Rural Health Network Sustainability Assessment Study

Year 1: Technical Findings

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525 South Lake Avenue, Suite 320 | Duluth, Minnesota 55802
(218) 727-9390 | info@ruralcenter.org
Get to know us better: www.ruralcenter.org/rhi

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Report created cooperatively with

National Cooperative of Health Networks Association, Inc.

Dr. Rebecca J. Davis

Evalytics, LLC

Research, Program Evaluation, Consulting

Dr. Gwen Martin, Evalytics, LLC

Kaaren Fife, Evalytics, LLC

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PURPOSE

The Rural Health Network Sustainability Assessment Study was developed collaboratively by Rural Health Innovations (RHI), the National Cooperative of Health Networks (NCHN), and Evalytics, LLC and funded from the U.S. Department of Health and Human Services, Health Resources and Services Administration, Federal Office of Rural Health Policy. The primary purpose of this study was to develop a valid and reliable instrument that would measure sustainability of rural health networks. The areas of sustainability included within the study—communication, collaborative environment, leadership, infrastructure, financial impact and evaluation and measurement—were used to provide structure to the study and were not intended to be final categories to describe sustainability characteristics. The secondary purpose of the study was to identify conceptual network characteristics to be used by RHI and NCHN as a tool for gathering information to better understand and support rural health network sustainability. The overall goal is to increase the impact of rural health networks.

STUDY METHODOLOGY AND INSTRUMENT VALIDATION

Since the primary purpose of the Rural Health Network Sustainability Assessment Study was to develop a valid and reliable instrument to measure network sustainability, certain statistical tests were applied to the data. For this research, the initial study construct being tested included communication, collaborative environment, leadership, infrastructure, financial impact, and evaluation and, measurement. The statistical techniques applied to the data include correlational analysis, reliability analysis, and factor analysis. Explanations, results, and interpretations of the findings are provided in the following pages.

Instrument Development and Description

The instrument has two sections. The first section asks questions about the characteristics of the network organization (years in existence, net income, member types, etc.). The second section asks respondents to respond to a series of statements in each of six areas of sustainability. The areas included within the study—communication, collaborative environment, leadership, infrastructure, financial impact, and evaluation and measurement—are used to provide structure to the study and are not intended to be final categories to describe sustainability characteristics. Each statement uses a three-item scale, “Yes,” “No,” or “N/A.” Since this assessment has been designed to obtain information about network sustainability, respondents are instructed to answer from the perspective of the network or grantee organization and not from a project or program perspective.

Assessment Administration

Lists of potential respondents were provided to Evalytics by NCHN and RHI, and the assessment was administered through an online assessment tool during March and April 2016. To increase response rates, a series of reminder e-mails were sent, and RHI and NCHN staff engaged in follow-up via phone calls with non-respondents. A total of 173 potential respondents were invited to participate in the Sustainability Assessment, of which 122 responded. This represents a 71% response rate.

Analysis Tools and Methods

Correlational Analysis – Correlational analysis is used to determine whether there is a linear relationship between variables. In other words, correlations indicate to what extent two or more variables fluctuate together.

Reliability Analysis – The reliability analysis determines whether a scale composed of questions consistently measures a construct. For this research, the initial constructs included communication, collaborative environment, leadership, infrastructure, financial impact, and evaluation and measurement.

Factor Analysis – This statistical technique is used to reduce the number of assessment items (data reduction) and to detect structure in the relationships between the items (classification). The result of classification will identify groupings of questions that may be described as conceptual characteristics. Data reduction and classification are important steps when developing a new instrument. Results of the fourth factor analysis of this study clearly showed six acceptable factors with assessment items that directly measure a latent variable.

Correlational Analysis – Results

The purpose of a correlational analysis is to determine whether there is a linear relationship between variables. In other words, correlations indicate to what extent two or more variables fluctuate together. These relationships can either be positive or negative. A positive correlation indicates that both variables either increase or decrease together, and a negative correlation indicates that as one variable increases the other decreases. Correlations are measured in terms of the *Pearson's r* correlation coefficient and can range from -1.00 to +1.00. A coefficient of +1.00 indicates a total positive correlation, a -1.00 indicates a total negative correlation, and a coefficient of 0 indicates no correlation.

The results of the correlational analysis show significant correlations between most of the 64 statements on the assessment, meaning significant linear relationships exist (Table 1). All the significant correlations were positive, meaning that there are

linear relationships between the assessment items. Due to the large number of possible correlations between all assessment items (1,675), the correlation matrix is too large to present in this report. Instead, a summary of the correlations is presented in the table below. This table shows the total number of possible correlations, total significant positive correlations, and the percentages of significant positive correlations within each of the key areas. The percent of significant positive correlations provides a guide to the strength of the linear relationship between the key areas. For example, the *Infrastructure* and *Evaluation and Measurement* scales have the largest percentage of significant positive correlations with 80%. The *Financial Impact* and *Evaluation and Measurement* scales have the lowest percentage of significant positive correlations with 17%.

Table 1. Summary of Correlational Analysis

Scale Comparison	Total Possible Significant Positive Correlations	Total Significant Positive Correlations	% Significant Positive Correlations
Infrastructure with Evaluation & Measurement	56	45	80%
Communication with Evaluation & Measurement	128	91	71%
Communication with Infrastructure	112	79	71%
Leadership with Evaluation & Measurement	96	62	65%
Leadership with Infrastructure	84	53	63%
Communication with Leadership	192	108	56%
Collaborative Environment with Leadership	156	87	56%
Communication with Collaborative Environment	208	110	53%
Leadership with Financial Impact	96	47	49%
Infrastructure with Financial Impact	56	27	48%
Collaborative Environment with Evaluation & Measurement	104	45	43%

Scale Comparison	Total Possible Significant Positive Correlations	Total Significant Positive Correlations	% Significant Positive Correlations
Collaborative Environment with Infrastructure	91	35	38%
Collaborative Environment with Financial Impact	104	28	27%
Communication with Financial Impact	128	30	23%
Financial Impact with Evaluation & Measurement	64	11	17%

Reliability Analysis – Results

The purpose of reliability analysis is to determine whether a scale composed of questions consistently measures a construct. For the purposes of this research, the initial study constructs being tested are *Communication, Collaborative Environment*, *Leadership*, *Infrastructure*, *Financial Impact,* and *Evaluation and Measurement*. The reliability of an instrument is measured by the Cronbach's alpha reliability coefficient. The Cronbach's alpha[1] is a measure of internal consistency, or how closely related are a set of items as a group. In most social science research, a reliability coefficient of .70 is considered acceptable. Results of the reliability analysis provides a Cronbach's alpha for the total scale and a Cronbach's alpha for the scale if a specific item were to be removed from the scale. To determine whether the assessment consistently measures the constructs, reliability analysis was conducted for each of the six key areas.

