THE POWER OF BEING UNDERSTOOD

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HEALTH CARE INDUSTRY UPDATE

ACFE

July 19, 2021

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Speakers List



Jessika Garis

Director and Senior Health Care Analyst



Jamie McGlothlin

Director, Health Care Analytics National Lead



Ryan Haggerty

Principal, Health Care Risk Consulting

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Agenda

Health Care Industry Update

(25 minutes – Jessika Garis)

Using Data Analytics in Health Care

(30 minutes – Jamie McGlothlin)

Managing “Risk” in the Health Care Industry

(20 minutes - Ryan Haggerty)

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RSM Health Care Analysts' Critical Themes in 2021

Causes

- Value-based reimbursement
- Consumerism and mental health & wellness
- Labor trends
- Regulatory and legislative changes
- Medical cost inflation and demographics changes

Effects

- Outside disruption
- Transaction activity
- Alternative Deals
- Health inequity

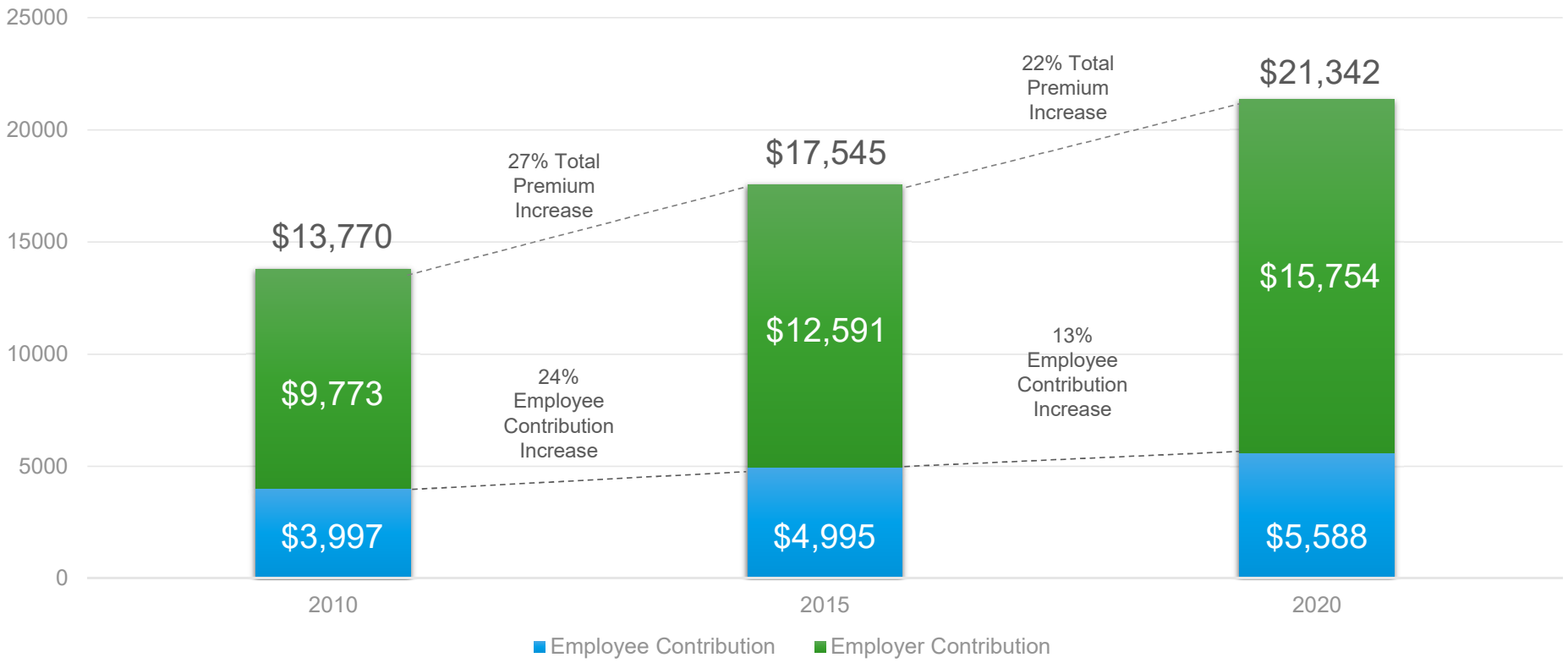
Enablers

- Data transformation
- AI and digital health
- Medical science innovation

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Medical cost inflation and demographics changes



Source: KFF Employer Benefit Survey, 2020

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What Does Consumerism Mean for Health Care?

