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Rural hospital health in the United States

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RURAL HOSPITAL HEALTH IN THE UNITED STATES

ABSTRACT

Introduction: Rural hospitals experienced both challenges and opportunities in providing healthcare to the community. As these facilities were one of the largest employers in the area, their impact was significant. Additionally, accessibility to necessary medical services was essential. Thus, sustainability of rural hospitals was vital. In order to assess sustainability, exploration into financial and quality outcomes could help support their ability to thrive.

Purpose of the Study: The purpose of this study was to determine the sustainability of rural hospitals in the U.S. by examining variables that affect these institutions such as accessibility, availability of services, quality outcomes, and effective administrative practices.

Methodology: This qualitative study utilized a literature review and open-ended survey of an expert in Hospital Administration within or collaborating with rural areas. Five databases were used to collect 48 total sources. These sources were reviewed and reduced to 32 sources that were used in the written research. Of these, 17 sources were used in the results section.

Results: The research showed that patient outcomes and mortality rates in rural hospitals fluctuated. However, many rural hospitals offered improvement services or referrals, quality improvement plans for pain management, and quality improvement for end-of-life care. Rural hospitals proved difficulty in maintaining specialties and testing equipment such as a medical ICUs and cardiac intensive care units, neurology, MRI and CT machines, and obstetric services. ROE was more than double in urban as opposed to rural hospitals. However, the state expansion of Medicaid proved profitable for rural hospitals in states that opted to participate.

Discussion/Conclusion: The research demonstrated the sustainability of rural hospitals in the U.S. was multifactorial. The online qualitative survey supported both the vitality of rural hospitals as

well as the limited resources and need for partnerships with regional hospitals to promote rural hospital sustainability.

Key Words: accessibility, administrative, availability, quality, rural hospitals, sustainability

INTRODUCTION

Rural hospitals have been an important part of the rural healthcare system in the United States (U.S). These institutions have provided the community with a sense of security because of their impactful contributions to its well-being (RHI, 2018; RHRG, 2010). Just like their urban counterparts, rural hospitals have offered an expansive provision of services, ranging from primary care to long-term care. For that reason, residents in rural areas have found them to be an essential component of their community (RHI, 2018).

As stated by the Health Resources and Services Administration (HRSA) (2019), rural hospitals have accounted for more than half the registered hospitals in the U.S. (HRSA, 2019). Moreover, according to the American Hospital Association (AHA) (2019), approximately 51 million rural Americans have utilized these facilities and have relied on them, not only as a vital resource for healthcare, but as an essential element to the health and welfare of their community's financial stability and social structure (AHA, 2019).

The U.S. Census Bureau (USCB) has not explicitly defined the term rural (USCB, 2010). Rather, it has been suggested the term is multifaceted and has included all populations and regions that are not considered urban (HRSA, 2018). The term urban has been classified to contain urbanized areas, or regions containing 50,000 or more people, and urban clusters, areas containing at least 2,500 and less than 50,000 people (HRSA, 2018). The rural hospital designation has been presented to facilities that have served the healthcare needs of these non-urban areas, numbering 19.3% of the U.S. population and encompassing 97% of the nation's land area (USCB, 2016).

These hospitals have, unfortunately, had to contend with numerous adversities including low reimbursement rates from federal and state payers, new and increasing government-imposed regulations, decreased patient volumes, various socioeconomic factors, and, oftentimes, uncompensated care (Frakt, 2019). One example that has been cited as a challenge for rural hospitals was these facilities have served a larger segment of the population that were socioeconomically disadvantaged and suffer from multiple health issues (AHRQ, 2017). This has led to poor health outcomes and higher overall costs for healthcare (AHRQ, 2017). In turn, the facilities have begun to struggle financially (Frakt, 2019). In fact, according to a study conducted by the National Rural Health Association (NRHA) in 2016, one-third of the nation's rural hospitals were at risk of closure. This was nearly 700 facilities, serving 11.7 million patients (NRHA, 2016).

Specific administrative programs have been created to help combat this financial uncertainty and, as such, promote sustainability. For example, the Critical Access Hospital (CAH) designation has been created to assist rural hospitals by increasing reimbursement (CMS, 2019). This label was given to eligible rural hospitals by the Centers for Medicare and Medicaid Services (CMS) that met specific criteria, including 25 or fewer acute care inpatient beds, a location more than 35 miles from another hospital, annual average Length of Stay (LOS) for acute care patients of 96 hours or less, and the provision of 24/7 emergency care services (CMS, 2019).

