Community Characteristics and Readmissions: Hospitals in Jeopardy

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Abstract

Objective: The purpose was to identify community characteristics that contribute to reductions in readmission rates and reimbursement penalties for hospital systems in upstate New York.

Methods: Hospitals in upstate NY were selected (N = 94). Using an ex post facto design and the ecological model, community characteristics of hospital systems were analyzed and coded. Independent t-tests, ANOVA, and Pearson Correlation tests were conducted.

Results: Characteristics correlated with reduced hospital readmission rates and reimbursement penalties included hospitals (1) with critical access status; (2) located in counties with a better county health rank; and (3) located in a primary care shortage area that utilized house calls.

Discussion: Implications include supporting policies that increase access to services, improve formulas for reimbursement, and encourage innovation in care delivery models. Future research efforts should focus on house calls in primary care shortage areas.

Keywords: readmission rates, ecological model, house calls, community health

Community Characteristics and Readmissions: Hospitals in Jeopardy

Mandates of the Patient Protection and Affordable Care Act (ACA) require monitoring the quality of care received in hospitals by tracking readmissions. Since the passing of this federal law, mandates allow for penalties in the form of reduced hospital reimbursement when Medicare patients are readmitted within a 30-day period (Jweinat, 2010; U.S. Department of Health and Human Services [USDHHS], 2010). Nearly 75% of hospitals nationwide were penalized for poor readmission rates between July 2010 and June 2013, and in New York State (NYS), 80% of hospitals lost revenue because of readmission rates. Well after the rollout of the ACA in 2016, NYS did even worse with 93% of hospitals penalized by Medicare (Rau, 2014, 2017). NYS ranked 2nd worst (49th) for healthcare costs, and worst (50th) in the nation for readmission rates.   NYS exceeded one billion dollars in direct costs for heart failure and pneumonia (New York State Department of Health [NYSDOH], n.d. a; NYSDOH, n.d. b; New York State Health Foundation, 2014).

These reduced payments threaten hospital viability. Rural hospitals have more vulnerability to closure due to reduced revenues. The Hill-Burton Act of 1946 funded the construction of many hospitals in rural areas. Within the past five decades many of these hospitals closed as a result of the U.S. Congress Prospective Payment System for Medicare, which capped payments to hospitals by a fixed amount based on diagnoses (Wishner et al., 2016).

In 1997, the Clinton administration attempted to address the problem of hospital closures with the Medicare Rural Hospital Flexibility Program, providing financial relief for rural hospitals with less than 25 beds. However, during the recession of 2008-2009, 42 rural hospitals across the country closed (Wishner et al., 2016). More alarming was the closure of another 72 rural hospitals between 2010 and 2016, further jeopardizing patient access to care. Most of those closures

occurred after the implementation of the ACA (Kaufman et al., 2016; Wishner et al., 2016). Hospitals are major employers and sources of income for numerous businesses; therefore, hospitals that are weak financially disrupt community well-being (American Hospital Association, 2017).

Reduced hospital revenue as a result of high readmission rates threatens nurse staffing. It is well documented that low nurse staffing is related to poor patient health and safety outcomes (Agency for Healthcare Research and Quality, 2004; American Nurses Association, 2014). High readmission rates contribute to a vicious cycle of poor staffing, poor quality of care, and lower reimbursement. Since nurses constitute the largest sector of the health care workforce and are responsible for the majority of care given in hospitals (American Association of Colleges of Nursing, 2019), a reduction in this human resource by hospital organizations has not only quality of care implications but economic as well. It is within the scope of nursing practice and shared governance to develop and implement evidence-based solutions that can yield cost savings and improve health outcomes (Lundmark, 2008).

Rationale

In response to the mandates of the ACA, hospitals across the country have created initiatives to enhance their quality of care to reduce readmission rates, improve health outcomes and maximize reimbursement (Linden & Butterworth, 2014). Little is known, comparatively or cumulatively, about how effective these programs are in bringing improvement to health status and reducing readmission rates in NYS. It would benefit healthcare providers working in policy, communities, and organizations to identify community characteristics and readmission reduction initiatives that are successful at improving health status and reducing the burden of disease. It is imperative to identify cost-effective and worthwhile strategies (Cohen et al., 2016). Strategies can also assist communities to reach two aims of Healthy People 2030 developed for older adults,

which are to "improve the health and well-being for older adults," and to reduce pneumonia related hospitalizations among the elderly (USDHHS, 2020, Older Adults section). Healthy People 2030 began in 1980, and provides a unifying framework for communities and organizations working on population health in the U.S.