- Convenient
- More than an app
- Individually customized

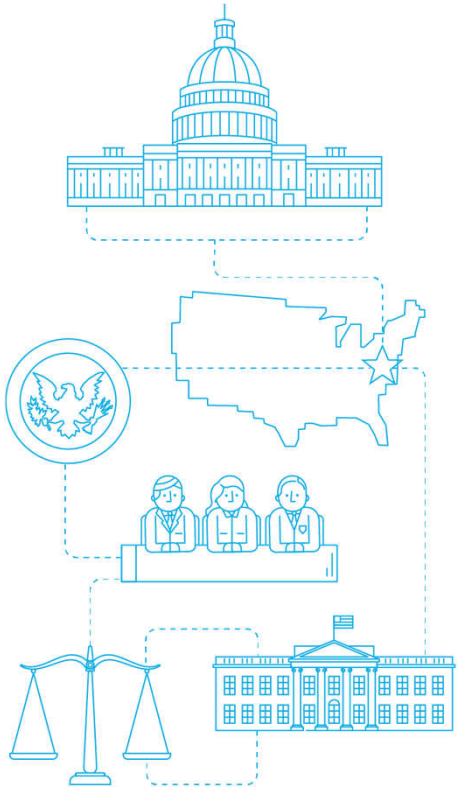


Source: Visual Capitalist

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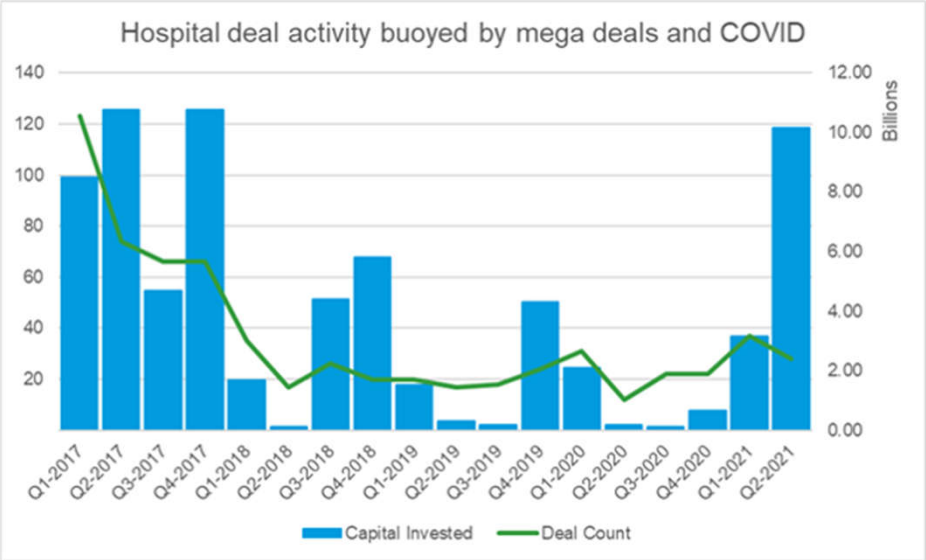
Regulatory and legislative changes

