

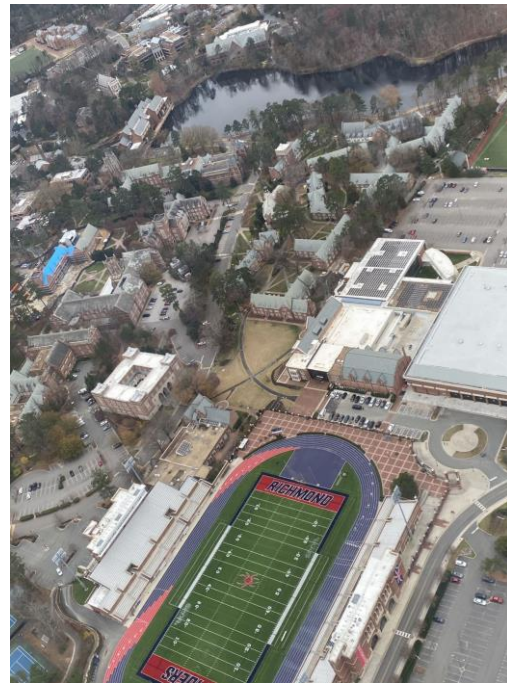
A Glimpse Inside Analytics in Healthcare, VCU Health System

Presenter: Cam Holmes

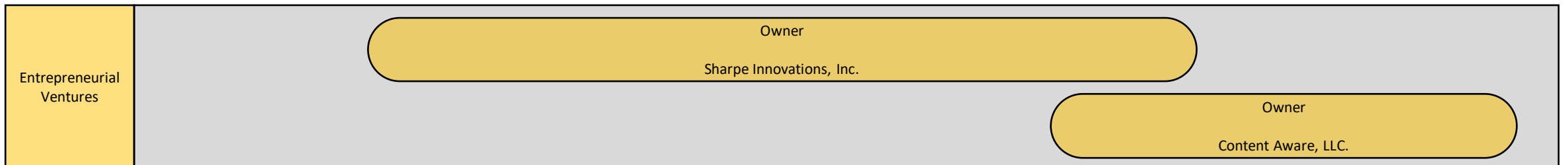
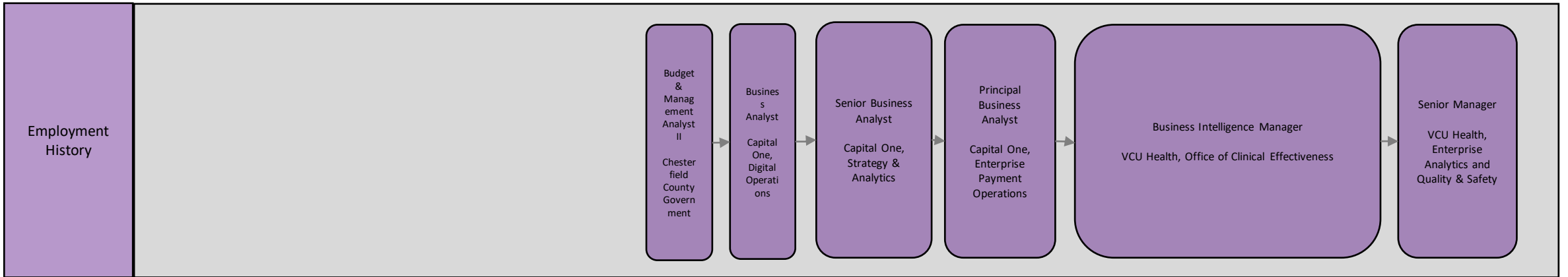
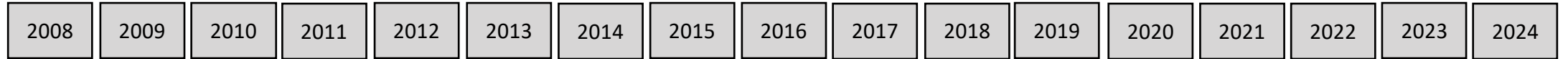
April 17, 2024



