2013 NATIONAL RURAL EMERGENCY DEPARTMENT STUDY

Establishing Rural Relevant Benchmarks

July 25, 2013

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Summary of the 6th *Annual National Rural Emergency Department Study*

The Emergency Department (ED) is often considered the 'front door' to a hospital and is a major center of operations. The ED may be the most important service offered by Critical Access Hospitals (CAH) in their largely rural communities (Critical Access Hospital – CAH – is a federal designation with distinct Medicare reimbursement rules). Rural EDs disproportionately account for patient volumes, expenses, revenues, risk, quality and patient satisfaction when compared to larger urban and suburban hospitals. This **6th Annual National Rural Emergency Department Study** quantifies performance indicators from the ED to define rural relevant benchmarks and to establish a baseline for comparison with national industry statistics.

iVantage Health Analytics works with hospitals and networks of hospitals to provide benchmarking and best practices for performance metrics such as:

- Total Time in the ED - The total time spent in the Emergency Department from arrival to discharge
- Time to Medical Screening Exam (MSE) - The total time it takes from arrival for a patient to be evaluated in the Emergency Department by a qualified provider
- Patient Satisfaction in the Emergency Department - Patient willingness to "recommend this Emergency Department to friends and family"
- Admissions to Acute/Inpatient - Percentage of Emergency Department visits admitted to a hospital's general acute/inpatient unit
- Admissions to Observation - Percentage of Emergency Department visits admitted to a hospital's observation unit
- Transfers - Percentage of Emergency Department visits that are transferred to another facility for care
- Patient Severity - Percent of patients categorized into each severity as codified by the Agency for Research and Healthcare Quality (ARHQ) Patient Severity Index[1]

About the Study

iVantage Health Analytics® maintains the largest proprietary repository of rural patient encounter data in the industry. Collected from a participating research base representing over 10% of all U.S. rural hospitals, the data is submitted voluntarily by users of the company's ED information products. One of its core products is EDManage™, a Web-based application that collects, reports and benchmarks data for individual Emergency Department visits. For the past six years, patient encounter-level data for over 3.2 million Emergency Department visits have been warehoused, aggregated and indexed. For this portion of the study, iVantage analyzed its proprietary EDManage™ database for visits during the 2012 calendar year.

Summary Statistics

Rural ED Indicators	2008	2009	2010	2011	2012	All U.S. Hospitals
Inpatient Admission Rate	5.9%	5.5%	5.3%	5.1%	4.2%	12.5%[2]
Observation Admission Rate	2.3%	2.9%	3.4%	3.2%	2.8%	2.1%[2]
Total Admission Rate	8.2%	8.4%	8.7%	8.3%	7.0%	14.6%[2]
Transfer Rate	3.7%	3.6%	3.8%	3.9%	4.0%	1.8%[2]
Mean Time to Medical Screening Exam	31 (min)	31 (min)	28 (min)	30 (min)	29 (min)	56 (min)[3]
Mean Total ED Time	120 (min)	123 (min)	119 (min)	122 (min)	123 (min	247 (min)[3]
Median Total ED Time	99 (min)	109 (min)	98 (min)	100 (min)	101 (min)	156 (min)[4]

n= 3.2 million patient encounters

SUMMARY STATISTICS REVIEW:

Volumes

ED utilization in *rural hospitals* doubled in the six-year period between 2007 and 2012. The average increase for All US Hospitals was 24% in the *decade* between 1998-2008[5]. Results from a recent ED survey conducted by HealthLeaders Media indicate that "almost nine in 10 healthcare leaders (86%) expect their ED volumes to increase within the next three years." Sixty-one percent of respondents to the same survey described their ED as being overcrowded, a sharp increase from 46% of respondents a year ago[6].

Patient Severity

In 2012, iVantage found that 54% of all Emergency Department visits to CAHs were categorized as low severity cases (semi/less-urgent and non-urgent) as coded by the Agency for Healthcare Research and Quality (AHRQ) Patient Severity Index[1]. Research shows that a national baseline of 29% of ED visits are low severity cases[2]. The lower severity found in rural hospitals poses the question as to the utilization of the rural Emergency Department as a primary care "safety net" location.

Access

More than 50% of rural ED visits were classified as less urgent/non-urgent. More than 50% of these low severity visits to the rural ED take place *during* daytime business hours (9am-5pm). This finding is in contrast to other research that reports a national baseline of 29% of patients' access the ED for lower severity visits, and only one third of all ED visits occur during business hours[5]. These data reveal new findings about *rural* practices and variation that is inconsistent with other generalized research addressing all US hospitals. These findings have policy implications regarding access to care in the rural setting and should be understood as incentives and reimbursement models are considered for the rural setting.

ED Wait Times

Rural hospitals have an ED total throughput time of 123 minutes. This is 124 minutes (more than two hours) faster than mean times reported in national research (247 minutes)[4]. It takes approximately half the time for a patient to see a physician in a rural location than in a larger urban hospital (29 vs. 56 minutes)[3].

Emergency Department Admissions:

Inpatient: Rural Emergency Departments have seen a 29% decrease in the average number of inpatient admissions from 2008-2012. In 2012, rural Emergency Departments admitted, on average, 4.2% of their visits to their hospital's general acute/inpatient unit, down from 5.9% in 2008. The CDC cites a national baseline average of 12.5% of all Emergency Department visits are admitted to their inpatient units[2].

Inpatient revenue accounts for 31 percent of national healthcare spending with nearly all of the growth in admissions due to a 17% increase in unscheduled admissions from the ED . "ED physicians are serving as the primary decision makers for up to half of all hospital admissions."[7] An analysis of iVantage's proprietary database reveals that ED physicians may play an even greater role in rural hospitals where more than 70% of inpatient admissions in 2012 came from the ED.

Observations: Admissions to observation units from the ED increased by 35% from 2008-2012 as regulatory pressures to reduce unnecessary hospitalizations increased. If observations and inpatient admissions from the rural ED were to be combined it would result in 7.0% of all rural ED visits being admitted to the hospital. This is compared to a 14.6% rate of admission reported in a 2007 CDC ED study (12.5% inpatient admission rate, plus a 2.1% observation admission rate for all U.S. hospitals[2]).

Transfers: The average transfer rate of 4.0% for rural emergency departments is more than double the 1.8% transfer rate reported in the 2007 CDC study[2]. Transfers and "Transfer Communication Measures" reflect a critical *rural* ED function. Rural hospitals, many times, conclude that the safest, most appropriate care can be delivered at another facility.

Patient Satisfaction

There is a negative correlation between ED wait times and patient satisfaction in the rural ED, thus as wait times increase, patients' willingness to recommend the facility decrease. Hospitals performing at or above the 90th percentile in Time to MSE or in Total Time in the ED scored significantly higher "Willingness to recommend" scores than those performing in the 10th percentile or lower in ED wait times.

Quality

Rural Hospitals performed on par with national published data on publicly reported Outpatient Process of Care Measures such as time to ECG (9 minutes vs. 8 minutes). However, rural hospitals underperform on other Outpatient Measures such as time to transfer (108 minutes vs. 60 minutes). This study includes proprietary data we may compare to the newest Outpatient Measures regarding time in the emergency department (Mean Time to MSE and Total Time in the ED) and demonstrates the efficiency of the rural emergency department.