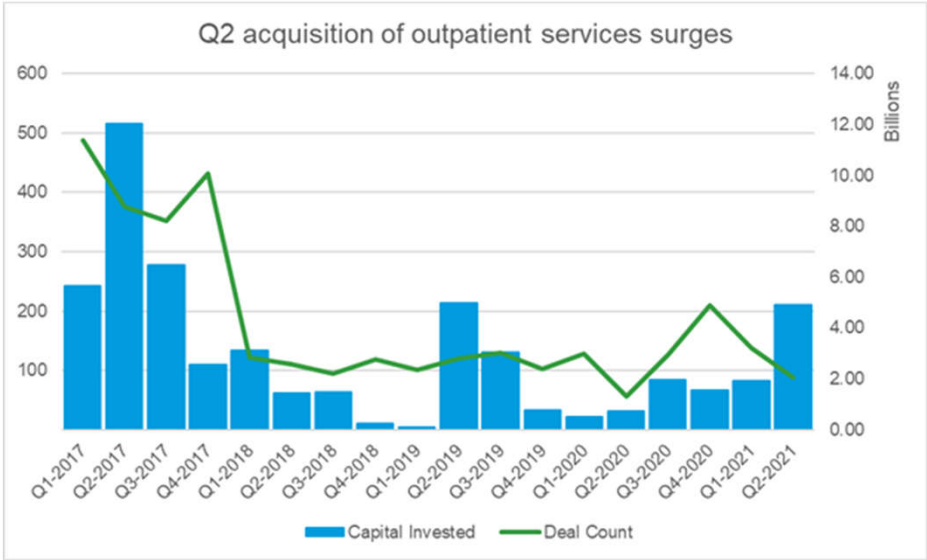
- President Biden's executive order to promote competition
  - Prescription Drugs
  - Hearing Aids
  - Hospital consolidation
    - M&A
    - Price transparency
  - Health insurance consolidation



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Mergers and Acquisitions





Source: Pitchbook

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USING DATA ANALYTICS IN HEALTH CARE

Common Types of Fraud

Unnecessary Treatment

- Writing orders (and billing for treatment) which is not medically necessary

Unperformed services

- Billing for treatment which never occurred

Kickbacks

- Directing treatment or referrals in return for compensation

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How can analytics help

- Data Analytics can detect order patterns that indicate unnecessary treatment through comparison to:



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Clinical Variation

Clinical variation refers to medical practice pattern variation for similar patients.

- **Unwarranted clinical variation** refers to medical practice pattern variation that cannot be explained by illness, medical need, or the dictates of evidence-based medicine. It is one of the causes of low value care often ignored by health systems.
- Our challenge is to **identify clinical variation** and **analyze if it is warranted**.



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Analytics for Clinical Variation

Track all orders
Imaging, Labs, Medications, Electrophysiology, Procedures, Referrals

Stratify orders based on ordering information
Ordering provider, workflow, orderset, service, location

Analyze orders based on patient
Diagnosis, DRG, comorbidity, age

Aggregate and quantify orders
- Antibiotics, opioids, imaging, blood products, echocardiograms, procedures
- Per encounter, per patient, per calendar day, per service day, per office visit, per episode



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CASE STUDY:
Congestive Heart Failure (CHF)

GOAL	APPROACH	RESULTS
Optimize CHF order set	1. Analyze all orders utilizing the CHF orderset 2. Analyze all orders for CHF patients which do not utilize the CHF Orderset	As part of this analysis, we learned that a full narcotics screen was being ordered for 95% of CHF patients. Our data showed no clinical usage of the results of this lab, and we then verified this with providers. The cost of the narcotics screen was $309. We removed the narcotics screen from the default list of orders in the CHF orderset.

Can also be applied to:
Any orders

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CASE STUDY:
POKE-R

PROBLEM	GOAL	APPROACH	RESULTS
PICU patients receive lots of "pokes," increasing cost, reducing patient experience and causing hospital acquired infections	Provide information to providers to allow reduction of poke	1. Define a poke Identify which orders count as "pokes" including blood labs, IV medications, radiology and invasive procedures. 2. Present poke information to providers – including: a. Past pokes and scheduled pokes b. Cost information c. Insure data is available during structured rounds	12.5% reduction in pokes 5 year savings $11,058,085 in 26 bed PICU

PUBLISHED:
- Avoiding Pain and Unnecessary Interventions and Reducing Cost in the PICU in *Critical Care Medicine*
- Poke-R - Using Analytics to Reduce Patient Harm in *10th International Conference on Health Informatics*

