



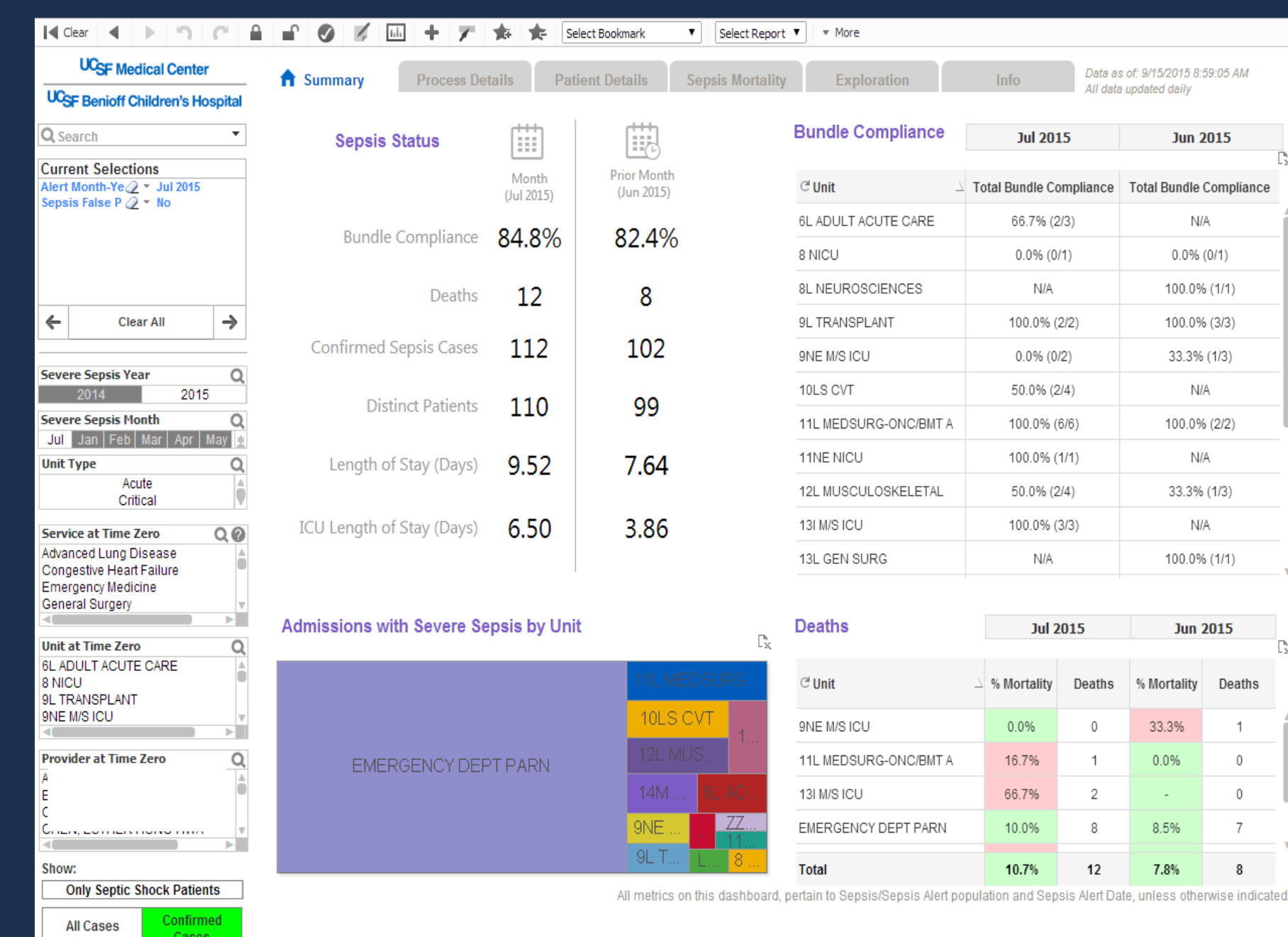
University of California  
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# Driving Change Through Analytics: Sepsis Dashboard