Rural Hospital Administrators were not well aware of Outpatient Core Measures according to *preliminary* results from the iVantage *Emergency Department Companion Study*. They reported mixed intention to voluntarily participate in the future. (CAHs voluntarily participate in many public-

reporting initiatives.) In 2010, 17% of CAHs reported Outpatient Process of Care Measures. In 2011, 20% of CAHs reported Outpatient Process of Care Measures despite these being a more relevant candidate measure set for the delivery of disproportionately outpatient-focused healthcare services in the rural hospital setting. In 2012, 23% of CAHs reported Outpatient Process of Care Measures.

Study Area #1: Total Time in the Emergency Department

Total Time in the Emergency Department (also referred to as throughput time), an industry standard for many years as a signal of efficiency, is among the newest measures CMS tracks in its Hospital Outpatient Quality Reporting (OQR) program reflecting processes of care and quality.

In a "2006 Emergency Department Summary," the Centers for Disease Control and Prevention (CDC) reported a 156-minute (2.6-hour) median total time in the ED[3]. Similarly, Press Ganey released their "ED Pulse Report" in July 2010 analyzing 1.5 million patient encounters from their client-base and documented a mean total time in the ED of 247 minutes (4.1 hours) in 2009, a slight increase from previous years[4]. Beginning with January 2012 discharges, CMS introduced OP-18: Median Time from ED Arrival to ED Departure for Discharged Patients. For 2012, CAHs reported a median time of 99 minutes, which is shorter than the reported median time of 139 minutes from the larger urban facilities.

Our study investigates similar questions from its EDManage™ dataset of more than 3.2 million patient encounters with an exclusive focus on CAHs. Noteworthy differences in total time in the ED exist when comparing CAHs to other data that do not exclusively focus on rural cohorts.

Table A: Total Time in the RURAL Emergency Department

Year	2008	2009	2010	2011	2012
Mean Total Time in the ED	120 (min)	123 (min)	119 (min)	122 (min)	123 (min)
Median Total Time in the ED	99 (min)	109 (min)	98 (min)	100 (min)	101 (min)

Table B: Benchmarks From Other National Studies

CDC 2006 Median Total Time in the ED	156 (min)
Press Ganey 2009 Mean Total Time in ED	247 (min)
CMS OP-18 Median Total Time in ED (CAHs)	99 (min)
CMS OP-18 Median Total Time in ED (PPS)	139 (min)

Chart 1a: Mean Total Time in ED

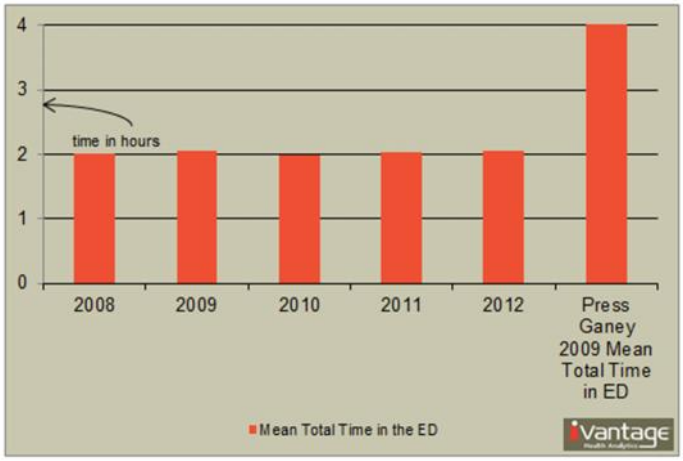
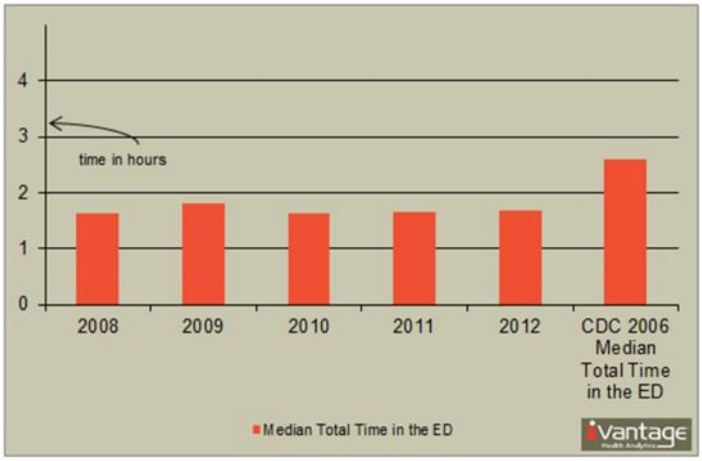


Chart 1b: Median Total Time in ED



In 2012, CAHs treated and discharged patients more than two hours faster than mean times reported by a 2010 Press Ganey study (123 minutes vs. 247 minutes)[2] and nearly an hour faster than the median time reported by a 2006 CDC study of hospitals *including* the CAH cohort (101 minutes vs. 156 minutes)[3].

Total Time in the ED, a measure longitudinally tracked in this study, is included in the CMS Hospital Outpatient Quality Reporting Program. iVantage sees this as a distinctly rural relevant measure given the cohort variation evidenced in this study. iVantage explores Outpatient Process of Care Measures in Study Area #10.

Our study also examines the severity of Emergency Department visits from 2008-2012 and notes that 54% of ED visits were categorized as semi/less urgent or non-urgent – levels four and five on the AHRQ Patient Severity Index[5]. Conversely, in the CDC's *2007 Emergency Department Summary* only 29% of patients fell into these less acute categories[2]. Larger medical centers offering definitive care to cardiac patients, trauma cases, and other services geared to patients with higher level of severity may naturally take more time to diagnose, more resources to treat and result in longer total time to discharge from the ED. While iVantage notes that it is possible that the total time in the ED may be influenced by severity, it is not explicitly examined in this study.

iVantage observes that throughput time in the rural emergency department took 116 minutes longer on average in 2012 for ED patients who were admitted to the hospital as inpatients. Additionally, throughput time in the rural emergency department took 111 minutes longer on average in 2012 for ED patients who were transferred to another facility.

Table C: Mean Throughput Time in the RURAL Emergency Department

Discharge Disposition	2008	2009	2010	2011	2012
IP Admission	210 (min)	220 (min)	225 (min)	232 (min)	239 (min)
Admitted - Observation	212 (min)	217 (min)	213 (min)	209 (min)	219 (min)
All Admissions	211 (min)	219 (min)	220 (min)	223 (min)	231 (min)
Transferred	221 (min)	220 (min)	225 (min)	232 (min)	234 (min)

Beginning with January 2012 discharges, CMS implemented new Emergency Department measures. While these measures are voluntary reporting for CAHs they are the most rural relevant measures. CAHs reported 190 minutes for ED-1: Median Time from ED Arrival to ED Departure for Admitted ED Patients which is shorter throughput time than the urban facilities for the same measure (266 minutes). CAHs reported 48 minutes (median) for ED-2: Admit Decision Time to ED Departure Time for Admitted Patients which is just over half the time reported by urban facilities (90 minutes).