Can also be applied to other ICUs including:
- NICU
- SICU
- MICU

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CASE STUDY:
Blood Utilization

PROBLEM	GOAL	APPROACH	RESULTS
Patients sometimes receive blood transfusions when not clinically required. This causes adverse outcomes.	Reduce unnecessary red blood cell transfusions, improve outcomes, reduce cost	1. Evaluate the clinical necessity of blood transfusions based on hemoglobin, base deficit, blood pressure, scvO2, lactate, blood loss, diagnosis 2. Analyze blood wastage and returns 3. Provide information for provider evaluation 4. Use supervised learning to adjust thresholds based on provider evaluations	• $3.3 million annual savings • 23% fewer units • 46% fewer non-indicated units

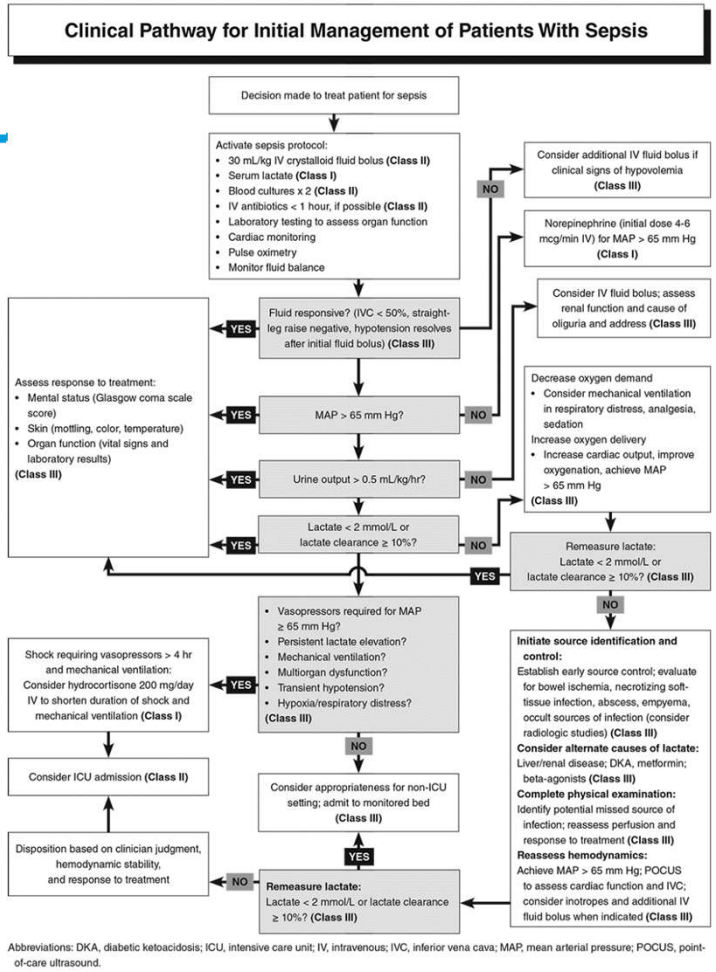
PUBLISHED:
Reducing Red Blood Cell Transfusions in *International Conference on Information Technology in Bio- and Medical Informatics (ITBAM)*

Can also be applied to other products including:
- Plasma
- Platelets

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Standardized Care Paths

- Best practice care pathways can be found as flow charts and decision points in literature.
- Pathways are defined for both acute encounters and chronic disease treatment.
- Standardized analytics apply across all of the care pathways.
- These processes can be implemented and tracked and measured using standardized technology and process automation engines such as Abbyy Timeline.



- PUBLISHED:
- Accelerating Analytics for Clinical Pathways to Drive Cost Reduction and Quality Improvement in *IEEE International Conference on Information Reuse and Integration (IRI)*

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Leveraging row level security

Row level security filters data based on values within the data.