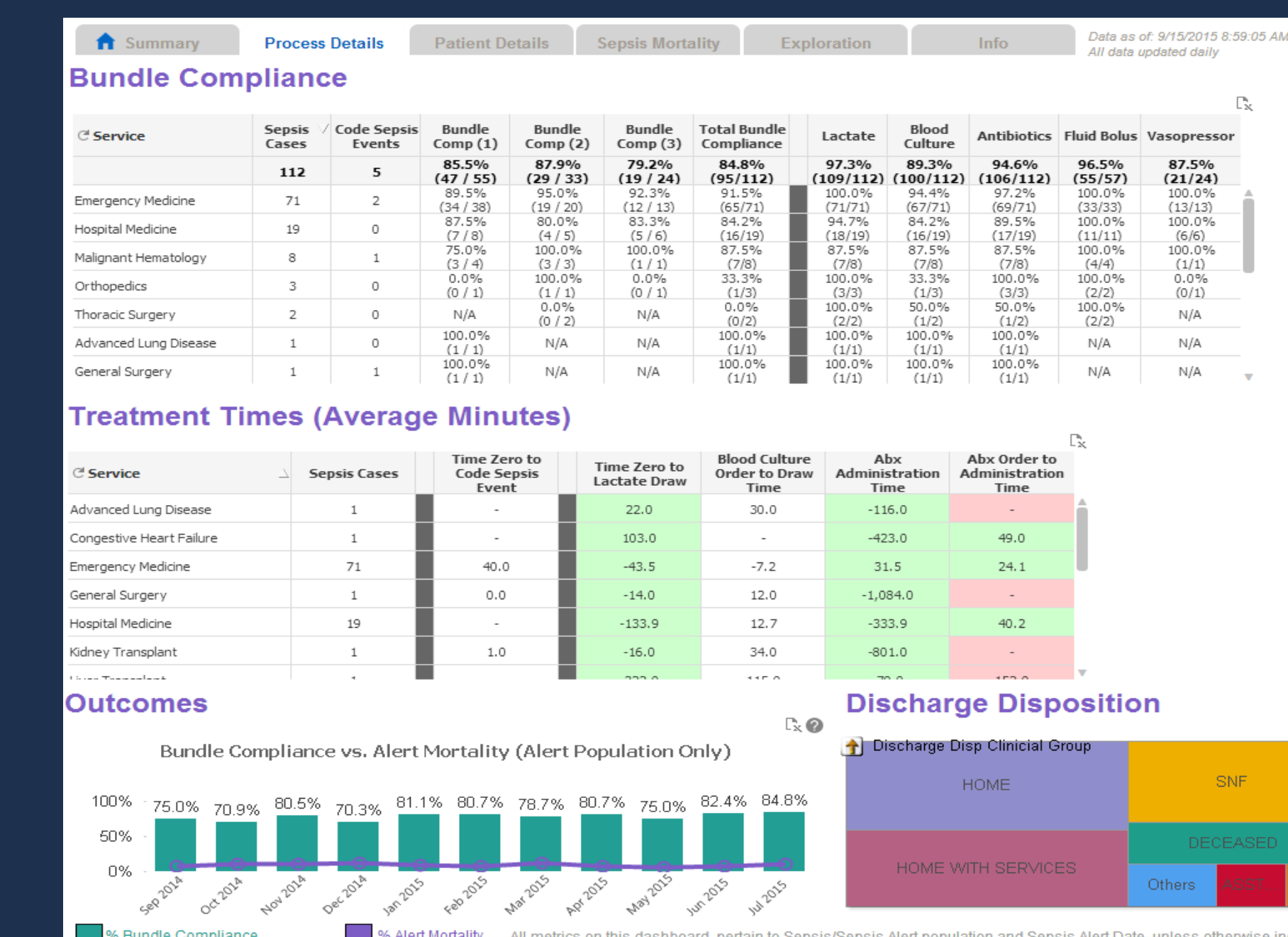
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## Background/Problem