As previously mentioned, sustainability has been a key issue in the policy implementation and projected success of rural hospitals (NRHRC, 2016). For rural hospitals, sustainability has been defined as the capacity to realize financial viability and has been determined by how productive the organization was in reaching its objectives and goals to remain positioned for future success (NRHRC, 2016). Although these hospitals have endured numerous hardships, they have also been presented with notable opportunities such as being the principal employer within a given

area (Kleinman, 2014). This local resource availability and community ties have been the foundation for a partnership between rural institutions and local and neighboring communities (Kleinman, 2014). A 2017 report released by the AHA stated, in general, hospitals accounted for 5.7 million direct jobs in healthcare and 10.3 million ripple-effect jobs (NRHA, 2018). This was especially significant to rural areas where the hospital was the primary opportunity for employment (NRHA, 2018).

The purpose of this study was to gauge the potential for the sustainability of rural hospitals in the U.S. by examining identifiable variables that affect these institutions such as accessibility, availability of services, quality outcomes, and effective administrative practices.

METHODOLOGY

The primary hypothesis of this research was, with proper management of resources such as finances and labor, rural hospitals could be sustainable by taking actionable administrative measures to promote ideas that increase hospital demand such as offering comprehensive healthcare services locally, thereby increasing quality and placing value on the organization's community relations.

The methodology for this study was a literature and case study review that followed a systematic qualitative approach adapted from the conceptual framework of Yao, Chu, and Li (2010). (See Figure 1). To research how rural hospitals could reach or maintain sustainability, it was first essential to identify and analyze their overall benefits. Additionally, issues that could hinder their long-term success were analyzed. In so doing, the opportunities and threats to their sustainability could be identified.

The systematic review was conducted in separate stages including: 1.) establishing an overall search strategy and determining inclusion and exclusion criteria, and 2.) literature and case study classification and analysis.

Step 1: Literature Identification and Collection

Initially, the search was relegated to the sustainability of rural hospitals to ascertain the scope of data available and determine significant areas in which to focus. As a rule, accessibility and availability of services dominated the material found. As such, the search terms for both internet and database inquiries included ‘rural hospitals’ and ‘sustainability’ or ‘accessibility’ or ‘availability’ or ‘administrative’ or ‘quality’. Both internet and database searches were used to acquire information; specifically, the databases of PubMed, EBSCO, ProQuest, Google, and Google Scholar were used.

Step 2: Literature Analysis

The search was restricted to English publications dated between 2009 and 2019. The selected literature was chosen for review based on whether their abstract presented information pertinent to the sustainability of rural hospitals. The articles were then selected for use by verifying whether they, more specifically, had details on how and why a rural hospital could reach sustainability. Further, an open-ended survey with an expert in Hospital Administration within or collaborating with rural areas added to the data collected. This expert was referred to as expert in Hospital Administration throughout the review. The survey was conducted via an online platform with a list of pre-determined questions. (See Appendix A). Specific data from the survey was extracted to supplement the principles of the conceptual framework. Approval was obtained from Marshall University’s Institutional Review Board (IRB) and received on September 24, 2019. The literature search was conducted by SC and KL. It was validated by AC, who acted as a second

reader and verified the references met the research study inclusion criteria. Using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (2015) method, the search identified 34 relevant citations. References were excluded (N=16) if they did not meet inclusion criteria parameters. References were included (N=17) if they could adequately help further discussion on the topic and the specified parameters. Articles from other sources (N=14) were also included in this search. These 32 references were subject to full-text review and included in the data abstraction and analysis. Only 17 results were used in the results section (PRISMA, 2015). (see Figure 2).

RESULTS

Accessibility to Care and Patient Outcomes in Rural Hospitals

In Delaware, medical transportation needs for middle-aged patients were examined and, of 27,518 trips, the mean miles traveled to pick up a patient in a rural area was 25.41 miles, the most likely reason was kidney dialysis with 60% and 93.5% of patients had no accompaniment to medical appointments (Smith et al., 2017). In a survey of 374 rural hospitals in the Rocky Mountain area, 209 (57%) had a quality improvement plan for pain management, while 142 (39%) offered quality improvement for end-of-life care (Fink, Oman, Youngwerth, & Bryant, 2013). To access a high-volume hospital that performed more specialized surgeries, such as a total knee replacement surgery, 1,506 rural area patients traveled greater than 50 miles, and 259 patients traveled greater than 100 miles (FitzGerald, Soohoo, Losina, & Katz, 2012).

