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Necessity of Analytics in Today's Healthcare Revenue Cycle

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Necessity of Analytics in Today's Healthcare Revenue Cycle

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Abstract

Because of the recently growing pressures to improve quality and reduce costs, healthcare

organizations are rapidly adopting IT in order to improve their operations and clinical care. As a

result, an accumulation of vast amounts of data are becoming available for use. It is important for

healthcare to use this data. Strome (2010) states that healthcare analytics is the application of

statistical tools and techniques to healthcare-related data in order to study past situations (i.e.,

operational performance or clinical outcomes) to improve the quality and efficiency of clinical

and business processes and performance. With the introduction of healthcare analytical tools, can

the healthcare industry take its huge and exponentially growing amounts of data and learn from

it? The purpose of this paper is to review the available literature on the use of analytical tools in

the healthcare industry with a focus on the revenue cycle. Most literature available to be

reviewed is centered around discussions and theories on the use of analytical tools in the

industry. A survey of revenue cycle leaders was conducted to determine the prevalence and

importance of analytical tools in conjunction with the revenue cycle. This information will be

valuable to revenue cycle leaders in determining if others in the industry are adopting these tools

and the potential benefits of using analytical tools in their own departments.

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Chapter 1

Introduction

Our healthcare system is in the midst of dramatic changes. Recent legislative directives such as the Deficit Reduction Act resulting in Medicare's decision to deny payment for charges incurred for hospital-acquired conditions, the Affordable Care Act, Meaningful Use, and ICD10 have all catapulted the use of information technology to the forefront of the healthcare industry. As a result, the healthcare industry has been accumulating massive amounts of data. All the pressure to increase quality, reduce costs, along with the increased use of IT and the resulting stockpiles of data, have made the healthcare industry ripe for the benefits of analytics. Praman (2012) points out that analytics can be focused in a variety of ways to improve clinical quality of care, reduce costs, increase efficiency, increase revenue and return on investment (ROI)(2012). It appears that analytical tools are becoming essential for healthcare executives and upper management in order to perform their jobs in an efficient way and stay up with their peers.

Purpose of the Study

The purpose of this study is to evaluate the usage of analytical tools due to the changing landscape of healthcare and determine the importance they have with revenue cycle leadership. By sending a survey (Figure 1) to a sample of revenue cycle decision makers and analyzing their responses it is hoped that a determination can be made as to the level of adoption of analytical tools as well as the importance/necessity they have in performing revenue cycle leadership roles.

Significance of Study

The significance of this study is to identify whether or not the exponentially expanding

data that is becoming available to the healthcare industry is being used by revenue cycle

leadership to gain insight. Are these leaders realizing the potential benefits of this data and the

knowledge it can provide via the use of analytical tools? Are they taking advantage of a

potentially more efficient ways to better utilize the powerful data they have to improve their

process and decision making via analytical tools?

Research Question

This study is an attempt to determine if analytical tools are being used and if they are

essential in decision making for healthcare leadership today specifically as it relates to the

revenue cycle.

Chapter 2

Review of Literature

A search for literature articles that addressed the adoption of healthcare analytics and its use in the healthcare industry was performed from 3 electronic databases: PubMed, Scopus and JAMA. The search was limited to articles created from 2005 to present. Search terms used were: healthcare analytics, business intelligence, benefits of healthcare analytics, healthcare analytical tools. In addition, AHIMA Journals were searched and healthcare information technology vendors were contacted for case studies regarding analytics. The search method identified a total of 249 articles. Two hundred and forty articles did not meet the needs of this review, leaving 9 articles for this review. Of those, only 5 articles contained actual studies that could be applied to the use of analytical tools.

Even though most articles found were discussion or theory in nature and did not include case studies, key concepts from one non case study article are included in this paper to gain valuable insight into the review of this topic. That article by Ward, Marsolo & Froehle identifies several analytical tools that are standing out in the healthcare industry today. They point out that "some analytics have experienced dramatic adoption or seem to present a potentially revolutionary approach to medical decision making and healthcare management" (2014). They have grouped them into two overlapping categories – Discover/Efficacy and Care Delivery. This article provides an overview of several analytics of interest that fall under the two categories see Figure 2.

Figure 2.
Some analytical areas and their contributions to healthcare
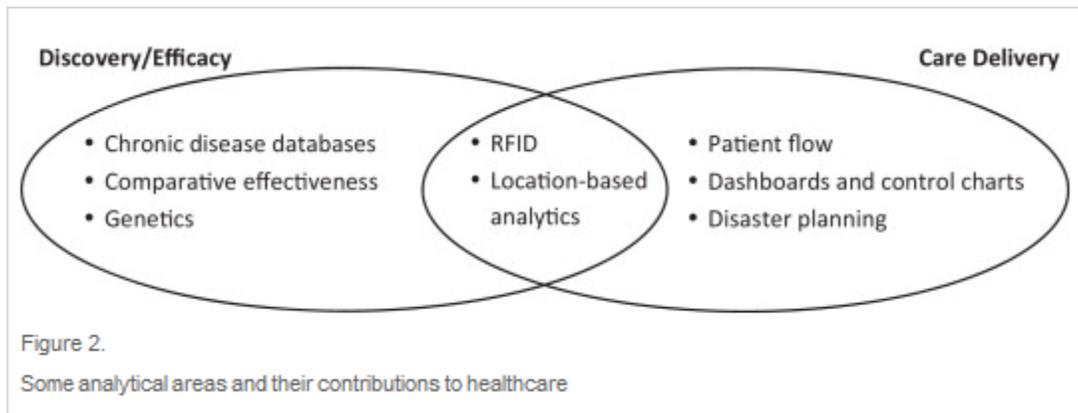
(Ward et al., 2014)