Study Area of Communication

Results from the reliability analysis on the *Communication* scale show a Cronbach's alpha coefficient of .898, which is well above the accepted level (Table 2). Additionally, the Cronbach's alpha coefficients for each of the individual items if they were to be deleted from the assessment are at or above .88, indicating that the reliability of the scale would not be significantly improved by removing any of the items in the *Communication* scale (Table 3).

Table 2. Communication Scale

[1] Pedhazur & Pedhazur Schmelkin, 1991, p.92-94

Communication Scale	
Cronbach's Alpha	N of Items
0.898	16

Table 3. Network Communication Scale

Communication Scale			
Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted
Network has a communication plan that has been approved by the Board of Directors	23.36	37.58	0.89
Network has processes in place that encourages two-way communication between network leadership including Executive Director, Board of Directors and members	22.98	39.76	0.90
Network has processes in place that encourages two-way communication between network leadership and stakeholders	22.99	39.43	0.89
Network has processes that encourages two-way communication between network leadership and the community	23.25	39.26	0.90
The communication plan informs others about the networks mission, activities and key metrics	23.44	34.79	0.88
The network produces an annual report	23.47	38.53	0.90
The network utilizes multiple platforms to inform others about network activities	23.11	39.22	0.90
The communication plan is consistent with the networks goals and objectives	23.44	34.62	0.89

Communication Scale			
Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted
Network leader communicates with staff and personnel to request feedback on network activities	22.95	40.42	0.90
Network leader promotes transparency by disclosing information about network activities to their members'	22.85	41.27	0.90
Network leader promotes transparency by disclosing information about network activities to their stakeholders	22.92	39.93	0.89
Network leader meets face to face with members to promote trust	22.84	41.35	0.90
Network leader meets face to face with stakeholders to promote trust	22.94	39.77	0.89
The networks Board of Directors reviews the communication plan annually	23.94	35.77	0.89
Network continuously monitors the communication plan to assess progress towards communication goals	23.68	34.03	0.88
Network revises the communication plan based on progress towards communication goals	23.63	34.01	0.88

Study Area of Collaborative Environment

Results from the reliability analysis on the *Collaborative Environment* scale show a Cronbach's alpha coefficient of .746, which is above the accepted level (Table 4). Additionally, the Cronbach's alpha coefficients for each of the individual items if they were to be deleted are at or above .71, indicating that the reliability of the scale would not be significantly improved by removing any of the items in the *Collaborative Environment* scale (Table 5).

Table 4. Collaborative Environment Scale

Collaborative Environment Scale	
Cronbach's Alpha	N of Items
0.746	13

Table 5. Network Collaborative Environment Scale

Collaborative Environment Scale			
Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted
Network membership includes key stakeholders that can help the network to attain its mission	19.12	10.54	0.73
Networks leadership creates opportunities for members to share ideas and problem solve together	19.09	10.77	0.73
Network has written member agreements or policies for its actions	19.25	10.59	0.74
Network provides job descriptions for Board of Director positions	19.78	9.78	0.73
Network has policies and procedures regarding member retention	19.70	9.40	0.71
Network has a board approved Network Leader succession plan in place	19.92	10.19	0.73
Network requires written confidentiality and conflict of interest forms from all members	19.66	10.13	0.74
Network has processes to encourage input from all members and stakeholders	19.13	10.27	0.72
Network collaborates with members and nonmembers for funding of programs and projects	19.17	9.93	0.72

Collaborative Environment Scale			
Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted
Network routinely shares joint outcome data and funding information with its members and stakeholders	19.27	9.73	0.72
Network membership includes a variety of types of organizations	19.30	10.38	0.74
Networks board members reflects demographic diversity which is representative of their respective community	19.48	9.59	0.74
Network organization has a strategy to solicit new members	19.58	9.94	0.74

Study Area of Leadership

Results from the reliability analysis on the *Leadership* scale show a Cronbach's alpha coefficient of .815, which is above the accepted level (Table 6). Additionally, the Cronbach's alpha coefficients for each of the individual items if they were to be deleted are at or above .78 indicating that the reliability of the scale would not be significantly improved by removing any of the items in the *Leadership* scale (Table 7).

Table 6. Leadership Scale

Leadership Scale	
Cronbach's Alpha	N of Items
0.815	12

Table 7. Network Leadership Scale

Leadership Scale			
Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted
Network leadership creates opportunity for innovation	19.02	10.55	0.80
Network staff are encouraged to be adaptable and ready for change	19.10	10.09	0.81
Network has clearly articulated value propositions for each network product and service	19.49	9.63	0.80
Network has a written strategic plan	19.13	9.71	0.79
Network programs projects and activities are aligned with the strategic plan	19.23	9.04	0.79
Network focuses efforts to attain the mission and vision of the organization	18.99	10.54	0.80
Network forms strategic partnerships or relationships that are aligned with its mission and vision	19.00	10.46	0.80
Network has bylaws that detail the structure of the Board and organization	19.23	9.88	0.81
Network policies are consistent with network goals and objectives	19.18	9.55	0.80
Network has a full-time Network Leader on staff	19.26	10.10	0.81
Network leader is aware of regional and national health care trends that could impact network members	19.04	10.60	0.81
Network uses a performance management system	19.74	10.03	0.81

Study Area of Infrastructure

Results from the reliability analysis on the *Infrastructure* scale show a Cronbach's alpha coefficient of .85, which is above the accepted level (Table 8). Additionally, the Cronbach's alpha coefficients for each of the individual items if they were to be deleted are at or above .78, indicating that the reliability of the scale would not be significantly improved by removing any of the items in the *Infrastructure* scale (Table 9).

Table 8. Infrastructure Scale

Infrastructure Scale	
Cronbach's Alpha	N of Items
0.85	7

Table 9. Network Infrastructure Scale

Infrastructure Scale			
Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted
Network has a written marketing plan that incorporates member needs into product and service development	7.11	10.03	0.81
The networks marketing plan was developed from an assessment of member needs for network services	7.46	8.40	0.79
Network continuously reviews the marketing plan to monitor progress toward marketing goals	7.52	8.42	0.79
The marketing plan is consistent with the Networks mission and vision	7.53	8.07	0.79
Network has an annual process to evaluate network leader performance	6.70	11.52	0.86

Infrastructure Scale			
Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted
Network routinely uses process improvement tools and methods	7.00	11.29	0.87
Network has a process in place to identify successes and opportunities for continuous improvement	6.73	11.08	0.85

Study Area of Financial Impact

Results from the reliability analysis on the *Financial Impact* scale show a Cronbach's alpha coefficient of .874, which is above the accepted level (Table 10). Additionally, the Cronbach's alpha coefficients for each of the individual items if they were to be deleted are at or above .85, indicating that the reliability of the scale would not be significantly improved by removing any of the items in the *Financial Impact* scale (Table 11).