About Me

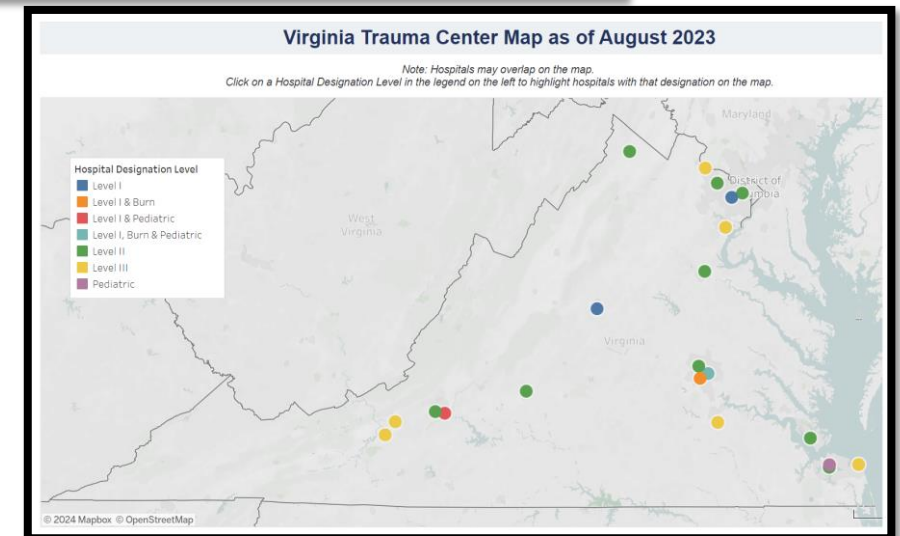
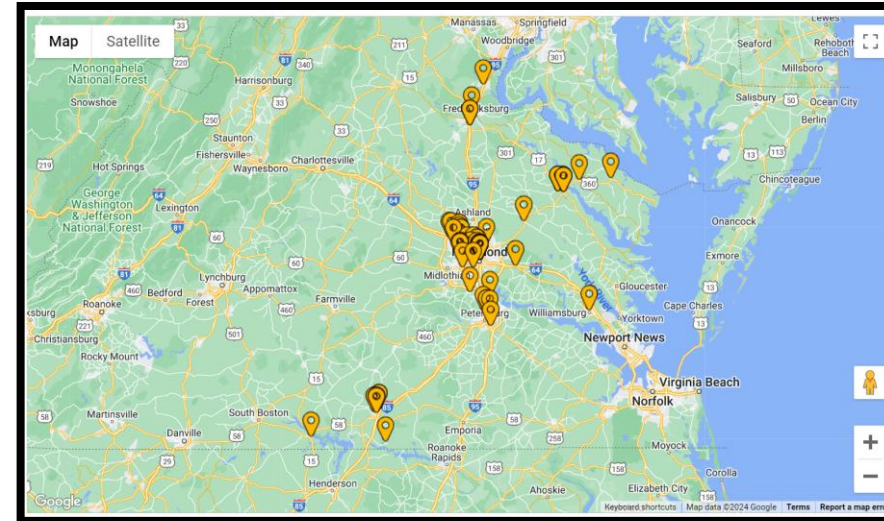