"Dashboards and control charts are used to monitor outcomes and look for process variations" (Ward et al., 2014). It is worth noting that one of the studies discussed later, attribute the discovery of necessary improvements in their facilities, to the utilization of dashboards which are analytical tools. Other examples provided in this article are worth including in this literature review to give an overall understanding of analytical tools and their potential uses. In addition to dashboards and control charts, Ward et al. mentions comparative effectiveness tools which can compare cost and effectiveness of treatment to discover ways to improve patient outcomes. Chronic disease databases that can be used to move our current health system into a learning health system in which every clinical visit becomes an opportunity to generate new evidence and knowledge. Disaster planning models use analytics to proactively plan responses to unforeseen events. Patient flow analytical tools can be used to predict resource utilization and downstream effects. Radio Frequency Identification Devices (RFID) can be used to track and manage patients in real-time and aid in compiling data for predictive modeling a patient's chronic diseases. (Ward et al., 2014)

Populations Studied

The 5 articles in the literature review performed for this study contained actual case studies of the use of analytical tools had varying populations. The populations studied were hospital patients of various criteria in which analytical tools where used to identify areas that may need improvement. The articles had different areas of focus but are linked by the identification of areas of improvement via analytical tools. One article study focused on the overutilization of HbA1c testing in New York Presbyterian Hospital. The population was obtained from the facility's clinical data warehouse between January 1996 and December 2010. In which, 397,926 HbA1c orders of 119,691 unique patients over 15 years were used in the study (Pivovarov, Albers, Hripcsak, Sepulveda, & Elhadad, 2014).

The second article contains three studies utilizing populations from Duke University Health Systems. Of those 3 studies, the first study focuses on patients that have been admitted to Durham Regional Medical Center (a community hospital of the Duke University Health System) from 2005 to 2007. The second study focuses on the patient accounts of Duke University Neonatal Intensive Care Unit (NICU). It does not specify the time frame. The third study focus on the segment of Duke University Health System (living) inpatient population that met the CDC vaccination priority eligibility criteria, pregnant patients, and pediatric patients with high risk diagnosis in the year 2009.

The two vendor case study populations are hospitals. The first study focuses on Spartanburg Regional Healthcare System. This hospital system reports being a 588 licensed 2 facilities, plus a 97 bed long term and acute care hospital serving North and South Carolina. The second study focuses on a small 48 bed hospital in Silverton, Oregon.

The last article by CDW Healthcare in conjunction with O'Keeffe and Company, had a

population of 150 various sized facilities across the Unites States.

Survey Method

The literature reviewed had several different methods of researching. The first article

used quantitative method by compiling amounts of HbA1c lab tests and lab values over a 15 year

period (Pivovarov et al., 2014). The second article contained three studies. The first two studies

discussed used a quantitative method and collected data from patient records and patient

accounts. Population sizes were not indicated. The third study's method was qualitative.

The vendor case studies are qualitative in nature. They were compiled using feedback

provided by revenue cycle leadership during interviews for vendor case studies.

The last article by CDW Healthcare, used a qualitative and quantitative method,

compiling numbers and requesting respondents feedback. This article performed a qualitative

anonymous survey.

Findings

According to a study by Pivovarov et al., 2014, through the use of distributional

analytics, they were able to identify the overutilization of Hemoglobin (HbA1c). They collected

all HbA1c measurements from 1996 to 2010 at New York Presbyterian Hospital, producing

397,926 HbA1c orders of 119,691 unique patients over 15 years to be used in the study

(Pivovarov, Albers, Hripcsak, Sepulveda, & Elhadad, 2014). All HbA1c lab test orders were

included and the counts were stratified by the HbA1c lab value. (Due to the American Diabetes

Association establishing guidelines in 2002 that patients with controlled diabetes should be

monitored every six months and patients with uncontrolled should be monitored every three

months, they aggregated the data into two subsets: (1996-2001) pre-guidelines group and (2003-

2010) post-guidelines group) The results indicated the maximum number of orders per patient

was 150, and the average was 3.32, with a large standard deviation of 5.83 orders. The study

noted the variance was due to various characteristics. Analysis did not exclude non diabetic

patients who may have only been tested for screening purposes. Also, patients may receive care

at other institutions. They analysis indicated that over 15 years there has been a steady increase

of 2.09 to 2.7 test per patient per year. To adjust for diabetes screening, they adjusted for those

patients that have had at least two HbHA1c test within their record. In this case there has been a

steady increase from 2.3 tests per patient per year in 1996 to 3.09 tests in 2010. After 2002,

rapid-repeat testing orders for HbA1c within 10 days increase from 1-2% of all HbA1c tests in

1996-2001 to 2.8-3.8% after 2001. This increase does not follow guidelines for diabetes

diagnosis (Pivovarov et al., 2014).