Table 10. Financial Impact Scale

Financial Impact Scale	
Cronbach's Alpha	N of Items
0.874	8

Table 11. Network Financial Impact Scale

Financial Impact Scale			
Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted
Network demonstrates its value to members by providing financial benefits	11.52	11.28	0.87
Network demonstrates its value to members by providing services or	11.44	12.01	0.88

Financial Impact Scale			
Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted
operational efficiencies that can be quantified in financial terms			
Network has financial systems and practices in place	11.36	10.89	0.84
Network has external audits each year or as required by law	11.56	10.49	0.86
Network has blended revenue streams to sustain the organization	11.52	11.13	0.86
Network maintains adequate cash resources for its operations	11.46	10.63	0.85
Network leadership review financial statements on a regular basis	11.36	10.92	0.85
Network has on staff or on contract a proven financial expert	11.36	11.02	0.85

Study Area of Evaluation and Measurement

Results from the reliability analysis on the Evaluation and Measurement scale show a Cronbach's alpha coefficient of .896, which is above the accepted level (Table 12). There is one item on the scale that would improve the overall Cronbach's alpha if it were deleted; the Cronbach's alpha would increase to .916 if the item "*Network has established staff performance evaluation processes across the organization including the Network Leader"* were removed from the scale (Table 13).

Table 12. Evaluation and Measurement Scale

Evaluation & Measurement Scale	
Cronbach's Alpha	N of Items
0.896	8

Table 13. Network Evaluation and Measurement Scale

Evaluation & Measurement Scale			
Scale Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted
Network has an evaluation plan to monitor progress towards goals objectives and outcomes	10.0275	16.008	0.877
The networks Board of Directors reviews the evaluation plan and results quarterly	10.5229	14.418	0.874
Networks evaluation plan include process measures to determine progress towards projects and activities	10.2936	13.691	0.865
Networks evaluation plan is consistent with network goals and objectives	10.2477	13.595	0.866
Network leaders and network Board of Directors are involved in the process and development of evaluation measures	10.1927	15.268	0.887
Network has developed key performance indicators for each area of the organization	10.3486	16.044	0.888
Network has established staff performance evaluation processes across the organization including the Network Leader	10.2385	17.517	0.916
Network shares its evaluation and measurement results with members and stakeholders on a regular basis	10.3303	14.945	0.882

Factor Analysis – Results

The statistical technique of factor analysis is used to reduce the number of assessment items (data reduction) and to detect structure in the relationships between the items (classification). Data reduction and classification are important steps when developing a new instrument. Reducing the number of items on the

assessment helps ensure that the assessment accurately measures a construct with as few items as possible, which will result in respondents taking less time to complete the instrument. Reducing the amount of time it takes a respondent to complete an instrument could have a positive impact on response rates.

Factor analysis identifies relationships between assessment items (direct measures) based on the factor scale scores. Factor scale scores represent the relationship between the assessment items and when grouped together an underlying factor can be conceptualized. The underlying factor is commonly referred to as a "latent variable." The purpose of this study is to determine how the assessment items are related to each other based on the factor scale scores. This in turn identifies a latent variable or conceptual factor. For example, the key area of *Communication* has 16 assessment items that theoretically directly measure the latent variable *Communication.* The hypothesis would be that the relationship between these items is strong enough to form a *Communication* factor with all 16 items.

Factor scale scores can be interpreted in much the same way as correlation coefficients: the higher the number, the greater the relationship. In most research fields, factor scale scores at or above .60 are considered acceptable and indicate a strong relationship between the item and the factor. Additionally, assumptions regarding the data must be met prior to conducting the factor analysis. These two assumptions are 1) there is an adequate number of responses to each item, and 2) there are linear relationships between items. The first assumption is tested using the Kaiser-Meyer-Olkin Measure of Sampling Adequacy[2] (KMO). Kaiser (1974) recommends a minimum value of 0.5 KMO value for the assumption to be met. Furthermore, values between 0.7 and 0.8 are acceptable, and values above 0.9 are considered excellent. The criteria for the Bartlett's test[3] is a significance level less than .05. Additionally, the results of the factor analysis should account for an acceptable amount of variance (at or above 66%) with the fewest number of factors.

Conducting factor analysis is a process, and often more than one factor analysis needs to be conducted on the data. The results of each factor analysis procedure inform further analysis by providing statistical information identifying the number of factors, which items load highly on the identified factors, and the amount of variance accounted for. Since factor analysis is a statistical data reduction technique, after each factor analysis procedure, items with insufficient factor scale

[2] Kaiser, 1970, p. 401-415
[3] Pedhazur & Pedhazur Schmelkin, 1991, p 596-597

scores (those with factor scale scores less than .60) are removed and the next factor analysis is conducted. The process of factor analysis continues until there are enough factors each with appropriate factor scale scores and an acceptable amount of variance explained.

The factor analysis on the network sustainability items required four separate iterations. Iterations one through three are summarized below, followed by an explanation of the detailed results of the fourth iteration.

Factor Analysis Summary – Iterations One Through Three

The first factor analysis iteration met the test of assumptions with a KMO value of 0.705 and a significance level from the Bartlett's test below .05. The first factor analysis resulted in 16 factors. These 16 factors account for 77% of the total variance. Ten assessment items had factor scale scores below .60, and nine assessment items failed to load on any factor. These 19 items were removed from the analysis, and a second factor analysis was conducted.

Results of the KMO and Bartlett's test show that the data met the acceptable criteria. The removal of assessment items that did not load and that had scale scores less than .60 resulted in a reduction of the number of factors from 16 to 11 with 75% of variance explained. For iteration two, three assessment items had factor scale scores below .60, and two additional items did not load on any factor. These items were removed, and a third factor analysis was conducted. Again, the criteria for the KMO and Bartlett's test were met. The results of the third iteration were very similar to the results found in the second iteration, and the number of factors was reduced to 10, which account for 76% of the variance. Only one item had a factor loading less than .60, and only one additional item did not load on any factor. These two items were removed from the fourth iteration.

Factor Analysis – Iteration Four

For the fourth factor analysis iteration, results from the KMO and Bartlett's test again show the data met the criteria for further analysis. The fourth iteration results further reduced the number of factors from 10 to six and accounted for 73% of the total variance (see Tables 14-15 below).