My Timeline

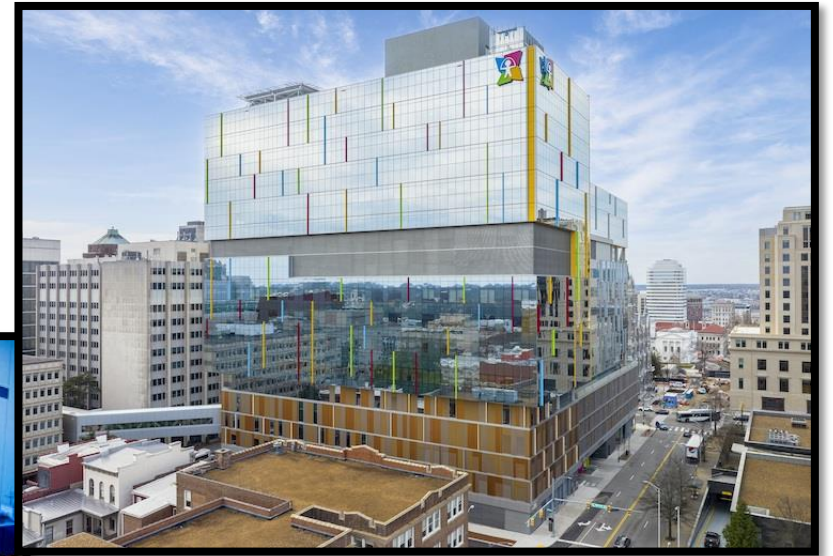


VCU Health System

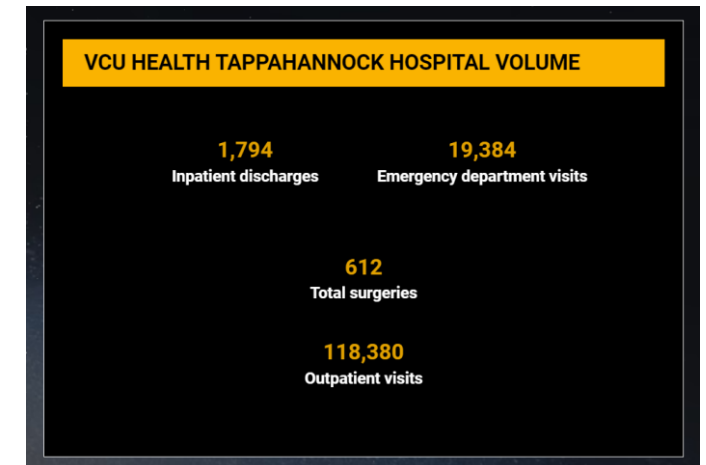
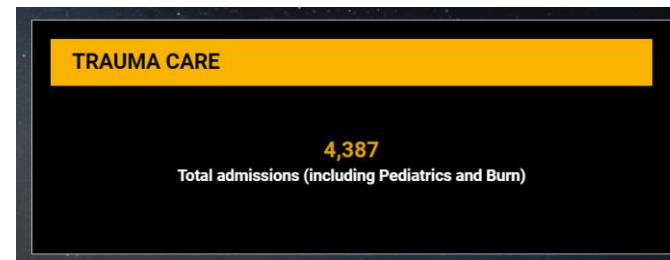
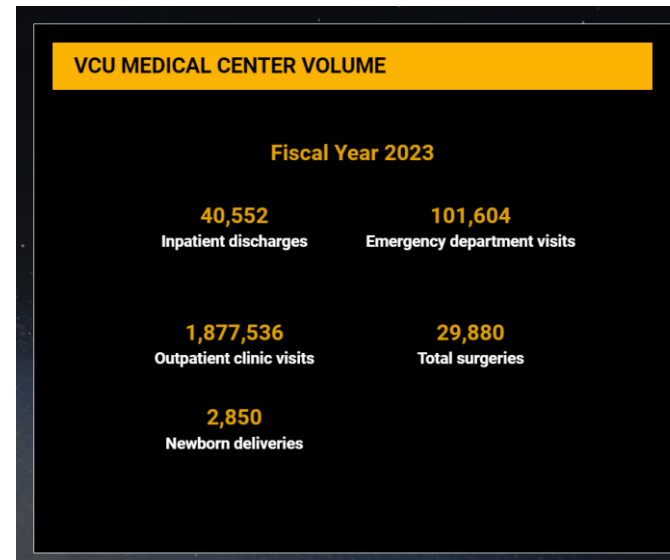
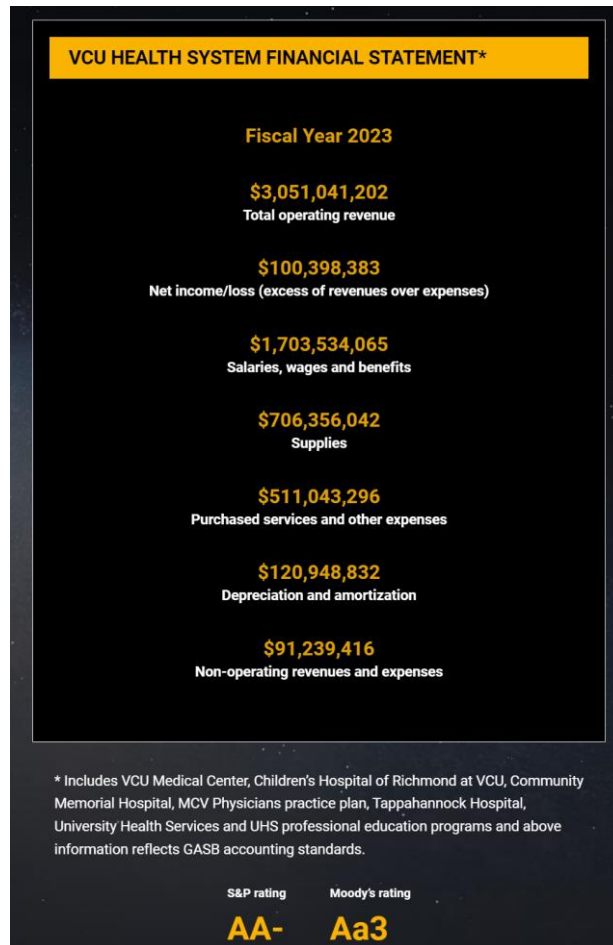
- VCU Health is a Level 1, Tier 1 comprehensive academic medical center in central Virginia and the only medical center in Virginia to hold all three trauma designations
 - The Medical Center is one of six Level 1 trauma centers in Virginia
 - One of three burn trauma centers
 - And one of two pediatric trauma centers
- VCU Health System is composed of several hospitals and clinics, one medical college, and four schools of health sciences (Dentistry, Health Professions, Nursing, and Pharmacy)
- The Medical Center is also the region's safety net, indigent care, department of corrections, and fallout center
- VCU, and UVA, are the only comprehensive academic medical centers in Central Virginia
- VCU is recognized by the American Nurses Credentialing Center as a Magnet hospital, the highest honor for nursing
- The Virginia Commonwealth University School of Medicine is the largest and oldest continuously operating medical school in Virginia
- The Massey Cancer Center is one of only two NCI-designated Comprehensive Cancer Centers in Virginia
- Children's Hospital of Virginia (CHoR), is the region's only full-service children's hospital
- The health system employs more than 800 physicians in 200 specialties, and over 14,000 in total



Source: [Virginia Department of Health: Virginia Trauma Center Maps](#)