Study Area #2: Time to Medical Screening Exam (MSE) in the Emergency Department

Using iVantage's EDManage™ tool hospitals track the time it takes for a patient to see a provider (time to a medical screening exam – or MSE) as an important milestone in the episode of care.

The CDC's "2006 Emergency Department Summary" reports a mean Time to MSE of 56 minutes. The report calls out a "markedly skewed distribution" and suggests a median figure of 31 minutes may better represent wait time to see a provider[3]. iVantage recognizes (and seeks to emphasize) a distribution in this and other statistics and considers Critical Access Hospital designation as a distinct cohort for rural relevant comparison. For example, when compared to the iVantage rural-focused database, the rural emergency department patients see a provider, on average, in half the time it takes in large urban medical centers.

Table D: Time to Medical Screening Exam (MSE) in the RURAL Emergency Department

Year	2008	2009	2010	2011	2012	All U.S. Hospitals
Mean Time to MSE	31 (min)	31 (min)	28 (min)	30 (min)	29 (min)	56 (min) [3]
Median Time to MSE	20 (min)	21 (min)	20 (min)	20 (min)	20 (min)	31 (min) [3]

According to a recent CDC study that included a special feature on emergency care, from 2008-2010 the mean wait time to see a physician in the emergency department was 33 minutes. This is more than 20 minutes faster than hospitals located in small to medium sized metropolitan areas (56 minutes) and more than 30 minutes faster than hospitals located in large metropolitan areas (67 minutes).[8]

CMS added OP-20: Door to Diagnostic Evaluation by a Qualified Medical Provider starting with January 2012 discharges. CAHs reported a median time of 19 minutes and a mean time of 24 minutes. In comparison urban facilities reported a median time of 30 minutes and a mean time of 36 minutes.

Study Area #3: Patient Satisfaction in the Emergency Department

iVantage provides patient satisfaction data through the SURVEYManage™ product offering. Our study sought to understand the relationship between emergency department wait times and patient satisfaction. Analysis revealed that there is a negative correlation between ED wait times and patient satisfaction, thus as wait times increase, a patient's willingness to recommend the facility decreased.

Further, it was found that hospitals performing at the 90th percentile or greater in wait times scored significantly higher "Willingness to Recommend" scores.

Time to MSE and Patient Satisfaction:

Table E: Distribution of Time to MSE in the RURAL Emergency Department

	2008	2009	2010	2011	2012
Mean Time To MSE	31 (min)	31 (min)	28 (min)	30 (min)	29 (min)
Median Time to MSE	20 (min)	21 (min)	20 (min)	20 (min)	20 (min)
90th Percentile	15 (min)	16 (min)	16 (min)	14 (min)	12 (min)
10th Percentile	46 (min)	47 (min)	47 (min)	44 (min)	36 (min)

iVantage observes that patient willingness to "recommend this facility to friends and family" on Emergency Department surveys remained fairly constant from 2008-2012.

Total Time in the ED and Patient Satisfaction:

Table F: Distribution of Total Time in the RURAL Emergency Department

Year	2008	2009	2010	2011	2012
Mean Total Time in ED	120 (min)	123 (min)	119 (min)	122 (min)	123 (min)
Median Total Time in ED	99 (min)	109 (min)	98 (min)	100 (min)	101 (min)
90th Percentile	98 (min)	95 (min)	89 (min)	89 (min)	90 (min)
10th Percentile	152 (min)	157 (min)	146 (min)	146 (min)	144 (min)

Hospitals performing at or above the 90th percentile (90 min) in Total Time in the ED scored higher "Willingness to Recommend" scores than those performing in the 10th percentile (144 min) or lower.

These statistics reinforce anecdotal findings in patient respondent comments on iVantage SURVEYManage™ instruments. Patient reported comments serve as a detailed indicator of frustrations with the timeliness of delivery of medical care, and the empirical findings suggest that longer wait times to see a provider and longer total times in the ED are patient dissatisfiers and shorter times are associated with higher patient satisfaction.

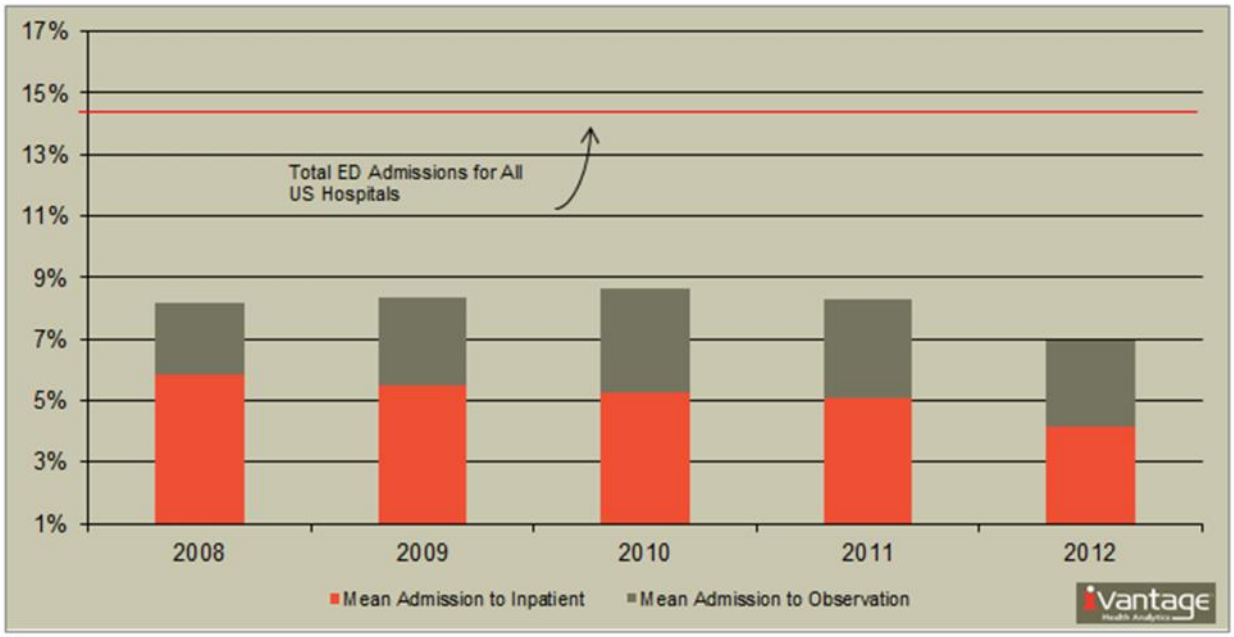
Study Area #4: ED Admissions – Inpatient and Observation

iVantage tracks Admissions from the Emergency Department to Inpatient and Observation settings utilizing EDManage™. These data are critical operational statistics for healthcare leaders who wish to evaluate and manage their admission yield annually, monthly, weekly, daily and by provider. The CDC's "2007 Emergency Department Summary" reported that 12.5% of all visits to the Emergency Department resulted in an admission to the hospital's general acute/inpatient unit[2]. Since 2005, our findings have noted empirical discrepancies with this often-quoted benchmark in its work with rural facilities. The inaugural Emergency Department study in 2007 brought clarity to this among other statistics for rural hospitals. These and other variations from "national norms" underscore the value of rural relevant benchmarks.