Another study conducted by Ferranti, Langman, Tanaka, McCall, and Ahmad, (2010) at

Duke University Health Systems called "Bridging the Gap: Leveraging business intelligence tool

in support of patient safety an financial effectiveness" points out that with carefully implemented

health analytic solutions and a mature approach to data collection will lead to improved patient

outcomes, increase efficiency and reduced costs. In their study, Ferrantiet al., present 3 cases

studies that illustrate the use of healthcare analytics to support their belief "that active investment

in health analytics will prove essential to realizing the full promise of investments in electronic

clinical systems" (2010). All three studies indicated support of their hypothesis. The first study

noted that by utilizing their Web Based Safety Dashboard they were able to proactively indentify

and improve their Clostridium difficile colitis (C. difficile) rates at Durham Regional Hospital.

The study included all Durham Regional Hospital and Duke University Hospital inpatient

admissions from March 2005 to October 2005. Although there were not any clinically significant

findings at the Duke University facility, the Durham facility study findings were significant. Through analytical tools they identified that Durham's C.difficile rate was 2 for every 100 patients admitted. They chose to address this by targeting hand washing and provider education. After the interventions, this rate markedly decreased within three months from two patients out of every 100 admissions contracting C. difficile to less than 0.25 for every 100 admits and has continued to remain steady. This translated into a prevention of 157.8 potential cases per year. They utilized figures from a previous study that determined the financial cost of C. difficile treatment to range from $3669.00 to $7234.00 of additional hospital costs per infected patient which translates into a minimum of $578, 968 savings for Durham Regional Hosptial per year. (Ferranti et al., 2010)

Ferranti et al., 2010 article included a second study conducted on Duke's Neonatal Intensive Care Unit which lost nearly $1.7 million the previous year and was expected to lose over $2.1 million the current year. They hypothesized that their accounting practices could be improved via using analytical tools to examine their data warehouse. They were able to identify four areas targeted for improvement: physician documentation, medial record coding, revenue modeling, and third party payments. They plotted actual revenue against the new revenue modeling uncovered by their analytical tools. The new model revenues are accurately predictive (slope=1.04) with a high degree of precision (R^2=0.99). This approach allowed the identification and correction of processes in each of the four areas not only eliminating the $2.1 million deficit but led to a profit of $400,000 within four months. More importantly, the analysis resulted in the correction and resubmission of previously submitted accounts, returning over $12 million in additional revenues over the following year and establishing precedents for future monitoring (Ferranti et al., 2010).

The third study, in the Ferranti et al., 2010 article, included a qualitative look at how Duke University Health System (DUHS) faced the H1N1pandemic and estimating the amount of vaccine it would need. According to Ferranti et al, 2010, the study included all DUHS patients used to query for patients meeting H1N1 vaccination eligibility as determined by the CDC. They sought to avoid two undesirable outcomes: 1) ordering too little, resulting in local shortage and under vaccinated populations or 2) ordering too much, resulting in waste and contributing to shortages in other locations. DUHS again turned to its analytical tools and data warehouse. They queried their database to compile a list of patients that met the CDC vaccination eligibility criteria. They were further grouped by inpatient status and for chronic disease. By utilizing these tools DUHS was able to quickly and accurately provide its estimate to the state to define its vaccination needs. Also, within 24 hours DUHS was also able to develop a list of high risk pediatric patients based on ICD9 codes along with next scheduled appointment times in order to disseminate vaccinations to appropriate locations. This also expedited education and communications to highest risk patient to get to a clinic for vaccinations. (Ferranti et al., 2010)

In addition to the articles above, there were two vendor case studies found that applied to this research. The first case study was on Spartanburg Regional Healthcare System. This hospital system reports being a 588 licensed 2 facilities, plus a 97 bed long term and acute care hospital serving North and South Carolina. (RelayHealth, 2013b) They utilize a vendor "add on" analytic product to compare their revenue cycle performance with their peers. The Vice President of the Spartanburg Cycle at Spartanburg, Brian Earnest, reports that prior to implementing their analytical tool, he spent hours poring through research presentations or reviewing Healthcare Financial Management Association publications trying to find the data he needed in order to determine if his facilities revenue cycle process and stats were in line with other facilities. He

decide to implement and analytical tool that his revenue cycle vendor offered that worked in

conjunction Spartanburg's current claims and remittance solutions. With the large amount of

data that was accessible to that vendor, the tool was able to provide Earnest with his facility's

numbers as well as the numbers of peer facilities. He was able to quickly compare his facilities

revenue cycle performance indicators with those of his peer hospitals. Because the analytical tool

could take advantage of the large amount of claim data already flowing through their claim

database, Earnest was able to see that his first pass rate on claims was 84.82% compared to the

first time rate of peer institutions of 68.17%. He was also able to determine that his electronic

transfer rate was slightly below his peers. This guided him to look deeper into this issue which

led him to focus on payers that were not set up electronically. He was able to immediately

address those payers and bring his hospital in to a normal range. He continues to rely on this

analytical tool to efficiently provide visibility into strategic financial trends and help him in more

informed decision making (RelayHealth, 2013).