Purpose and Goal

The purpose of this study was to identify community characteristics and organizational initiatives that were correlated with lower reimbursement penalties and lower hospital readmission rates for heart failure and pneumonia. As previously stated, the cost of treating heart failure and pneumonia continue to strain the NYS budget. This article specifically addresses community characteristics. Organizational initiatives are discussed in a separate paper (Summers & Atav, 2020). The study's purpose is driven by the overarching goal of improving health quality for the elderly. By building on community characteristics and implementing organizational initiatives that are correlated with reduced readmissions or loss of revenue, improved health quality for the elderly is achievable.

Framework and Review of the Literature

Ecological Model

This study used the ecological model as a framework and guide for the literature review. For the purposes of this article, policy and community levels of the ecological model (McLeroy, et al., 1988) are discussed. Stanhope and Lancaster (2020) describe the five levels of the ecological model as individual, interpersonal, organizational, community, and public policy. The Institute of Medicine has long supported the ecological perspective and its importance in addressing determinants of population health, acknowledging the interchange and impact among various levels (2002). The study specifically applied the ecological model (see Figure 1) to examine the

impact that the levels of policy and community have on hospital quality, namely readmissions, and to identify components that are correlated to lower reimbursement rates and penalties.

Figure 1

The Ecological Model (Summers, 2018)

Policy Level Factors

The ACA and Centers for Medicare and Medicaid Services (CMS) regulations represent the policy level because these entities govern quality measures, and they create algorithms for calculating the payment adjustment factor which ultimately determines payment (Centers for Medicare and Medicaid Services [CMS], 2020). The federal ACA authorized the Secretary of Health and Human Services to identify measures of quality that include avoidable hospital readmissions and sets guidelines for reimbursement reductions. Beginning with the Deficit Reduction Act of 2005, the Secretary was mandated to include hospital outcomes such as readmission rates in the Hospital Inpatient Quality Reporting program. These legislated outcome measures were expanded with the ACA in 2010 and are now included in reports generated by the

Agency for Healthcare Research and Quality (AHRQ) and the Hospital Consumer Assessment of Healthcare Providers and Systems (CMS, 2020).

For the purpose of this study, the outcome for the ecological model was hospital quality (see Figure 1) and was represented using (1) hospital 30-day all cause readmission rates, (2) heart failure related readmission rates (RRHF), and (3) pneumonia related readmission rates (RRPN), as reported by the NYS Department of Health. The fourth outcome examined was the payment adjustment factor (PAF), which is the reimbursement penalty imposed on hospitals. The PAF is calculated using a base hospital operating payment for specific diagnostic related groups, and the local wage index of the hospital's region. A PAF of one is desirable. In the first year of the ACA, the PAF penalty was capped at 1%, and has incrementally increased to a 3% reduction in reimbursement as of 2016 (CMS, 2020; Hoffman, 2017). Since the PAF is calculated using heart failure and pneumonia related data, two additional interval outcomes were included in this study: the excess readmission ratios for heart failure and pneumonia (ERRHF and ERRPN, respectively). These two ratios are risk-adjusted measures that compare actual readmission rates to that of expected rates for that hospital based on national rates and hospital and community characteristics. A higher ratio is equated to poorer than expected readmissions related to heart failure or pneumonia (CMS, 2020).

Community Level Factors

Community health workers provide care to individuals, families, and groups, with an aim to improve population health. One of the strongest correlations to life expectancy among race, age, and sex, is education and socioeconomic status (Olshansky et al., 2012). Socio-economic status has a direct influence on life expectancy, and when the distribution of social supports in a community is increased, health status can be improved (Marmot et al., 2008; Wilkinson & Marmot,

2003). Community level variables addressed in this study included characteristics of (a) rural status, (b) critical access hospital status, (c) primary care provider shortage status and (d) county rank for health factors.

Rural Status. The Office of Management and Budget (OMB) classification for a core based statistical area (CBSA) was utilized. The OMB classification uses three CBSAs based on a county geographic unit. The metropolitan area consists of a core urban population of 50,000 or more. The micropolitan area has populations from 10,000 to 50,000. Non-metropolitan areas contain a population of less than 10,000, which for this study is termed rural (Rural Health Information Hub, 2020).