Table 14.
KMO and Bartlett's Test Results
Fourth Iteration

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.766
Bartlett's Test of Sphericity	Approx. Chi-Square	3137.041
	Df	528
	Sig.	0

Table 15.
Total Variance Explained
Fourth Iteration

Component	% of Variance	Cumulative %
1	29.42	29.42
2	14.235	43.655
3	11.013	54.668
4	7.844	62.512
5	7.147	69.658
6	4.272	73.93

Results of the fourth factor analysis clearly show six areas of study with assessment items that directly measure a conceptual factor (Table 16). At this point in the study process, the latent variables can be conceptualized as factors or characteristics of networks:

The first factor has seven items with factor scale scores above .60. As the table below shows, the seven items which score highly on this factor were designed to measure network sustainability in terms of ***Evaluation and Measurement***, one of the original key areas. The second factor, which can be conceptualized as ***Communication****,* another original key area, is comprised of six items with factor scale scores at or above .60. Items which loaded highly on factor three originated from three key areas: *Communication*, *Leadership*, and *Collaborative Environment*. Since these items all had factor scale scores at or above .60 and are conceptually related, this factor has been identified as measuring sustainability in terms of ***Collaboration***. Factor four is comprised of six items originally designed to measure *Financial Impact*. However, based on the specific six remaining items, this factor has been re-conceptualized as **Financial Infrastructure**. Factor five has four items that originated in the key area of *Infrastructure*. These four items are all related to a network's response to its members' needs; therefore, factor five can be conceptually identified as ***Member Driven***. The last factor is comprised of four items that originated from three key areas—*Leadership*, *Communication*, and *Collaborative Environment*—and will be conceptually identified as ***Leadership***.

Table 16. Factor Analysis Results of Fourth Iteration

Conceptualized Factors with Reduced and Classified Assessment Items	Factor Scale Score "Loading"	Initial Area of Study
Factor 1 - Evaluation & Measurement		
Networks evaluation plan include process measures to determine progress towards projects and activities	0.908	Evaluation & Measurement
Networks evaluation plan is consistent with network goals and objectives	0.904	Evaluation & Measurement
Network has an evaluation plan to monitor progress towards goals objectives and outcomes	0.878	Evaluation & Measurement
The networks Board of Directors reviews the evaluation plan and results quarterly	0.769	Evaluation & Measurement
Network shares its evaluation and measurement results with members and stakeholders on a regular basis	0.721	Evaluation & Measurement
Network has developed key performance indicators for each area of the organization	0.672	Evaluation & Measurement
Network leaders and network Board of Directors are involved in the process and development of evaluation measures	0.671	Evaluation & Measurement
Factor 2 - Communication		
Network revises the communication plan based on progress towards communication goals	0.908	Communication
Network continuously monitors the communication plan to assess progress towards communication goals	0.902	Communication
The communication plan is consistent with the networks goals and objectives	0.841	Communication

Conceptualized Factors with Reduced and Classified Assessment Items	Factor Scale Score "Loading"	Initial Area of Study
The networks Board of Directors reviews the communication plan annually	0.800	Communication
The communication plan informs others about the networks mission, activities and key metrics	0.781	Communication
Network has a communication plan that has been approved by the Board of Directors	0.677	Communication
Factor 3 - Collaboration		
Network leader promotes transparency by disclosing information about network activities to their stakeholders	0.853	Communication
Network leader meets face to face with stakeholders to promote trust	0.818	Communication
Network focuses efforts to attain the mission and vision of the organization	0.816	Leadership
Network forms strategic partnerships or relationships that are aligned with its mission and vision	0.781	Leadership
Network membership includes key stakeholders that can help the network to attain its mission	0.655	Collaborative Environment
Network leadership creates opportunity for innovation	0.642	Leadership
Factor 4 - Financial Infrastructure		
Network has financial systems and practices in place	0.848	Financial Impact
Network maintains adequate cash resources for its operations	0.825	Financial Impact
Network leadership review financial statements on a regular basis	0.824	Financial Impact

Conceptualized Factors with Reduced and Classified Assessment Items	Factor Scale Score "Loading"	Initial Area of Study
Network has on staff or on contract a proven financial expert	0.780	Financial Impact
Network has blended revenue streams to sustain the organization	0.719	Financial Impact
Network has external audits each year or as required by law	0.701	Financial Impact
Factor 5 – Member Driven		
The marketing plan is consistent with the Networks mission and vision	0.907	Infrastructure
The networks marketing plan was developed from an assessment of member needs for network services	0.903	Infrastructure
Network continuously reviews the marketing plan to monitor progress toward marketing goals	0.899	Infrastructure
Network has a written marketing plan that incorporates member needs into product and service development	0.829	Infrastructure
Factor 6 - Leadership		
Network leader promotes transparency by disclosing information about network activities to their members'	0.813	Communication
Network leader is aware of regional and national health care trends that could impact network members	0.809	Leadership
Networks leadership creates opportunities for members to share ideas and problem solve together	0.702	Collaborative Environment
Network leader meets face to face with members to promote trust	0.664	Communication

ASSESSMENT FINDINGS

Network Organization Description

Membership Type

Most network organizations that responded to the study indicated they have members (97%). Respondents were asked to identify types of organizations that comprised their network membership. Since networks can have a variety of member types, respondents were asked to select all organization types. Table 17 shows the number and percent of organization types. Eighty-one percent of respondents (n = 99) indicated they had "*Hospitals*" as members, 60% (n = 73) had "*Primary Care Clinics*," and 43% (n = 52) had "*Behavioral Health Clinics*" as network members.

Table 17. Network Organization Types

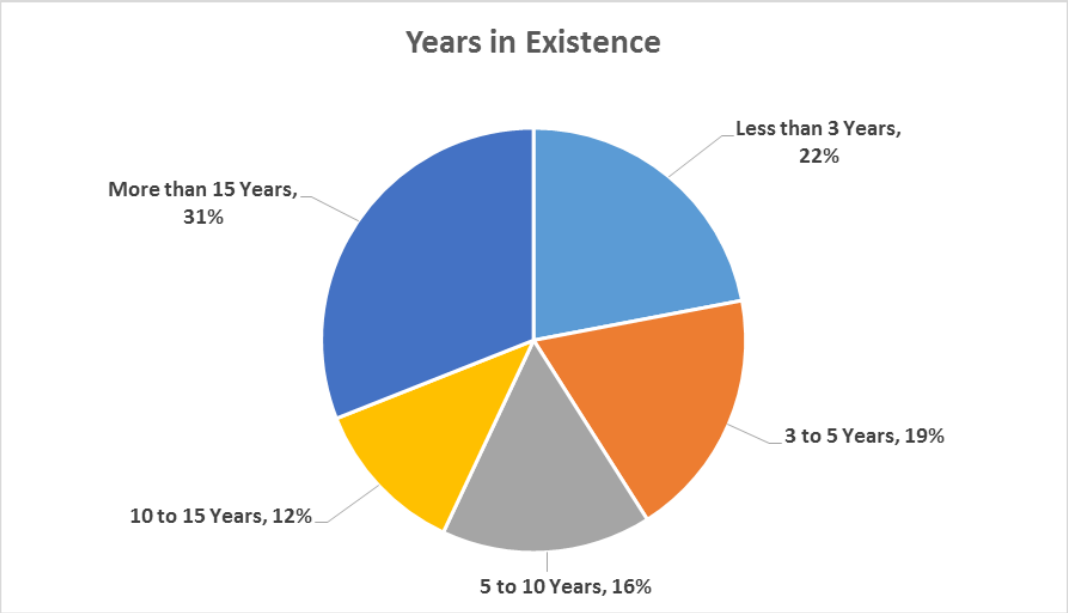
Organization Types	N	Percent of Cases
Hospital	99	81%
Primary Care Clinic	73	60%
Behavioral Health Clinic	52	43%
Public Health Organization	44	36%
Community Health Center	41	34%
Social Service Organization	35	29%
University or College	35	29%
Long Term Care Organization	25	21%
Specialty Care Clinic	24	20%
Emergency Services Organization	22	18%
Elementary or Secondary School	22	18%

Organization Types	N	Percent of Cases
Technical or Community College	21	17%
Home Health Organization	20	16%
State Department	19	16%
Faith Based Organization	19	16%
Allied Health Organization	12	10%

Years in Existence

Forty-three percent of networks have been in existence more than 10 years, and 41% have been in existence less than five years (Figure 1). The remaining 16% of networks have been in existence between five and 10 years.