Table G: Inpatient Admissions and Observation Rates in the RURAL Emergency Department

	2008	2009	2010	2011	2012	All U.S. Hospitals
Mean Admission to Inpatient	5.9%	5.5%	5.3%	5.1%	4.2%	12.5%[2]
Mean Admission to Observation	2.3%	2.9%	3.4%	3.2%	2.8%	2.1%[2]
Total ED Admissions	8.2%	8.4%	8.7%	8.3%	7.0%	14.6%[2]

Chart 2: Mean ED Admissions



In 2012, our study found a *total* admission rate of 7.0 % from the rural ED when compared to the national average of 14.6% reported by other all-hospital studies. This may indicate that people in rural locations are far less likely to be admitted to the hospital where they receive initial ED care. A recent study noted that "ED physicians are serving as the primary decision makers for up to half of all hospital admissions."[7] An analysis of iVantage's proprietary database reveals that ED physicians may play an even greater role in rural hospitals where more than 70% of inpatient admissions in 2012 came from the ED. Most rural hospitals treat a mix of patients presenting with less severity than larger hospitals (more than 50% of rural Emergency Department visits were deemed "semi/less urgent" or "non-urgent" in calendar year 2012). This stands in contrast to the CDC's 2007 study, which noted that only 29% of all ED visits were categorized as low severity.[2]

A combination of factors may signal a trend away from Emergency Department admissions in the rural setting. For example, our study observes an 18% increase in ED admissions to Observation units/beds from 2008-2012. The increase in admissions to Observation beds stands in contrast to the 40% decline in ED admissions to acute/inpatient beds during the same time period. iVantage points to the creation of the Recovery Audit Contractors (RAC) role in 2006 as a key contributor to the decline in admissions to

CAH inpatient units as hospitals have been forced to carefully evaluate the clinical indication for and eligibility of their inpatient admission in line with RAC guidance.

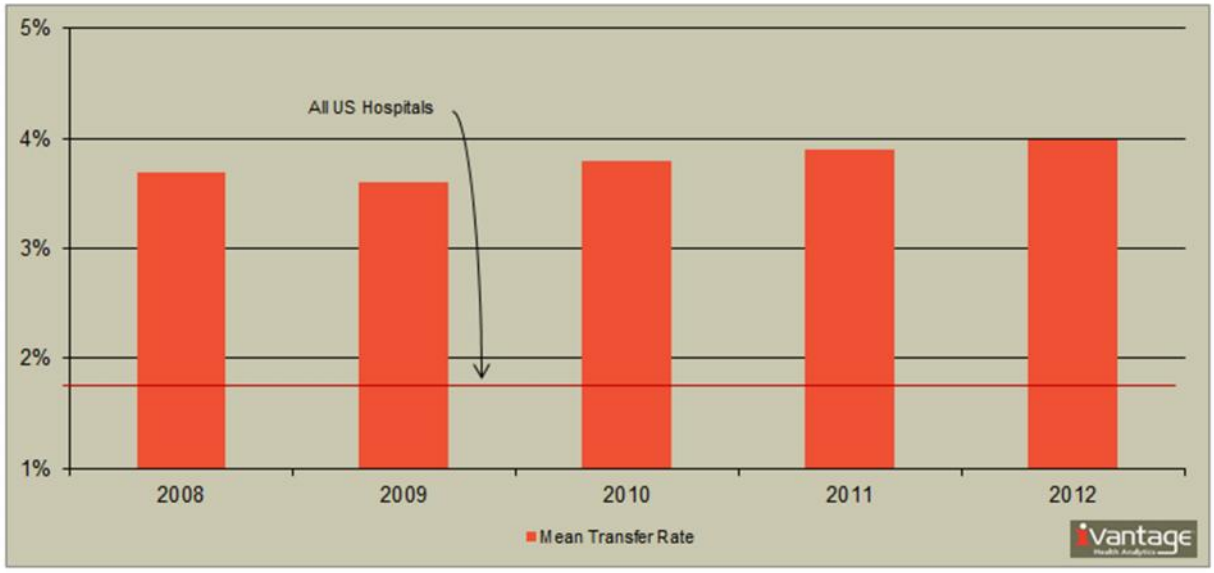
Study Area #5: Transfers

Many rural facilities do not offer the services needed to support more acute, complex or low-frequency admissions. A CAH may not be designated as a Trauma Center or possess intensive care unit (ICU), and emergency medical services (EMS) protocol may dictate transport to a larger facility.

Table H: ED Transfer Rates in the RURAL Emergency Department

	2008	2009	2010	2011	2012	All U.S. Hospitals
Mean Transfer Rate	3.7%	3.6%	3.8%	3.9%	4.0%	1.8%

Chart 3: Mean ED Transfer Rates



When patients present in the rural ED with a high severity, they are more likely to be transferred (4.0%) than the 1.8% rate of transfers as reported by the 2007 CDC study.[2]

Given this high rural variation, iVantage notes the exceptional burden often placed on rural family members seeking to support a transferred patient where distances and geography may necessitate a flight or incur long drive times in order to provide care-giver assistance. While there is little question that clinical necessity will drive these types of transfer decisions, rural health policy should attend to the dynamics where rural families seek to be reunited with recuperating loved ones in the post-acute setting for rehabilitative care.

Study Area #6: Gross Charges in the Emergency Department

Increasing volumes in the Emergency Department are increasing total healthcare expenditures in the US and increasing *relative* healthcare expenditures in the US. Rural utilization of the Emergency Department amplify these trends:

- Emergency Department visits in the US have been increasing since the 1950's.
- In 1990 there were 90 million Emergency Department visits contributing 1.9% of the total US health expenditures.
- In 2008 there were 124 million visits and a doubling of the percentage of total US costs to 3.7%, about $84 billion.[9]

Rural hospitals see a disproportionate share of their volume come through the Emergency Department with fewer admissions from primary care physicians and fewer scheduled surgeries than larger urban medical centers. iVantage compared gross charges across these facilities to establish a baseline for comparison.

iVantage's comparative database reveals a mean gross charges value of over $5 million in the Emergency Department in 2012. Noted variances in these data include Critical Access Hospital affiliations with systems, which impacts available cost report data. iVantage captures this data directly from the CAHs regardless of system affiliation. iVantage utilizes these financial data as a source for rural relevant comparison.

Table I: Gross Charges in the RURAL Emergency Department

Year	Mean ED Gross Charges	Mean ED Charges (% of Total)
2012	$5,091,299	18.4%
2011	$4,569,896	18.0%
2010	$3,926,534	19.2%
2009	$4,286,243	18.4%
2008	$3,709,786	15.0%

Study Area #7: Payer Mix and Admissions

The majority of rural EDs are now considered "safety net hospitals", defined as those hospitals providing a disproportionate share of services to Medicaid and uninsured patients. A 2007 study published by the Journal of the American Medical Association (JAMA) suggests that the number of safety net hospitals has nearly doubled since 1997.[10] Furthermore, CAHs disproportionately serve aging populations and poorer communities in rural America. By definition, CAHs are in the business of providing this safety net.