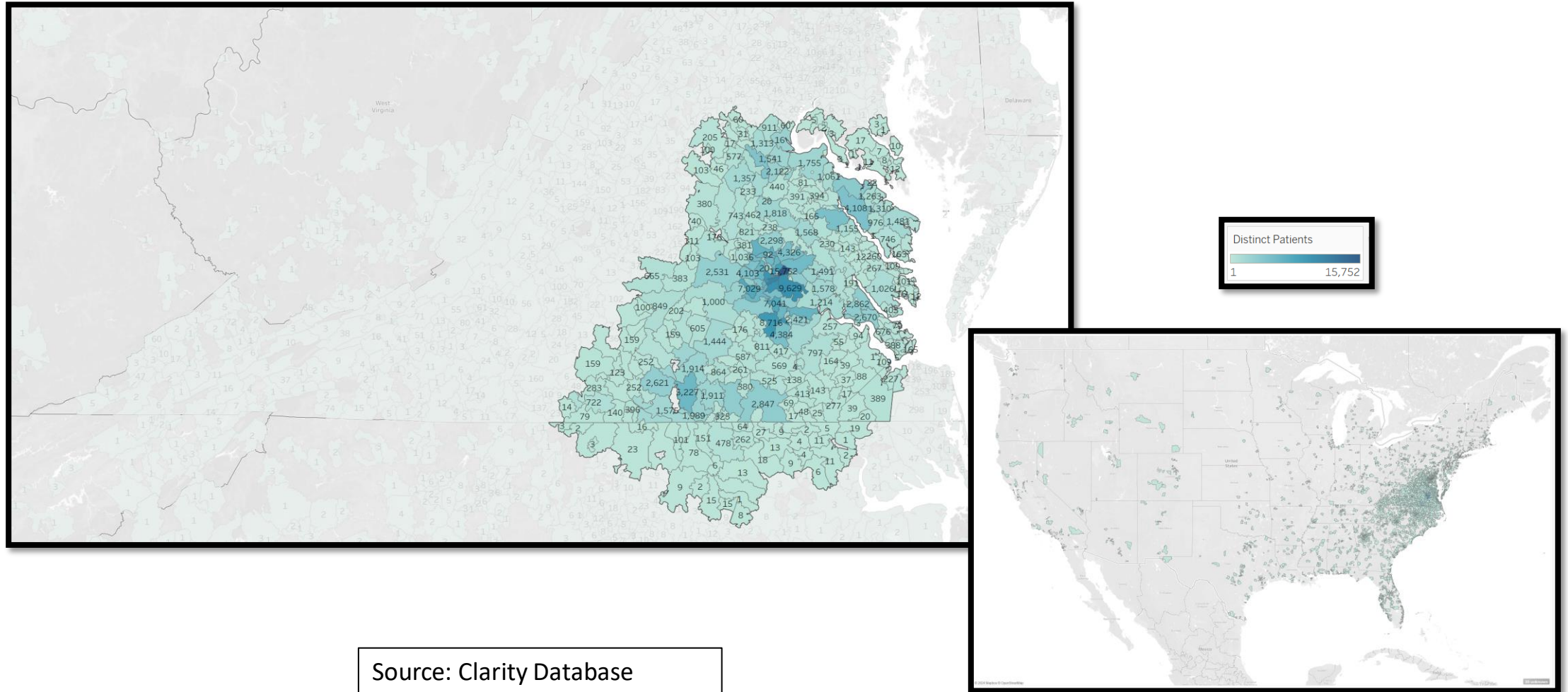


Impact on the Community



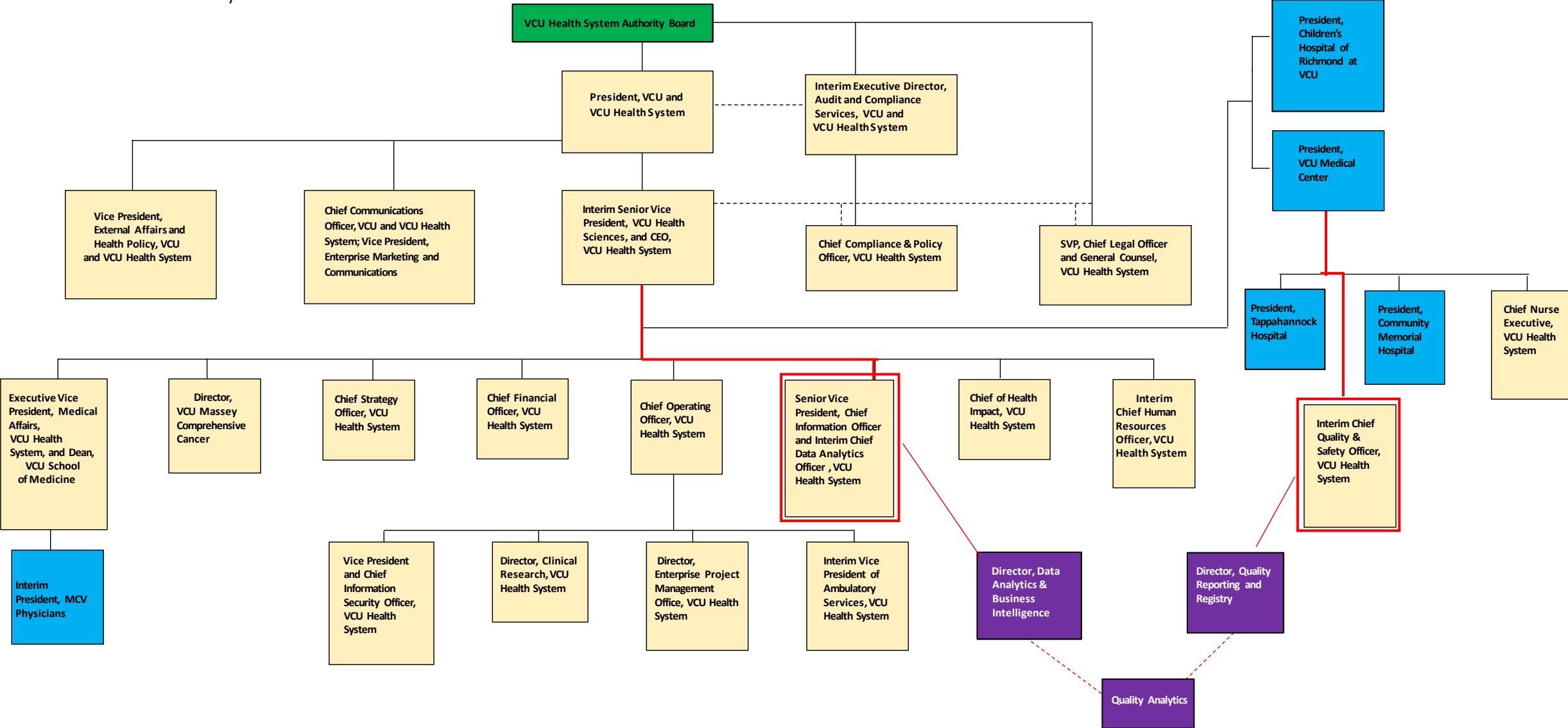
Source: [VCU Health Facts and Figures 2022-2023](#)

