.000	0.938
14	Surgical Site Infection (SSI) Rate	--	--	--	--	--	--	--
	SSI Colon	1.166	1.148	1.5	1.91	N/A	0	1.36
	SSI HYST	0.996	1.469	0	2.5	N/A	N/A	0.64
15	Methicillin-Resistant Staphylococcus Aureus (MRSA) Rate	0.040	0.031	0.039	0.055	N/A	0.000	0.012
16	Clostridium Difficile Infection (CDI) Rate	0.585	0.423	0.259	0.531	N/A	0.000	0.741

Target Quality Measures								
		TN	TN	TN	TN	TN	TN	TN
		Indian Path Medical Center	Bristol Regional Medical Center	Sycamore Shoals Hospital	Johnson County Community Hospital	Unicoi County Memorial Hospital	Laughlin Memorial Hospital	Takoma Regional Hospital
1	Pressure Ulcer Rate	0.23	0.80	0.31	N/A	0.40	0.27	0.34
2	Iatrogenic Pneumothorax Rate	0.45	0.32	0.44	N/A	0.40	0.37	0.45
3	Central Venous Catheter-Related Blood Stream Infection Rate	0.14	0.09	0.16	N/A	0.17	0.15	0.15
4	Postoperative Hip Fracture Rate	0.06	0.06	0.06	N/A	0.06	0.06	0.06
5	PSI 09 Perioperative Hemorrhage or Hematoma Rate	4.78	4.72	4.66	N/A	4.75	4.52	4.98
6	PSI 10 Postoperative Physiologic and Metabolic Derangement Rate	1.1	0.97	1.11	N/A	N/A	1.10	1.11
7	PSI 11 Postoperative Respiratory Failure Rate	12.36	16.50	13.37	N/A	N/A	8.98	12.51

8	PSI 12 Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate	5.38	4.25	5.23	N/A	4.76	6.16	7.58
9	PSI 13 Postoperative Sepsis Rate	9.09	8.88	0.00	N/A	N/A	9.38	9.48
10	PSI 14 Postoperative Wound Dehiscence Rate	2.2	1.95	2.26	N/A	N/A	2.22	2.24
11	PSI 15 Accidental Puncture or Laceration Rate	1.38	1.38	1.35	N/A	1.26	2.17	1.49
12	Central Line-Associated Bloodstream Infection (CLABSI) Rate	0.000	1.202	0.900	N/A	0.000	0.000	0.000
13	Catheter-Associated Urinary Tract Infection (CAUTI) Rate	0.000	0.824	0.000	N/A	0.000	0.000	0.000
14	Surgical Site Infection (SSI) Rate	--	--	--	--	--	--	--
0	SSI Colon	0.00	0.00	3.230	N/A	N/A	2.330	0.000
0	SSI HYST	7.14	0.00	0.000	N/A	N/A	N/A	0.000
15	Methicillin-Resistant Staphylococcus Aureus (MRSA) Rate	0.080	0.056	0.067	N/A	0.000	0.000	0.000
16	Clostridium Difficile Infection (CDI) Rate	0.813	0.719	0.604	N/A	0.000	0.441	0.124

Quality Monitoring Measures								
		Baseline Ballad Health System	Baseline TN Ballad	Franklin Woods Community Hospital	Johnson City Medical Center	Hancock County Hospital	Hawkins County Memorial Hospital	Holston Valley Medical Center
Structural Measures								
1	Participation in a systematic database for nursing sensitive care	N/A	Yes	Yes	Yes	N/A	No	Yes
2	Participation in a multispecialty surgical registry	N/A	Yes	Yes	Yes	N/A	Yes	Yes
3	Participation in general surgery registry	N/A	Yes	Yes	Yes	N/A	No	Yes
4	The Ability for Providers with HIT to Receive Laboratory Data Electronically Directly into their ONC-Certified EHR System as Discrete Searchable Data	N/A	Yes	Yes	Yes	N/A	Yes	Yes
5	Tracking Clinical Results between Visits	N/A	Yes	Yes	Yes	N/A	Yes	Yes
6	Safe surgery checklist use (outpatient)	N/A	Yes	Yes	Yes	N/A	Yes	Yes
7	Safe surgery checklist use (inpatient)	Yes	Yes	Yes	Yes	N/A	Yes	Yes
Survey of Patient's Experiences								
8	Communication with nurses - "nurses **always** communicated well"	82.1%	82.8%	84.0%	77.0%	90.0%	87.0%	81.0%
9	Communication with nurses- "nurses **usually** communicated well"	13.1%	13.9%	13.0%	17.0%	8.0%	11.0%	16.0%
10	Communication with nurses - "nurses **sometimes or never** communicated well"	4.6%	3.3%	3.0%	6.0%	2.0%	2.0%	3.0%