The second vendors supplied case study was on Silverton Hospital, a 48 bed hospital

located in Oregon. According to Sean Riesterer, Silverton's Director of Revenue cycle, he felt

there were issues with his organization's claim cycle but did not have concrete data as to what

the underlying issues were. He needed the ability to gather data clearly and consistently in order

to understand what their issues were. He was spending too much time pulling data out of their

hospital information system and then manually putting it together with information from his

revenue cycle solution. This was time consuming and not producing the information he needed.

He began utilizing an add-on analytical tool that worked with his existing revenue cycle solution.

He was able to determine that his facility had an issue with length of claims cycle. He found that

15 to 20 percent of the hospitals monthly claim dollars were taking more that 5 weeks to submit

(RelayHealth, 2013). Via his analytical tool, he was able to drill down further to determine the

root cause. They were averaging 26 days to complete charts after delivering treatment. Because he was able to easily pull concrete data via the analytical tool, on his facility as well as numbers from peer hospitals, he was able to show physicians and staff where the issues resided. When Silverton's physicians could clearly see the time that it was taking to complete documentations and coding and how it adversely affected the hospital, they were then able to understand the importance of their role in the velocity of the facility's revenue cycle. Since implementing their revenue cycle analytical tool, Silverton has realized a 20 percent reduction in gross unbilled A/R days and a 15% reduction in gross A/R days. As a result, their average service to submission rate fell to below 13 days (RelayHealth, 2013).

Finally, a study titled "Analytics in Healthcare" done in August 2014 by CDW Healthcare in conjunction with O'Keeffe and Company surveyed 150 healthcare decision makers. The study reports a margin of error of ±7.97% at a 95% confidence level. Significant results from this study revealed that more than two thirds of healthcare decision makers say analytics is one of their organization's top three priorities. They indicated that the top motivational factors driving analytics are: the rising cost of healthcare (59%), Medicare/Medicaid EHR incentive programs (44%) and Accountable Care (41%). The majority of organizations (67%) are planning for or are in the process of implementing analytics; however, smaller organizations are lagging (CDW, 2015). This article reports the percentage of respondents who say analytics is one of their organization's top three priorities and they also categorized the respondents by hospital size:

51-200 beds 67%

201-500 69%

501-1,000 beds 73%

1,000+ beds 77%

It also reports that 65% of organizations say their analytics spending will increase in 2015 and the average organization plans to spend $1.9 million on analytics in 2015 (CDW, 2015). Organizations using analytical tools indicated that they are experiencing clinical benefits (improved patient care, 82%) and operational benefits (improved financial reporting capabilities, 54%).

As these articles and case studies indicate, there is a growing realization that there are benefits to be had with the utilization of analytical tools in the healthcare industry. However, there were not specific research articles identified on the use of analytical tools specific to the revenue cycle. The decision was made to conduct a focused survey of revenue cycle leaders and obtain their feedback regarding the use of analytical tools in their job role.

Chapter 3

Methodology

Research Design

A survey questionnaire (Figure 1) with a cover letter (Figure 3) was developed to collect

information to examine the necessity of analytical tools use in the healthcare revenue cycle. The

following variables were included:

1. Is your role connected to a healthcare facility's revenue cycle management area?

2. Health care facility type

3. Size of healthcare facility

4. Do you currently use analytical tools for financial performance evaluation? If no,
   survey skipped to question 13)

5. If yes, how long have you used these types of tools at your facility?

6. What areas do you feel the use of your analytical tools have directly resulted in
   improvements in your facilities financial performance?

7. Do these tools make it possible for you to quickly obtain useful reporting on your
   revenue cycle performance without the need to involve IT/data analyst staff for report
   creation?

8. Do you feel these tools are useful in quickly determining root cause analysis of
   revenue cycle issues in your organizations?

9. Do you feel these tools are essential in your ability to make informed decisions
   regarding your revenue cycle performance?

10. Has your facility realized a return on your investment on your analytical tools?

11. Would you consider the use of analytical tools essential in the healthcare industry
    today in regards to financial performance?

12. What type of analytical tools are being used to analyze your revenue cycle area data?

13. If your facility is not using analytical tool applications in your department, are their
    plans at your facility to implement these types of products in the near future?

Validity and Reliability

In order to review the validity and appropriateness, a rough draft of the questions used in

the survey were submitted for approval from Dr. Rebecca Reynolds, associate professor and

program director for the University of Tennessee's Health Informatics and Information

Management Department and Sajeesh Kumar, PhD, associate professor the graduate program in

the University of Tennessee's Health Informatics and Information Management Department.

Database Selection

Review of various surveys tools revealed that Qualtrics' survey based research platform

would meet the needs of this study. It supplied the functionality require to build this study's

survey, distribute it, collect and analyze that data obtained from the respondents.

Database Collection Instrument

Functionality provided by the Qualtrics survey tool, enabled the creation of a survey with

the previously listed questions. Once the creation of the survey was completed, this tool provided

a web link that was easy to supply to the survey sample.

Population and Sample Design

In order to obtain a relevant sample population, research was conducted to obtain

potential survey participants that were in healthcare revenue cycle leadership roles. It was

decided to create a database of healthcare facility leadership email addresses found by searching

healthcare facility websites and the Healthcare Financial Management Association (HFMA)

websites. Email addresses were selected based on the job roles listed on the websites that were

related to health care facility revenue cycle management areas.