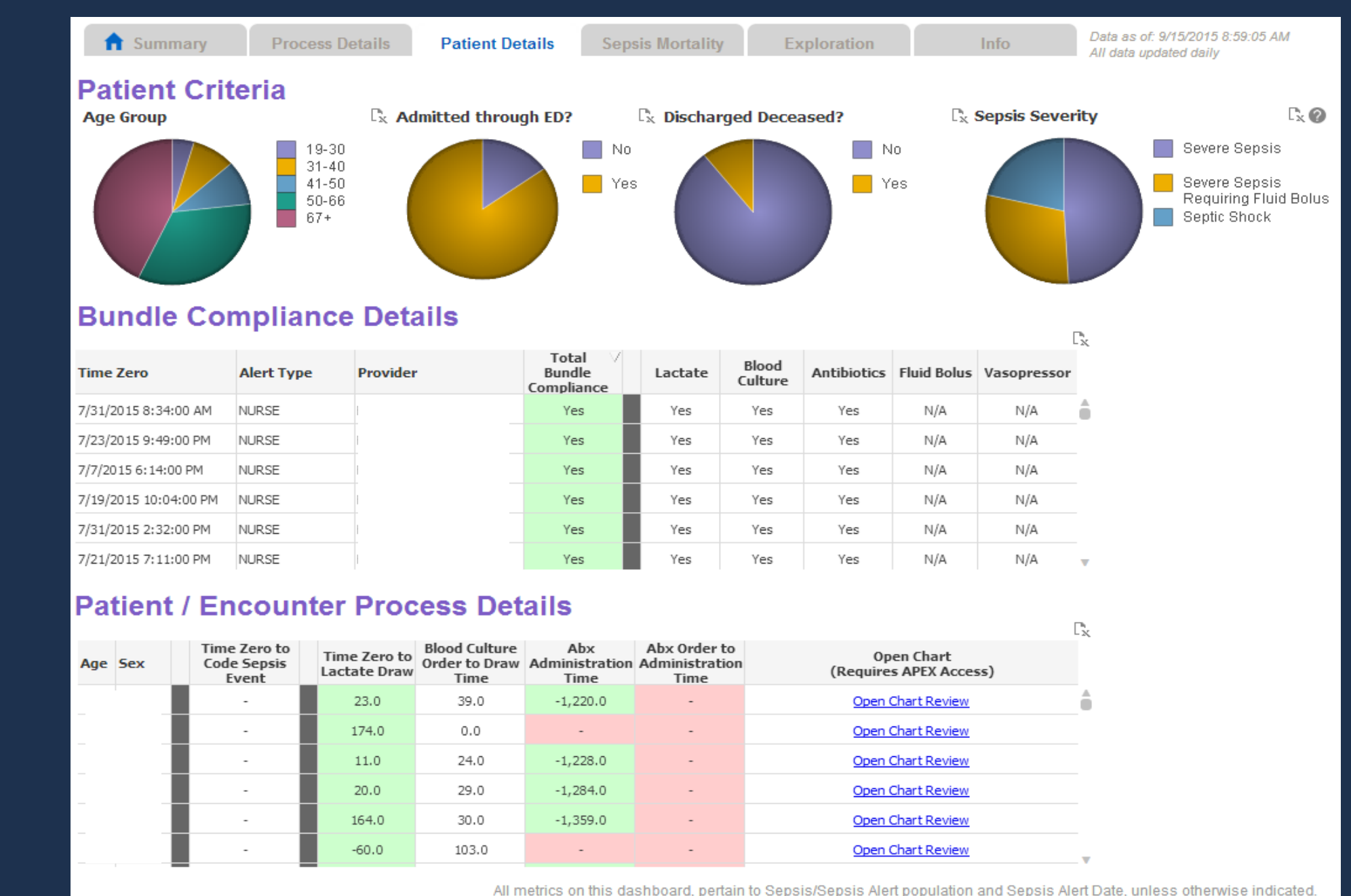
- Historically, UCSF maintained an antiquated database of patients with coded diagnoses of severe sepsis or septic shock for bundle compliance reporting
- Retrospective case abstraction was time-consuming and resource-intensive and did not facilitate timely feedback to front-line clinicians with the opportunity for “just-in-time” feedback lost
- After the successful launch and spread of Sepsis Best Practice Alerts, data demands and alert fatigue increased
- UCSF needed a better strategy to analyze alert sensitivity and positive predictive value in order to optimize the surveillance system
- Sepsis Alert data were recognized as a valuable resource for “real-time” sepsis bundle compliance analysis and alert optimization. However, existing reports proved cumbersome with growing volume of alerts
- Sepsis Leadership recognized the need to merge sepsis alert data with bundle compliance data