EXAMPLES

- Show PHI only for patients who the provider discharged or wrote an order for
- Show only metrics for provider's specialty
- Show only DRGs treated by a provider
- Benchmark a provider against others in their service only
- Filter data based on user's role
- Anonymize data for other providers except for directors
- Anonymize cost data for other services except for leadership

USE CASE



We were able to create a single Tableau dashboard, which showed within Epic and was available to >600 physicians filtering based on physician role, specialty and relationship to patient

PUBLISHED:
Developing Enterprise-wide Provider Analytics in *12th International Conference on Health Informatics*

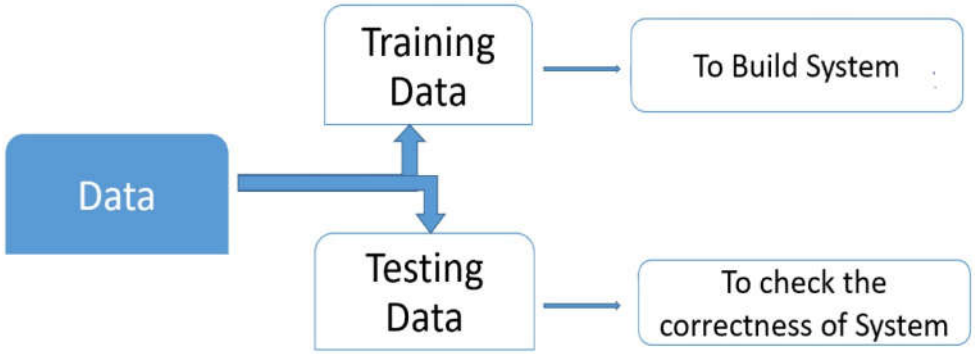
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What is predictive analytics

Predictive analytics is a broad term for many types of algorithms but the goal is always the same: to use past data and events to predict future data and events.

Not all healthcare events are predictable and often predictive analytics algorithms fail. The most important thing is to recognize if an algorithm works prior to relying on the results to make decisions.

Data, especially healthcare data, has many attributes and data points. The ones selected as “features” will be used in the predictive algorithm. We then “train” and “test” the algorithm.



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Case Study: Predicting ED Arrivals and Occupancy

PROBLEM: Emergency Department overfills causing long delays and emergency procedures to create occupancy

GOAL: Predict high occupancy in the emergency room to allow mitigation efforts

APPROACH:

1. Obtain historical data for emergency room patients
2. Augment data with local weather, holidays and events data
3. Predict ED arrivals

- Evaluate and choose features and algorithms, train and test
- Chosen features: day of week, time of day, date, temperature, relationship to holidays

4. Predict ED length of stay for patients in the ED using statistics

Based on partial information from: service, date, time, diagnosis, ED events

5. Predict future occupancy

This is a calculation using predicted ED arrivals, current occupancy and predicted ED length of stay for current patients

Can also be applied to:
Urgent Care
Walk-In Clinics
OR

RESULTS:

Able to predict overflow as Yellow, Orange or Red (previous was just red)
Alerts up to 96 hours ahead
78% accuracy at 72 hours

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Case Study: Digital Twin

PROBLEM: Adding resources or demand in one area of a hospital can cause bottlenecks in other areas.

GOAL: Analyze resource constraints and what-if scenarios to predict bottlenecks, occupancy and length of stay. Use this analysis to optimize resource allocation

APPROACH:

1. Map the resources (beds, imaging machines, etc)
2. Fill in what each resource can support (patient type, movement) through data profiling and manual review
3. Extract the clinical treatment plan from historical encounters
4. Randomly push patients/treatment plans through the hospital to test resource constraint usage, bottle necks, throughput
5. Allow resources to be edited to test what if scenarios

PUBLISHED:

Predicting Hospital Capacity and Efficiency
in *11th International Conference on Health Informatics*