Quality of care and patient outcomes were examined in rural CAHs and compared to non-CAHs, for the diagnosis of Congestive Heart Failure (CHF), rural CAHs had a mean Health Quality Qliance (HQA) score of 78.7 and a 30-day mortality rate of 13.8%. This was compared to non-CAHs who realized an 84.8 HQA score and 11.9% 30-day mortality rate for CHF patients

(Joynt, Harris, Orav, & Jha, 2011). (See Figure 3 for the 30-day mortality rate for rural CAHs and non-CAHs). When considering patients hospitalized for atrial fibrillation between 2012 and 2014, the in-hospital mortality rate in rural hospitals was 1.3% and 1.0% in urban hospitals, with a sample size of 29,785 and 218,946, respectively (O'Neal, Sandesara, Kelli, Venkatesh, & Soliman, 2018). Ross, Patzer, Goldberg, Osborne, and Lynch (2019) considered liver disease, risk of dying, and hospital's rurality found rural hospitals had double the in-hospital mortality compared to urban hospitals with 2% mortality for those with minor risk of passing (1% for urban hospitals), 2% compared to 1% for moderate risk patients rural versus urban, respectively, and 6% for rural and 3% for urban for those patients with a major risk of passing due to end-stage liver disease (Ross, et al., 2019). When rurality was considered in the likelihood of death following traumatic injury, 8,673,213 cases were examined and found rural patients were 14% more likely to die from a trauma than non-rural patients (Jarman, Castillo, Carlini, Kodadek & Haider, 2016).

Availability of Services in Rural Hospitals

Based on the 2009 AHA survey on hospital characteristics, one study compared clinical resources available at CAHs with non-CAHs and found 30% of CAH facilities had a medical Intensive Care Unit (ICU), while 74.4% of non-CAHs had an ICU (Joynt, et al., 2011). Similar findings were realized in the categories of cardiac intensive care unit, cardiac catheterization, surgical capacity, and the physician specialties of cardiologists and pulmonologists; however, 36.1% of physicians in CAH were generalists compared to 29% in non-CAHs (Joynt, et al., 2011). (See Figure 4 for a comparison of clinical resources between CAH and non-CAHs). In 2014, 69% of the most isolated rural U.S. counties had no local obstetric services (Hung, Henning-Smith, Casey, & Kozhimannil, 2017). In a 2017 Marshall University case review of four rural hospitals and 40 total cases, cardiology was the greatest needed specialty for transfer, with 21 patients

(52.5%), the most frequent transfer diagnosis was that of acute coronary syndrome, with 23 patients (57.5%), and critical care/higher level care was the next most prevalent reason for transfer with 8 patients (20%) (Nair, Vaughan, & Bennett, 2017).

An observational study which considered availability of anticoagulation reversal agents for use of presented intracranial hemorrhage cases in Emergency Departments (ED) in 103 rural Iowa hospitals found 87 (84%) had access to Fresh Frozen Plasma (FFP) for warfarin reversal, 69 (67%) of which could be administered within 60 minutes (Faine, Amendola, Homan, Ahmed, & Mohr, 2018). This study also considered available services of MRI access, CT scan access, and neurology coverage, finding that 29 (28%) EDs had MRI access, 101 (98%) had CT scan access, and 12 (12%) had at least partial access to neurology services while 80 (78%) had no access to neurology coverage (Faine, et al., 2018). Between 2010 and 2014, of 263 rural hospitals who participated in a telephone survey in Colorado, Iowa, Kentucky, New York, North Carolina, Oregon, Vermont, Washington, and Wisconsin, 7.2% discontinued obstetric services (Hung, Kozhimannil, Casey, & Moscovice, 2016). In the Rocky Mountains, 374 rural hospitals were accessed as to the availability of palliative care aspects and found 282 (76%) had a contractual relationship with a hospice program (Fink, et al., 2013).

