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DIUC22 Presentation: Accelerating Your Analytics Journey through an Application-Based Strategy

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Vice President
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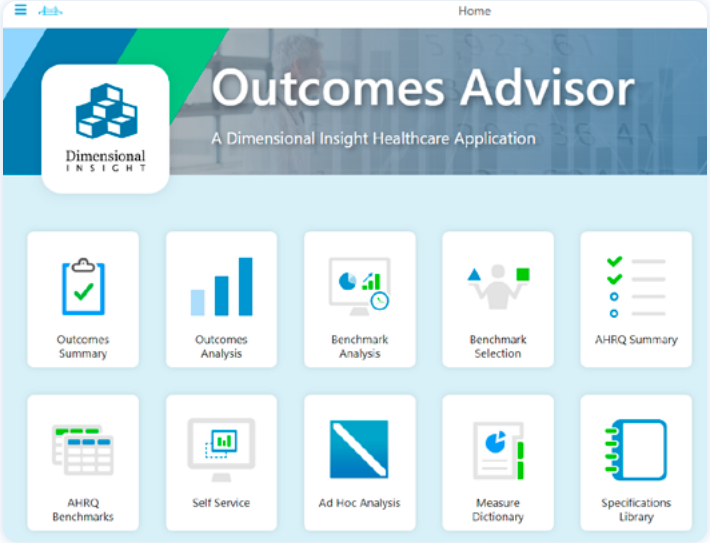

How can you fast-track analytics ROI and reduce the amount of work in development? Learn how an application-based strategy can help you achieve analytics success across the enterprise.

Duration: 28:46

Using Analytics to Get a Pulse on the Health of Your Emergency Department

Kathy Sucich

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When everything is running as intended, a hospital is like a well-oiled machine. Each department plays a role in keeping the hospital working. But one weak link in the chain can negatively impact the entire organization.

The emergency department is critical to the overall flow and financial health of your hospital. And one of the lessons from the last few years is that it's even more critical that your emergency department is running at peak efficiency. This helps both hospital finances by getting patients in the door and patient care, as patients don't have to wait for long periods of time and can quickly and safely get to where they need to be without the potential for exposure.

However, the emergency department faces unique challenges. As Nora Lissy, RN, BSN, MBA, Dimensional Insight's Director of Healthcare Implementations, says, "A poorly run emergency department can result in poor customer service, low employee morale, and the increased potential for poor clinical outcomes."

Emergency department challenges

What are some of the challenges faced by emergency departments? And how can analytics help address them? Let's examine the biggest issues EDs face:

Capacity: According to the Centers for Disease Control and Prevention, emergency departments handle 130 million visits per year in the United States. If there are more patients in the ED than can be treated, everyone suffers. Patients aren't getting the care they need, and the department can't reach its maximum potential.