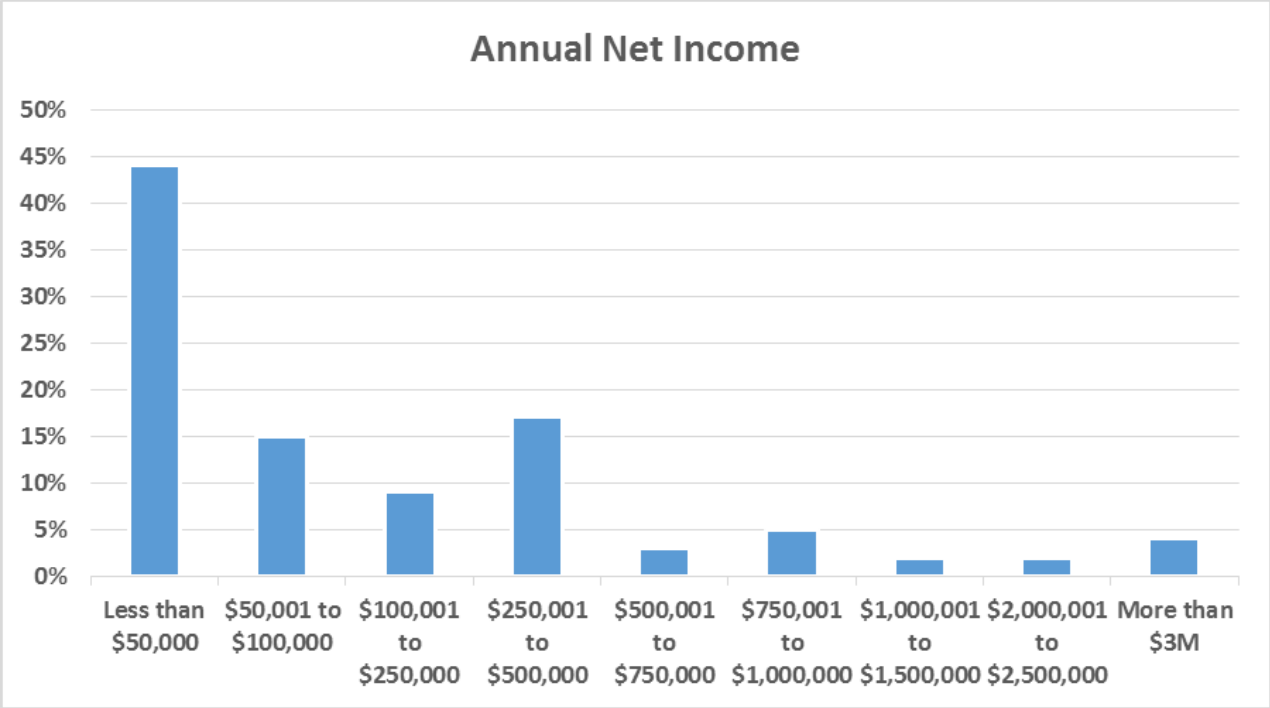
Figure 1. Network Years in Existence



Annual Net Income

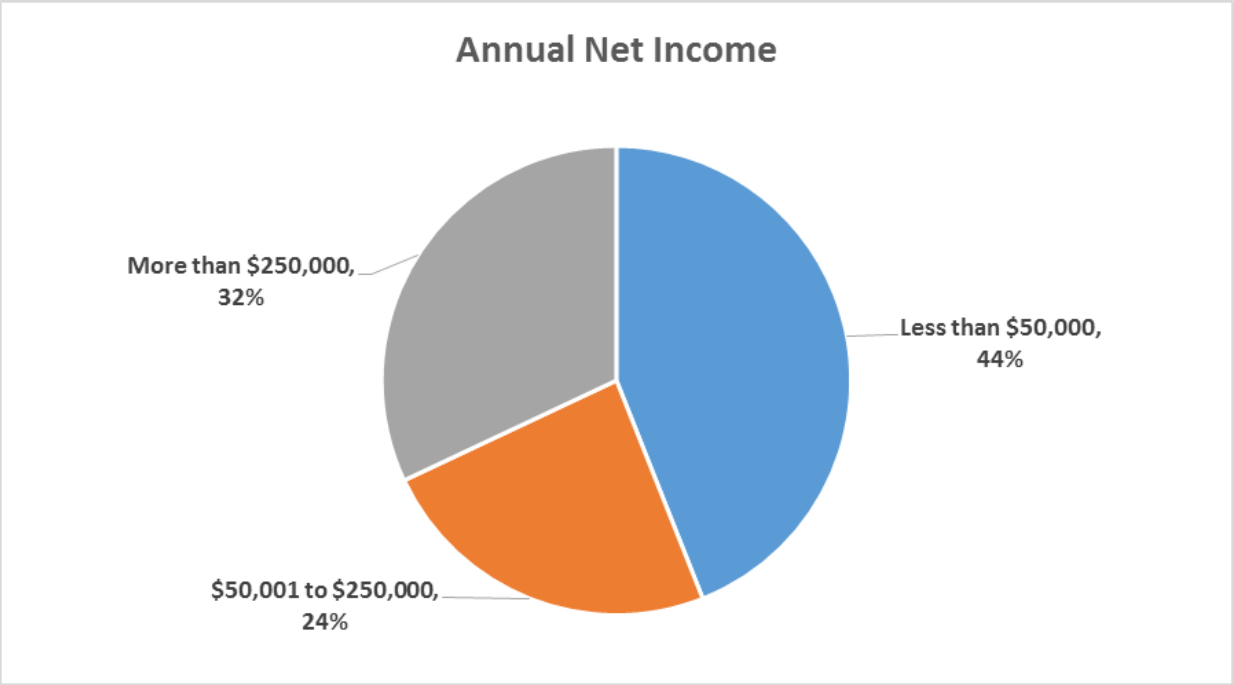
Respondents were asked to provide the network's annual net income for the most recent fiscal year. The assessment defined annual net income as *"all revenues and grant funds minus all expenses for the network organization."* Forty-four percent of respondents reported their network had annual net income of *"Less than $50,000"* (Figure 2). Seventeen percent reported an annual net income between *"250,001 and $500,000,"* and 15% reported annual net income between *"$50,001 and $100,000."* Sixteen percent reported net incomes above $500,000.