The SepsisDash landing page displays high-level sepsis bundle compliance and sepsis mortality data



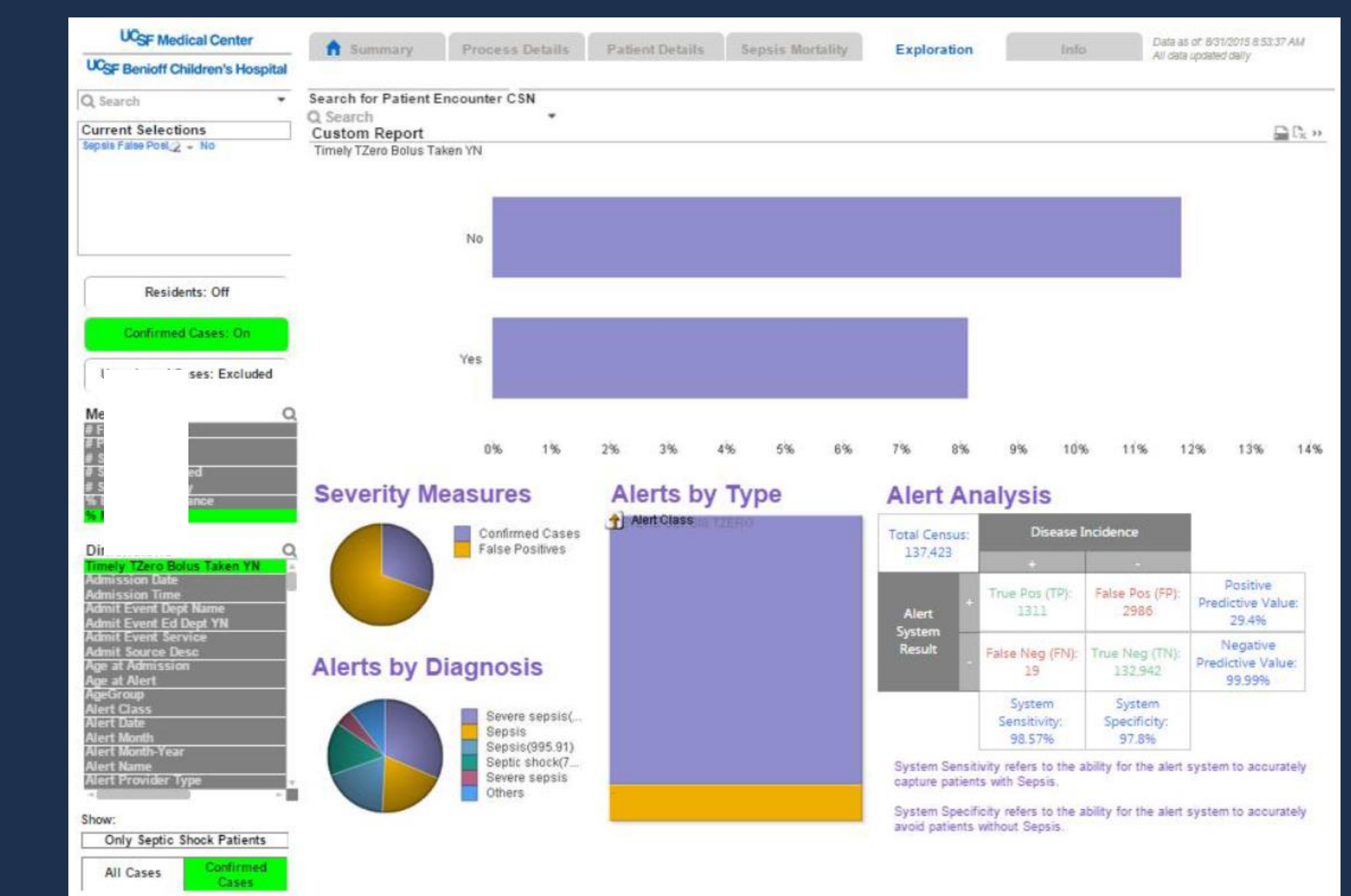
Process Details tab displays bundle compliance data and process times by unit, service, provider, or resident