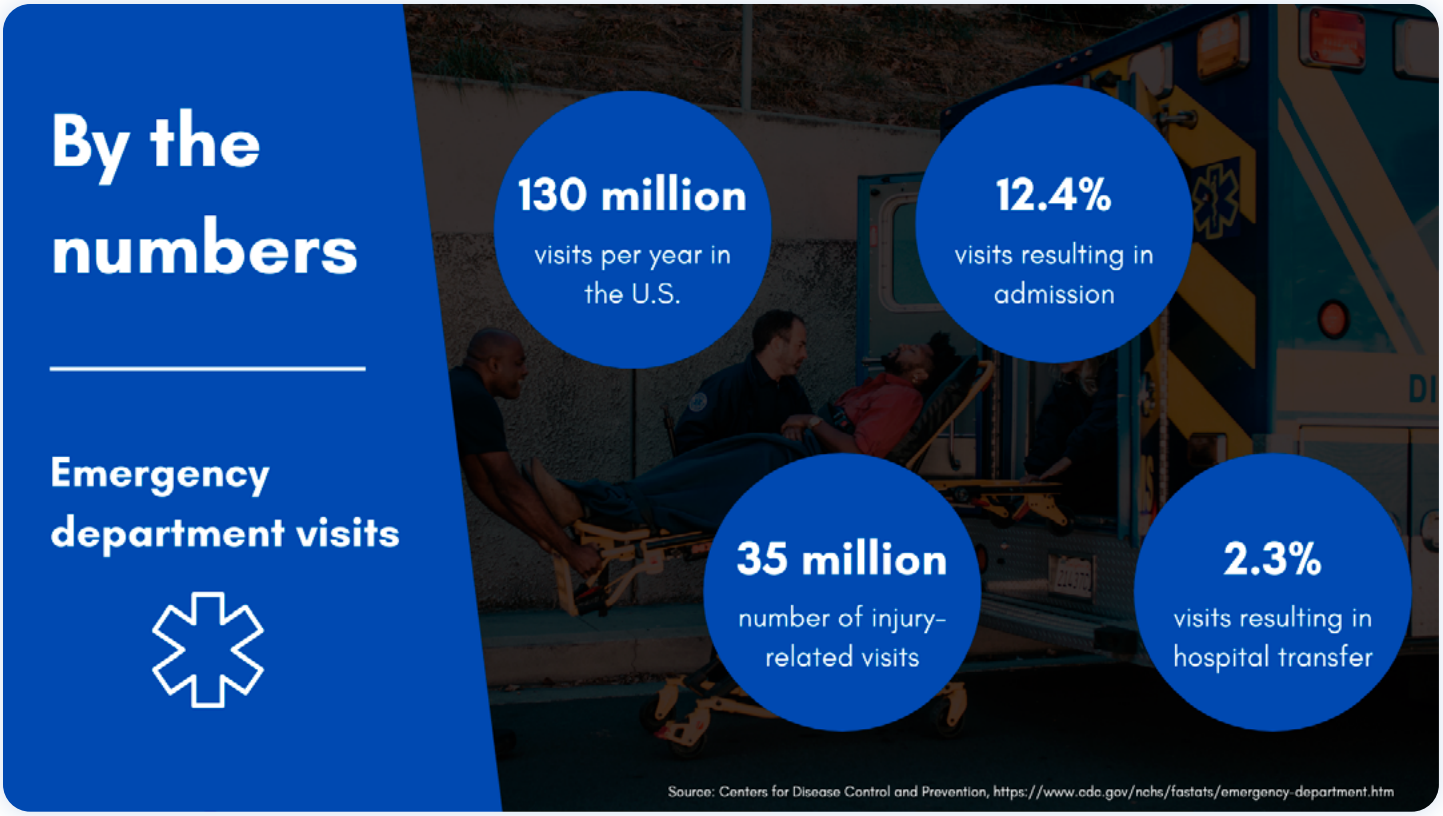
Throughput: The American College of Emergency Physicians (ACEP) estimates that about 70% of patients admitted to a hospital enter through the ED. Moving these patients requires communication both in the department among admitting staff and physicians, as well as communication between the department and the hospital at large. Bottlenecks can have a rippling effect throughout the system, leading to substandard care, unhappy patients, and higher costs.

Finances: When operations are running smoothly, an emergency department should serve as a positive financial resource for a hospital. However, when it's poorly run, the ED can find itself losing money. The complexities include lost revenue if a patient ends up leaving the hospital before being seen due to a long wait time.

Staffing: Like any business, hospitals can only succeed when they are putting staff members in the best position to treat patients. This includes making sure employees are not overworked, and that shifts are balanced in a way that keeps the emergency department from being over- or under-staffed at different times during the day.

Ancillary services: Ancillary services in the emergency department include everything from lab services to radiology services to diagnostic studies. When turnaround times for these services are delayed, that can affect everything from throughput to the ED census.

While these challenges are certainly daunting, they can be addressed through the improved insight that comes from deploying an analytics solution. Analytics helps hospitals and health systems to get a pulse on the health of their emergency departments and take swift action to make improvements. As Dimensional Insight's Nora Lissy says, "Analytics provides the data to streamline processes, improve patient outcomes, and identify areas of transformation in the emergency department."



Gaining insight into the health of the ED with Dimensional Insight

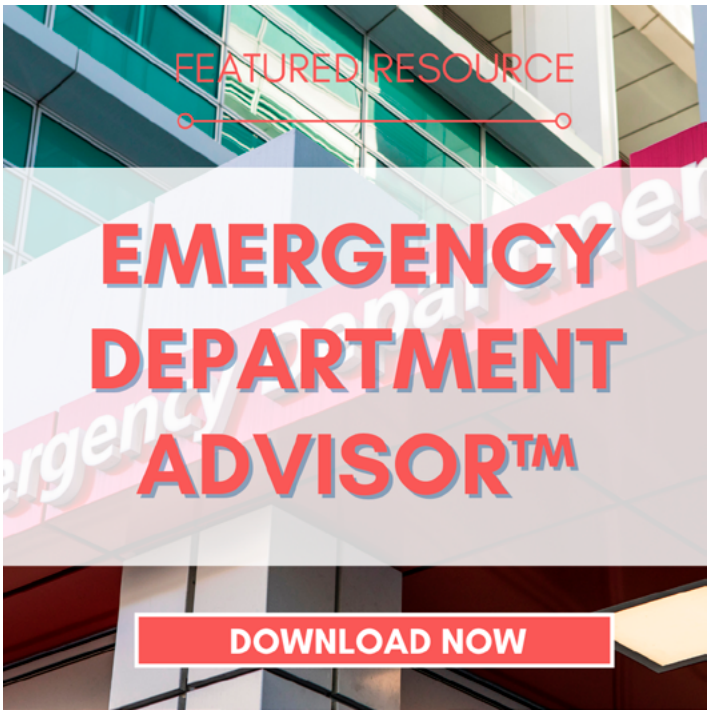
At Dimensional Insight, we have developed our Emergency Department Advisor application with the needs of ED users in mind. Our healthcare industry expertise combined with our customer-focused, outcomes-driven methodology has led us to create an application that, quite simply, gets the results you need.