In 2023, VCU Health saw patients from each state, including Alaska and Hawaii. The Health System saw 371,000 distinct patients, with 349,500 coming locally from Central Virginia and North Carolina



VCU Health System Organization Chart

Current as of January 2024



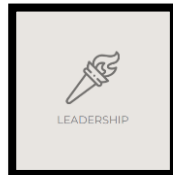
Enterprise Analytics and Quality & Safety

Enterprise Analytics (EA)

- Reports to the Chief Information Officer
- Supports the health system as a shared service, like the horizontal models IT and HR have at most organizations
- Most health systems use a “hub and spoke model,” meaning analytics is centralized directly under EA, but each Team has subject matter experts who know specific parts of the business (Finance, CHoR, HR, Cardiology, etc.)
- Normal work consists of new data and tool creation, technical implementations, data movement, report writing and monthly reporting, and analytics and data science that supports business and academic needs
- Teammates have backgrounds in IT, nursing informatics, analytics and data science, web development (UX/UI), and ETL
- Most have degrees in economics, business, finance, computer science, or health information systems

Quality & Safety

- Reports to the President of the Medical Center
- Supports the health system, similarly to the shared model of HR and IT, though the chain of command for Quality & Safety rolls up to the Medical Center, and not the CEO of the Health System → generally the Chief Quality Officer rolls up to the health system CEO
- Uses a centralized model, similarly to EA, where team members have SME knowledge of certain lines of business, and those are the ones they support
- Team consists of Process Improvement, Project Management, Analytics, and Operations
- Normal work consists of improving patient care, recovery, and outcomes by leveraging traditional analytics, LEAN, and external benchmarking to identify areas of risk or opportunity, then pulling in project management to help implement strategies
- Teammates have backgrounds in nursing, informatics, pharmacy, project management, LEAN / Six Sigma, and analytics
- Most have degrees in nursing or business. My team happens to have degrees in economics and math



What is Analyst-Type Work?

- At the most basic level, analysts turn disparate data into meaningful and actionable information that inspire change
- Irrespective of industry, analysts turn raw data into information by leveraging the company's many resources to investigate questions from all angles of the business, but mostly from business leadership and executives
 - Practically what this means is analysts and data scientists help the organization by converting data into information, and they do that by having three unique sets of skills:
 - SME level knowledge of the business area they support
 - Technical knowledge of connecting data to form information that locates themes
 - Are business minded and can create stories of impact
- How do they do it?
 - Analysts use tools to gather relevant data for a given task and use their SME knowledge of the business and related tools to showcase visualizations, themes, and ultimately share a recommendation to leadership
 - Analytics relies heavily on engagement. Strong analysts will proactively engage the business as they are learning and building understanding of the project they are examining. Strong analysts will continue leveraging the business to bullet proof their work and begin building stories to inspire a recommendation that will improve the business



Support self-service BI users

Build analytical data models

Create data visualizations, dashboards and reports

Identify relevant data and metrics to analyze

Share data insights with business users

Write and run BI queries

My Team's Scope

- Our work is aimed at improving the care, recovery, and patient experience for all patients, at all locations—having said that, we have an emphasis on inpatients
- We sit as technical and business leads on all enterprise sponsored quality improvement efforts
- We have SME-level knowledge of the business, the underlying tools and technology, both internal and external data sources, and how to join and assemble disparate data sources into manageable data we can conduct analysis on
- ...we read and research, code, and use analytics to develop enterprise strategy



Now For the Fun Part!!