The nine-state study that spanned 2010 through 2014 of 263 rural hospitals also found that of the 19 hospital respondents to specify the causality of the unit closure, 15 (79%) cited staffing issues, including recruitment, retention, and reliability (Hung, et al., 2016). In a 2012 study of rural Iowa area hospitals with (ICU), 24 (52%) of the 46 ICUs staffed the unit with non-critical care inpatient physicians rather than board-certified intensivists during the evening and non-peak hours (Mohr, Collier, Hassebroek, & Groth, 2014). Of 238 rural hospitals surveyed, 98% had

difficulty staffing the unit with challenges in retaining or recruiting obstetric physicians realized in 50 (20.6%) of the facilities (Kozhimannil et al., 2015).

Financial Management in Rural Hospitals

Using the CMS Healthcare Cost Report Information System for 1,505 rural hospitals, the Return On Equity (ROE) was \$0.05 (5%) (meaning for every \$1 earned, \$0.05 was retained) compared to a ROE of \$0.12 (12%) among 1,750 urban hospitals (Turner, Broom, Elliott, & Lee, 2015). Brady, (2018) obtained CMS and AHA data from 2014-2015 and compared rural hospitals in Medicaid expansion states to those in non-expansion states, and found the mean uncompensated care in rural expansion hospitals was \$987,059 with Medicaid revenue that totaled, on average, \$1,740,393 and \$1,219,517 for uncompensated care and \$766,757.20 for mean net Medicaid revenue in non-expansion states in rural hospitals (Brady, 2018).

In a 2012 study of rural hospitals going through a merger or acquisition, 1,260 hospitals were sampled pre- and post-merger and found a mean operating margin of -0.27%, mean total profit margin of 2.22, mean earnings before interest and taxes of \$154,150, a mean current ratio of 3.13, and a mean percent of equity financed of 57.48%, while the average salary for full-time staff was \$49,987 (Noles, Reiter, Boortz-Marx, & Pink, 2015). Post-merger, the average hospital operating margin decreased by 1.4%, total profit margin decreased by 0.12%, and the average salary of full-time staff decreased by \$1,223 annually (Noles, et al., 2015). Ellis (2011) compared Press Ganey patient satisfaction surveys for in-patient and ED care with 2009 revenue totals for rural Oklahoma hospitals. Total revenue for May 2009 was the highest, at \$3,326,376, and patient satisfaction for ED and in-patient was 91.1% and 86.1% (Ellis, 2011).

DISCUSSION

The sustainability of rural hospitals in the U.S. is multifactorial. This review sought to gauge this sustainability by examining literature in the field as well as administering an anonymous online survey with an expert in Health Care Administration. In doing so, factors that may affect sustainability such as quality of care and patient outcomes, accessibility of services, and financial performance were discovered. The results suggested, with proper management and government support, rural hospitals could continue to serve a vital role within the community.

Quality of Care and Patient Outcomes in Rural Hospitals

Patient outcomes in rural hospitals fluctuated. In-hospital mortality rate percentages were slightly higher in urban hospitals as compared to rural hospitals (O'Neal, et al., 2018; Ross, et al., 2019). Additionally, rural hospitals offered improvement services or referrals for such, quality improvement plans in place for pain management, and quality improvement for end-of-life care (Fink, et al., 2013).

Availability of Services in Rural Hospitals

In rural hospitals, it was difficult to maintain necessary specialties such as a medical ICUs and cardiac intensive care units or, in some more isolated areas, even obstetric services (Joynt, et al., 2011; Hung, et al., 2017). Access to available specialty testing such as MRI and CT scans and, thus, neurology services suffered in rural hospitals as well (Faine, et al., 2018). Of the hospitals that realized a unit closure, many cited staffing, retention, and recruitment as the reasons (Hung, et al., 2016).

Financial Management in Rural Hospitals

ROE was more than double in urban as opposed to rural hospitals (Turner, et al., 2015). However, the optional state expansion of Medicaid proved profitable for rural hospitals in states

that opted for the expansion (Brady, 2018). Mergers and acquisitions also effected rural hospitals showing, post-merger, a decrease in the average hospital operating margin, total profit margin, and the average salary of full-time staff (Noles, et al., 2015)

Online Survey with an Expert in Hospital Administration

The expert participated in an online opinion survey that gauged the current views of the sustainability of rural hospitals. As such, no quantitative measures were obtained, only qualitative measures were expressed by the expert. The expert defined “rural” in terms of hospitals and relayed most rural hospitals have a critical access designation, with limited capacity and capabilities, and no additional services for 30 miles and serve as a conduit to the community and their needs. The expert noted that rural hospitals have been a vital hub to stabilize, facilitate access for the patient and make referrals to more specialized care. The expert expressed the advantages of rural hospitals being convenience and personal touch for the patient, while disadvantages were limited resources; however, partnering with a regional referral center and implementing telemedicine could heighten sustainability. The expert noted potentially profitable services for rural hospitals as specialty physicians, lab services, imaging, and surgeries, of which rural hospitals cannot afford to hire the physicians and staff and purchase the equipment for low volume return.