Critical Access Hospital Status. Another community level factor examined was whether the hospital was classified by CMS as a critical access hospital (CAH). To qualify as a CAH, the hospital must have (1) less than 25 acute care hospital beds, (2) be located greater than 35 miles from another hospital, (3) have an average length of stay of less than 96 hours, and (4) provide emergency care 24 hours daily and seven days a week (Rural Health Information Hub, 2019).

CAHs have provided needed access to healthcare services in otherwise remote geographic areas. CAHs are granted more leeway than non-CAHs in terms of financial reimbursement. Organizations that oversee the administration of CAHs often experience an excessive financial burden (Bigby, 2014; Reiter et al., 2013). Baernholdt et al. (2014) found no difference between hospitals with a critical access designation and those without the designation when measuring nurse-rated quality of care and community perceptions. Gaps in the literature exist for studies comparing readmission and reimbursement outcomes between CAHs and non-CAH entities.

Primary Care Shortage Area Status. The Health Resources and Services Administration designates Health Professional Shortage Areas for regions with shortages of primary care

providers, dentists, and mental health providers (Health Resources and Services Administration, 2020). Primary care provider shortages were examined because advanced practice nurses (APNs) serve in the role of a primary care provider. Primary care providers are a patient's first contact with the health care system. A lack of providers contributes to decreased access to care and potentially a deterioration of health status. A shortage also creates an environment for over-utilization of emergency rooms and increased hospital admissions (Commonwealth Fund, 2013).

County Health Rank. The Health Factor Rank, developed by the University of Wisconsin Population Health Institute, is based on categories that quantify aspects of social determinants contributing to population health including elements of health behaviors, clinical care, as well as social, economic and physical environmental features (University of Wisconsin Population Health Institute, 2016). A county with a score of one is better than the other counties in that state. Consequently, it was expected that hospitals located in metropolitan communities with a better county health rank and adequate availability of primary care providers would have lower readmission rates and less reimbursement penalties.

Organizational Level Factors

The authors have discussed in a separate paper the variables at the organizational level of the ecological model. Those variables include whether a hospital utilized any hospital readmission reduction programs, as well as the level of nurse competency involved in a hospital's interdisciplinary discharge planning team. Hospital programs that contributed significantly to reductions in readmission rates and payment penalties for hospital systems in upstate New York included an organizational collaboration or utilization of (1) certified home health agencies, (2) telehealth, (3) house calls, (4) APNs on interdisciplinary discharge teams, and (5) the utilization of more than one type of hospital readmission reduction initiative (Summers & Atav, 2020).

Methods

Design and Sample

This study incorporated a non-experimental, ex post facto design which is considered another method of determining causal relationships (Lord, 1973). Ex post facto designs may be categorized as quasi-experimental. In this design, there is neither random assignment nor manipulation. The research is conducted after events have occurred without any intervention by the researcher (Ex Post Facto Research Design, 2021). The university's Institutional Review Board (IRB) granted an exempt status since no human subjects or populations were under investigation (IRB protocol #3891-16).

This study included 94 hospitals located in 53 upstate NY counties. Hospitals in nine counties with close proximity to the New York City metropolis were excluded in order to fairly represent rural hospitals. Hospitals excluded were in the following nine counties: Bronx, Kings, New York, Queens, Richmond, Rockland, Westchester, Nassau, and Suffolk. Five hospitals were excluded due to: (a) closure (n = 1); (b) the facility was either strictly an urgent care or emergency department (n = 3); or (c) the facility was under the organization and data collection of a Pennsylvania hospital system (n = 1). Six counties in NYS did not have any hospitals. Rural status was limited to and based on the core-based statistical area as defined by the OMB. Data were collected from public domain sources including CMS, the AHRQ, the U.S. Census, the Rural Health Information Hub, NYSDOH, the University of Wisconsin Population Health Institute, and specific hospital websites.

Scope and Limitations

Information was accessed through various government, non-government, and hospital public domain websites. Data were collected at the hospital and county levels for 94 hospitals in

53 counties, then categorized following the ecological model as a framework. This study's scope is applicable to upstate NY hospitals, and based on the assumption that data sources were correctly collected, analyzed, and reported. One limitation inherent in a quasi-experimental ex post facto design is that it is a weaker level of evidence for establishing causal relationships when compared to a randomized control trial (Lord, 1973).