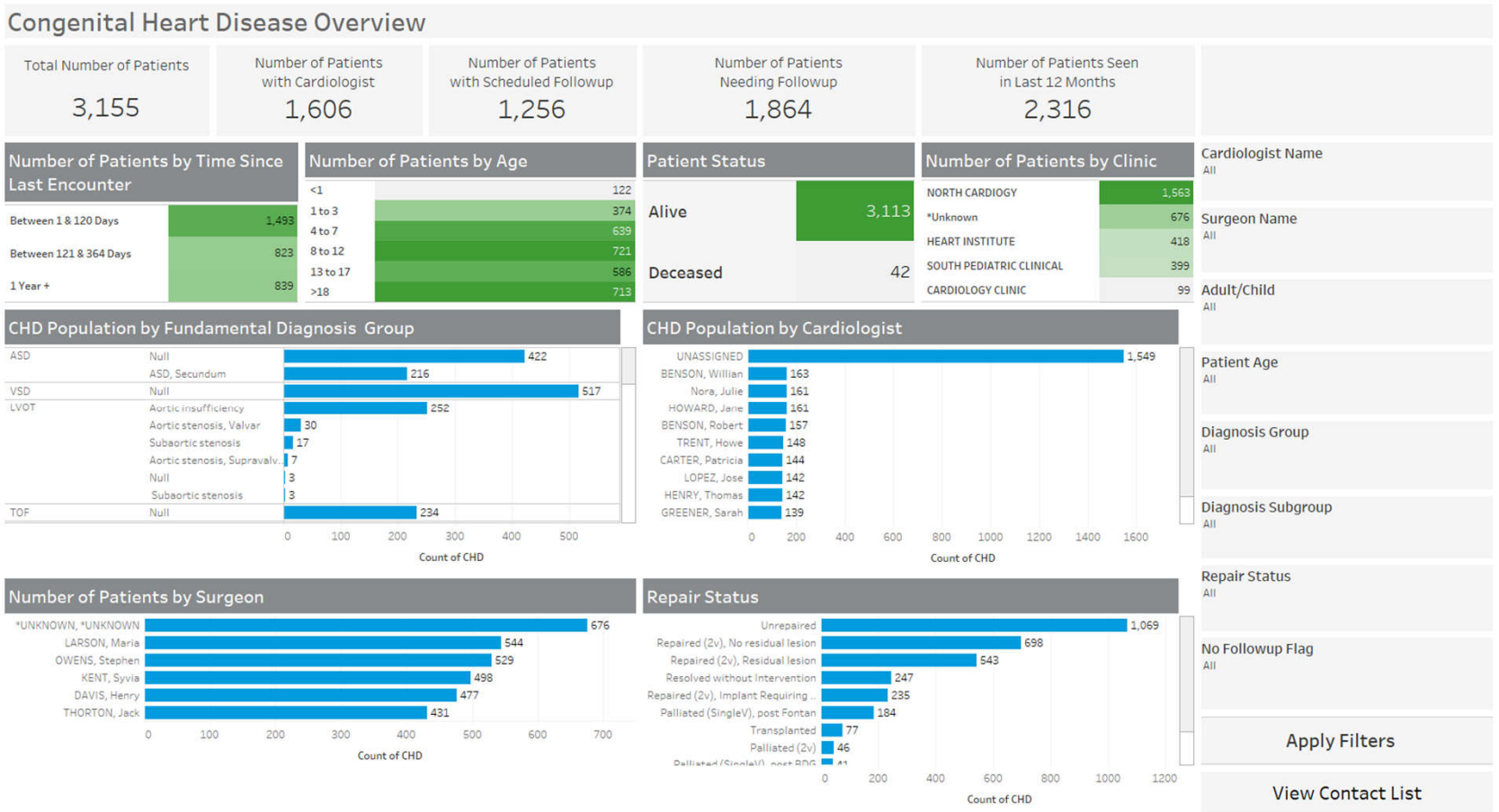
Can be applied to:

- Beds
- Staffing
- Imaging resources
- Clinics
- Operating Rooms

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CASE STUDY:
Congenital Heart Defects (CHD)



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Supervised Learning for CHD

Supervised learning is an approach to creating artificial intelligence, where the program is given labeled input data and the expected output results.