11	Communication with doctors - "doctors **always** communicated well"	80.0%	84.1%	84.0%	77.0%	92.0%	92.0%	82.0%
12	Communication with doctors - "doctors **usually** communicated well"	13.6%	12.0%	15.0%	18.0%	6.0%	7.0%	15.0%
13	Communication with doctors - "doctors **sometimes or never** communicated well"	6.3%	3.8%	4.0%	5.0%	2.0%	1.0%	3.0%
14	Responsiveness of hospital staff - "**always** received help as soon as wanted"	67.6%	73.5%	72.0%	66.0%	95.0%	78.0%	66.0%
15	Responsiveness of hospital staff - "**usually** received help as soon as wanted"	25.8%	20.5%	21.0%	25.0%	4.0%	20.0%	26.0%
16	Responsiveness of hospital staff - "**sometimes or never** received help as soon as wanted"	9.1%	6.0%	7.0%	9.0%	1.0%	2.0%	8.0%
17	Pain management - "pain was **always** controlled"	68.4%	74.5%	76.0%	66.0%	89.0%	81.0%	73.0%
18	Pain management - "pain was **usually** controlled"	22.7%	19.3%	19.0%	25.0%	5.0%	13.0%	21.0%
19	Pain management - "pain was **sometimes or never** controlled"	9.3%	5.7%	5.0%	9.0%	1.0%	6.0%	6.0%
20	Communication about medicines - "staff **always** explained medicines before giving it"	64.1%	67.8%	68.0%	60.0%	77.0%	83.0%	63.0%
21	Communication about medicines - "staff **usually** explained medicines before giving it"	19.9%	17.3%	16.0%	18.0%	18.0%	10.0%	17.0%

22	Communication about medicines - "staff **sometimes or never** explained medicines before giving it"	18.7%	15.7%	16.0%	22.0%	5.0%	7.0%	20.0%
23	Cleanliness of hospital environment - "room and bathroom were **always** clean"	73.6%	74.5%	83.0%	62.0%	86.0%	86.0%	66.0%
24	Cleanliness of hospital environment - "room and bathroom were **usually** clean"	16.4%	17.0%	13.0%	24.0%	14.0%	9.0%	21.0%
25	Cleanliness of hospital environment - "room and bathroom were **sometimes or never** clean"	10.5%	8.5%	4.0%	14.0%	0.0%	5.0%	13.0%
26	Quietness of hospital environment - "area around room was **always** quiet at night"	64.7%	67.4%	74.0%	52.0%	79.0%	74.0%	63.0%
27	Quietness of hospital environment - "area around room was **usually** quiet at night"	24.4%	26.3%	22.0%	37.0%	18.0%	23.0%	29.0%
28	Quietness of hospital environment - "area around room was **sometimes or never** quiet at night"	10.6%	6.4%	4.0%	11.0%	3.0%	3.0%	8.0%
29	Discharge information - "Yes", given discharge information	85.9%	87.1%	88.0%	84.0%	92.0%	92.0%	87.0%
30	Discharge information - "No", not given discharge information	14.2%	12.9%	12.0%	16.0%	8.0%	8.0%	13.0%
31	Care Transition- understood their care when they left hospital - **Strongly agree**	52.1%	55.3%	61.0%	48.0%	70.0%	55.0%	54.0%