Exacerbating this trend of increasing numbers of safety net hospitals, healthcare experts forecast primary care shortages that will likely force patients to the ED for care as a last resort – often when they are sicker. Primary care shortages in rural communities are far worse than elsewhere. Merritt Hawkins/ANM Healthcare reports that 2009-2010 was the first time in the seventeen-year history of

their survey that physician recruitment was down. The report also notes a significant reversal in physician recruitment rates between smaller communities and well-populated areas.[11]

Table J: Physician Recruitment

Recruitment Area Population	2008-2009 % of Merritt Hawkins Recruitments	2009-2010 % of Merritt Hawkins Recruitments
<25,000	39	26
>100,000	26	42

While uninsured and the underinsured are already stressing safety net hospitals such as CAHs, healthcare reform and the anticipated increase in Medicaid enrollment in many rural communities may provide a further strain on the system given the lack of access to primary care.
iVantage looks to payer-mix data as a proxy for demographic safety net findings highlighted in the JAMA study.

- *Commercial Insurance* payment in the rural ED steadily fell from an average of 33% in 2007 to 26.7% in 2012.
- *Medicare* payment in the rural ED has moved from 30% to 22.9% over the same period.
- *Medicaid* payment in the rural ED has moved from 18.9% to 17.9% over the same period.
- *Self-Payment* in the rural ED has moved from 15% to 12.0% over the same period.
- *Other* forms of payment in the rural ED have moved from 3.1% in 2007 to 20.5% in 2012.

Study Area #8: Average Patient Severity

Our study examined patient severity in rural Emergency Departments using the AHRQ Patient Severity Index[1] (1-5 scale, with 1 being the most severe visit and 5 being the least). Table K shows ED visits from the iVantage database from 2008-2012. Our findings reveal that 54% of all visits to Critical Access Hospitals were for semi-urgent and non-urgent ED visits (levels 4 and 5 of AHRQ Patient Severity Index). This is in contrast to their larger more urban counterparts that see less severe cases at 29% of all visits.[2] While 5.1% of patients need to be seen immediately in larger EDs[6], less than 1% of patients in rural EDs are triaged at this level.

EMS protocol in rural hospitals often dictates that high severity cases may necessarily bypass rural EDs and ambulances may be diverted to larger medical centers. This may be particularly skewed if the rural hospital does not offer trauma services, does not support an Intensive Care Unit (ICU) or does not offer definitive cardiac care, for example. Also, the relative proximity of other acute care services may impact the choices of patients and EMS when faced with decisions for location of treatment in more severe scenarios.

Larger medical centers offering definitive care to cardiac patients, trauma centers, and other services geared to patients with higher level of severity may naturally take more time to diagnose and require more resources to treat. Time in the rural ED is explored in Study Area #1 & #2. While iVantage notes

that it is possible that the total time in the ED may be influenced by severity, it is not explicitly examined in this study.

Table L: Patient Severity in the RURAL Emergency Department

Level	2008 %	2009 %	2010 %	2011 %	2012 %	All US %
1: Resuscitation	0.4	0.3	0.6	0.3	0.3	4.5
2: Emergent	4.4	4.1	5.5	5.2	4.2	11.3
3: Urgent	30.0	29.5	28.2	28.7	27.4	38.5
4: Semi-Urgent	33.7	34.4	31.7	31.9	35.1	21.0
5: Non-Urgent	19.4	17.9	21.1	23.0	18.9	7.9
N/A	12.1	13.8	13.1	10.9	14.1	16.9

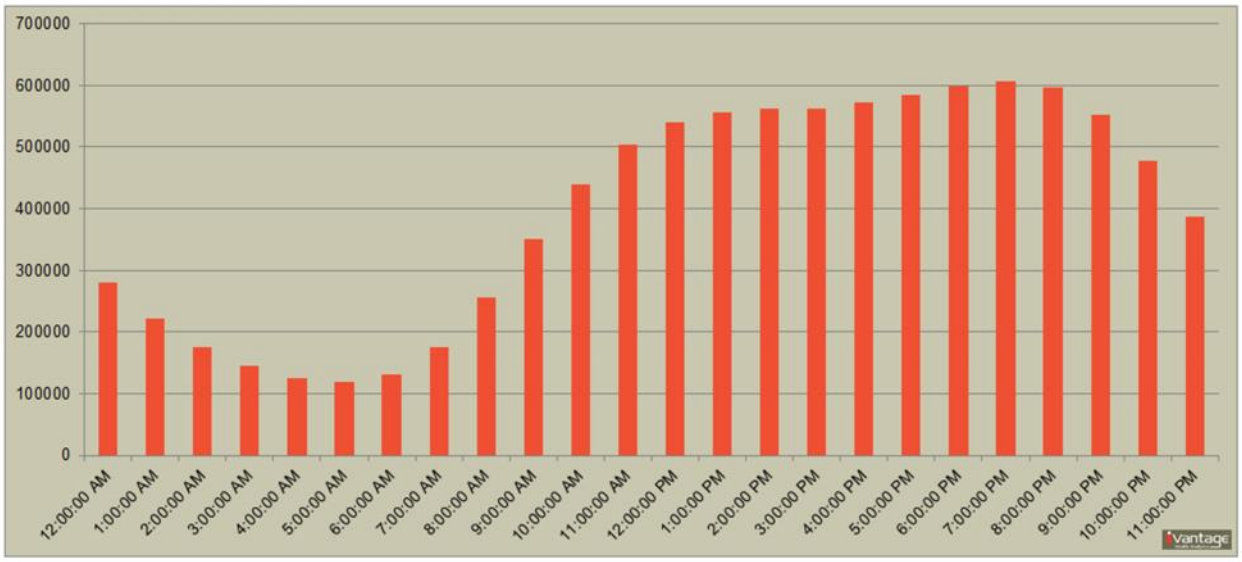
AHRQ Patient Severity Index[1] (1-5 scale, with 1 being the most acute visit and 5 being the least)

Study Area #9: Access-Average Patient Severity and Time of Day

Research from the published literature reveals conflicting claims around access to primary care and the impact that this may have on ED utilization. For example, as emergency volumes spiked, physician office visits have been in *decline*, as documented by the Kaiser Family Foundation.[12] However, more recent research cited before the U.S. Senate Health, Education, Labor and Pensions Committee and Subcommittee on Primary Health and Aging suggests, "It is no*t* the case that people who use emergency departments for non-urgent health problems have no source of primary care they could use instead. … *Two*-thirds reported they had a regular source of medical care at a physician's office … This strongly suggests that use of emergency departments for non-urgent problems does not reflect lack of access to other primary care providers for most patients, although it is a much more important reason for uninsured patients" And; **"***Two-thirds* of all emergency department visits occur *outside* normal business hours—8 a.m. to 5 p.m., Monday through Friday."[1] An analysis of rural ED visits found that 65% of all rural ED visits from 2007-2012 took place outside normal business hours which supports these findings.