Supervised learning can be used to improve algorithms, such as the CHD use case



- Design workflows for following up identified patients
- Allow providers to review the patient charts, prioritize and assign follow-up dates
- For patients who come to cardiology follow-ups, track whether further intervention was ordered
- Reprioritize identified patients based on learning feedback from #2 (how soon the chosen follow-up date was) and #3

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MANAGING “RISK” IN THE HEALTH CARE INDUSTRY

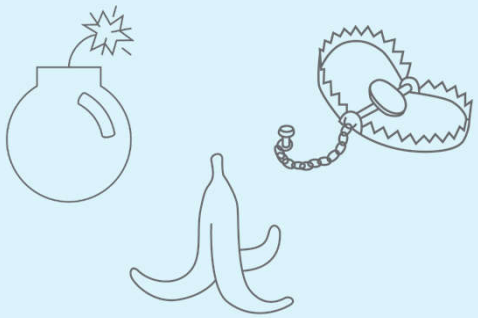
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Why is “Risk” a hot topic in health care?

The health care industry is experiencing unprecedented change, which is requiring organizations to build and strengthen their capabilities to anticipate, understand, plan for and respond to the emerging risks and opportunities that exist throughout their enterprise and across the continuum of care.

Risk types include but are not limited to:

- Strategic
- Financial
- Regulatory/Compliance
- Operational
- Clinical
- Reputational
- Competitive
- Cyber
- IT

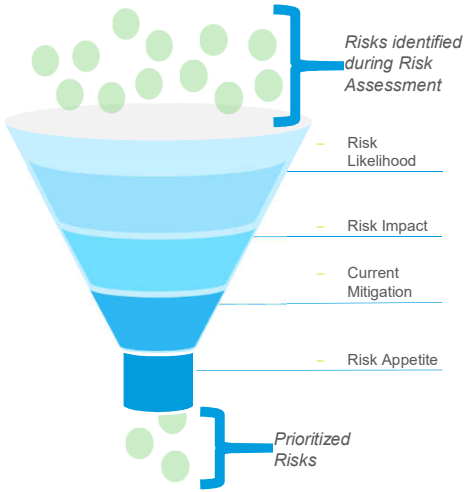


Stakes are high – Boundaries of risk are expanding – Industry specific complexity demands subject matter expertise – Resources are scarce

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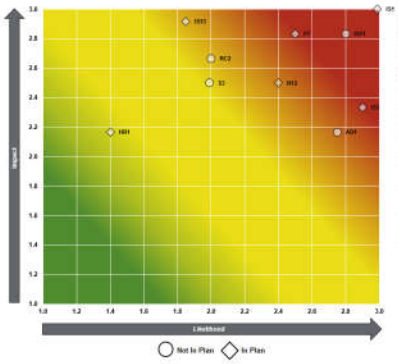
Risk Assessment Approach and Results



Examples of risk factors considered include, but aren't limited to:

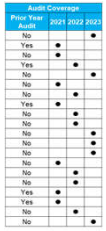
- Degree of impact to patient care or employee safety
- Degree of impact to reputation and commitment to your community
- Legal or regulatory risk considerations
- Degree of relationship to strategic clinical or financial initiatives
- Degree of direct financial impact
- Degree of process or system change
- Degree of oversight or personnel change
- History of known process or system vulnerabilities
- Existence and degree of upstream and/or downstream implications of process or system change (unintended consequences)
- Speed of risk onset or estimated risk response time







High Risk Auditable Entities		
Risk ID	Auditable Entity	Severity Risk Rating
1	Cloud Transition	8.50
2	System Credentials	8.00
3	Behavioral Health	8.00
4	Physician Contracting	7.50
5	Data Stewardship and Integrity	7.50
6	Security/Cybersecurity	7.00
7	Nurse Staffing	6.50
8	Payroll	6.50
9	Recruitment	6.50
10	Business Continuity/Disaster Recovery	6.00
11	Financial Reporting	5.50
12	Change Management	5.50
13	Patient Experience	5.50
14	Hospice and Home Health	5.00
15	Patient Financial Services	5.00
16	Drug Diversion/Controlled Substance	4.67
17	Disbursements Cycle	4.67
18	Inventory Materials Management	4.67
19	Physician Group Acquisitions	4.67
20	Pharmacy	4.67