32	Care Transition - understood their care when they left hospital - **Agree**	41.2%	39.0%	34.0%	47.0%	22.0%	41.0%	40.0%
33	Care Transition - understood their care when they left hospital - **Disagree or Strongly disagree**	6.1%	4.8%	5.0%	5.0%	8.0%	4.0%	6.0%
34	Overall rating of hospital - 9-10 rating	70.7%	75.1%	82.0%	66.0%	80.0%	74.0%	74.0%
35	Overall rating of hospital - 7-8 rating	19.5%	17.4%	14.0%	24.0%	7.0%	21.0%	19.0%
36	Overall rating of hospital - 0-6 rating	9.2%	7.5%	4.0%	10.0%	13.0%	5.0%	7.0%
37	Willingness to recommend the hospital - definitely	71.3%	75.9%	85.0%	65.0%	81.0%	76.0%	78.0%
38	Willingness to recommend the hospital - probably	22.2%	19.5%	13.0%	29.0%	9.0%	21.0%	19.0%
39	Willingness to recommend the hospital - probably or definitely not	6.5%	4.6%	2.0%	6.0%	10.0%	3.0%	3.0%
Timely and Effective Care								
40	Improvement in Patient's Visual Function within 90 Days Following Cataract Surgery	N/A	N/A	N/A	N/A	N/A	N/A	N/A
41	Endoscopy/polyp surveillance: appropriate follow-up interval for normal colonoscopy in average risk patients	73.0%	82.3%	78.0%	67.0%	N/A	97.0%	N/A
42	Endoscopy/polyp surveillance: colonoscopy interval for patients with a history of adenomatous polyps - avoidance of inappropriate use	83.0%	76.8%	100.0%	68.0%	N/A	95.0%	62.0%

43	Median time to transfer to another facility for acute coronary intervention	47.4	67.2	N/A	N/A	N/A	N/A	N/A
44	Median time to ECG	5.22	7.1	8.0	N/A	N/A	9.0	N/A
45	Fibrinolytic therapy received within 30 minutes of emergency department arrival	N/A	N/A	N/A	N/A	N/A	N/A	N/A
46	Aspirin at arrival	97.0%	97.4%	98.0%	N/A	N/A	100.0%	N/A
47	Emergency department volume	N/A	not reported	Medium	Very High	Medium	Low	Very High
48	Median time from emergency department arrival to emergency department departure for admitted emergency department patients	227.29	231.5	234.0	245.0	N/A	175.0	340.0
49	Admit decision time to emergency department departure time for admitted patient	124.50	93.6	70.0	95.0	102.0	49.0	186.0
50	Median time from emergency department arrival to emergency department departure for discharged emergency department patients	124.53	131.7	130.00	152.0	N/A	80.0	153.0
51	Door to diagnostic evaluation by a qualified medical professional	15.09	20.0	16.00	19.0	N/A	14.0	24.0
52	Median time to pain medication for long bone fractures	37.84	49.0	36.00	35.0	N/A	38.0	52.0
53	Patient left without being seen	0.9%	0.9%	1.0%	1.0%	1.0%	0.0%	1.0%

54	Head CT scan results for acute ischemic stroke or hemorrhagic stroke who received head CT scan interpretation within 45 minutes of arrival	63.2%	44.4%	66.7%	0.0%	N/A	50.0%	78.6%
55	Immunization for influenza	97.4%	87.9%	99.0%	96.0%	N/A	97.0%	95.0%
56	Influenza Vaccination Coverage among Healthcare Personnel	97.0%	96.6%	99.0%	98.0%	100.0%	99.0%	94.0%
57	Thrombolytic Therapy	N/A	82.2%	N/A	N/A	N/A	N/A	83.0%
58	Hospital acquired potentially preventable venous thromboembolism	1.7%	1.4%	N/A	0.0%	N/A	1.0%	3.0%
59	Warfarin therapy discharge instructions	N/A	57.8%	N/A	N/A	N/A	N/A	56.0%
60	Elective delivery	0.3%	0.0%	0.00	0.00	N/A	N/A	0.00
Complications								
Reduce Surgical Complications								
61	Hospital level risk-standardized complication rate (RSCR) following elective primary total hip arthroplasty (THA) and total knee arthroplasty (TKA)	2.9%	0.0	N/A	0.0	N/A	N/A	0.0
62	Complication/patient safety for selected indicators (composite)	0.83	0.92	0.82	0.89	N/A	0.88	1.07
63	Death rate among surgical inpatients with serious treatable complications	140.6	135.72	N/A	153.53	N/A	N/A	130.24
Readmissions Rates								
64	Chronic obstructive pulmonary disease (COPD) 30-day readmission rate	18.2%	17.8%	10.1%	20.1%	N/A	18.6%	19.7%

