IBM Panorama:
Best Practices for Data and Analytics Modernization

with **IBM Consulting's Public Health Group**

Hello! We're from the **IBM Consulting Public Health Group.**

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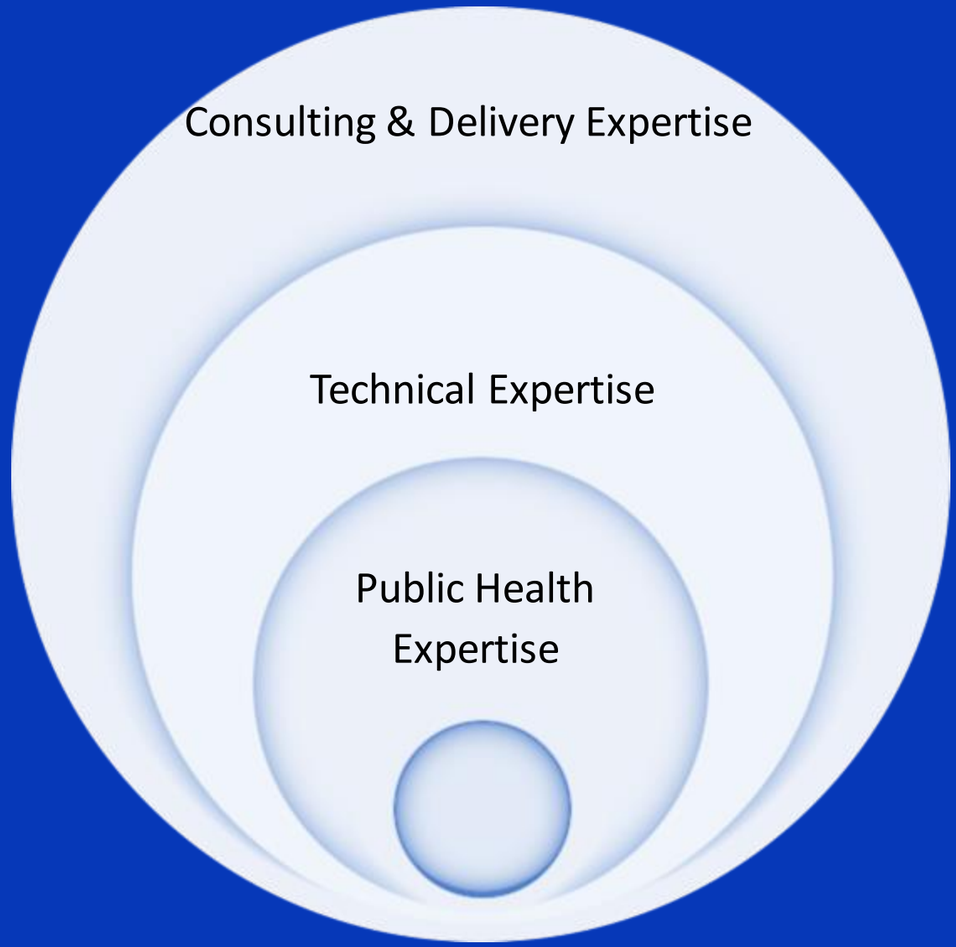
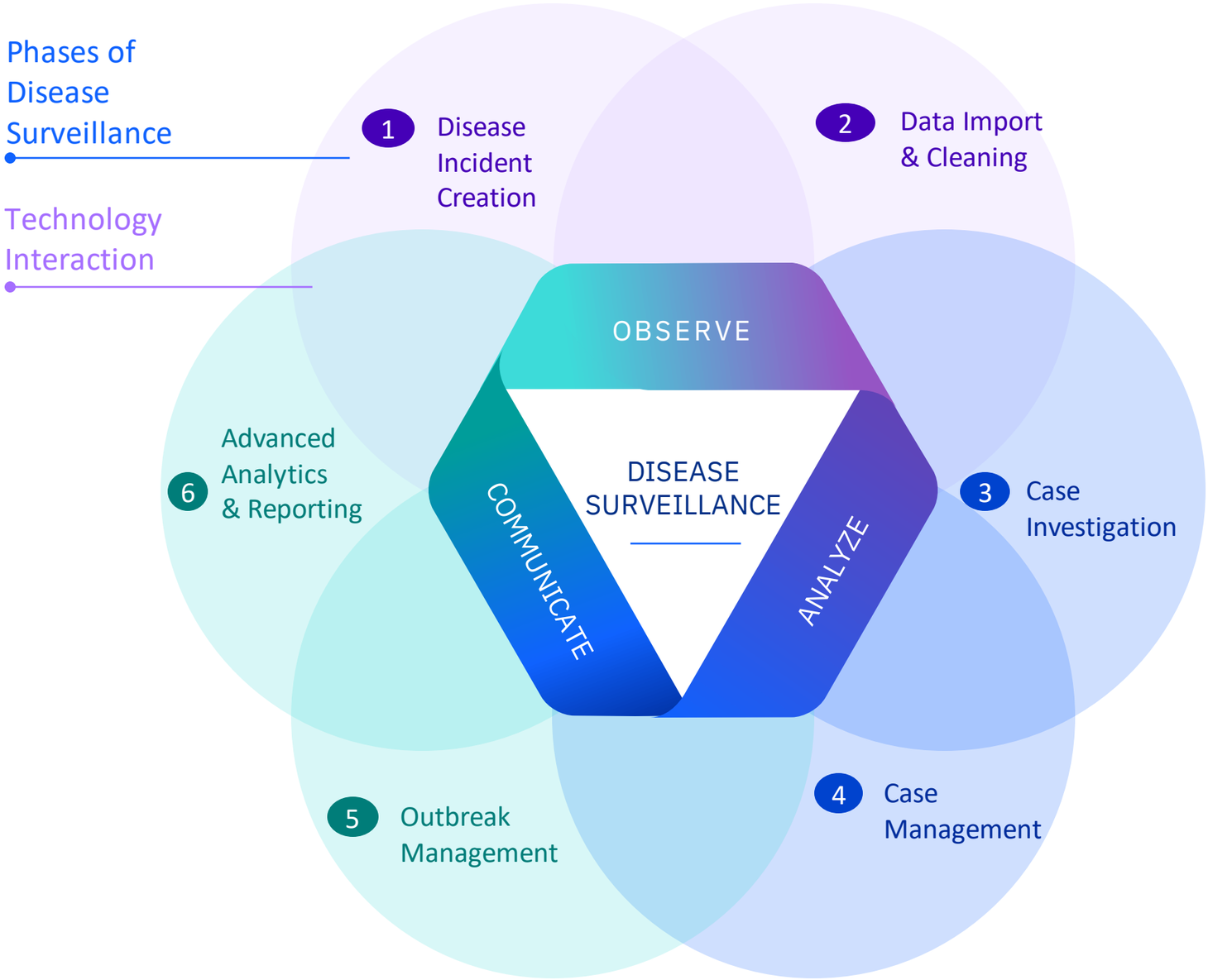