Limitations

According to the expert surveyed, lack of funding for research and technology for rural healthcare limited availability of data. Funding for research was also limited by the narrow definition of rural and what government aid could be provided. Also, because only 5 databases were used, publication bias could be introduced. Lastly, members of the group are currently employed in the healthcare system within rural areas and could view the literature with research bias.

Practical Implications

Bearing in mind the study limitations and areas of deficiency revealed, while the vitality of rural hospitals has been demonstrated, so have some of the challenges that impede sustainability such as limited availability of services. As such, further research is needed to discover specific models to promote partnerships with regional hospitals and enhance the sustainability of rural hospitals which could support the health and well-being of rural populations with the knowledge of ways to enhance rural health care delivery.

CONCLUSION

The research demonstrated the sustainability of rural hospitals in the U.S. is conceivable. Although barriers existed, promoting standards such as collaborating with larger regional facilities, investing in people and technology, and utilizing government aid could offer rural hospital a secure future.

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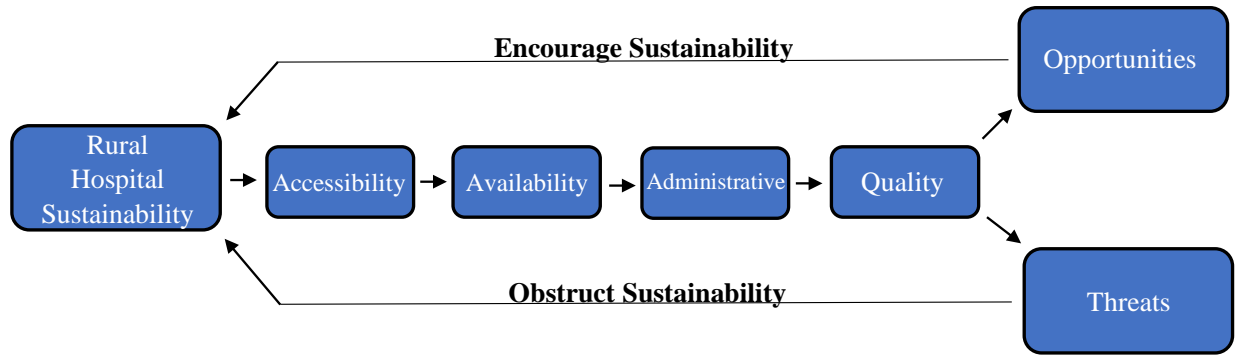


Figure 1: Conceptual Framework adapted from Yao, et al. (2010)