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Emerging / Top Health Care Risks

Main Areas	Sub-Area	External SME - Top Healthcare Risks
Reputation / Brand		Health Equity Measurement, Reporting and Improvement
		Public Relations / Public Response Management: Clinical, Social, Environmental
Clinical	Nursing	Clincal Staffing - Supply / Demand / Risk Management
	Labs	Lab Operations Productivity and Throughput Measurement
	Pharmacy	COVID Vaccine Administration/ Distribution: Inventory and Refrigeration Management
		Pharmacy Operations - Service Level Measurement, Productivity and Quality KPIs
	Practice	Physician Performance Measurement / Readiness for Value Based Care / APMs
	Quality	Clinical Quality Measurement, Reporting and Improvement - Value Based Care / APMs
Shared Services (non-IT)	Revenue Cycle	Price Transparency Strategy vs. Meeting Minimum Requirements
		Post Public Health Emergency - "Unwinding" Eased Restrictions Related to Billing and Coding
		Use of third party vendors across revenue cycle
	Human Resources	Employee Equity - Diversity and Inclusion / Gender Measurement, Reporting and Improvement
		Workforce of the Future - Work from Home Productivity Measurement
	Supply Chain	Supplier Diversification and Risk Management
		Inventory Management of High Dollar Consigned Inventory
IT		Cyber - Ransomeware Response Protocols and Insurance Coverage
		Network Segmentation
Education		Medical Student Involvement in Patient Care
Research		Adherance to Trial/Research Program Requirements
		Grant Management / Designated or Restricted Donation Governance

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Managing Risk: 3 Essential Components

In order to build and strengthen the capabilities required to anticipate, understand, plan for and respond to the emerging risks and opportunities that exist throughout your enterprise and across the continuum of care you may wish to consider the following:

Cross Department Collaboration, Cooperation and Coordination

Deliberate and meaningful teaming by multiple departments to achieve the common, collective goal of risk management

- Internal Audit
- Compliance
- ERM
- Cyber
- Security and Privacy

Utilization of Technology / Tools

Audit Management and/or GRC software that centralizes risk management activities, enables collaboration and provides real-time visibility

- Risk Assessment Methodology, Process and Results
- Auditing and Monitoring Plans
- Audit execution / Project Management
- Audit Reports / Results
- Audit issue tracking and follow-up
- Departmental performance against metrics
- Supporting documentation / work papers

Leveraging Data Analytics

Identification, collection, review and assessment of select organizational data that provides insight into potential risk trends and informs risk response

- Enables both Assurance and Advisory roles
- Proactive and Predictive
- Likely already exists - just need to know where to look

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In Summary – Lessons Learned

In order to build and strengthen the capabilities required to anticipate, understand, plan for and respond to the emerging risks and opportunities that exist throughout your enterprise and across the continuum of care you may wish to consider the following:

Cross Department Collaboration, Cooperation and Coordination

- ✓ **Talk** – Early and Often
- ✓ **Share** – Ideas and Information
- ✓ **Trust** – Evidence and Instincts
- ✓ **Organize** – Who/What/Where/When/How
- ✓ **Standardize** – Taxonomy and Tone
- ✓ **Formalize** – Methodologies and Expectations
- ✓ **Culture – Culture – Culture**

Utilization of Technology / Tools

- ✓ Determine **what tool you need** and **how you are going to use it**
- ✓ **Leverage the functionality** that exists – get what you pay for
- ✓ **Commit to the process – set it up right and invest the time to educate the team**
- ✓ **Establish, encourage and enforce expectations of use – eliminate unnecessary workarounds and inconsistent use**

Leveraging Data Analytics

- ✓ Don't over complicate it
- ✓ Utilize the data analytics that already exist
- ✓ Listen and learn from key stakeholders
- ✓ Ask about it during Risk Assessment

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