Emergency Department Advisor helps hospitals by:

- Identifying potential bottlenecks and uncovering opportunities for improved ED throughput.
- Flagging patients who return to the ED and supplying detailed information from all ED visits. This allows for analysis of frequent flyers, gaps in care, and better care management.
- Providing a comprehensive compilation of ED metrics around efficiency, throughput, effectiveness, and outcomes, all in one single application.

The metrics used for Emergency Department Advisor, while ED-specific, can also be shared across Dimensional Insight's suite of applications throughout the hospital. This is the benefit of deploying applications from Dimensional Insight's enterprise analytics platform. While departmental applications from other vendors require you to start from scratch with each new project deployment, with Dimensional Insight, the logic and metrics are available for shared use as all applications are part of a single "family" of products. This results in data integrity, ultimately leading to trust in data across the system, as well as far less time to results and fewer dollars spent in the process.

Want to learn more? Get more information on Emergency Department Advisor and learn what makes Dimensional Insight unique in our approach to analytics.



Meet the Dimensional Insight Team: Gabrielle Amarosa

Over the past several years, the number of healthcare applications built at Dimensional Insight on Diver Platform has exploded. We now have 15 healthcare applications! Gabrielle Amarosa is a crucial member of our healthcare applications team. I sat down with her this week to better understand her part in developing these applications – and other responsibilities at Dimensional Insight.

Rose Curtis

Senior Marketing Manager
LinkedIn

Gabrielle, what is your role at Dimensional insight, and what responsibilities does your role entail?

My title is "Lead Healthcare Business Intelligence Consultant," and I work on the Healthcare Applications Team. Our team is exciting. Our primary mission is to design, develop, and maintain healthcare applications such as Hospital Operations, Ambulatory Operations, etc. We also have responsibilities with direct customer work.

Our team does direct customer work partly because of the high demand for consultants and partially because customer work informs our application development work. For example, customer work can reveal feedback on the pain points and where we can improve applications. Working with the customer creates a "cycle of feedback." I spend about 60% of my time on application work and 40% on customer work.

More specifically, my responsibility is to be involved in the design and planning of new applications. I help discuss what belongs in that application and which metrics we want to track, and then we work backward to plan how we technically develop that application. I'm also extensively involved in the development – the code work – of creating and updating those applications.

Once an application is stamped and sent out the door, we support the organization's consulting arm as they install and customize it. We can provide some expertise there, especially when it's a new application for the consultant. Once an application is launched and used by customers, we provide regular maintenance, including fixing bugs and making improvements. I'm also very involved in planning for improvements and doing updates.

Do you use Diver to develop applications?

Yes. We work on specific application development using our tools, the entire suite of the Diver Platform. We use the same tools that our customers use.

Do you mean ProDiver, Workbench, and DivePort?

Yes, because each application touches all three tools. And typically, we work on Measure Factory-based applications.

Customers have access to all the tools we are using to build applications. We don't have any special "secret tools."

Tell me more about the process of developing applications.

What's remarkable is we're in a fortunate position to be centralized and able to talk to many hospitals and healthcare systems. So we have a direct line to hearing what problems they are trying to solve.

When creating these applications, even though we're using available tools, we're aggregating all that firsthand industry knowledge and saying, "To solve this problem, here's what we would put into it. "This would be a jumping-off point for a customer to solve these problems or do that analysis. I think that's special about our work process – the integration of all we know as a team. We can see which initiatives are vital to customers. Knowing what is critical is helpful when deciding our next application initiative.

This sharing of expertise is even something that is happening organically within our customer base.

I witnessed it at our users' conference (DIUC). I learned that several customers I work with have an email chain amongst themselves (Diver users from three different healthcare organizations). They will often reach out to each other to brainstorm how to solve a problem they're facing at their organization using Dimensional Insight technology before or in addition to reaching out to us directly. I was impressed by how our customers have a community of support among themselves.

Who are your customers, and what do you do for them?