Outcome Measures

The outcome of the study was hospital quality. To measure quality, the following variables were used to operationalize hospital quality (see Table 1):

- Hospital readmission rates

- Readmission rates for heart failure

- Readmission rates for pneumonia

- Payment adjustment factor

- Excess readmission ratio for heart failure

- Excess readmission ratio for pneumonia

Table 1

Dependent Variable Measurement and Source

Dependent (Outcome) Variable Name	Measure	Sources
Hospital Readmission Rate	Interval	1. NYSDOH: Health Profiles- Hospitals 2. Medicare: Hospital Compare Dataset
Readmission Rate for Heart Failure	Interval	1. NYSDOH: Health Profiles- Hospitals 2. Medicare: Hospital Compare Dataset
Readmission Rate for Pneumonia	Interval	1. NYSDOH: Health Profiles- Hospitals 2. Medicare: Hospital Compare Dataset
Payment Adjustment Factor	Interval	CMS: Readmission Reduction Program
Excess Readmission Ratio for Heart Failure	Interval	CMS: Readmission Reduction Program
Excess Readmission Ratio for Pneumonia	Interval	CMS: Readmission Reduction Program

Predictor Qualities

This study examined several community factors that could possibly impact the outcome measures.

1. Was the hospital located in a rural area? The three categories of location included metropolitan, micropolitan, or rural.

2. Was the hospital a critical access hospital or not?

3. Was the hospital located in a primary care shortage area or not?

4. What was the hospital's county health rank? The range for this variable was 1 to 62.

Data Analyses

Analyses were conducted using IBM's Statistical Package for the Social Sciences (SPSS) version 22, facilitating the completion of statistical tests. Descriptive statistics were conducted providing a summary of the data and how often the community characteristic occurred among hospitals in upstate NY. Bivariate analyses included independent *t*-tests to compare the means of outcome variables, and to determine if there was a significant difference in readmission rates and reimbursement penalties for hospitals that were (1) categorized as a critical access hospital and (2) located in a primary care shortage area. For the independent variable of rural status with three groups, the parametric analysis of variance (ANOVA) was utilized providing analysis for differences among the groups' means in both within-group variance and between-group variance. Games-Howell post hoc analyses were chosen to determine which groups were statistically different. Pearson correlations were also conducted for the county health rank with each of the readmission outcomes. This parametric test is particularly useful in determining if a correlational relationship exists, how strong that relationship is, and if that relationship is direct or inverse (Plichta & Kelvin, 2013).

Results

Several significant findings are discussed in this section. Community characteristics addressed in this study included (1) rural status, (2) critical access hospital status, (3) primary care provider shortage status, and (4) county health rank. Organizational level factors and the type of hospital readmission reduction program employed by the hospital are discussed elsewhere in detail (Summers & Atav, 2020). Since no individuals were studied, and the subjects under consideration were hospitals, the interpersonal and intrapersonal levels of the ecological model were not specifically addressed in this study. Of the community characteristics studied, none were associated with significant differences in (1) readmission rates, (2) readmission rates related to heart failure, (3) excess readmission ratios for heart failure, or (4) excess readmission ratios for pneumonia. The hospitals with critical access status, however, had lower readmission rates related to pneumonia compared to non-critical access hospitals. Reimbursement penalties based on the payment adjustment factors were lower for hospitals located in counties with a better county health rank and located in primary care shortage areas utilizing house calls.

Descriptive statistics were calculated for 94 hospitals in upstate NY (see Table 2):

Table 2

Descriptive Statistics and Frequencies for Hospitals in Upstate NY: Community Variables

Characteristics	*Number (%) of Hospitals (N = 94)*	*Mean (SD) [Min. –Max. Range]*
Community Predictor Variables		
County Health Rank	94 (100%)	32.72 (15.55) [2-61]
Metropolitan	63 (67%)	
Micropolitan	21 (22.3%)	
Rural	10 (10.6%)	
Primary Care Provider Shortage	58 (61.7%)	
Critical Access Hospital	12 (12.8%)	

Rural Status

A one-way, between subjects ANOVA was conducted to compare the effect of rural status on readmission rates and reimbursement penalty rates in upstate NY hospitals. There was not a significant effect. Results, however, indicated that hospitals located in micropolitan settings trended towards worse outcomes compared to hospitals located in either metropolitan or rural settings, (see Table 3). These findings could be explained by a greater source of revenue and economic support in metropolitan areas. Likewise, rural areas may receive federal government financial support. It could be argued that micropolitan communities have an economic disadvantage and include many older industrial cities and towns with an aging population and a diminishing workforce (Sisson, 2018).