An analysis of all rural ED visits from 2007 to 2012 indicates the lowest volume of rural ED visits occurred overnight between the hours of midnight and 8 am. Additionally, the highest volume of ED visits occurred between the noon and 8PM timeframe.

Chart 4: Total ED Visits by Time of Day



iVantage patient encounter-level data reveals that 54% of Rural ED visits are classified as less urgent (See Study Area #8.) Of these low severity visits to the rural ED, 58% take place during business hours. This stands in contrast to research suggesting only one third of patients access the ED for lower severity visits and only one third of all visits occur during daytime business hours[5]. These rural cohort data raise questions about *rural* practices and variation that may not be well understood in national research. Policy makers should note these and other important rural cohort variations.

iVantage studied the ACO Shared Savings File to evaluate the Rural Per-capita Physician Service payments for rural beneficiaries and found that they are 18% less costly than payments for urban beneficiaries. Conversely, per-capita Outpatient Service payments for rural beneficiaries are 14% more costly than payments for urban beneficiaries.[13] These data further emphasize the rural cohort variation.

Further research is needed regarding *rural* ED utilization in terms of volumes, severity, and where possible, the more appropriate location for non-urgent care in the clinic compared with non-rural ED utilization patterns. This may be particularly important for those rural-cohort data that stand in contrast with national data sets that commingle Emergency Departments of all cohorts for analysis.

Research by iVantage indicates policy development should carefully consider the nature of a distinct rural challenge with respect to access to primary care.

Table M: Rural vs. All US Emergency Department Patient Severity

Level	2008	2009	2010	2011	2012	All US
1: Resuscitation	0.4%	0.3%	0.6%	0.3%	0.3%	5.1%
2: Emergent	4.4%	4.1%	5.5%	5.2%	4.2%	10.8%
3: Urgent	30.0%	29.5%	28.2%	28.7%	27.4%	36.6%
4: Semi-Urgent	33.7%	34.4%	31.7%	31.9%	35.1%	22.0%
5: Non-Urgent	19.4%	17.9%	21.1%	23.0%	18.9%	12.1%
N/A	12.1%	13.8%	13.1%	10.9%	14.1%	13.4%

Table N: Severity and Time of Day of RURAL Emergency Department Visits

	2008	2009	2010	2011	2012
% of non-urgent Rural ED Visits	53%	52%	53%	55%	54%
% of all non-urgent ED visits seen during business hours	57%	55%	37%	57%	44%

An analysis of patient severity based on the AHRQ Patient Severity Index for rural ED visits from 2008 to 2012 reveals a weighted average patient severity of 2.9. An analysis of ED visits by time of day reveals on average a relatively higher patient severity level during the overnight hours from midnight to 7AM than during the waking hours.

Chart 5: Weighted Average Patient Severity by Time of Day

A similar analysis was performed segmenting the severity of ED visits that occurred on weekends and weekdays. The analysis revealed that patient severity was only slightly higher on average during the

week (2.89) than on the weekend (2.91). An analysis segmenting severity over months of the year revealed a slightly higher patient severity (2.86) during the winter months than during the summer months (2.95).

Study Area #10: CMS Outpatient Process of Care Measures

The Hospital Outpatient Quality Reporting (OQR) is a quality-reporting program created by CMS to improve quality of care by providing nationwide benchmarking around evidence-based standards for appropriate processes of care in the outpatient setting.

iVantage tracks the rate of *voluntary* adoption of these outpatient public reporting measures among the CAH cohort, especially in light of national efforts to focus upon these measures as part of the Medicare Beneficiaries Quality Improvement Project (MBQIP), an initiative emanating from the Federal Office of Rural Health Policy (FORHP). MBQIP seeks to have CAHs implement quality improvement initiatives to improve their patient care and operations. Seventeen percent of CAHs voluntarily reported Outpatient Process of Care Measures in 2010. iVantage notes 23% of CAHs voluntarily reported these measures in 2012.

Table O shows outpatient process of care measures that align with phase II of MBQIP (OP 1 through OP 7). The greatest disparity between CAHs and larger facilities remains the "Mean Time to Transfer" for Acute Myocardial Infarction (AMI) patients. CAHs average 74 minutes for a transfer, while larger hospitals average 60 minutes. Long distances and the need for air-transport are often cited as reasons for delayed transfer times among rural hospitals.

Table O: CMS Outpatient Process of Care Measures
OP 1-7 July 2011 – June 2012 Results
OP 18 & 20 and ED 1 & 2 January through June 2012

Measurement Group	All US	CAH	Flex ED Study[14]
OP-1: Median Time to Fibrinolysis	26 (min)	23 (min)	N/A
OP-2: Fibrinolytic Therapy within 30 minutes	68%	68%	15%
OP-3: Mean Time to Transfer	60 (min)	74 (min)	N/A
OP-4: Aspirin Within 24 Hours	97%	96%	N/A
OP-5: Mean Time to ECG	10 (min)	10 (min)	24 (min)
OP-6: Antibiotics at the right time	95%	92%	N/A
OP-7: Correct Antibiotic Selection	96%	94%	N/A
OP-18: Median Time in ED	137 (min)	99 (min)	N/A
OP-20: Median Time to MSE	29 (min)	19 (min)	N/A
ED-1: Median Time in ED for Admitted Patients	259 (min)	190 (min)	N/A
ED-2: Median Time from Admit Decision to Discharge for Admitted Patients	86 (min)	48 (min)	N/A