Patient Details tab provides patient-specific compliance data and allows users to launch the patient chart in EPIC

## RESULTS

- SepsisDash transformed UCSF sepsis case abstraction and reporting processes
- Combining real-time sepsis surveillance data with an interactive dashboard allowed UCSF to implement a concurrent sepsis abstraction and reporting process triggered by clinical indicators, not administrative ICD coded data
- Monthly case review volume has increased by 500 percent, allowing the Sepsis Nurse Analytic team to capture the true incidence of sepsis at UCSF
- Meaningful feedback to specific nurses, residents and managers can be provided within just days of the sepsis event, often while the patient is still hospitalized
- Utilizing sepsis surveillance data in the dashboard also allows for efficient evaluation of system sensitivity, specificity, and positive predictive value. Based on this analysis, alert triggers were adjusted to improve the accuracy of the sepsis surveillance system, reduce alert volume, and prevent alert fatigue
- UCSF achieved a 51 percent reduction in the volume of RN sepsis alerts in the medical/surgical ICUs while positive predictive value improved from 58 to 62 percent
- Increased user access to data: 310 unique users with 900 sessions since launch in February 2015



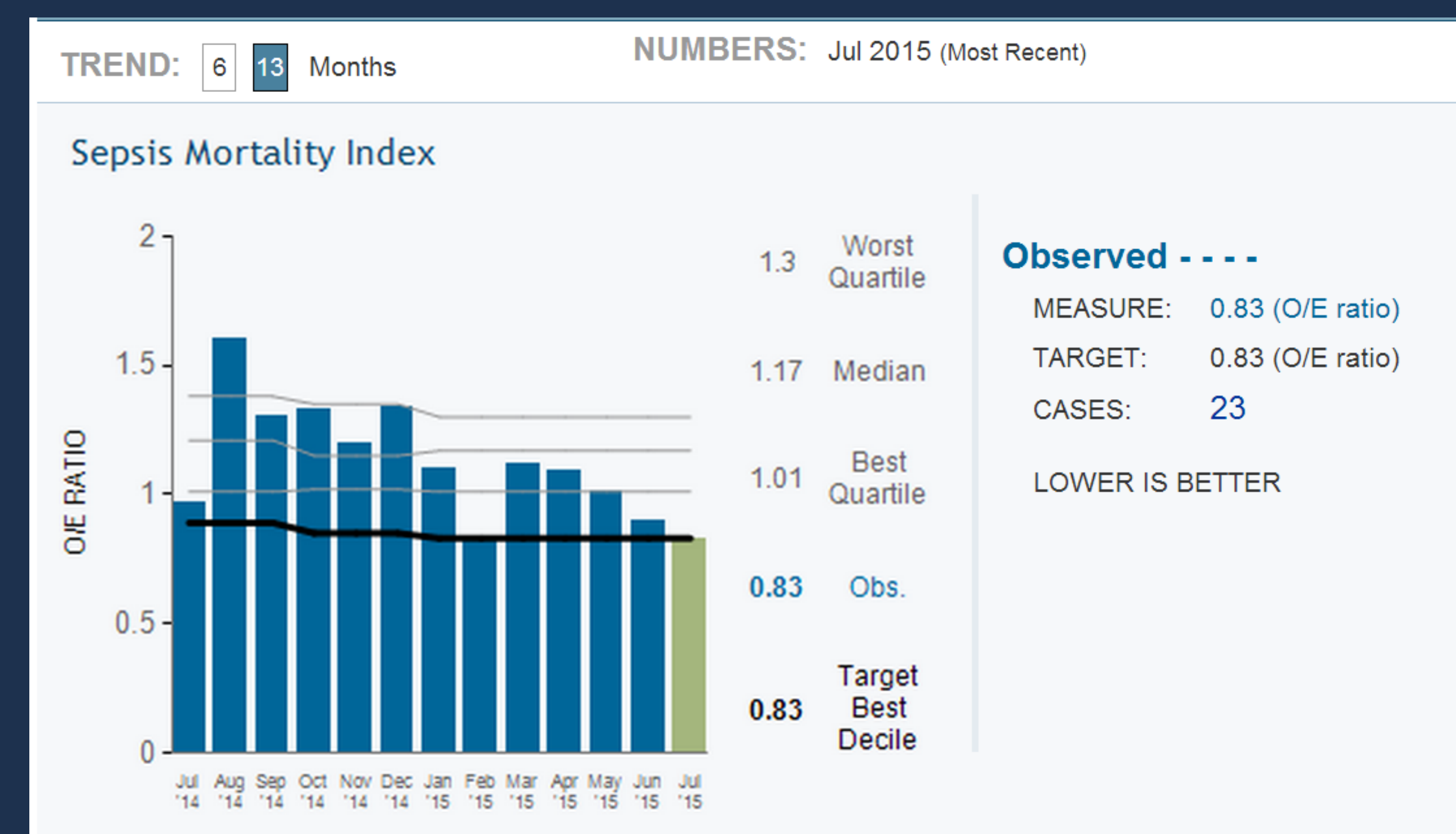
The Exploration tab allows data discovery and alert analysis. Add variables onto an X or Y axis to examine relationships between any of the data elements stored in SepsisDash

## LESSONS LEARNED

- Due to clinical complexity, nursing expertise is still required to confirm sepsis cases; complete automation is unreliable