65	Acute myocardial infarction (AMI) 30-day readmission rate	12.9%	12.5%	N/A	13.5%	N/A	N/A	8.5%
66	Heart failure (HF) 30-day readmission rate	20.5%	19.7%	9.7%	22.6%	N/A	21.1%	21.6%
67	Pneumonia (PN) 30-day readmission rate	17.7%	17.0%	16.3%	18.8%	17.0%	16.8%	19.4%
68	Stroke 30-day readmission rate	9.3%	9.4%	0.0%	9.4%	N/A	N/A	14.6%
69	Coronary artery bypass graft (CABG) surgery 30-day readmission rate	8.7%	8.9%	N/A	8.7%	N/A	N/A	8.0%
70	30-day readmission rate following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA)	3.8%	3.4%	N/A	3.0%	N/A	N/A	4.2%
71	30-day hospital-wide all- cause unplanned readmission (HWR)	12.0%	12.3%	4.6%	10.6%	15.6%	14.6%	12.7%
Death Rates								
72	COPD 30-day mortality rate	1.8%	2.8%	2.6%	2.3%	N/A	0.0%	1.4%
73	Acute myocardial infarction (AMI) 30-day mortality rate	4.7%	7.1%	N/A	4.8%	N/A	N/A	4.5%
74	Heart failure (HF) 30-day mortality rate	3.9%	5.3%	2.1%	4.2%	N/A	0.0%	3.8%
75	Pneumonia (PN) 30-day mortality rate	4.7%	7.2%	2.0%	5.1%	16.9%	2.6%	2.6%
76	Stroke 30-day mortality rate	8.2%	10.4%	N/A	7.7%	N/A	N/A	17.4%
77	Coronary artery bypass graft (CABG) surgery 30-day mortality rate	2.0%	2.0%	N/A	1.2%	N/A	N/A	1.4%
Use of medical imaging / Outpatient imaging efficiency								
78	MRI Lumbar Spine for Low Back Pain	38.0%	40.7%	33.9%	35.4%	N/A	N/A	43.1%
79	Mammography Follow-Up Rates	8.0%	8.3%	N/A	5.8%	N/A	3.7%	2.9%

80	Abdomen CT - Use of Contrast Material	6.0%	7.1%	12.7%	4.6%	N/A	6.0%	14.3%
81	Thorax CT - Use of Contrast Material	1.0%	0.9%	0.0%	0.2%	N/A	3.2%	0.0%
82	Cardiac Imaging for Preoperative Risk Assessment for Non-Cardiac Low-Risk Surgery	3.0%	3.5%	1.6%	2.9%	N/A	N/A	4.4%
83	Simultaneous Use of Brain Computed Tomography (CT) and Sinus CT	2.0%	1.4%	N/A	2.8%	N/A	N/A	1.0%

Quality Monitoring Measures								
		Indian Path Medical Center	Bristol Regional Medical Center	Sycamore Shoals Hospital	Johnson County Community Hospital	Unicoi County Memorial Hospital	Laughlin Memorial Hospital	Takoma Regional Hospital
Structural Measures								
1	Participation in a systematic database for nursing sensitive care	Yes	No	Yes	N/A	No	Yes	No
2	Participation in a multispecialty surgical registry	Yes	Yes	Yes	N/A	Yes	Yes	Yes
3	Participation in general surgery registry	Yes	Yes	Yes	N/A	Yes	Yes	No
4	The Ability for Providers with HIT to Receive Laboratory Data Electronically Directly into their ONC-Certified EHR System as Discrete Searchable Data	Yes	No	Yes	Yes	N/A	Yes	Yes
5	Tracking Clinical Results between Visits	Yes	Yes	Yes	Yes	N/A	Yes	Yes
6	Safe surgery checklist use (outpatient)	Yes	Yes	Yes	N/A	N/A	Yes	Yes
7	Safe surgery checklist use (inpatient)	Yes	Yes	Yes	N/A	Yes	Yes	Yes
Survey of Patient's Experiences								
8	Communication with nurses - "nurses always communicated well"	82.0%	82.0%	85.0%	N/A	79.0%	81.0%	83.0%
9	Communication with nurses- "nurses usually communicated well"	14.0%	14.0%	12.0%	N/A	18.0%	16.0%	14.0%