Table 3

ANOVA for Outcomes According to Rural Status

Outcome	Metro Mean	SD	n	Micro Mean	SD	n	Rural Mean	SD	n	F	p
RR	15.612	.8166	56	15.845	.7131	20	15.720	.7563	5	.657	.521
RRHF	22.282	1.5567	56	22.570	1.5991	20	21.960	1.1014	5	.410	.665
RRPN	17.679	1.5984	56	17.330	1.2978	20	17.140	1.2361	5	.595	.554
PAF	.9950	.0054	56	.9926	.0045	20	.9929	.0048	5	1.702	.189
ERRHF	1.0240	.0687	56	1.0514	.0849	20	1.0216	.0608	5	1.098	.339
ERRPN	1.0340	.1174	56	1.0159	.0669	20	1.0007	.0791	5	.389	.679

Note. RR= readmission rates; RRHF=Readmission rates related to heart failure; RRPN= Readmission rates related to pneumonia; PAF= Payment adjustment factor; ERRHF= Excess readmission ratio for heart failure; ERRPN= Excess readmission ratio for pneumonia

Critical Access Hospital Status

Those hospitals classified as CAHs had lower readmission rates related to pneumonia than non-CAHs, t (33) = -.171, p = .021 (see Table 4). Hospitals classified as a CAH did not have the same data collection and analysis methods as non-CAHs. Therefore, independent sample t-tests were only conducted for the three readmission rates. There is limited literature available that examines various readmission rates of CAHs, but these findings do not agree with a previous study stating that CAH status does not make a difference in readmission rates (Lichtman et al, 2012). This research adds new knowledge regarding pneumonia related admissions and CAHs.

Table 4

Independent Sample t-tests Results for the Predictor Critical Access Hospital Status

	Critical Access Hospital			Non-Critical Access Hospital					
Outcome	*Mean*	*SD*	*n*	*Mean*	*SD*	*n*	*p*	*t*	*df*
RR	15.45	.3475	11	15.67	.7833	82	.103	-.919	33
RRHF	21.65	1.1396	11	22.35	1.5317	82	.064	.562	33
RRPN	16.87	.8211	11	17.57	1.4975	82	**.021***	-.171	33

Note. RR= readmission rates; RRHF=Readmission rates related to heart failure; RRPN= Readmission rates related to pneumonia.

p < .05*

Primary Care Shortage Area Status

Those hospitals located in communities with a shortage of primary care providers had similar readmission rates and reimbursement penalties (no significant difference) compared to hospitals located in non-shortage areas (see Table 5). This could be due, in part, to the size of the sample. This adds to the body of literature that Medicare hospital readmission and reimbursement

rates have not been specifically studied in the context of shortage areas; however, it is known that

a shortage of providers, among other factors, is predictive of Medicaid readmissions (Jiang et al,

2016).

Table 5

Independent Sample t-tests Results for the Predictor Primary Care Shortage Area

	Shortage Area			Non- Shortage Area					
Outcome	*Mean*	*SD*	*n*	*Mean*	*SD*	*n*	*p*	*t*	*df*
RR	15.71	.7453	46	15.63	.8464	35	.645	.436	79
RRHF	22.57	1.5641	46	22.02	1.4596	35	.087	1.633	79
RRPN	17.51	1.4432	46	17.63	1.5907	35	.745	-.359	79
PAF	.9938	.0049	46	.9949	.0056	35	.395	-.941	79
ERRHF	1.0422	.0751	46	1.0152	.0673	35	.091	1.673	79
ERRPN	1.0178	.0639	46	1.0402	.1418	35	.418	-.950	79

Note. RR= readmission rates; RRHF=Readmission rates related to heart failure; RRPN= Readmission rates related

to pneumonia; PAF= Payment adjustment factor; ERRHF= Excess readmission ratio for heart failure; ERRPN=

Excess readmission ratio for pneumonia.