Real Life Example

Background:

- Health systems have tremendous amounts of data, stemming from internal health records, CMS, vendors, and many other sources
- We look beyond internal data and through registries for a variety of reasons, one being as a method for benchmarking peer performance
 - Registries are complex, with members required to meet guidelines to share and access member data
- Being a member allows organizations to download raw data and analyze their performance against “like” institutions. Due to requirements and complications, most vendors have canned reports that can be helpful, but most health systems have analytics embedded in operations and those folks translate raw data to perform deep analyzes and start conversations on organizational change

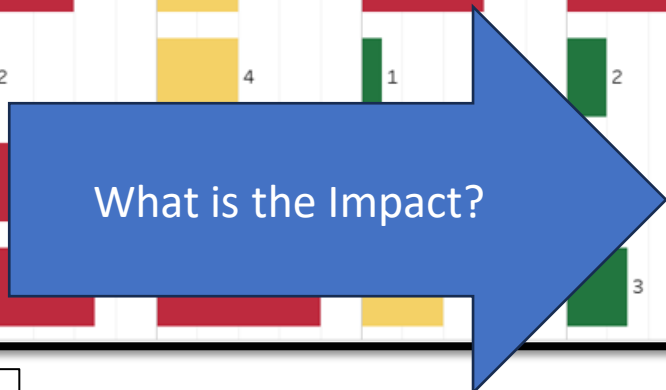
The Task:

- The CEO recently met with their Leadership Team and wants to benchmark VCU’s quality compared to medical centers before next quarter’s check in
- Depending on the results, strong performance could lead to directed marketing spend, while poor performance could ensue project improvement efforts and segmented departmental trainings
- The information provided to the CEO will subsequently be shared amongst the CEO’s Leadership Team, and if need be, budgeted efforts will be negotiated with the Board for next fiscal year budget and EPMD will prioritize efforts against the existing backlog



Rank of Local Competitors' Patient Satisfaction Scores (HCAHPS)

Time Period: April 2022 – March 31, 2023



Source: [Centers for Medicare & Medicaid Services](#)

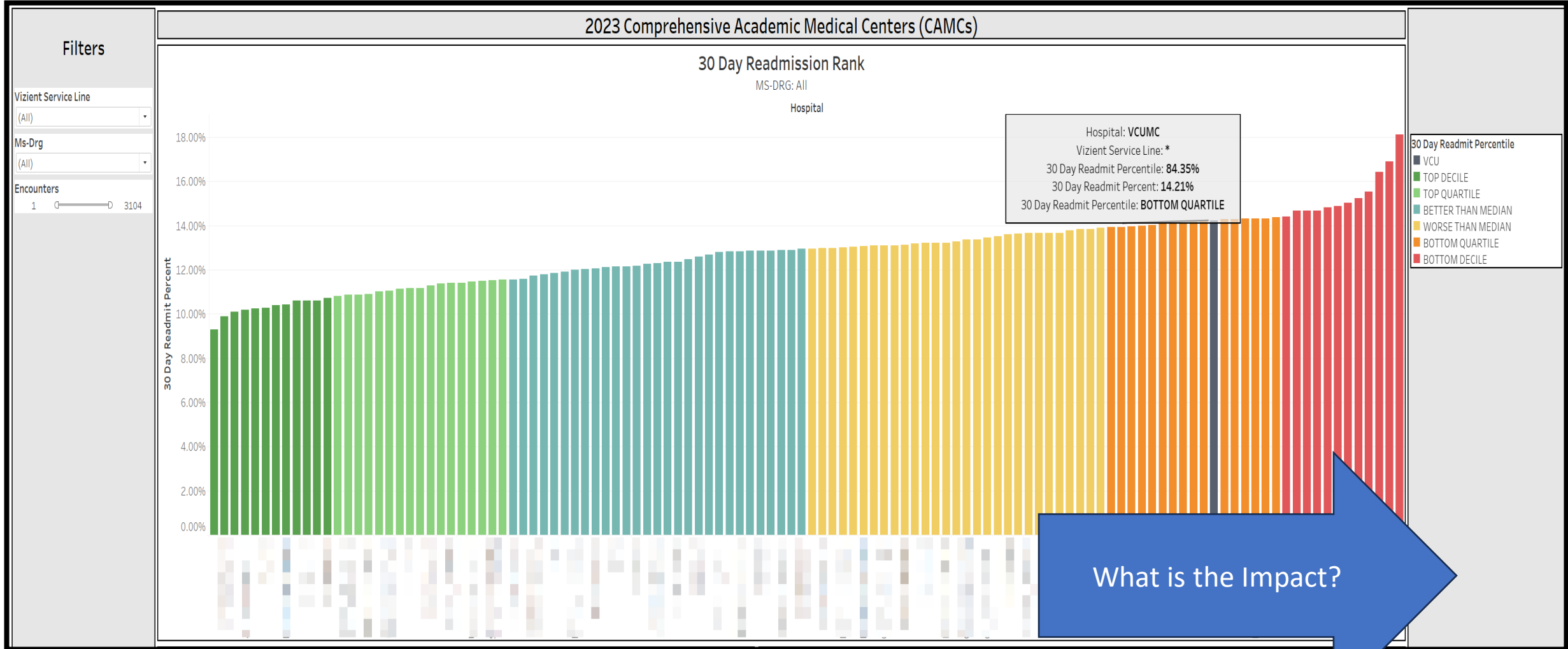
Positive Patient Satisfaction Scores (HCAHPS)