Figure 2. Network Annual Net Income of Study Participants



Due to the distribution of the data reported for annual net income, this variable was recoded into three categories for statistical analysis and comparison purposes. After the recode, the proportion of networks with net incomes *"Less than $50,000"* remained the same (44%). The net income categories above $250,000 were combined and totaled 32%, and 24% represented networks with annual net incomes between $50,001 and $250,000 (Figure 3).

Figure 3. Annual Net Income by Category



Grant Participation

Respondents were also asked to indicate which grants they currently have and which grants, if any, they have received from the Health Resources and Services Administration (HRSA) in the past two years. At the time the assessment was conducted, 56% of networks indicated having a *"Rural Health Network Development Program Grant,"* 23% indicated having a *"Rural Health Network Development Planning Grant*," and 15% indicated have a *"Rural Health Information Technology Workforce Program Grant*." An additional 11% of respondents indicated having a *"Rural Health Allied Health Training Program Grant*" (Table 18).

Over the past two years, 51% of respondents indicated receiving a *"Rural Health Network Development Program Grant,"* 32% reported receiving a *"Rural Health Network Development Planning Grant,"* and 13% reported receiving a *"Rural Health Information Technology Workforce Program Grant."* An additional 10% of respondents indicated receiving a *"Rural Health Allied Health Training Program Grant*" (Table 19).

Table 18. Current Grants

Grant Name	N	Percent of Cases
Rural Health Network Development Program	49	56%
Rural Health Network Development Planning Grant Program	20	23%
Rural Health Information Technology Workforce Program	13	15%
Rural Health Allied Health Training Program	10	11%
Telehealth Network Grant Program	4	5%
Delta State Rural Development Network Grant Program	1	1%
Rural Health Care Coordination Network Partnership	1	1%

Table 19. Grants – Last Two Years

Grant Name – Last Two Years	N	Percent of Cases
Rural Health Network Development Program	45	51%
Rural Health Network Development Planning Grant Program	28	32%
Rural Health Information Technology Workforce Program	11	13%
Rural Health Allied Health Training Program	9	10%
Telehealth Network Grant Program	3	3%
Small Provider Health Care Quality Grant Program	3	3%
Rural Health Care Coordination Network Partnership	2	2%
Delta State Rural Development Network Grant Program	1	1%

Factor Scale Scores and Conceptualized Network Characteristics

For each of the factors, scale scores were calculated for descriptive and statistical analysis purposes. To calculate the scale scores, responses of "*Yes*" were given a numerical value of "2," "*No*" responses were given a numerical value of "1," and "*N/A*" responses were given a numerical value of "0." Prior to conducting the descriptive and statistical analysis, a frequency distribution was carried out on each of the scale scores. The frequency distribution revealed several instances where the minimum scale score was "0," meaning that for each of the items comprising that scale, the respondent indicated "*N/A*." Further review of the data revealed that when the total scale score equaled zero, the respondents had only completed a part of the assessment or they had completed the entire assessment but indicated "*N/A*" on **all** assessment items. These respondents were not included in the analysis.

Table 20 shows the descriptive statistics for each of factor scale scores. Due to the different number of items which compose each factor, the minimum and maximum scores will vary across factors. The factors with more items will have higher minimum and higher maximum scores, and the factors with fewer items will have lower minimum and lower maximum scores. Due to these differences, comparisons between factor scores should not be made. The factors or conceptualized network characteristics are listed in numerical order by maximum factor scale scores.

Table 20. Factor Scale Scores Statistical Results

Sorted by Factor Scale Scores

Factor Scale Scores and Conceptualized Network Characteristics	N	Minimum	Maximum	Mean	Range
Factor 1 - Evaluation & Measurement	107	1.00	14.00	10.43	1 to 21
Factor 2 - Communication	105	1.00	12.00	7.50	1 to 18
Factor 3 - Collaboration	109	3.00	12.00	11.72	1 to 18
Factor 4 - Financial Infrastructure	104	3.00	12.00	10.36	1 to 18
Factor 5 – Member Driven	101	1.00	8.00	4.01	1 to 12
Factor 6 - Leadership	108	3.00	8.00	7.84	1 to 12

Evaluation and Measurement

The *Evaluation and Measurement* factor is comprised of seven statements regarding the network's evaluation and measurement activities. As mentioned previously in this report, respondents were asked to respond to each statement with *"Yes," "No,"* or *"N/A*." Seventy-three percent of respondents indicated their *"Network has an evaluation plan to monitor progress towards goals, objectives and outcomes*," 73% indicated their *"Network's evaluation plan is consistent with network goals and objectives*," and 71% indicated their *"Network leaders and network Board of Directors are involved in the process and development of evaluation measures*" (Table 21). Less than half of respondents indicated their "*Network has developed key performance indicators for each area of the organization*" and "*The networks Board of Directors reviews the evaluation plan and results quarterly*" with 47% and 43%, respectively.

Table 21. Factor 1 – Evaluation and Measurement

Frequency Distribution

Factor 1	Yes		No		NA	
Evaluation & Measurement	N	%	N	%	N	%
Network has an evaluation plan to monitor progress towards goals, objectives and outcomes	80	73%	27	25%	2	2%
Network's evaluation plan is consistent with network goals and objectives	79	73%	5	5%	25	23%
Network leaders and network Board of Directors are involved in the process and development of evaluation measures	77	71%	15	14%	17	16%

Factor 1 Evaluation & Measurement	Yes		No		NA	
	N	%	N	%	N	%
Networks evaluation plan include process measures to determine progress towards projects and activities	72	66%	14	13%	23	23%
Network shares its evaluation and measurement results with members and stakeholders on a regular basis	63	58%	28	26%	18	17%
Network has developed key performance indicators for each area of the organization	51	47%	50	46%	8	7%
The network's Board of Directors reviews the evaluation plan and results quarterly	47	43%	39	36%	23	21%

Communication

The ***Communication*** factor is comprised of six items, and the percentage of respondents who indicated "*Yes*" on the assessment ranged from 64% to 23% (Table 22). The largest percentage of respondents who indicated "*Yes*" was in response to the statement, "*The communication plan is consistent with the networks goals and objectives.*" Half of respondents indicated their "*Network revises the communication plan based on progress towards communication goals*," and only 23% of respondents indicated "*The networks Board of Directors reviews the communication plan annually.*"