Hospital Readmission Reduction Programs and Controlling for Primary Care Shortage Area Status

Additionally, each hospital readmission reduction program's effect on hospital readmission

rates and reimbursement penalties was examined using independent sample *t*-tests, while

controlling for primary care shortage area. Those hospitals located in primary care shortage areas

utilizing house calls had lower reimbursement penalties compared to those hospitals not utilizing

house calls, $t(44) = 1.848$, p = .018 (see Table 6). Hospitals in primary care shortage areas utilizing

other hospital readmission reduction programs had similar readmission rates and reimbursement penalties compared to those hospitals not utilizing the programs.

Table 6

Independent t-tests Results for the Predictor Variable (House Call) in Primary Care Shortage Areas

	House Call			No House Call					
Outcome	*Mean*	*SD*	*n*	*Mean*	*SD*	*n*	*p*	*t*	*df*
RR	15.61	.6875	8	15.73	.7640	38	.673	-.398	44
RRHF	22.41	1.1115	8	22.61	1.6537	38	.671	-.318	44
RRPN	16.88	.8730	8	17.64	1.5231	38	.056	-1.365	44
PAF	.9967	.0030	8	.9932	.0051	38	**.018***	1.848	44
ERRHF	1.0415	.0836	8	1.0424	.0745	38	.972	-.029	44
ERRPN	1.0004	.0752	8	1.0215	.0618	38	.477	-.847	44

Note. RR= readmission rates; RRHF=Readmission rates related to heart failure; RRPN= Readmission rates related to pneumonia; PAF= Payment adjustment factor; ERRHF= Excess readmission ratio for heart failure; ERRPN= Excess readmission ratio for pneumonia

p < .05*

County Health Rank

The Pearson correlation indicated that those hospitals located in communities with a poorer (higher number) county health rank had a negative correlation with the PAF (r (79) = -.230, p = .039) (see Table 7), meaning that hospitals located in counties with a worse health rank experienced higher reimbursement penalties. County health rank is based on social-economic elements, the environment, certain health behaviors, and the availability and quality of clinical care (University of Wisconsin Population Health Institute, 2016). These findings add new

knowledge to the body of literature since no known previous studies have specifically examined county health rank with reimbursement penalties.

Table 7

Pearson Product Correlation for Community Health Rankings on Readmission Outcomes

	RR	RRHF	RRPN	PAF	ERRHF	ERRPN
County Health Rank	-.068	.067	-.043	**-.230***	.086	-.068

p < .05*

Discussion

In light of the significant findings, critical access hospitals play an important part in managing pneumonia. Hospitals located in a county with a better county health rank have less reimbursement penalties assessed against them. Additionally, hospital organizations located in primary care shortage areas that utilize either physician or APNs to conduct house calls benefit financially. They experience lower reimbursement penalties when compared to hospitals in non-shortage areas that utilize house calls.

Rural Status

This study demonstrated that hospitals located in micropolitan areas had worse outcomes than hospitals located in metropolitan or rural settings. Critical access hospitals have different reimbursement formulas. Unlike most hospitals that are under a prospective payment reimbursement, critical access hospitals' reimbursements are cost based (Reiter et al., 2013). These formulas may provide an advantage over micropolitan hospitals. Metropolitan hospitals may have the advantage of rich resources in specialists, technology, and a stronger economic base. Laws and regulations that govern healthcare and healthcare financing in all settings should be reevaluated. Furthermore, expanding the study to include other states may solidify this finding.

Critical Access Hospital Status

Critical access hospitals had lower readmission rates related to pneumonia compared to the rates in non-critical access hospitals. This unexpected finding could be related to the number of hospitals in the study. These favorable findings could be related to the financial leeway and incentives granted to them (Bigby, 2014; Reiter et al., 2013). Why readmission rates for pneumonia were lower, and why readmission rates for heart failure were not lower in critical access hospitals compared to non-critical access hospitals could be explained by the acute nature of pneumonia. Patients may have a better chance of resolving the condition without a subsequent hospital readmission compared to the chronic disease of heart failure which frequently entails multiple readmissions (Goroll & Mulley, 2021). This finding supports the need to implement policies that will help sustain these small rural hospitals.

Primary Care Shortage Status

Hospitals located in communities with a shortage of primary care providers had neither better nor worse readmission rates and reimbursement penalties compared to hospitals located in non-shortage areas. Communities in non-primary care shortage areas typically have better outcomes (Commonwealth Fund, 2013). However, when each hospital readmission reduction program was examined while controlling for whether hospitals were located in primary care shortage areas, hospitals that utilized house calls had lower reimbursement penalties. Organizations located in primary care shortage areas should consider expanding their services to include the use of house calls.