10	Communication with nurses - "nurses sometimes or never communicated well"	4.0%	4.0%	3.0%	N/A	3.0%	3.0%	3.0%
11	Communication with doctors - "doctors always communicated well"	85.0%	84.0%	86.0%	N/A	80.0%	85.0%	78.0%
12	Communication with doctors - "doctors usually communicated well"	10.0%	14.0%	11.0%	N/A	12.0%	13.0%	11.0%
13	Communication with doctors - "doctors sometimes or never communicated well"	5.0%	2.0%	3.0%	N/A	8.0%	2.0%	7.0%
14	Responsiveness of hospital staff - "always received help as soon as wanted"	65.0%	69.0%	82.0%	N/A	71.0%	73.0%	71.0%
15	Responsiveness of hospital staff - "usually received help as soon as wanted"	25.0%	23.0%	13.0%	N/A	23.0%	22.0%	24.0%
16	Responsiveness of hospital staff - "sometimes or never received help as soon as wanted"	10.0%	8.0%	5.0%	N/A	6.0%	5.0%	5.0%
17	Pain management - "pain was always controlled"	72.0%	74.0%	75.0%	N/A	71.0%	70.0%	73.0%
18	Pain management - "pain was usually controlled"	22.0%	21.0%	19.0%	N/A	25.0%	22.0%	20.0%
19	Pain management - "pain was sometimes or never controlled"	6.0%	5.0%	6.0%	N/A	4.0%	8.0%	7.0%
20	Communication about medicines - "staff always explained medicines before giving it"	63.0%	67.0%	73.0%	N/A	68.0%	61.0%	63.0%

21	Communication about medicines - "staff usually explained medicines before giving it"	18.0%	17.0%	14.0%	N/A	21.0%	20.0%	21.0%
22	Communication about medicines - "staff sometimes or never explained medicines before giving it"	19.0%	16.0%	13.0%	N/A	20.0%	19.0%	16.0%
23	Cleanliness of hospital environment - "room and bathroom were always clean"	74.0%	62.0%	82.0%	N/A	72.0%	70.0%	77.0%
24	Cleanliness of hospital environment - "room and bathroom were usually clean"	16.0%	22.0%	13.0%	N/A	23.0%	18.0%	14.0%
25	Cleanliness of hospital environment - "room and bathroom were sometimes or never clean"	10.0%	16.0%	5.0%	N/A	5.0%	12.0%	9.0%
26	Quietness of hospital environment - "area around room was always quiet at night"	66.0%	65.0%	73.0%	N/A	68.0%	61.0%	66.0%
27	Quietness of hospital environment - "area around room was usually quiet at night"	28.0%	28.0%	23.0%	N/A	23.0%	30.0%	28.0%
28	Quietness of hospital environment - "area around room was sometimes or never quiet at night"	6.0%	7.0%	40.0%	N/A	9.0%	9.0%	6.0%
29	Discharge information - "Yes", given discharge information	86.0%	88.0%	86.0%	N/A	76.0%	88.0%	91.0%