Table 22. Factor 2 – Communication

Frequency Distribution

Factor 2 Communication	Yes		No		NA	
	N	%	N	%	N	%
The communication plan is consistent with the networks goals and objectives	72	64%	8	7%	32	29%
The communication plan informs others about the networks mission, activities and key metrics	67	60%	19	17%	26	23%
Network has a communication plan that has been approved by the Board of Directors	58	51%	44	39%	11	10%
Network revises the communication plan based on progress towards communication goals	56	50%	16	14%	41	36%
Network continuously monitors the communication plan to assess progress towards communication goals	50	44%	23	20%	40	35%
The networks Board of Directors reviews the communication plan annually	25	23%	42	39%	41	38%

Collaboration

All assessment items within the *Collaboration* factor received "*Yes*" responses from over 90% of the respondents (Table 23). Ninety-seven percent of respondents indicated their "*Network focuses efforts to attain the mission and vision of the organization*" and their "*Network leader meets face to face with members to promote trust.*" Ninety-one percent of respondents, the lowest percentage within this factor, indicated their "*Network leader promotes transparency by disclosing information about network activities to their stakeholders.*"

Table 23. Factor 3 – Collaboration

Frequency Distribution

Factor 3 Collaboration	Yes		No		NA	
	N	%	N	%	N	%
Network focuses efforts to attain the mission and vision of the organization	107	97%	1	1%	2	2%
Network leader meets face to face with members to promote trust	109	97%	2	2%	2	2%
Network forms strategic partnerships or relationships that are aligned with its mission and vision	106	96%	2	2%	2	2%
Network leadership creates opportunity for innovation	105	96%	2	2%	3	3%
Network membership includes key stakeholders that can help the network to attain its mission	104	94%	5	5%	2	2%

Factor 3 Collaboration	Yes		No		NA	
	N	%	N	%	N	%
Network leader promotes transparency by disclosing information about network activities to their stakeholders	103	91%	6	5%	4	4%

Financial Infrastructure

Factor 3, Financial Infrastructure, is comprised of six items, and the percent of "*Yes*" responses ranged from 82% to 63% (Table 24). The items "*Network leadership reviews financial statements on a regular basis*" and "*Network has on staff or on contract a proven financial expert*" have percentages above 80% with 82% and 81%, respectively. The lowest percentage of "*Yes*" responses was observed on the item "*Network has blended revenue streams to sustain the organization*" with 63%.

Table 24. Factor 4 – Financial Infrastructure

Frequency Distribution

Factor 3 Financial Infrastructure	Yes		No		NA	
	N	%	N	%	N	%
Network leadership reviews financial statements on a regular basis	89	82%	10	9%	10	9%
Network has on staff or on contract a proven financial expert	88	81%	12	11%	9	8%
Network has financial systems and practices in place	85	78%	18	17%	6	6%

Factor 3 Financial Infrastructure	Yes		No		NA	
	N	%	N	%	N	%
Network maintains adequate cash resources for its operations	80	73%	17	16%	12	11%
Network has external audits each year or as required by law	76	70%	14	13%	19	17%
Network has blended revenue streams to sustain the organization	69	63%	32	29%	8	7%

Member Driven

Of the six factors, the *Member Driven* factor has the lowest percentage of respondents who indicated "*Yes*" on each assessment item. In fact, the percentages of "*Yes*" responses only range from 31% to 29% (Table 25). Over half of respondents indicated the item "*The marketing plan is consistent with the Networks mission and vision*" was *not applicable,* and 65% of respondents indicated their network **did not** have "*a written marketing plan that incorporates member needs into product and service development.*"

Table 25. Factor 5 – Member Driven

Frequency Distribution

Factor 5 Member Driven	Yes		No		NA	
	N	%	N	%	N	%
The marketing plan is consistent with the Networks mission and vision	34	31%	20	18%	55	51%

Factor 5 Member Driven	Yes		No		NA	
	N	%	N	%	N	%
The networks marketing plan was developed from an assessment of member needs for network services	32	30%	31	29%	45	42%
Network continuously reviews the marketing plan to monitor progress toward marketing goals	28	26%	33	30%	48	44%
Network has a written marketing plan that incorporates member needs into product and service development	32	29%	71	65%	7	6%

Leadership

All items within factor 6, *Leadership*, have percentages of respondents that indicated "*Yes*" at or above 95% (Table 26).

Table 26. Factor 4 – Leadership

Frequency Distribution

Factor 6 Leadership	Yes		No		NA	
	N	%	N	%	N	%
Network leader meets face to face with members to promote trust	109	97%	2	2%	2	2%

Factor 6 Leadership	Yes		No		NA	
	N	%	N	%	N	%
Network leader promotes transparency by disclosing information about network activities to their members	108	96%	1	1%	3	3%
Network's leadership creates opportunities for members to share ideas and problem solve together	106	96%	4	4%	1	1%
Network leader is aware of regional and national health care trends that could impact network members	104	95%	2	2%	4	4%

Factor Scale Score Comparisons

Evaluation & Measurement

Statistically significant differences were observed between *Evaluation & Measurement* factor scale scores and the number of years a network has been in existence. Interestingly, networks that have been in existence *less than 3 years* and *more than 15 years* have statistically significantly lower average *Evaluation and Measurement* factor scale scores than networks that have been in existence from three to 15 years (Table 27). The average *Evaluation & Measurement* factor scale scores for networks in existence *less than 3 years* and *more than 15 years* are 9.65 and 8.76, respectively. Mean *Evaluation & Measurement* factor scale scores for the other categories range from 10.80 to 12.37.

Table 27. Factor 1 - Evaluation & Measurement Network Years in Existence Comparison

Factor 1 - Evaluation & Measurement Network Years in Existence Comparison		
	N	Mean
Less than 3 Years	26	9.65
3 to 5 Years	19	12.37
5 to 10 Years	15	10.80
10 to 15 Years	14	11.93
More than 15 Years	33	8.76

Sig. $\leq$ .05

No statistically significant differences were observed between the *Evaluation & Measurement* factor scale scores and a network's annual net income. Even though statistically significant differences were not observed, as a network's annual net income increases**,** the *Evaluation & Measurement* factor scale scores also increase (Table 28). The average *Evaluation & Measurement* factor scale score for networks with annual net incomes *less than $50,000* is 9.55, the average factor scale score for networks with annual net incomes between *$50,001 and $250,000* is 10.75, and the average factor scale score for networks with annual net incomes *more than $250,000* is 11.06.

Table 28. Factor 1 - Evaluation & Measurement Network's Annual Net Income Comparison

Factor 1 - Evaluation & Measurement Network's Annual Net Income Comparison		
	N	Mean
Less than $50,000	47	9.55
$50,001 to $250,000	28	10.75
More than $250,000	32	11.06

Communication

No statistically significant differences were observed between the number of years a network has been in existence and the *Communication* factor scale score. Additionally, there is no apparent pattern between the years in existence categories and the average *Communication* factor scale scores. Networks that have been in existence *10 to 15 years* have the lowest average *Communication* factor scale score, while networks that have been in existence *3 to 5 years* have the highest factor scale score with 8.05 (Table 29).