- When analytics produces results like the HCAHPS scores on the previous slide, we celebrate!
 - We celebrate that we are delivering on our mission to provide great care and great service to our community
 - We celebrate that our institution is being recognized as the highest performer in the Richmond Area
- Discovering VCU leads the Region, directly influences marketing spend to help promote our health system. Subsequently on areas where VCU was middle of the pack, would ensue process improvement efforts on why the health system underperformed on hospital cleanliness and quietness—with budget conversations promptly following additional analysis
- Scores like these also help influence our reimbursement from CMS, meaning our institution receives a larger portion of dollars from CMS' annual withholding, and as a non-profit, we are able to reinvest these dollars

What Happens When Poor
(or Really Poor) News is
Uncovered?

Rank of Comprehensive Academic Medical Centers' Readmission Rates

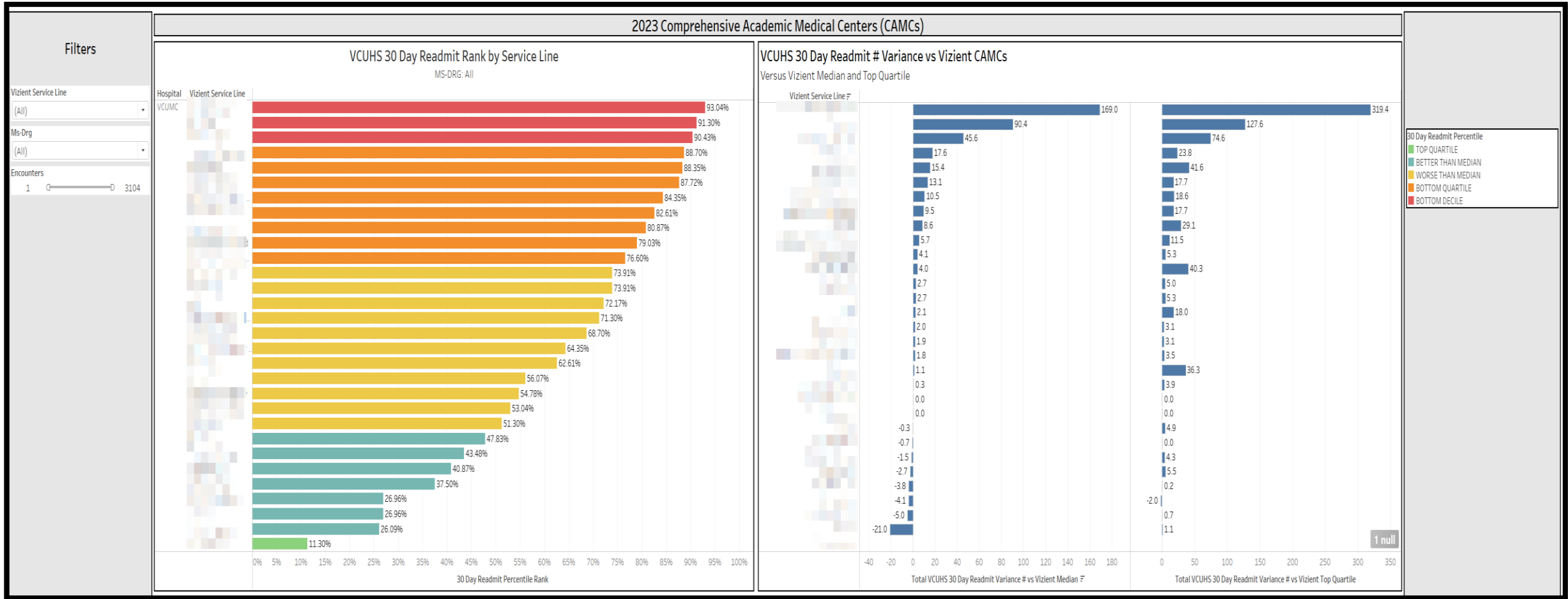
Time Period: January 1, 2023 – December 31, 2023