30	Discharge information - "No", not given discharge information	14.0%	12.0%	14.0%	N/A	24.0%	12.0%	9.0%
31	Care Transition-understood their care when they left hospital - Strongly agree	55.0%	53.0%	59.0%	N/A	47.0%	50.0%	56.0%
32	Care Transition - understood their care when they left hospital - Agree	40.0%	42.0%	38.0%	N/A	40.0%	45.0%	40.0%
33	Care Transition - understood their care when they left hospital - Disagree or Strongly disagree	5.0%	5.0%	3.0%	N/A	4.0%	5.0%	3.0%
34	Overall rating of hospital - 9-10 rating	73.0%	77.0%	79.0%	N/A	67.0%	77.0%	77.0%
35	Overall rating of hospital - 7-8 rating	19.0%	16.0%	17.0%	N/A	21.0%	17.0%	16.0%
36	Overall rating of hospital - 0-6 rating	8.0%	7.0%	4.0%	N/A	12.0%	6.0%	7.0%
37	Willingness to recommend the hospital - definitely	78.0%	78.0%	78.0%	N/A	62.0%	76.0%	78.0%
38	Willingness to recommend the hospital - probably	17.0%	19.0%	18.0%	-N/A	28.0%	22.0%	19.0%
39	Willingness to recommend the hospital - probably or definitely not	5.0%	3.0%	4.0%	N/A	10.0%	2.0%	3.0%
Timely and Effective Care								
40	Improvement in Patient's Visual Function within 90 Days Following Cataract Surgery	N/A	N/A	N/A	N/A	N/A	N/A	N/A
41	Endoscopy/polyp surveillance: appropriate follow-up interval for normal colonoscopy in average risk	N/A	57.0%	100.0%	N/A	N/A	86.0%	91.0%

	patients							
42	Endoscopy/polyp surveillance: colonoscopy interval for patients with a history of adenomatous polyps - avoidance of inappropriate use	73.0%	46.0%	75.0%	N/A	N/A	89.0%	83.0%
43	Median time to transfer to another facility for acute coronary intervention	N/A	N/A	N/A	N/A	N/A	47.0	79.0
44	Median time to ECG	4.0	N/A	5.0	N/A	8.0	7.0	9.0
45	Fibrinolytic therapy received within 30 minutes of emergency department arrival	N/A	N/A	N/A	N/A	N/A	N/A	N/A
46	Aspirin at arrival	93.0%	N/A	N/A	N/A	N/A	N/A	99.0%
47	Emergency department volume	Medium	High	Medium	Low	Low	Medium	Medium
48	Median time from emergency department arrival to emergency department departure for admitted emergency department patients	220.0	255.0	210.0	N/A	209.0	206.0	221.0
49	Admit decision time to emergency department departure time for admitted patient	78.0	96.0	69.0	N/A	N/A	N/A	29.0

50	Median time from emergency department arrival to emergency department departure for discharged emergency department patients	121.0	147.0	124.0	N/A	119.0	124.0	139.0
51	Door to diagnostic evaluation by a qualified medical professional	18.0	23.0	14.0	N/A	18.0	25.0	26.0
52	Median time to pain medication for long bone fractures	32.0	43.0	63.0	N/A	56.0	65.0	70.0
53	Patient left without being seen	1.0%	1.0%	0.0%	1.0%	1.0%	1.0%	2.0%
54	Head CT scan results for acute ischemic stroke or hemorrhagic stroke who received head CT scan interpretation within 45 minutes of arrival	N/A	60.0%	0.0%	N/A	0.0%	100.0%	N/A
55	Immunization for influenza	99.0%	96.0%	98.0%	N/A	93.0%	96.0%	100.0%
56	Influenza Vaccination Coverage among Healthcare Personnel	97.0%	99.0%	99.0%	N/A	99.0%	96.0%	87.0%
57	Thrombolytic Therapy	N/A	83.0%	N/A	N/A	N/A	N/A	N/A
58	Hospital acquired potentially preventable venous thromboembolism	0.0%	3.0%	N/A	N/A	N/A	N/A	N/A
59	Warfarin therapy discharge instructions	N/A	55.0%	N/A	N/A	N/A	N/A	N/A
60	Elective delivery	0.00	0.0%	N/A	N/A	N/A	N/A	0.0%
Complications								
Reduce Surgical Complications								