I have worked with a variety of customers over the past three years. I'm currently involved with Robert Wood Johnson Barnabas Health (RWJBH) and Saratoga Hospital.

At Saratoga Hospital, they installed our Hospital Operations application a couple of years ago, in 2020. Our contact there is proficient in the Diver Platform. He does a lot of custom work that pushes the boundaries of what our applications do. Occasionally, he'll reach out to me when he has questions or tries to do something out of the box. Sometimes he needs to brainstorm or get feedback on why something isn't working as he expects. My role there is as an advisor and collaborator on custom pages and applications he's building.

My role is different at RWJBH. They started with a standard Ambulatory application, but everything they're doing now is entirely custom. So I help them with various custom reports and custom functionality.

Is there anything about your job that would surprise people?

People might be surprised by how collaborative our team is and how much cross-team collaboration we do. Because we are very technical, people may think we work in little bubbles, but it's not like that. There is genuinely an emphasis on listening to the customer and creating applications that cater to their needs. I discussed that earlier in the "cycle of feedback."

Everyone on the team has at least one customer they are working with consistently, bringing their feedback back to our group. We also regularly meet with the Cambridge office developers to discuss functionality as we create more complex applications. We collaboratively request new features, not just putting in a feature request but saying: "This is the type of result we're trying to get. We can think of a lot of ways to go about it. What's feasible? What could we see coming in the next minor version? The next major version?" We also collaborate with the consulting team on Measure Factory's best practices and what they want to see in future application versions.

Have you seen our technology benefits customers?

Yes, I have. I've gotten a lot of positive feedback from working with customers. For some background, healthcare is a slow-moving industry. It is slow because the data and the practices are highly regulated – and for a good reason. There is so much personally identifying information. It can be difficult to transition organizations when everyone's trying to focus on patient care. It is possible to have technology aid those goals. But the adoption piece can be challenging because it takes time to learn new things, and time spent learning is not directly spent focusing on a patient.

With healthcare being such a slow-moving industry, many processes are still manual or Excel-based. Sometimes there are issues with the data governance piece because there is information from many systems. We often see this challenge in hospitals that have switched source systems or have acquired other hospitals.

Hospitals and healthcare systems with these issues might not have experienced a single source of truth in the way we emphasize the concept with the Diver Platform. I've seen this at new customer installations. Once we come in and collaborate with those customers, once they have the Diver Platform in place and start seeing the data and applications, there's always a lot of positive feedback about how they can finally trust the data.

We've had customers say that end users didn't trust their data before using the Diver Platform. But now, when told that they are looking at Diver data, there is more buy-in. That is the most significant benefit I've seen.

Other benefits I've seen are that customers save a lot of time on manual processes and improve their reporting with minimal interruption to what their employees are doing daily.

What is the most difficult aspect of your job?

As I said earlier, we have a mix of application development and client work. Although there are a lot of benefits to doing both types of work, it can be challenging to juggle. So every Monday, we meet as a team, discuss our priorities, and develop a plan for the week. For example, what are the current projects? Are we releasing a new application? Or new functionality?

We go into the week with this plan. But sometimes unexpected customer requirements pop up and must be addressed. Sometimes we help out with support tickets. If something is not working or a customer needs our help – our plans change. Sometimes, these urgent requests come up. So, the most challenging part of my job is being flexible enough to prioritize customer needs while making meaningful progress on our application initiatives.

What's most rewarding?

It is rewarding to finish an application or a new application feature and have it installed at a customer site. But, it is even more rewarding to get feedback that it's working, that it's solving a real problem for them, and that it's making a tangible improvement in what they're doing day-to-day.

Also, we've curated a collaborative team of like-minded people. We love a technical challenge or exciting data problem. We are all invested in what everyone else on the team is doing. As a result, our team culture is enriching. We get to collaborate and be excited when we solve something together. In addition, there is a sense of pride when our teammate has a really good or out-of-the-box idea for addressing a problem.

How long have you worked at Dimensional Insight? And how did your career here begin?

I started as an intern in August 2019, then transitioned to a full-time role on this team in December of the same year. I had a nontraditional background. I had some experience working in disability insurance internships. I was also a high school mathematics teacher for a couple of years after college. Ultimately, I wanted to merge my love for math and data with doing something that felt impactful in a work environment with a positive culture. So that is how I ended up here. It has been a very happy (little over) three years.

What are your favorite types of projects?

I've talked about the type of projects we do, but I also have one part of my role that I haven't discussed yet. That is, I love working on government-regulated measures. For example, the Center for Medicare and Medicaid Services (CMS) has a variety of outcome measures that track hospital readmissions, mortality, the average length of stay, and excess days in acute care (EDAC) after a hospital visit. The measures are technically dense and are updated yearly. Because these measures are part of our healthcare applications, we must keep our applications up to date with any measure changes. We usually provide these CMS updates to our customers in the late summer to early fall.