Data Collection Procedures

A cover letter (Figure 3) with a quick link to the survey was sent to the identified sample

population via email on October 19, 2015. A second reminder was sent on October 25, 2015 with

a deadline of Oct 29, 2015.

Data Analysis

Qualtics data analysis functionality was used to analyze the data received from the survey

participants.

Chapter 4

Results

Response Rate of Population

A total of 35 responses to the survey were received from revenue cycle leaders via the

Qualtrics survey tool. The first request yielded 23 responses. The second request yielded 12

responses. Overall response rate was 35%

Frequency Tables

Summaries of the number of responses and percentages of the responses to all 13 survey

questions are shown in the following tables. The 1st question determined if the respondent did

indeed work in the healthcare revenue cycle area. If the respondent answered no, the survey

ended. If the respondent answered yes, the survey went on to determine if the respondent's

facility uses analytical tools. If no, it asked if there are plans to and then ended. If the respondent

answered yes to the first 2 questions, then the survey went on to ask about the respondent's

facility characteristics and then requested responses to determine the usage and benefits of

analytic tools.

Response Rates

Table 1

1. Is your job role connected to a health care facility's revenue cycle management area?

#	Answer		Response	%
1	Yes		32	91%
2	No		3	9%
	Total		35	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.09
Variance	0.08
Standard Deviation	0.28
Total Responses	35

Table 2

2. Health care facility type

#	Answer		Response	%
1	Acute Care		27	84%
2	Behavioral Heath		2	6%
3	SNF/LTC		1	3%
4	Outpatient Clinic		0	0%
5	other		2	6%
	Total		32	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	1.38
Variance	1.08
Standard Deviation	1.04
Total Responses	32

Table 3

3. Size of health care facility

#	Answer		Response	%
1	100 beds or less		10	31%
2	101 to 200 beds		6	19%
3	201 to 500 beds		8	25%
4	501 to 1000 beds		6	19%
5	1001 or more beds		2	6%
	Total		32	100%

Statistic	Value
Min Value	1
Max Value	5
Mean	2.50
Variance	1.68
Standard Deviation	1.30
Total Responses	32

Table 4

4. Do you currently use analytical tool applications for revenue cycle performance evaluation?

#	Answer		Response	%
1	Yes		27	84%
2	No		5	16%
	Total		32	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.16
Variance	0.14
Standard Deviation	0.37
Total Responses	32

Table 5

5. How long has your facility used these types of tools?

#	Answer		Response	%
1	less than 1 year		4	15%
2	1 year to 3 years		9	35%
3	more than 3 years		13	50%
	Total		26	100%

Statistic	Value
Min Value	1
Max Value	3
Mean	2.35
Variance	0.56
Standard Deviation	0.75
Total Responses	26

Table 6

6. What areas do you feel the use of your analytical tools have directly resulted in improvements in your facilities revenue cycle performance?

#	Answer		Response	%
1	Decreased A/R days		16	62%
2	Decreased payer denials		14	54%
3	Improvements in billing process work flow efficiencies		16	62%
4	Improvements in charge monitoring		11	42%
5	Other		2	8%
6	No improvements recognized		0	0%

Statistic	Value
Min Value	1
Max Value	5
Total Responses	26

Figure 4

6. What areas do you feel the use of your analytical tools have directly resulted in improvements in your facilities revenue cycle performance?
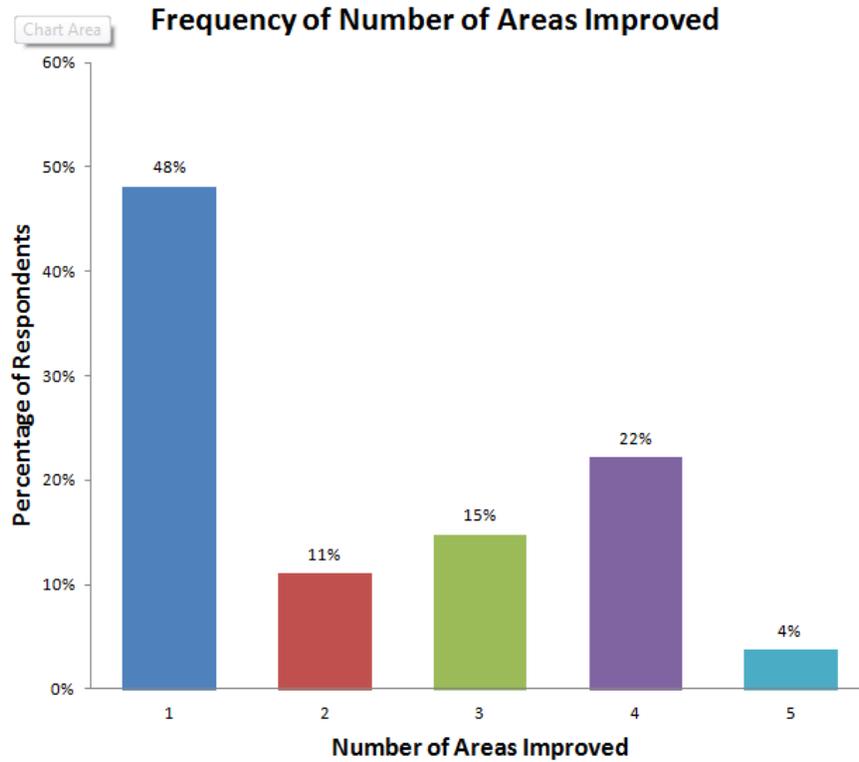
Table 7

7. Do these tools make it possible for you to quickly obtain useful reporting on your revenue cycle performance data without the need to involve IT/data analyst staff for report creation?