61	Hospital level risk-standardized complication rate (RSCR) following elective primary total hip arthroplasty (THA) and total knee arthroplasty (TKA)	0.0	0.0	0.0%	N/A	N/A	N/A	N/A
62	Complication/patient safety for selected indicators (composite)	0.87	0.81	0.87	N/A	0.82	1.09	1.05
63	Death rate among surgical inpatients with serious treatable complications	135.61	123.34	N/A	N/A	N/A	135.88	N/A
Readmissions Rates								
64	Chronic obstructive pulmonary disease (COPD) 30-day readmission rate	18.4%	20.1%	14.6%	N/A	N/A	19.8%	19.1%
65	Acute myocardial infarction (AMI) 30-day readmission rate	10.4%	8.9%	17.5%	N/A	N/A	16.6%	N/A
66	Heart failure (HF) 30-day readmission rate	18.1%	22.6%	16.1%	N/A	N/A	24.2%	21.3%
67	Pneumonia (PN) 30-day readmission rate	14.8%	14.7%	N/A	N/A	N/A	18.3%	17.1%
68	Stroke 30-day readmission rate	6.2%	13.4%	7.2%	N/A	N/A	12.1%	12.2%
69	Coronary artery bypass graft (CABG) surgery 30-day readmission rate	N/A	10.0%	N/A	N/A	N/A	N/A	N/A
70	30-day readmission rate following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA)	3.4%	1.8%	3.3%	N/A	N/A	3.8%	4.5%
71	30-day hospital-wide all- cause unplanned readmission (HWR)	9.5%	13.1%	10.4%	N/A	N/A	16.3%	15.2%
Death Rates								

72	COPD 30-day mortality rate	2.0%	0.0%	0.7%	N/A	N/A	6.9%	8.9%
73	Acute myocardial infarction (AMI) 30-day mortality rate	4.5%	3.8%	10.0%	N/A	N/A	14.7%	N/A
74	Heart failure (HF) 30-day mortality rate	2.2%	3.7%	3.5%	N/A	N/A	15.4%	12.5%
75	Pneumonia (PN) 30-day mortality rate	2.0%	3.4%	3.8%	N/A	N/A	19.9%	14.1%
76	Stroke 30-day mortality rate	3.3%	15.0%	0.0%	N/A	N/A	14.1%	15.1%
77	Coronary artery bypass graft (CABG) surgery 30-day mortality rate	N/A	3.3%	N/A	N/A	N/A	N/A	N/A
Use of medical imaging / Outpatient imaging efficiency								
78	MRI Lumbar Spine for Low Back Pain	N/A	43.2%	N/A	N/A	N/A	47.8%	N/A
79	Mammography Follow-Up Rates	5.6%	9.1%	7.2%	N/A	4.7%	17.7%	17.7%
80	Abdomen CT - Use of Contrast Material	7.9%	4.0%	3.2%	N/A	4.7%	7.1%	6.9%
81	Thorax CT - Use of Contrast Material	0.0%	0.2%	0.5%	N/A	0.0%	3.2%	1.3%
82	Cardiac Imaging for Preoperative Risk Assessment for Non-Cardiac Low-Risk Surgery	1.5%	4.0%	0.0%	N/A	N/A	4.1%	9.4%
83	Simultaneous Use of Brain Computed Tomography (CT) and Sinus CT	N/A	80.0%	1.2%	N/A	0.7%	2.0%	N/A

n/a – Data will not be compared at this level.

Other (Quality) Data Methodology

- Because Hospital Compare does not report results by system and only reports results by individual hospital (with some exclusions: for example Critical Access and Specialty Hospitals), and because the TN COPA and VA Cooperative Agreement require Ballad Health aggregate results compared to Ballad Health baseline performance (as confirmed during clarifying conversations between TN DOH, VA DOH, and Ballad Health between January and March, 2018), a need to calculate a Ballad Health baseline for each of the 16 + 83 quality measures existed. The methodology described in this overview was designed to address that requirement.
- This document provides an overview of the methodology used by Ballad Health to calculate a baseline value for each of the 16 Target Quality Measures and 83 Quality Monitoring measures included in Exhibit K, TN Terms of Certification and as required in the TN Terms of Certification, Exhibit G and as referenced in the TN Terms of Certification 4.02c(ii), and referenced in the VA Cooperative Agreement, Conditions 12 & 39.