I've been involved with that process since I joined Dimensional Insight. First, we take the government's documentation and sift through it to see what's relevant to our code base and how our customers use those measures. Then we put together a plan to do an update that causes minimal disruption to our customers and their end users but keeps them up to date with the latest specifications.

Many people don't enjoy working on these CMS updates because government documents can be dry and complicated. But I find it rewarding because those measures are so interesting. They're going to be so crucial to the transition to value-based care.

The CMS updates also allow us to engage with very self-sufficient customers who don't reach out to us often. Every fall, it gives us a chance to check in and say, "Hey, we have the new CMS package. How are things going? What are your current projects? Do you need any help installing this?" So for many reasons, I always look forward to that time of year. I love working on that annual process.

Why should people pick Dimensional Insight over our competitors?

From a technical perspective, our platform is unique. It is not like anything else on the market. It covers everything. Our solution is truly end-to-end, all the way from getting the basics of the data down through data governance and through to some exciting dashboards and visualizations that are accessible and relevant to various data consumers in an organization.

There is also something I touched upon earlier about putting the customer first. If we get a request because a customer is trying to solve a problem we haven't encountered before, we don't view it as a hassle. On the contrary, we consider it an exciting challenge. That is the sort of thing we find fulfilling to do. Everyone is thrilled to go out of their way to work with that customer.

That is something that sets us apart from the competition. We really are customer focused. We love encountering unusual or challenging questions because it pushes us to think differently. We have cultivated a culture where that's what we enjoy doing. Customers with complex problems will not get that sort of treatment from our competitors.

How do you like to spend your time away from work?

I'm lucky enough to live close to my niece and nephew, so I spend a lot of time playing with them. Otherwise, I spend my time reading, playing board games, and attending yoga classes.

What are you currently reading?

I'm currently reading The Prison Healer by Lynette Noni. It's the first novel in a fantasy series.

A book about a healer sounds healthcare-related. Do you usually only read books related to healthcare?

No, no. I mostly read fantasy and fiction. This one just happens to be healthcare-adjacent.

OK! Well, thanks for spending time with me! □

Applications Dashboards: Patterns for Exposing Data

Gabrielle Amarosa

Lead Healthcare Business Intelligence Consultant

On the healthcare applications team, we have developed standard Measure Factory applications for visualizing, analyzing, and understanding data. In addition, our team has identified valuable patterns for creating dashboard templates across related measures groups within applications. Customers can use these to build custom Measure Factory applications or extend one they already have.

To better understand how these patterns expose data, let us look at the Overview, Trends, and Compare pages in one section of our Emergency Department Advisor Measure Factory application.

Figure 1

Figure 1 shows the menu page or starting page of the Emergency Department Advisor application. As shown in Figure 1, the menu tiles break out related focus groups of measures. For this article, let us stick with ED Quality.

Figure 2

The Figure 2 Overview page displays related measures broken out by the Month to Date, Current Complete Month, and Year to Complete Month timeframes, all in one Matrix Portlet In addition, there are subdivisions displayed within each timeframe on this page: Current, Previous, Percent Change, and a visual indicator to communicate whether that number is moving in the desired direction over time or not. This page is interactive and a great starting place for our users to identify measure values or changes in measure values that warrant further investigation.

Something immediately jumps out when looking at this page: our ED Mortality number has increased significantly over the past Year-to-Complete Month. So that's something to keep an eye on.

Figure 3

We may find an answer as to why ED Mortality has increased significantly on the next page, Trends, shown in Figure 3. We can see that the Trends page shows similar information to what we saw on the Overview page, but in a more visual medium. Each measure shows a line chart for 24 months of data. As shown on the Overview page, the Trends page shows Current and Previous timeframe comparisons.