#	Answer		Response	%
1	Yes		23	88%
2	No		3	12%
	Total		26	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.12
Variance	0.11
Standard Deviation	0.33
Total Responses	26

Table 8

8. Do you feel these tools are useful in quickly determining root cause analysis of revenue cycle issues in your organization?

#	Answer		Response	%
1	Yes		21	81%
2	No		5	19%
	Total		26	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.19
Variance	0.16
Standard Deviation	0.40
Total Responses	26

Table 9

9. Has your facility experienced a return on investment for your revenue cycle analytical tool application expenditure?

#	Answer		Response	%
1	Yes		9	35%
2	No		1	4%
3	Too soon to tell		7	27%
4	Do not know		9	35%
	Total		26	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	2.62
Variance	1.69
Standard Deviation	1.30
Total Responses	26

Table 10

10. Would you consider the use of analytical tools essential in the health care industry today in regards to evaluating revenue cycle performance?

#	Answer		Response	%
1	Yes		24	92%
2	No		0	0%
3	Do not know		2	8%

Statistic	Value
Min Value	1
Max Value	3
Total Responses	26

Table 11

11. If your facility is not using revenue cycle analytical tools applications in your department, are their plans at your facility to implement these types of products in the near future?

#	Answer		Response	%
1	Yes		3	60%
2	No		2	40%
	Total		5	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.40
Variance	0.30
Standard Deviation	0.55
Total Responses	5

Table 12

#	Answer		Response	%
1	Yes		25	96%
2	No		1	4%
	Total		26	100%

12. Do you feel these tools are essential in your ability to make informed decisions regarding your revenue cycle performance?

Statistic	Value
Min Value	1
Max Value	2
Mean	1.04
Variance	0.04
Standard Deviation	0.20
Total Responses	26

Table 13

13. What type of analytical tools are being used to analyze your revenue cycle area?

#	Answer		Response	%
1	Web applications, ie Tableau, Qlikview		1	4%
2	Existing revenue cycle vendor add on products, ie RelayHealth's Acuity		14	54%
3	Cloud based platforms, ie Mede Analytics		2	8%
4	In house created tools		9	35%
5	other		0	0%
	Total		26	100%

Statistic	Value
Min Value	1
Max Value	4
Mean	2.73
Variance	1.00
Standard Deviation	1.00
Total Responses	26

Chapter 5

Analysis and Discussion

The first survey question was deigned to filter out those participants that did not hold a

job role that was healthcare revenue cycle related. Ninety one percent (91%) of the respondents

had a job role that was connected to a area. Eight percent (8%) of respondents were not and

therefore the survey ended for those participants after their first response. (Table 1)

Eighty four percent (84%) of respondents with healthcare facility revenue cycle

management job roles were from acute care facilities, 6% were from behavioral health facilities,

3% were from skilled nursing (SNF) or long term care facilities (LTC), and 6% were from other

types of facilities. (Table 2)

Thirty on percent (31%) were from facilities with 100 beds or less, 19% were from 101 to

200 beds, 25% were from 201 to 500 beds, 19% were from 501 to 1000 beds and 6% were from

facilities with more than 1,000 beds. (Table 3)

Eighty four percent (84%) of the respondents currently use analytical tool applications

for revenue cycle performance evaluation. Sixteen (16%) did not. (Table 4)

Of the 16% that did not use these tools, 60% responded to a subsequent question that they

had plans to use in the future, 40% did not have plans to use revenue cycle analytical tools.

(Table 11)

Of the 84% that used these types of tools, 15% had used them less than a year, 35% had

used them for one to three years and 50% had used them more than three years. (Table 5)

Of the respondents that utilized analytical tools, 62% reported they directly resulted in

improvements in decreasing their account receivable (A/R) days, 54% reported improvement in

decreasing payer denials, 62% reported improvements in billing process work flow efficiencies,

42% reported improvements in charge monitoring, 8% reported other improvements. In addition,

0% reported that no improvements were recognized. (Table 6) This survey question allowed for

the respondents to select all the choice that applied to their facility. So it is worth examining the

frequency of the number of selections the respondents selected (excluding the option of "no

improvements recognized" as it was not selected by any respondent). It was found that 48%

responded by selecting only one choice from the 5 areas given in the survey question. However,

22% of the respondents listed 4 areas that their facility has seen improvements directly related to

the use of analytical tools. Fifteen percent (15%) listed three areas, 11% chose 2 areas and 4%

chose five areas. (Graph 1). The mean (average) number of selections was 2.2 and the median

was 2.