- Notes:
    - Baseline = results posted on Hospital Compare July 2017
        - PSI baselines were not included in the July 2017 Hospital Compare release; these baselines were posted in the October 2017 release and that is what is used in this report
        - For OP 23 Head CT Results & PSI 4 Surgery Comp, a baseline was not reported on Hospital Compare; baseline provided on this report is based on internal numerators and denominators for time frame 10/2015 – 9/2016 (which mirrors the July 2017 publish performance period) thereby replicating definition used by Hospital Compare
        - HAI/Infection Rates/Mortality/Readmissions
            - Hospital Compare publishes rates (SIRS) that compare actual infections to the number of expected infections and this SIR changes each year; this methodology does not readily enable concise monitoring for improvement monthly, quarterly, or year over year
            - Hospital Compare publishes mortality and readmissions rates using a proprietary formula; this methodology does not readily enable concise monitoring for improvement monthly, quarterly, or year over year
            - THEREFORE, HAI/Infection Rates/Mortality/Readmissions baselines provided on this report are based on the numerators and denominators reported to Hospital Compare which are the factors in the baseline SIR/Rate and actual SIR/Rate for the identical Hospital Compare timeframe, thereby translating the SIR into a usable value for monitoring improvement over past performance.

Ballad Baseline Calculation Approach

For HAI, Readmission, Mortality, HCAHPs, Quality Measures:		
STEP	ACTION	RESULT
1	Download each hospital's flat file from Hospital Compare matching performance period for July 2017 publish	Detailed data behind the published results, including each hospital's denominators and numerators
2	Capture denominator and numerator for each measure, for each hospital	List of denominators and numerators that includes all hospitals and for each measure
3	Total all denominators, by measure	Ballad denominator for each measure
4	Total all numerators, by measure	Ballad numerator for each hospital
5	Calculate absolute rate for each measure (numerator/denominator)	Ballad rate (absolute)

For PSI		
STEP	ACTION	RESULT
1	Download each hospital's flat file from Hospital Compare matching performance period for October 2017 publish	Detailed data behind the published results, including each hospital's denominators and PSI rates
2	Capture denominator and rate for each measure, for each hospital	List of denominators and rates that includes all hospitals and for each PSI measure
3	Solve for numerator (x/denominator = rate) for each measure for each hospital	List of numerators for all hospitals for each PSI measure
4	Total all denominators, by measure	Ballad denominator for each measure
5	Total all numerators, by measure	Ballad numerator for each hospital
6	Calculate absolute rate for each measure (numerator/denominator)	Ballad rate (absolute)

For ED Throughput		
STEP	ACTION	RESULT
1	Download each hospital's flat file from Hospital Compare matching performance period for July 2017 publish	Detailed data behind the published results, including each hospital's median for each measure
2	Weight each median value using hospital volume counts from Hospital Compare	List of weighted values for all hospitals
3	Average all values	Ballad median

For PSI 90:		
STEP	ACTION	RESULT
1	Download each hospital's flat file from Hospital Compare matching performance period for October 2017 publish	Detailed data behind the published results, including each hospital's denominators and numerators
2	Capture PSI rate for each measure, for each hospital	List of rates that includes all hospitals and for each measure
3	Weight each value using acute care hospital volume counts from Hospital Compare	List of weighted values for all hospitals
4	Average all values	Ballad rate

For Imaging:		
STEP	ACTION	RESULT
1	Obtain hospital volumes for each measure, annualize if full 12 month not available	Annual volumes for each hospital
2	Weight each value using hospital volume counts	List of weighted values for all hospitals
3	Average all values	Ballad rate

COPA Index Report Appendix:

Final score:

1. Determine score (Pass or Fail) for Economic Sub-Index.

2. If applicable, determine impact of a failing score on the Economic Sub-Index on continuing Public Advantage.

3. If the result of Item 2 indicates a possible continuing Public Advantage, then determine from the results of the Annual Review the numerical score ranging from 0 to 100 for each Sub-Index (excluding the Economic Sub-Index).

4. Multiply the applicable score for each Sub-Index by its assigned weighting:

	Year 1
Sub-Index	**Percentage Weight**
Population Health	50%
Access to Care	30%
Other	20%
Total	**100%**

5. Add results of Item 4 for Final Score.

6. Application of Final Score to Public Advantage:

Final Score	Public Advantage Clear and Convincing?
(≥ 85)	Yes
(60-<85)	Unclear. All facts and circumstances to be considered in determination of continuing Public Advantage. May constitute Noncompliance and/or result in proposal by the Department of a COPA Modification.
(< 60)	No. COPA revoked absent compelling circumstances, including without limitation additional COPA Modifications proposed by the Department.

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