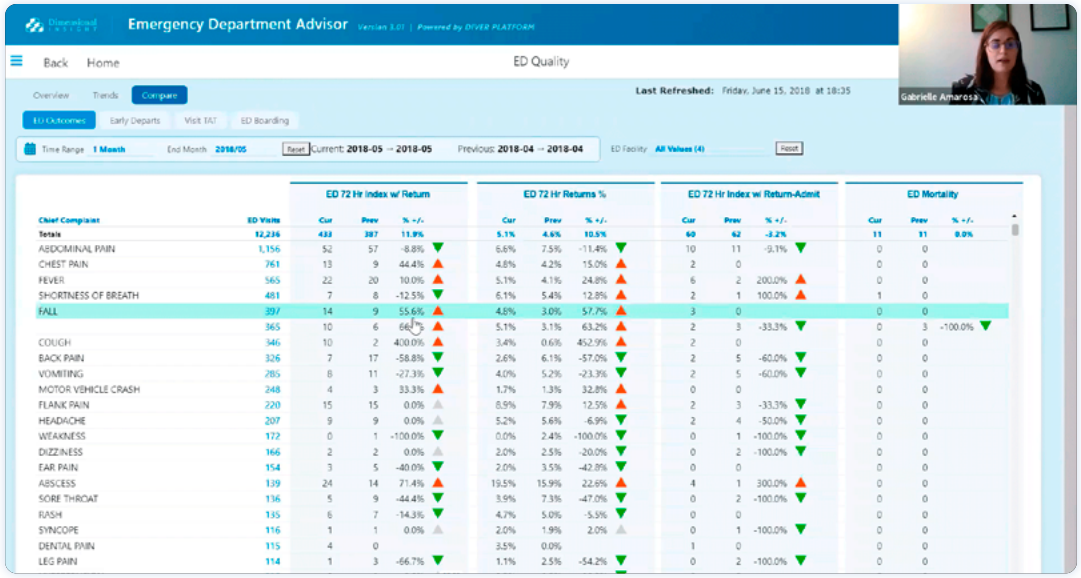


Figure 4

The Trends page is helpful because it can help users focus or narrow in on some patterns that may not have been as obvious on the Overview page without the graphical representation. In addition, the Trend page's visual display of quantitative information helps the user find answers to questions like "have current trends been persistent over time?" For instance, if we consider our previous example, the upper righthand line chart clearly illustrates that rising ED Mortality has persisted over time. It deserves further analysis to uncover an explanation for that pattern

Another thing to note about this page is that it is built using stamps. Stamps make replicating portal design structure while modifying each portal with different measures (or even in a separate application) very efficient and straightforward.

Now let us look at a different page in the ED Quality section of the Emergency Department Advisor application.

Figure 4 shows the Comparison page of the ED Quality section of the Emergency Department Advisor application. We can see that this page is composed of QuickViews and a Measures Portlet broken out by a dimension and a time range, where we have control over changing both. This page is useful because it lets you slice the data in many ways to see what might be driving significant trends. For instance, if a user wants a better idea of what might be going on with ED Mortality, they could select 12 months of data for a time range and select the patient age group dimension. Then, the user can quickly see that the oldest population is driving the increase in ED Mortality. If the user wants to investigate further, they could also change the facility to see if the same driver is consistent across all hospital locations. The phenomenon may be unique or prevalent in different sites. The user can select any dimension from the QuickView on this Comparison page that might be interesting or relevant to what's driving an increase in ED Mortality.

It can be interesting to look at the Measure Overview in conjunction with the Compare page. Suppose a user does more in-depth analysis and wants to understand more about the measures displayed. They can go to the Measure Dictionary and open the Measure Overview from the measure name. The Measure Dictionary shows the definition and business logic for the measure of interest and the rules that comprise that measure. Users can quickly flip back and forth between the analysis and and the definition of the measure they're analyzing. We can navigate to that same information by directly clicking on the measure name on the Overview or Trends page.

One more page that can be useful to look at in tandem with the pages we have discussed is the Current Month page. On the Current Month page is another Matrix Portlet, but it serves a slightly different purpose from what we saw earlier. On the Current Month page, one can see the measure values broken out over individual dates to simulate a flash report, where we have control over the Year and Year-Month combinations. Controlling the Year and Year-Month combinations is helpful because it can help the user identify whether a date or a group of dates is responsible for some of the changes we're observing.

To look further into that through this lens, one could analyze a different Year-Month combination to see if there's any degree of seasonality that might be driving the increase in ED Mortality in addition to the age group component we identified from the Compare page.

I hope that this has helped you see how these five pages – Overview, Trends, Compare, Measure Dictionary, and Current Month – can be used to expose measure data from different angles to generate answers to user analysis questions. I also hope this sparks some ideas about how you might be able to use these patterns to design your Measure Factory application – or extend the one you already have – to facilitate exciting analysis. ☐

Click here to see the original Knowledge Forum presentation of this material.

5 Metrics for Your "Tripledemic" Dashboard

Kathy Sucich

VP, Marketing

LinkedIn

There's been a lot of talk about the "Tripledemic" that healthcare professionals are fearing this winter. Not only are we likely to face another wave of COVID-19 infections, but that will likely collide with a surge of flu and respiratory syncytial virus (RSV) infections.