Eighty eight percent (88%) of respondents reported that these tools make it possible for

them to quickly obtain useful reporting on their revenue cycle performance data without the need

to involve IT/data analyst staff for report creation. Only 12% reported that they would still need

IT/data analyst involvement. (Table 7)

Eighty one percent (81%) of respondents feel these tools are useful in quickly

determining root cause analysis of revenue cycle issues in their organization. Nineteen percent

(19%) did not feel these tools are useful in quickly determining root cause analysis of revenue

cycle issues in organization. (Table 8)

Thirty five percent (35%) reported feeling that their facility experienced a return on

investment for their revenue cycle analytical tool application expenditure. Four percent (4%)

reported feeling they have not. Twenty seven percent (27%) reported they have not had their

tools long enough to determine this and 35% did not know. (Table 9)

Ninety two percent (92%) of respondents reported that they consider the use of analytical

tools essential in the health care industry today in regards to evaluating revenue cycle

performance. No respondents reported that they did not consider the use of analytical tools

essential in the health care industry today in regards to evaluating revenue cycle performance.

2% of respondent did not know. (Table 10)

Ninety six percent (96%) of respondents feel these tools are essential in their ability to

make informed decisions regarding their revenue cycle performance. Only 4% reported not

feeling they are essential in making informed decisions regarding their revenue cycle

performance. (Table 12)

Of the types of analytical tools available, 54% of responded that they used existing

revenue cycle vendor add on products, 35% reported using in house created tools, 8% reported

cloud based platforms, and 4% reported using web applications. No respondents reported using

other types. (Table 13)

Limitations and Discussion

It is important to discuss the limitations of this study.

- The review of the literature was very limited in the number of peer reviewed articles on the use of analytic in the healthcare industry.

- The case studies that were found were provided by vendors of analytical products which have the potential of bias.

- Although the sample size used in this survey was not insignificant, a larger sample size would have been more ideal. It is challenging to obtain a population of email addresses and to get responses in the current environment that requires email users to be cautious of replying to or clicking on unfamiliar links in emails.

- The respondents are basing their responses on their own observations and experiences with analytical tools.

- Different facilities are at different levels of experience in regards to how to handle their revenue cycle areas, so some may have little exposure to analytical tools and what they can offer.

Chapter 6

Conclusion and Recommendations

Summary of findings

The findings from the literature review performed on analytical tool usage in the

healthcare industry, revealed a limited amount of peer reviewed articles that addressed this topic.

Those that were found had promising results in the use of analytical tools to uncover issues and

lead to improving healthcare. However, the peer reviews were limited in information pertaining

to healthcare revenue cycles. The study performed by CDW, did reveal positive responses from

150 healthcare facilities but still the focus was more on non revenue cycle areas. The vendor case

studies provided actual revenue cycle leadership feedback and specific improvements that

revenue cycles departments have observed and attribute to their use of analytical tools..

The survey performed for this paper, was directed to revenue cycle leadership and the

responses indicated that the use of analytical tools in healthcare revenue cycle departments is

beneficial. The survey responses indicated analytical tool usage is becoming prevalent by the

high number of respondents reporting using tools or plans to adopt in the near future. The survey

revealed that the majority of respondent feel these tools provide valuable information to the users

and allow them to perform their job roles more efficiently. It also reveal most of these leaders

feel these tools are essential for informed decision making and necessary for revenue cycle

leaders in today's healthcare environment.

Conclusion

In conclusion, this study sought to determine if analytical tools are being used in the

healthcare arena. It specifically put a focus on the healthcare revenue cycle. The survey

conducted did find that a large percentage of revenue cycle leadership are utilizing analytical

tools or planning to do so in the near future. The survey results indicate that analytical tools are

making an impact on decision making and that revenue cycle leaders feel they are essential for

their job role.

Implications of the Study

Those in the healthcare revenue cycle management area can benefit from the findings in

this study if they are considering implementing an analytical tool to assist in evaluating key

performance indicators in their department as well as a tool to making more informed leadership

decisions.

Recommendations

This study's survey was focused on healthcare revenue cycle areas. A subsequent study

could expound on the use of analytical tools in other areas of the healthcare industry such as

quality or patient access. Additionally, more studies could be performed on the different types of

analytical tools, survey what is being used or satisfaction rates among the differing tools as well

as study their efficacy in improving healthcare.

References

CDW. (2015, January 20). Analytics in Healthcare. Retrieved from:

http://www.cdwnewsroom.com/analytics-in-healthcare-report/

Ferranti, J. M., Langman, M.K., Tanaka, D., McCall, J. & Ahmad, A. (2010). Bridging the Gap:

Leveraging Business Intelligence Tools in Support of Patient Safety and Financial

Effectiveness. *Journal of the American Medical Informatics Association* 17(2), 136–143.

Retrieved from www.scopus.com

Pivovarov, R., Albers, D. J., Hripcsak, G., Sepulveda, J. L., & Elhadad, N. (2014). Temporal

trends of hemoglobin A1c testing. *Journal of American Medical Infromatics Association*,

21, 1038-1044.