Table 29. Factor 2 – Communication Network Years in Existence Comparison

Factor 2 – Communication Network Years in Existence Comparison		
	N	Mean
Less than 3 Years	27	7.22
3 to 5 Years	19	8.05
5 to 10 Years	14	7.93
10 to 15 Years	14	6.79
More than 15 Years	30	7.23

No statistically significant differences were observed between a network's annual net income and the average *Communication* factor scale scores. However, networks with annual net incomes *less than $50,000* and *more than $250,000* have higher, but not statistically higher, *Communication* factor scale scores than networks with annual net incomes between *$50,001 and $250,000* (Table 30). The average factor scale score for networks with annual net incomes above $250,000 is 7.97, and the average factor scale score for networks with annual net incomes *less than $50,000* is 7.57. Networks with annual net incomes between *$50,001 and $250,000* have an average *Communication* factor scale score of 6.57.

Table 30. Factor 2 – Communication Network's Annual Net Income Comparison

Factor 2 – Communication Network's Annual Net Income Comparison		
	N	Mean
Less than $50,000	46	7.57
$50,001 to $250,000	28	6.57
More than $250,000	30	7.97

Collaboration

No statistically significant differences were observed between the *Collaboration* factor scale score and the number of years a network has been in existence. Interestingly, the average factor scale scores only range from 11.50 to 11.84 across all years in existence categories (Table 31).

Table 31. Factor 3 – Collaboration Network Years in Existence Comparison

Factor 3 - Collaboration Network Years in Existence Comparison		
	N	Mean
Less than 3 Years	27	11.81
3 to 5 Years	19	11.84
5 to 10 Years	15	11.93
10 to 15 Years	14	11.50
More than 15 Years	33	11.58

Much the same is true regarding comparisons between *Collaboration* factor scale scores and a network's annual net income. In fact, the mean factor scale scores across annual net income categories are almost identical with 11.68 and 11.65 (Table 32).

Table 32. Factor 3 – Collaboration Network's Annual Net Income Comparison

Factor 3 - Collaboration Network's Annual Net Income Comparison		
	N	Mean
Less than $50,000	48	11.65
$50,001 to $250,000	28	11.68
More than $250,000	32	11.88

Financial Infrastructure

Statistically significant differences were observed between mean *Financial Infrastructure* factor scale scores and the number of years a network has been in existence. As Table 33 shows, networks that have been in existence longer (*more than 15 years*) have statistically significantly higher mean *Financial Infrastructure* factor scale scores than networks that have been in existence a shorter amount of time. The average factor scale score for networks that have been in existence *more than 15 years*, 11.52, is statistically significantly higher than the factor scale scores for networks that have been in existence 10 years or less (9.67, 9.16, and 8.27).

Table 33. Factor 4 - Financial Infrastructure Network Years in Existence Comparison

Factor 4 - Financial Infrastructure Network Years in Existence Comparison		
	N	Mean
Less than 3 Years	26	8.27
3 to 5 Years	19	9.16
5 to 10 Years	15	9.67
10 to 15 Years	14	10.93
More than 15 Years	33	11.52

Sig. $\leq$.05

No statistically significant differences were observed between average *Financial Infrastructure* factor scale scores and network annual net income. Even though statistically significant differences were not observed, average factor scale scores are higher for networks with annual net incomes over *$50,001* compared to networks with annual net incomes below *$50,001* (Table 34). The average *Financial*

Infrastructure factor scale score for networks with annual net incomes *less than $50,000* is 9.34, compared to almost identical factor scale scores of 10.46 and 10.47 for networks with annual net incomes of between *$50,001 and $250,000* and networks with annual net incomes *more than $250,000*, respectively.

Table 34. Factor 4 - Financial Infrastructure Network's Annual Net Income Comparison

Factor 4 - Financial Infrastructure Network's Annual Net Income Comparison		
	N	Mean
Less than $50,000	47	9.34
$50,001 to $250,000	28	10.46
More than $250,000	32	10.47

Member Driven

No statistically significant differences were observed between the number of years a network has been in existence and average *Member Driven* factor scale scores. However, networks that have been in existence *more than 15 years* and *less than 3 years* have the lowest *Member Driven* factor scale scores with 3.03 and 3.70, respectively (Table 35). Networks that have been in existence *10 to 15 years* have the highest average factor scale scores with 4.62.

Table 35. Factor 5 – Member Driven Network Years in Existence Comparison

Factor 5 – Member Driven Network Years in Existence Comparison		
	N	Mean
Less than 3 Years	27	3.70
3 to 5 Years	19	4.16
5 to 10 Years	15	4.07
10 to 15 Years	13	4.62
More than 15 Years	32	3.03

Statistically significant differences were observed between *Member Driven* factor scale scores and network annual net income. Networks with annual net incomes *more than $250,000* have significantly higher factor scale scores than networks with annual net incomes below *$250,000* (Table 36). The average *Member Driven* factor scale score for networks with annual net income *more than $250,000* is 5.00, compared to 3.26 and 3.18 for networks with annual net incomes *less than $50,000* and networks with annual net incomes between *$50,001 and $250,000*, respectively.

Table 36. Factor 5 – Member Driven Network's Annual Net Income Comparison

Factor 5 – Member Driven Network's Annual Net Income Comparison		
	N	Mean
Less than $50,000	47	3.26
$50,001 to $250,000	28	3.18
More than $250,000	31	5.00

Leadership

No statistically significant differences were observed between the number of years a network has been in existence and *Leadership* factor scale scores. Average *Leadership* factor scale scores range from 7.67 for networks that have been in existence *less than 3 years* to 7.97 for networks that have been in existence *more than 15 years* (Table 37).

Table 37. Factor 6 – Leadership Network Years in Existence Comparison

Factor 6 – Leadership Network Years in Existence Comparison		
	N	Mean
Less than 3 Years	27	7.67
3 to 5 Years	19	7.95
5 to 10 Years	15	7.87
10 to 15 Years	14	7.71
More than 15 Years	33	7.97

No statistically significant differences were observed between average *Leadership* factor scale scores and a network's annual net income. Networks with annual net incomes above *$250,000* have slightly higher average factor scale scores (7.94) than networks with annual net incomes *below $250,000* (7.83 and 7.75) (Table 38).

Table 38. Factor 6 – Leadership Network's Annual Net Income Comparison

Factor 6 – Leadership Network's Annual Net Income Comparison		
	N	Mean
Less than $50,000	48	7.83
$50,001 to $250,000	28	7.75
More than $250,000	32	7.94

CONCLUSION

The findings of this first study of rural health network sustainability validates assessment items for continued study of network sustainability. Secondly, the findings identify six conceptual characteristics of rural health networks. The validated assessment items and identified characteristics create an opportunity to develop network sustainability benchmarks and provide guidance for technical assistance and evaluation of rural health network sustainability. A second iteration of this study will be completed in Spring 2017. The results of the second study year will inform future decisions related to identifying network sustainability benchmarks and focusing technical assistance on six specific network characteristics.

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