Source: Raw Data Analyzed from Registry

Rank of VCU's Service Line Readmission Performance, Relative to CAMCs

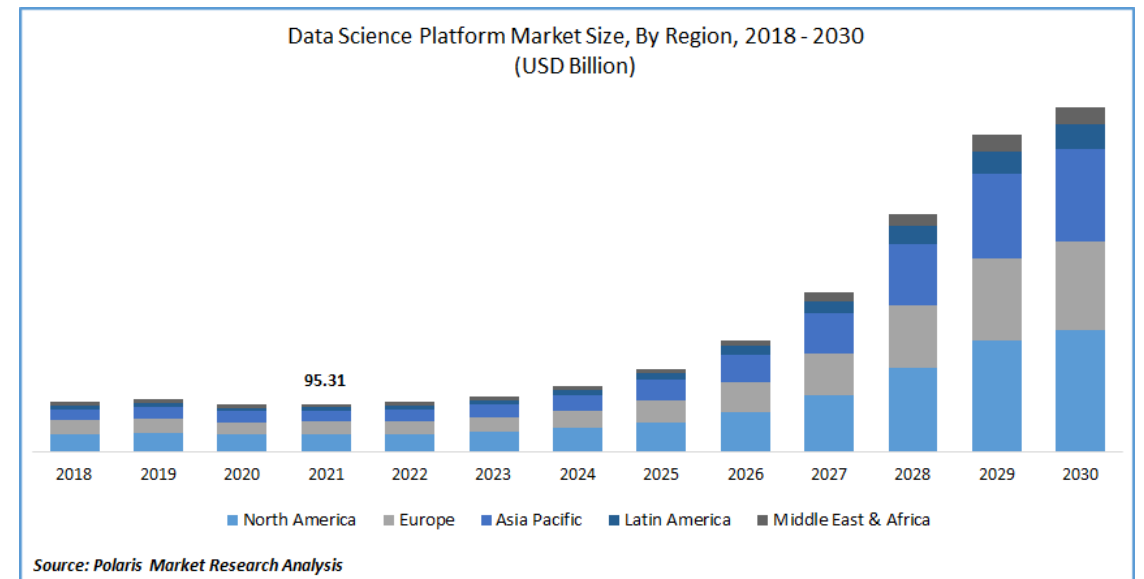
Time Period: January 1, 2023 – December 31, 2023



Concluding Thoughts

- While now everyone has had some exposure to the impact of analytics in healthcare, please realize, healthcare is not unique, and all industries use analytics to research questions and identify opportunities
- All strong companies, irrespective of industry, should have analytics as part of their strategy, and as a result, the market for data scientists, AI / machine learning engineers, SQL / python coders, and analysts is growing at a faster rate than most other positions—with the data science market growing at 20-25% annually, and AI / ML growing even faster

- Most recent grads begin their career as an analyst, in some form or fashion. Whether they land in banking, agriculture, oil and gas, fashion, social media, academics, agriculture, healthcare, management consulting, et al.
- Developing a few skills in analytics and pairing those with your passion in a specific industry, can be a recipe for success!



Source: [Polaris Market Research](#)

Feel Free to Ask Questions and My Contact Information is Below

- [Web Portfolio](#)
- [LinkedIn](#)
- [Email](#)



Cam Holmes

Appendix

Class Profile



Maxwell Davis
-Biology undergrad
-Crafting his resume and networking amongst the community



Ross Miller
-Government undergrad
-Interviewing for governmental consultancy roles



Dylan Siesky
-Economics undergrad
-Will see firsthand how health systems operate following a sport medicine procedure



Alicia Dawson
-Business and Mathematics undergrad
-Conference championship is priority and will be actively looking afterward



Gena Pike
-Marketing and Finance undergrad
-Actively looking and networking for opportunities within RVA



Lucy Yeomans
-English undergrad
-Applied for mission-based work with the Peace Corps and open to coaching positions



Joe Gooley
-Leadership Studies and Entrepreneurship undergrad
-Engaging with network in Boston



Faith Pinckney
-Musicology undergrad
-Looking to join Joe Gibbs Racing



Whitney Liebler
-Business Information Technology undergrad
-Recently began Master of Science in Management program

Notes

- “A Glimpse Inside brings” together Master of Science in Management (MSM) students with representatives from notable firms to provide insight into a company’s inner workings. The program gives participants the opportunity to learn from corporate executives about a company’s industry, corporate philosophy, culture, and hiring practices
- Masters of Science and Management is positioned under the B-School at Richmond
- There are eight students in the inaugural class, Whitney is the ninth and has begun taking courses
- 60% of the class are athletes, representing football, track, swimming, and baseball
- The MSM Program is a great resource for athletes who have a fifth year of eligibility in their related sport
- Most students are coming from academic schools that are one level below Richmond’s sports program
- The students have various practices and team meetings, but I have an attendance policy as part of their MSM Program. As a result, some students have skipped practices or matches in order to attend class
- All students attend the “A Glimpse Inside” series
- Most students are fifth year students and have had some sort of internship experience. Most are looking for roles around Richmond
- The class’ Career Leader Report shows strong behaviors towards entrepreneurship
- All students have a solid grasp of leadership skills, hard work, and dedication

Questions to help answer

1. Who I am
2. Ask who everyone wants to do
3. Company overview
4. Org chart
5. What I do and what my role is
6. Example of my work—
7. My journey through school and career journey
8. What does my week look like
9. What was your major in school and did you get a graduate degree?
10. What has been your career path to date from graduation to your current role?
11. What specific skills are needed for your current role?
12. Are those different than the skills needed for an entry level job in your area?
13. Did you get those skills in school or elsewhere?
14. What is a week in your life like?
15. What are the expected deliverables from your job?
16. Can you show us an example of any sort or just a template without content?
17. How many people in your organization have roles like yours?
18. What advice might you have for the next generation of professionals?