Chart 6a: Mean Times for Select CMS Outpatient Process of Care Measures

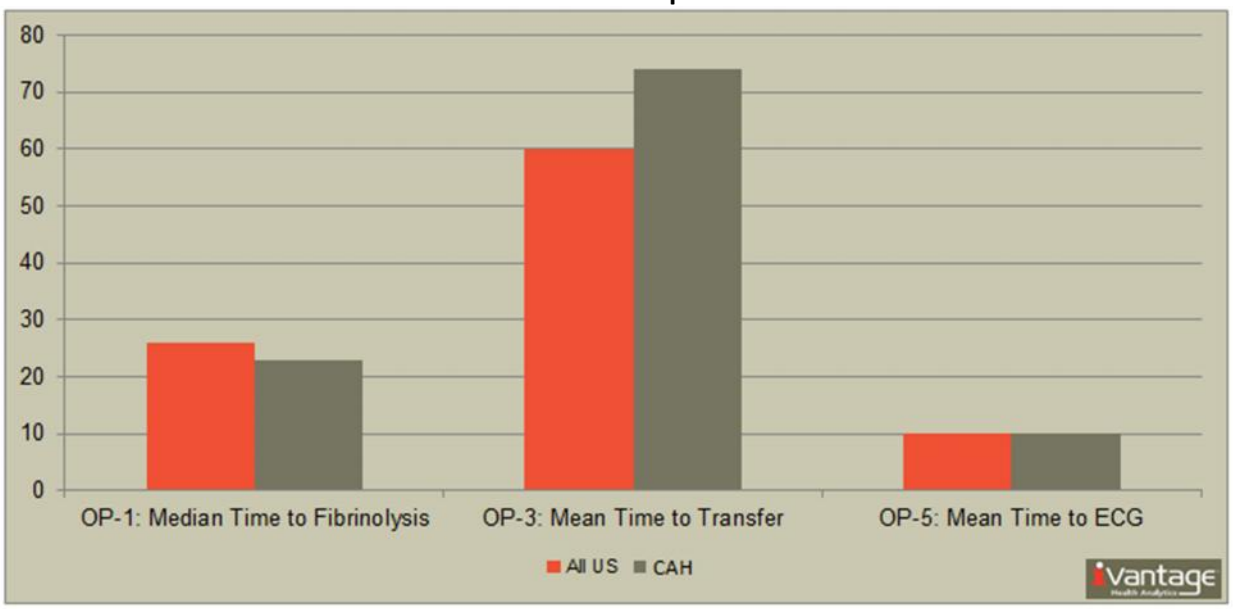
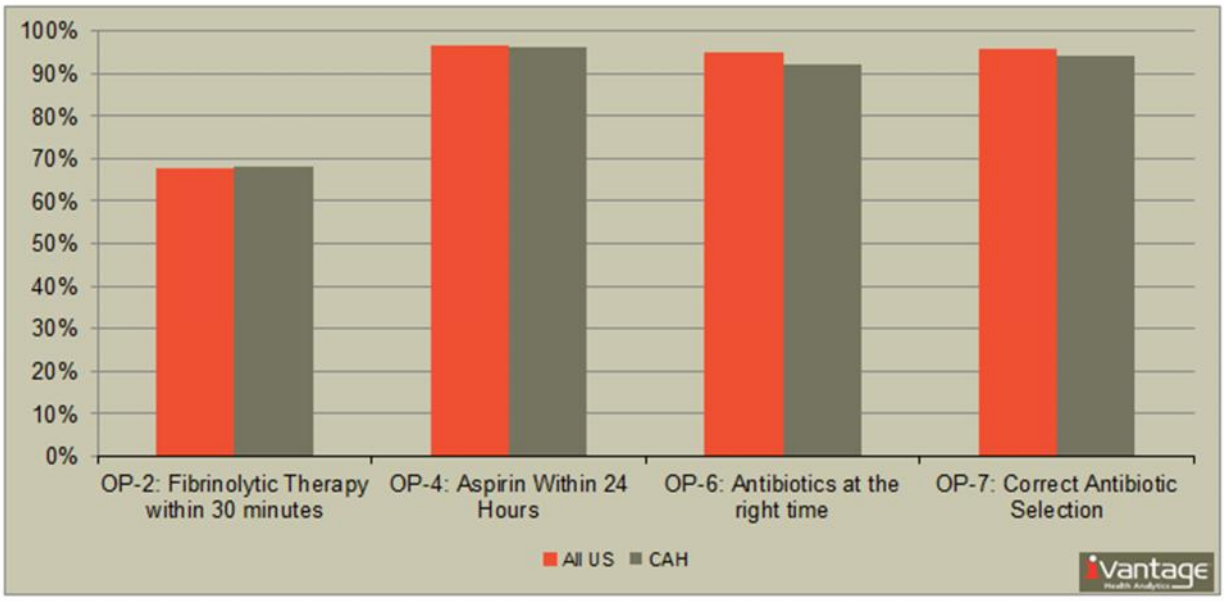


Chart 6b: Percentages for Select CMS Outpatient Process of Care Measures



Research from the Flex Monitoring Team study results from 2008-2009 (included in Table O for comparison) show how quickly CAHs have improved on two of these measures; Fibrinolytic Therapy within 30 Minutes (15% to 68%) and Mean Time to ECG (24 minutes to 10 minutes).

iVantage notes that Outpatient Measures are a 'better fit' for rural hospitals when compared to inpatient process of care measures, given the disproportionate utilization of outpatient services offered in the rural setting. Evaluation of rural care delivery, rural quality and rural value will rely on these and other distinctly rural relevant measures.

Study Area #11: Hospital Consumer Assessment of Healthcare Performance and Systems (HCAHPS)

iVantage notes the relatively low admission rates to inpatient acute care services from the rural ED (see study area # 4). However, the majority of inpatient admissions flow from the emergency department. "ED physicians are serving as the primary decision makers for up to half of all hospital admissions."[7] An analysis of iVantage's proprietary database reveals that ED physicians may play an even greater role in rural hospitals where more than 70% of inpatient admissions in 2012 came from the ED. Therefore, iVantage evaluates patient perspectives on their experience in the rural *inpatient* setting.

Utilizing the publicly available CMS Hospital Compare database, iVantage investigated HCAHPS scores in Critical Access Hospitals. The HCAHPS survey is administered to inpatients voluntarily to provide feedback on their hospital experience. iVantage tested the variance between CAHs and larger urban medical centers on HCAHPS. The table below shows the mean HCAHPS scores for July 2011 through June 2012. iVantage finds that CAHs perform better than the all-U.S. mean scores in all ten high-level areas of the HCAHPS survey.

Table P: HCAHPS Scoring Comparison
July 2011 – June 2012

Measures	US CAHs	All US Hospitals
Nurse Communication	82%	78%
Doctor Communication	85%	81%
Staff Responsiveness	75%	67%
Pain Control	73%	71%
Medicine Communication	68%	63%
Discharge Information	86%	84%
Hospital Cleanliness	80%	73%
Quietness Around Room	64%	60%
Willingness to Recommend	73%	71%
Overall Hospital Rating	74%	70%

About iVantage Health Analytics

iVantage Health Analytics, Inc.™ is a privately held healthcare business intelligence and technology company. The company is a leading provider of information products serving an expansive healthcare industry. iVantage Health Analytics™ integrates diverse information with innovative delivery platforms to ensure customers' timely, concise, and relevant strategic action.

iVantage Health Analytics™ combines in-depth expertise, extensive data and exclusive resources to help hospitals and health systems manage the complex requirements of the Affordable Care Act. Now healthcare executives can take advantage of a single source for solutions that can measurably contribute to meeting the requirements of healthcare reform.

Management and Policy Implications:

Volumes, Patient Severity & Access

Rural hospital emergency departments see increasing utilization with increasing charges/costs. Rural hospital Emergency Department visits are of lower severity than non-rural hospital emergency departments. Most low severity Emergency Department visits occur during business hours.

- Can hospitals develop tracked care for lower severity visits, potentially leveraging Physician extenders like PAs and LPNs?
- Does cost sharing through patient co-pays and high-deductible insurance encourage more appropriate Emergency Department utilization when clinically indicated?
- Can hospitals employ financial counseling after MSE to more appropriate and cost effective sources of care when clinically indicated?
- Are rural hospitals affiliated with Physicians/Clinics?
- Do rural hospitals affiliate/collaborate/coordinate with Federally Qualified Health Centers and Community Health Centers?
- How well is care coordinated between rural Emergency Department providers and other primary care providers?
- Should the rural Emergency Department be the center of focus for rural ACO development?

ED Wait Times

Rural hospitals are twice as efficient in getting patients evaluated by a provider (Time to Medical Screening Exam) *and* in their total throughput time.