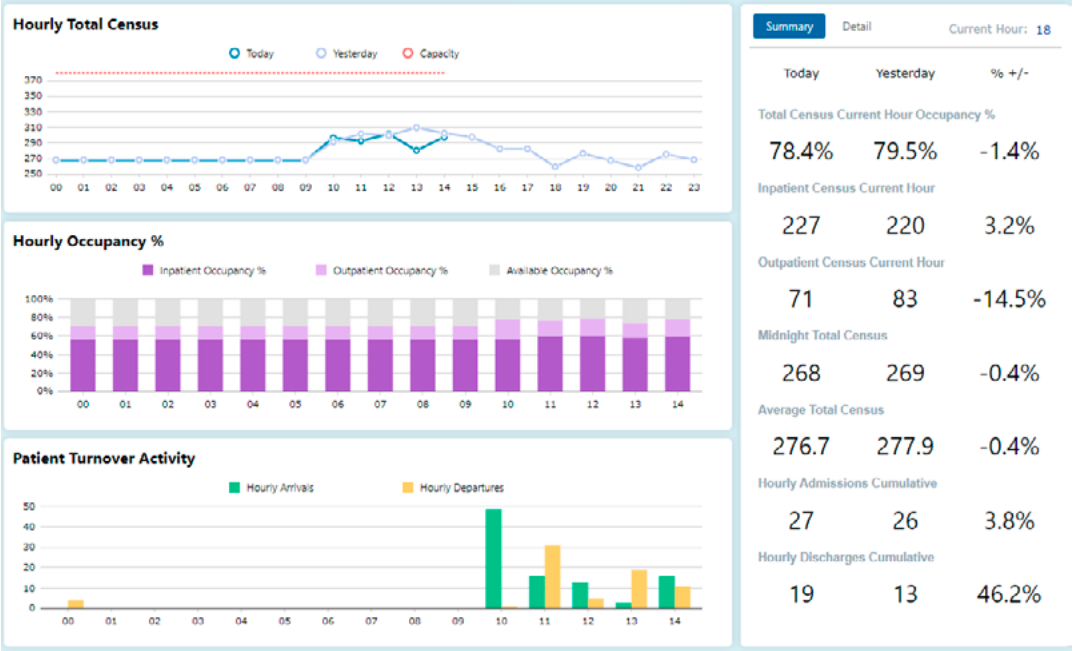
Already, RSV and the flu are starting to overwhelm capacity in many adult and pediatric hospitals. This problem is exacerbated by the staff shortages that many hospitals are currently facing.

How your hospital or health system better manage the influx of patients at your facilities and more adeptly respond to challenges such as bed management, staffing, and efficiency of care? Here are 5 metrics that are important to track that will help your organization optimize operations and patient care during the Tripledemic.

1. Census

Your health system needs to know how many people are in your facilities and how close they are to capacity. Keeping close tabs on the census allows you to understand how you need to best allocate resources.

With the ability to drill-down and view where people are in your hospital and the capacity of different departments, you can shift staffing resources to those areas that have the greatest need.



2. Length of stay

How long are patients staying in your hospital? And what is the length of stay for COVID/flu/RSV patients compared to those in the hospital for other reasons?

Understanding length of stay and the differences between patient cohorts will help you better anticipate staffing and bed needs during times of surge, which in turn, will help you better care for patients.

3. Throughput

Once someone checks into your ER, how long does it take them to be triaged? And from there, how long does it take them to be seen by a doctor? With so many ERs overwhelmed by patients these days, it's important to know how to move patients through the system more quickly. Monitoring throughput data can help identify bottlenecks in the system.

Once your hospital takes notice of areas of concern, you can more effectively pinpoint areas for improvement and shift resources to address throughput issues.