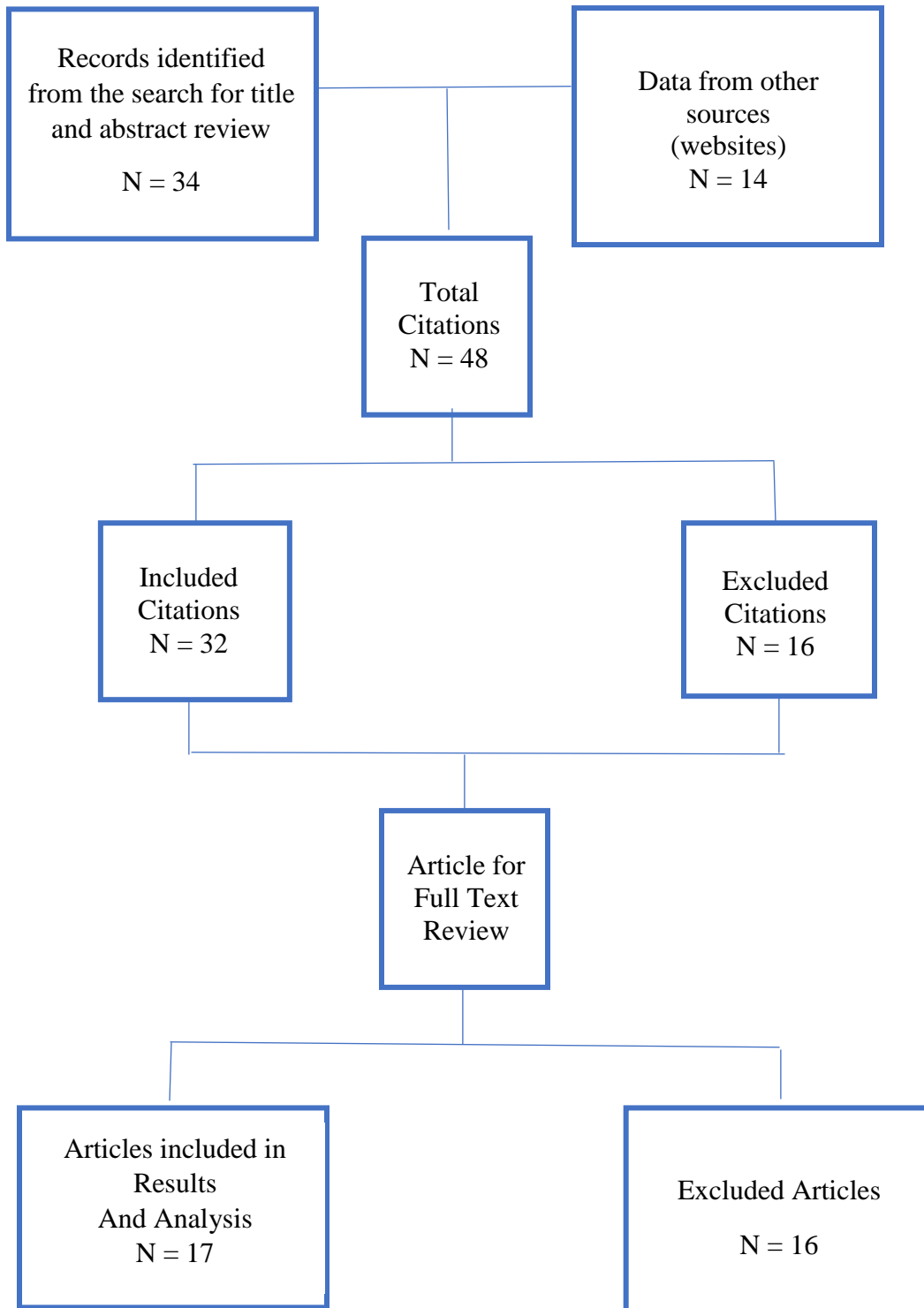


Figure 2: Overview of Literature Evaluation adapted from PRISMA (2015)