- Insight gained on sepsis alert optimization strategies to fine-tune criteria and parameters
- When it comes to data visualizations, ‘less is more’

## NURSING IMPACT

- Sepsis Project led by masters prepared nurse leaders
- Sepsis Nurse Leaders utilized data to identify knowledge gaps, tailor educational approach to unit specific workflows
- Sepsis Nurse Leaders empowered unit based RN champions with data to drive change and improve patient outcomes
- Review of Sepsis cases transitioned from manual abstraction to a more streamlined, automated process resulting in time saved for Sepsis Nurse Analyst



Sepsis mortality index decreased to 0.83 as of July 2015

## SOLUTION FOUND IN TECHNOLOGY

- Automated reports were built to capture key elements of sepsis recognition and care. Over 120 data points are captured including lactate, blood culture, antibiotic, and IV fluid metrics
- Sepsis alerts trigger these reports which feed into data warehouse where data are extensively validated
- UCSF utilized the electronic sepsis surveillance system data reports to build SepsisDash, an interactive sepsis dashboard
- Provides a Big Data strategy for growing Sepsis program, now operating on 18 patient care units on two campuses

## CHANGES IMPLEMENTED

- SepsisDash is a sepsis analytic tool that displays on-demand sepsis alert information juxtaposed with care bundle compliance and mortality data
- Data are available to front-line clinicians at the unit, service, and individual provider level
- Embedding SepsisDash within EPIC facilitates chart review workflows while maintaining patient information safely in the EHR.
- End users can launch directly into each patient encounter to review