Measures	MONTH TO DATE			CURRENT COMPLETE MONTH			YEAR TO DATE		
	Jun-2021	Jun-2020	% +/-	May-2021	May-2020	% +/-	2021	2020	% +/-
Median Turnaround Time Mins									
Admit to Departure	181	211	-14.5% ▼	191	223	-14.0% ▼	222	294	-24.2% ▼
Arrival to Admit	109	115	-5.3% ▼	114	126	-9.5% ▼	126	145	-13.0% ▼
Arrival to Departure	188	206	8.7% ▼	204	212	-3.6% ▼	225	237	-4.7% ▼
Arrival to In Room	66	64	3.1% ▲	66	66	0.2% ▲	69	73	-5.7% ▼
Arrival to Seen by Physician	36	40	-9.8% ▼	41	46	-9.4% ▼	52	63	-18.0% ▼
Arrival to Triage	58	57	1.8% ▲	58	57	1.8% ▲	58	58	0.0% ▲
First to Last Consult	7	8	-6.9% ▼	8	9	-11.3% ▼	8	10	-14.0% ▼
In Room to Departure	244	291	-16.1% ▼	264	314	-16.0% ▼	313	413	-24.2% ▼
Average Turnaround Times Mins									
Admit to Departure	294.7	347.7	-18.1% ▼	319.6	381.1	-16.2% ▼	395.1	537.2	-26.5% ▼
Arrival to Admit	124.0	133.8	-7.3% ▼	131.3	145.6	-9.8% ▼	147.8	179.0	-17.4% ▼
Arrival to Departure	229.7	265.6	-13.5% ▼	260.0	281.1	-7.5% ▼	298.3	348.5	-14.4% ▼
Arrival to In Room	65.9	65.6	0.4% ▲	67.3	67.8	-0.7% ▼	71.0	78.1	-9.1% ▼
Arrival to Seen by Physician	51.5	57.7	-10.6% ▼	59.4	64.7	-8.1% ▼	74.7	92.0	-18.8% ▼
Arrival to Triage	57.9	57.7	0.3% ▲	58.0	57.6	0.7% ▲	58.2	58.0	0.3% ▲
First to Last Consult	8.2	9.2	-10.8% ▼	8.7	10.0	-12.8% ▼	9.8	12.1	-19.1% ▼
In Room to Departure	370.2	451.9	-18.1% ▼	422.6	510.9	-17.3% ▼	507.2	679.1	-25.3% ▼

4. Test results

Hospitals not only need to worry about their sick patients, but they also have to worry about the well-being of their staff, and make sure they don't become sick themselves or inadvertently spread illness to others.

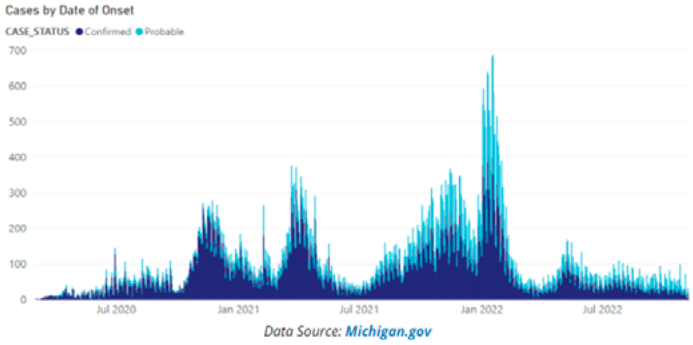
With analytical systems, you can visualize and easily access test results of your patient and employee populations, and see how many positive patients you have for certain illnesses. Noticing upticks in cases or percentage of tests that are positive can indicate spread in your hospital or spread in the community that is starting to reach your doors. Better understanding these numbers allows you to make appropriate decisions around isolating patients or providing the right levels of care.

5. Community spread

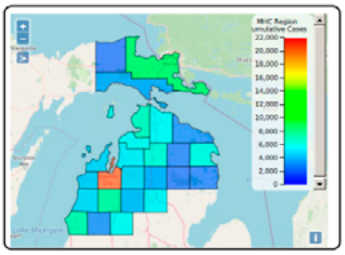
One way you can determine whether your hospital will have a surge of patients is to look at what's happening in the community around you. Since hospital admissions numbers trail positive results in the community, noticing upward trends in your area can help you anticipate surges in your ER.

On its COVID-19 Tracker, Munson Healthcare displays COVID data, both confirmed and probable cases, from the entire state of Michigan. This data, which is made public on Munson's website, is useful to both hospital staff and the wider community, as it enables people to see surges and declines in case numbers, letting them make appropriate decisions about either hospital operations or their own personal risk level and comfort with being around others.

In addition, Munson displays cumulative cases in its care region in a heat map so it can track where there are more or fewer cases in the community.



Munson Healthcare Region Cumulative Cases



Source: Munson Healthcare COVID-19 Tracker, https://www.munsonhealthcare.org/services/community-health/covid19/munson-healthcare-covid-19-tracker

Similar dashboards could show data in other ways, such as using a heat map to display current case numbers instead of historical numbers. This could enable health systems to shift resources to hospitals in its system that are seeing greater case numbers, and could allow systems to anticipate surges ahead of time based on upticks it starts to see in the data.

Conclusion

It is a challenging time for healthcare professionals, given staffing shortages and a looming Tripledemic on the horizon. An analytics dashboard certainly can't cure these problems. But keeping tabs on the right metrics can help you make smarter decisions about where to focus your resources and how to better anticipate needs in order to provide the best possible patient care. ☐

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DIUC22 Videos

If you missed any of the sessions at the 2022 Dimensional Insight Users Conference (DIUC22), you may want to catch up on what you missed by watching one of the session recordings.

All of the session videos are on one page of our website at:

https://www.dimins.com/diuc22/videos/