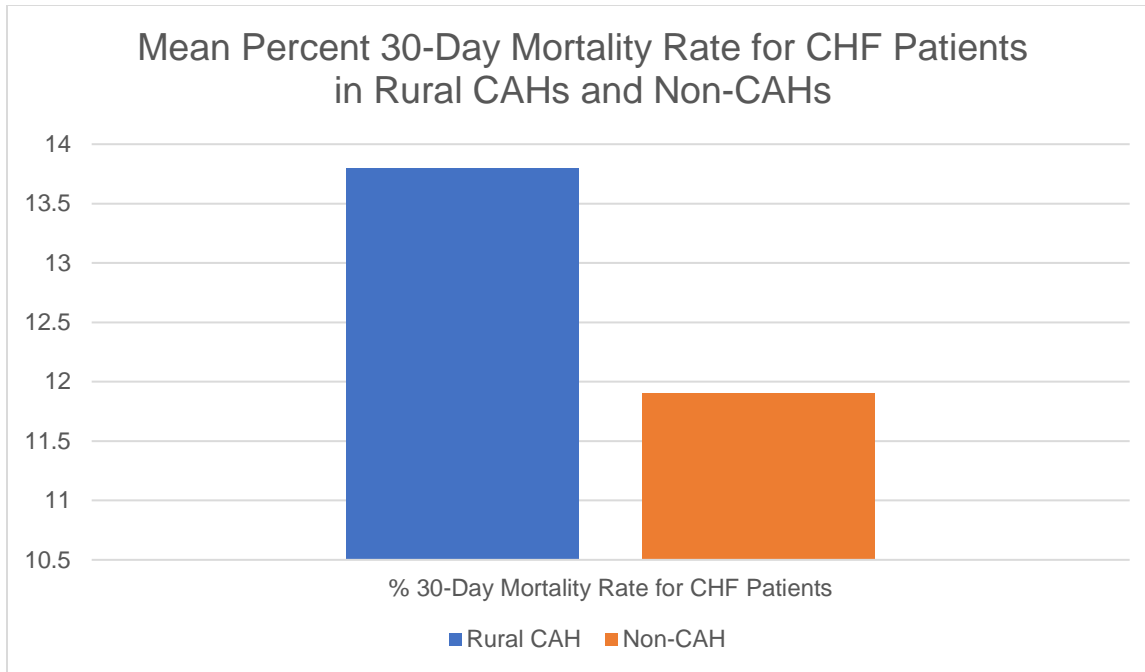


Figure 3: Mean Percent 30-Day Mortality Rate for CHF Patients in Rural CAHs and Non-CAHs (Joynt, et al., 2011).

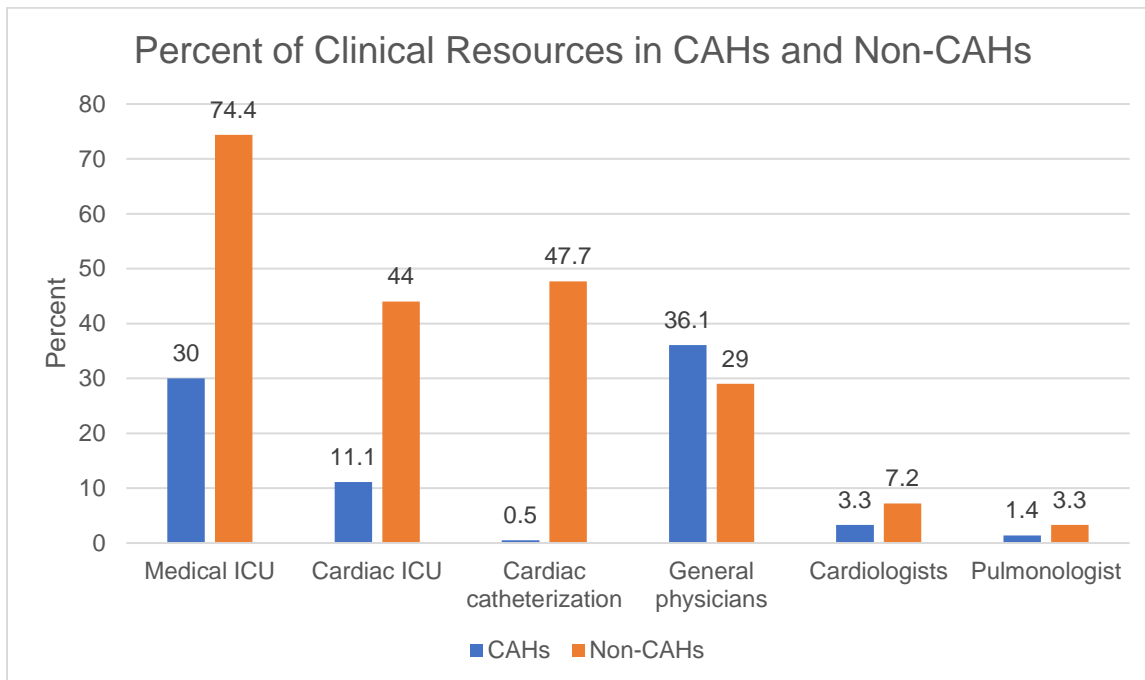


Figure 4: Percent Comparison of Clinical Resources in CAHs and Non-CAHs (Joynt, et al., 2011)

APPENDIX A

Questions Asked via an Open-ended Question Survey

of an Expert in Hospital Administration within or Collaborating with Rural Areas

- How would you define “rural” when applied to hospitals?
- What impact do rural hospitals have on access to:
 - 1.) health care
 - 2.) specialized care?
- What impact has CMS’ Meaningful Use/MACRA/MIPS had on the sustainability of rural hospitals? Have any barriers been identified in implementing government guidelines in rural hospitals?
- How does the community respond to rural hospital services vs. services offered at urban/bigger hospitals?
- How has EMR adoption affected profitability in rural hospitals?
- What are advantages and disadvantages to rural hospitals?
- What resources are available to rural hospitals to heighten sustainability?
- What services provided in a rural hospital are more profitable for the hospital; and/or, conversely, are there any services that are detrimental to the profitability of a rural hospital?
- What resources are available in your rural hospital to facilitate interoperability?
- How are rural hospitals utilized in local community health and outreach?