County Health Rank

As expected, hospitals located in counties with a better county health rank had lower reimbursement penalties. There is a need for supportive funding for county policies and programs

that address specific measures used in the calculation of county health rank. Nevertheless, this is an indication of a reciprocal relationship between healthier communities and better hospitals.

Recommendations

Policy

As previously stated, it is important to promote policies that will add value to the county health rank, and that will financially support successful hospital programs, thus strengthening communities and organizations. Although there is much heated debate over reforming the ACA, there is no lack of support for continuing efforts to improve both reimbursement and hospital readmission reduction schemes proposed by the ACA (Network for Regional Healthcare Improvement, 2015; Richie et al., 2014). There are several federal bills under consideration in Congress that have the potential to enhance population health, and also lend support to the findings of this research.

The Independence-at-Home Act moves this model of care delivery from a demonstration status to permanent status. This legislation could ensure that the delivery of health care within the context of patient homes would continue on a larger scale, through funding and expanding Medicare benefits (U.S. Senate 1202, 2019). Another federal bill that directly impacts reimbursement penalties has been introduced calling for reform of the methodology by which reimbursement penalties are calculated, namely the payment adjustment factor. Sponsors of the bill state that the calculations do not take into account the chronic illness burden nor the severity of the illness, and thus reform of the reimbursement methodology would lessen the financial strain on the nation's hospitals (U.S. House of Representatives 3611, 2017). Similarly, the Save Rural Hospitals Act called for reform in reimbursement calculations for rural hospitals and CAHs, because current methodologies were not halting the rapid rate of these hospital closures. This

legislation would eliminate hospital payment reductions for both Medicare and Medicaid in rural hospitals (U.S. House of Representatives 2957, 2017), and ultimately contribute to the strength of rural communities.

State policy recommendations include a bill to revise public health law in New York. NY Senate Bill 1805 proposes funding that would support the development and implementation of collaborative service plans among hospitals, home care, practitioners, and emergency medical services, which in turn, builds community health (NY Senate 1805, 2020). Other models of care for communities need to be developed. Primary prevention strategies must be a priority focus for policymakers and communities such as the recently passed expansion of Medicare payment for home health services ordered by a nurse practitioner, clinical nurse specialist, certified nurse-midwife, or physician assistant (American Association of Nurse Practitioners, 2020).

Future Research

Considering the legislative proposals and study findings, future research efforts should be directed towards examining care delivery models that expand the practice of house calls and the role of the advanced nurse practitioner. Conducting research in primary care shortage areas on the use of house calls is of particular interest and could prove financially beneficial to hospital organization serving those areas. The house call shows promise in reducing pneumonia related readmissions, and in reducing reimbursement penalties especially in primary care shortage areas. Expanding research to explore levels of the ecological model not included in this study, namely interpersonal and intrapersonal levels, could be included in these future research efforts.

Practice

There are numerous and well documented theories and models that believe nursing care is what makes a difference in patient outcomes. The nurse-patient relationship has been a vital factor

in patients reaching optimal health outcomes (Bell et al., 2009). When nurse practitioners grow their practice from a nursing theoretical basis advances in nursing theory can be achieved in both organizational and community settings (Ackerman et al, 2010). This approach to nursing care is in contrast to the predominant medical framework that is foundational to most hospital administrations (Scott, 1982). Nurse practitioner competencies include using evidence to shape practice environments, solving practice problems, and ultimately improving outcomes (Hamric & Tracy, 2019). Organizations should employ nurse practitioners to either conduct house calls for each primary care office, or redesign the workflow to allow providers the time to follow-up with house calls when appropriate for their patients

In conclusion, this study supports efforts to revise reimbursement formulas to increase fiscal sustainability of hospital systems. It also supports community level workforce development for house calls in primary care shortage areas. With awareness of various community characteristics that affect hospital quality, APNs can promote and implement initiatives correlated with reduced readmissions and loss of revenue. In doing so, health quality for the elderly is achievable.

Compliance with Ethical Standards

Declaration of Conflicting Interest: The authors declare that there is no conflict of interest, financial or otherwise, and have obtained exempt status from Binghamton University's Institutional Review Board.

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