Praman, S., (2012, November 8). Healthcare Analytics – Is it paying for itself? Retrieved from

http://www.ibmbigdatahub.com/blog/healthcare-analytics-%E2%80%93-it-paying-itself

RelayHealth. (2013a). *Gaining actionable insight into financial systems

and areas impacting the revenue cycle*. Retrieved from:

http://media.relayhealth.com/documents/2013.11.21-

+RH+Spartanburg+Case+Study_v6-P8402.pdf

RelayHealth. (2013b). *Root cause comparative data engages physicians to accelerate cash.*

Retrieved from: http://media.relayhealth.com/documents/H685+Case+Study+-

+Silverton+6-13.pdf

Strome, T. (2010, March 14). *What is healthcare analytics?* Retrieved from

http://healthcareanalytics.info/2010/03/what-is-healthcare-analytics-2/

Ward, M.J., Marsolo, K.A., & Froehle, C.M. (2014). Applications of business analytics in

healthcare. *Business Horizons, 57*, 571-582. Retrieved from

http://www.sciencedirect.com.ezproxy.uthsc.edu/science/article/pii/S0007681314000895

Appendix

Figure 1

Survey questionnaire created and distributed via Qualtrics Survey tool

14. Is your role connected to a healthcare facility's revenue cycle management area?

    o   Yes
    o   No
(If no – survey ended)

15. Health care facility type

    o   Acute Care
    o   Behaviorial Health
    o   SNF/LTC
    o   Outpatient Clinic
    o   Other

16. Size of healthcare facility

    o   100 beds or less
    o   101 to 200
    o   201 t0 500
    o   501 to 1000
    o   1001 or more beds

17. Do you currently use analytical tools for financial performance evaluation? (If no, survey skipped to question 11)

    o   Yes
    o   No

18. If yes, how long have you used these types of tools at your facility?

    o   Less than 1 year
    o   1 year to 3 years
    o   More than 3 years

19. What areas do you feel the use of your analytical tools have directly resulted in improvements in your facilities financial performance? (multiple selections can be made)

    o   Decreased A/R days
    o   Decreased payer denials
    o   Improvements in billing process workflow efficiencies
    o   Improvement in charge monitoring
    o   Speed up revenue cycle velocity
    o   Other
    o   No improvements recognized

20. Do these tools make it possible for you to quickly obtain useful reporting on your revenue cycle performance without the need to involve IT/data analyst staff for report creation?

  o   Yes
  o   No

21. Do you feel these tools are useful in quickly determining root cause analysis of revenue cycle issues in your organizations?

  o   Yes
  o   No

22. Do you feel these tools are essential in your ability to make informed decisions regarding your revenue cycle performance?

  o   Yes
  o   No

23. Has your facility realized a return on your investment on your analytical tools?

  o   Yes
  o   No
  o   Too soon to tell
  o   Do not know

24. If your facility is not using analytical tool applications in your department, are their plans at your facility to implement these types of products in the near future?

  o   Yes
  o   No

25. Would you consider the use of analytical tools essential in the healthcare industry today in regards to financial performance?

  o   Yes
  o   No
  o   Do not know

26. What type of analytical tools are being used to analyze your revenue cycle area data?

  o   Web Applications, ie Tableau, Qlikview
  o   Existing revenue cycle vendor add on products, ie RelayHealth's Acuity
  o   Cloud based platforms, ie Mede Analytics
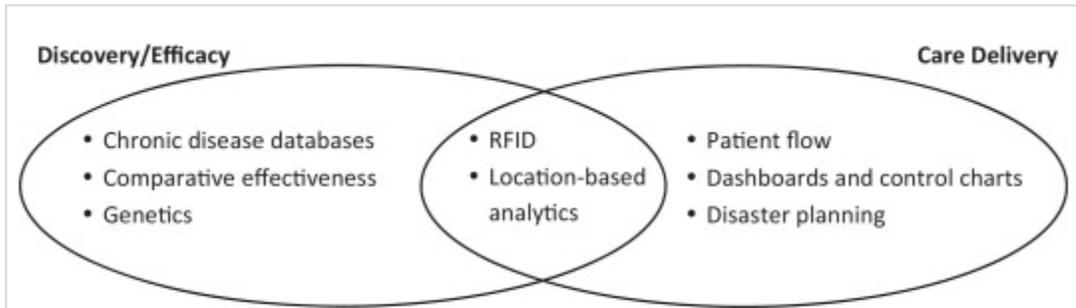 o   In house created tools

Figure 2

Figure 2.

Some analytical areas and their contributions to healthcare

(Ward et al., 2014)

Figure 3

Cover letter sent to sample population

My name is Kristen Thomas, RN, BSN and I am a Masters' degree candidate in the Health Informatics and Information Management (MHIIM) program at the University of Tennessee Health Science Center (UTHSC). I am in the processes of completing my thesis. I obtained your contact information from your HFMA chapter website and would greatly appreciate your participation in a very brief and anonymous survey for my research.

Below is a link to a brief survey attempting to determine if there is increasing usage of analytical tools by healthcare revenue cycle management leadership. My thesis topic is The Necessity of Analytical Tools in Revenue Cycle Management in Today's Healthcare Environment.

If you would give my research just a few minutes of your time and complete my survey by Oct 29, 2015, I would be very appreciative.

If you have questions, my e-mail address is kthoma56@uthsc.edu

The link to the survey is
https://newqtrial2015az1.az1.qualtrics.com/SE/?SID=SV_9vgHcvc865tsFsF

(Please note that this survey has been reviewed and approved by my advisor, Associate Professor HIIM program at UTHSC, Dr. Sajeesh Kumar.)

Thank you so much for your time,

Kristen Thomas, RN, BSN
Graduate student
University of Tennessee Health Science Center
kthoma56@uthsc.edu
cell # 918-361-9100

Figure 4