- Are there strategic opportunities to divert suburban Emergency Department visits to rural providers to decrease costs and wait times?
- Where clinically indicated, can a more coordinated deployment of Emergency Medical Services (EMS) leverage the rural ED as a 'relief valve' for the often over-crowded Urban and Suburban ED?
- Should Emergency Medical Services protocol leverage wait times in relative real-time?
- Can these data lead to better coordination of care between Emergency Medical Services and Emergency Department Care?

Emergency Department Admissions and Transfers:

Rural emergency departments admit approximately half the patients (Inpatient and Observation) *and* transfer approximately twice as many patients compared to more urban emergency departments.

- Can rural hospitals support additional services to keep rural patients closer to home?
- Can rural hospitals coordinate care with tertiary facilities to bring patients home for post-acute, rehabilitative care in swing bed programs?
- Given high rates of transfer, should policy/quality focus on "*Transfer Communication Measures"*?
- What are the best ways to manage emergency room physicians who are increasingly becoming the decision makers when it comes to hospital admissions?

Quality and Patient Satisfaction

Rural Hospitals performed on par with other hospitals on publicly reported Outpatient Process of Care Measures such as Time to ECG (9 minutes vs. 8 minutes). Rural Hospitals significantly outperform other hospitals on the newest outpatient measures around time to MSE and total time in the ED. Patients experience higher patient satisfaction in rural hospitals compared with other hospitals.

- Can rural hospitals more fully participate in outpatient process of care measures?
- Should outpatient measures be utilized for rural focused *value* based policy
- Given transportation distances and logistical challenges does local medical control and Emergency Management Services need to evaluate the *possibility* to meet certain recommended standards (mean time to percutaneous intervention (PCI) in less than 60 minutes, for example) and develop alternative processes and measures?

Payer Mix Discussion and Implications

iVantage notes considerable discussion among rural hospital administrators regarding high deductible health insurance plans among commercially insured patients and the impact of utilization of ED and other outpatient services. Trends in employer-sponsored benefits points toward greater adoption of high deductible plans: "According to a new survey of large companies, 70 percent said they will offer high-deductible insurance plans by 2013 along with accounts that allow patients to purchase medical services with pretax dollars. One-fifth of the respondents indicated that by 2013, high deductible plans would be the only option they offer."[15]

Cost sharing has long been looked to as 'balancing force' in healthcare consumption. "The absence of cost sharing results in significantly greater emergency department use than does insurance with cost sharing. A disproportionate amount of the increased use involves less serious conditions."[16] Given rural ED utilization for low severity visits, cost sharing through higher co-pays and high deductible plans may have a significant impact on rural healthcare utilization patterns. Further, cost structures in Critical Access Hospitals, long sheltered under cost based reimbursement, are starting to become important as commercially insured rural community members begin to ask questions about costs of services.

The creation of Accountable Care Organizations (ACOs) seeking to maximize shared savings under the Affordable Care Act puts additional pressure on rural communities where outpatient services including those in the ED may have been historically more highly priced than at non-rural hospitals. iVantage notes pressure to contain costs as hospitals seek to utilize iBenchamarks™ for Operational Assessments in review of their cost structure and productivity. iVantage clients are seeking to analyze their "Medicare break even" strategy as they see Commercial Insurance payment, long a premium, collapsing towards Medicare payment points.

Cited Resources

1 Gilboy N, Tanabe P, Travers DA, Rosenau AM, Eitel DR. Emergency Severity Index, Version 4: Implementation Handbook. AHRQ Publication No. 12-0014, December 2011. Agency for Healthcare Research and Quality, Rockville, MD. http://www.ahrq.gov/research/esi/

2 Niska, Richard, Farida Bhuiya, Jianmin Xu. "National Hospital Ambulatory Medical Care Survey: 2007 Emergency Department Summary. National Health Statistics Report 2010. Retrieved from http://www.cdc.gov/nchs/data/nhsr/nhsr026.pdf

3 Pitts, Steven R, Richard W. Niska, Jianmin Xu, Catherine W. Burt. "National Hospital Ambulatory Medical Care Survey: 2006 Emergency Department Summary. National Health Statistics Report 2010." Retrieved from http://www.cdc.gov/nchs/data/nhsr/nhsr026.pdf

4 "Pulse Report 2010 Emergency Department: Patient Perspective on American Healthcare". Press Ganey. 2010. May 2010. Retrieved http://www.PressGaney.com/galleries.default-file/2010_ED_Pulse_Report.pdf

5 National Institute for Healthcare Reform. NonUrgent Use of Hospital Emergency Departments. May 11, 2011. Retrieved from http://hschange.org/CONTENT/1204/1204.pdf

6 Tocknell, Margaret Dick. "Healthcare Leaders Look to Efficiencies Inside and Outside the ED." Retrieved from: http://content.hcpro.com/pdf/content/291606.pdf

7 Kristy Gonzalez Morganti, Sebastian Bauhoff, Janice C. Blanchard, Mahshid Abir, Neema Iyer, Alexandria C. Smith, Joseph V. Vesely, Edward N. Okeke, Arthur L. Kellermann. "The Evolving Role of Emergency Departments in the United States" retrieved from: http://www.rand.org/pubs/research_reports/RR280.html

8 National Center for Health Statistics. "Health, United States, 2012: With Special Feature on Emergency Care." Hyattsville, MD. 2013. Retrieved from: http://www.cdc.gov/nchs/data/hus/hus12.pdf

9 Burt, CW., McCaig, LF. Trends in Hospital Emergency Department Utilization: United States, 1992-99. US National Library of Medicine. National Institutes of Health. September 2011. Volume 150 pp 1-34.

10 Ledue, Chelsea. Nearly Two-thirds of EDs Classified as Safety Net Hospitals. Healthcare Finance. August 2010. http://www.healthcarefinancenews.com/news April 2010.

11 "2010 Review of Physician Recruiting Incentives". Merritt-Hawkins-an AMN Healthcare Company. 2010. September 21, 2010. http://www.merritthawkins.com/uploadedfiles/merrittHawkins/surveys/mha2010incentivesurvPDF.pdf

12 Berry, Emily. "Emergency Department Volumes Rise as Office Visits fall". AMA News. January 16, 2012. Retrieved from http://www.ama-assn.org/amednews/2012/01/16/bisb0116.htm

13 "Rural Relevance Under Healthcare Reform". iVantage Health Analytics. June 2012. Retrieved from http://www.ivantagehealth.com/rural-relevance-under-healthcare-reform/

14 Flex Monitoring Team. Rural Hospital Emergency Department Quality Measures: Aggregate Data Report 2008-2009. MN, NC, ME: Flex Monitoring Team, May 2010.

15 "Performance in an Era of Uncertainty," Towers Watson. 2012. Retrieved from http://www.towerswatson.com/assets/pdf/6556/Towers-Watson-NBGH-2012.pdf

16 O'Grady, Kevin F., Manning, Willard G., Newhouse, Joseph P., Brook, Robert H. The Impact of Cost Sharing on Emergency Department Use. The New England Journal of Medicine. August 22, 1985. Volume 313 pp. 484-490.

Additional Resources

American College of Emergency Physicians. ACEP 2011 National Emergency Physicians Survey Results. April 2011. Retrieved from http://www.acep.org/Content.aspx?id=78646