Agenda

1. “How do public health agencies achieve high-quality data and analytics modernization?” featuring, **IBM Panorama**
2. Panorama Insights Examples
3. 5 Best Practices
4. Q&A and Discussion

Disease Surveillance: the functional and technological golden thread



IBM Panorama is a public health information system developed in 2003 in response to the SARS pandemic. It has since served over 10 public health agencies worldwide for over 111 million persons.

Disease Surveillance and Health Prevention Management:

Investigation Management	Notifiable disease case and contact management data
Outbreak Management	Management of communicable disease outbreak data
Family Health	Clinic-based or population health-based services data

Immunization and Inventory Management:

Inventory Management	Vaccine & drug inventory management
Immunization Management	Repository for individual immunization records
Recipient Module	Portal for citizen access to immunization records

Interoperable featuring FHIR and HL7 standards, RESTful APIs

Aligns with CDC North Star Architecture requirements

Cloud-native Configurable and Modular

Person-Centered, Public Health data model

Real-world Success Stories bring us best practices

Enhancing Clinical Decision Support through Immunization and Inventory Management in Canada

7 of 10 Canadian provinces use IBM Panorama Inventory and Immunization Management modules

- **10,000+** daily users.
- **87%** of surveyed users said the Vaccine and Materials Inventory Management has had a positive impact.

Predictive Analytics in Rhode Island

Leveraging international data on COVID-19 disease outbreaks, IBM developed a **predictive model and dashboard** to forecast the Omicron outbreak.

We validated conventional models and rallied decision makers around necessary mitigations to curb the outbreak.

School Immunization Records in Ontario

Centralized tracking and analysis of immunization coverage rates for school-aged children to understand risk areas and effectively and rapidly respond to outbreaks.

Digitizing COVD-19 Response in Nova Scotia

Implemented a cloud-native Panorama application with managed services in response to the lack of comprehensive public health electronic information system, reliance on paper, and siloed processes to **improve the management of vaccine inventory, immunization programs**, communicable diseases and outbreaks.

Hospitalization determination with machine learning in Rhode Island

Enriched disease surveillance with additional insights on the causes of SARS-CoV-2 positive hospitalizations. Machine learning with natural language processing enables cause of hospitalization determination with **80% accuracy.**

Better Clinical Outcomes in Canada

Inventory Management Module helps jurisdictions plan and manage the vaccine supply, distribution, and return movement. Automated templates eliminated paper vaccine forms and reduced duplicative paperwork.

The 5-day process to replenish influenza vaccine was reduced to 3 hours.

Disease Surveillance: the functional and technological golden thread

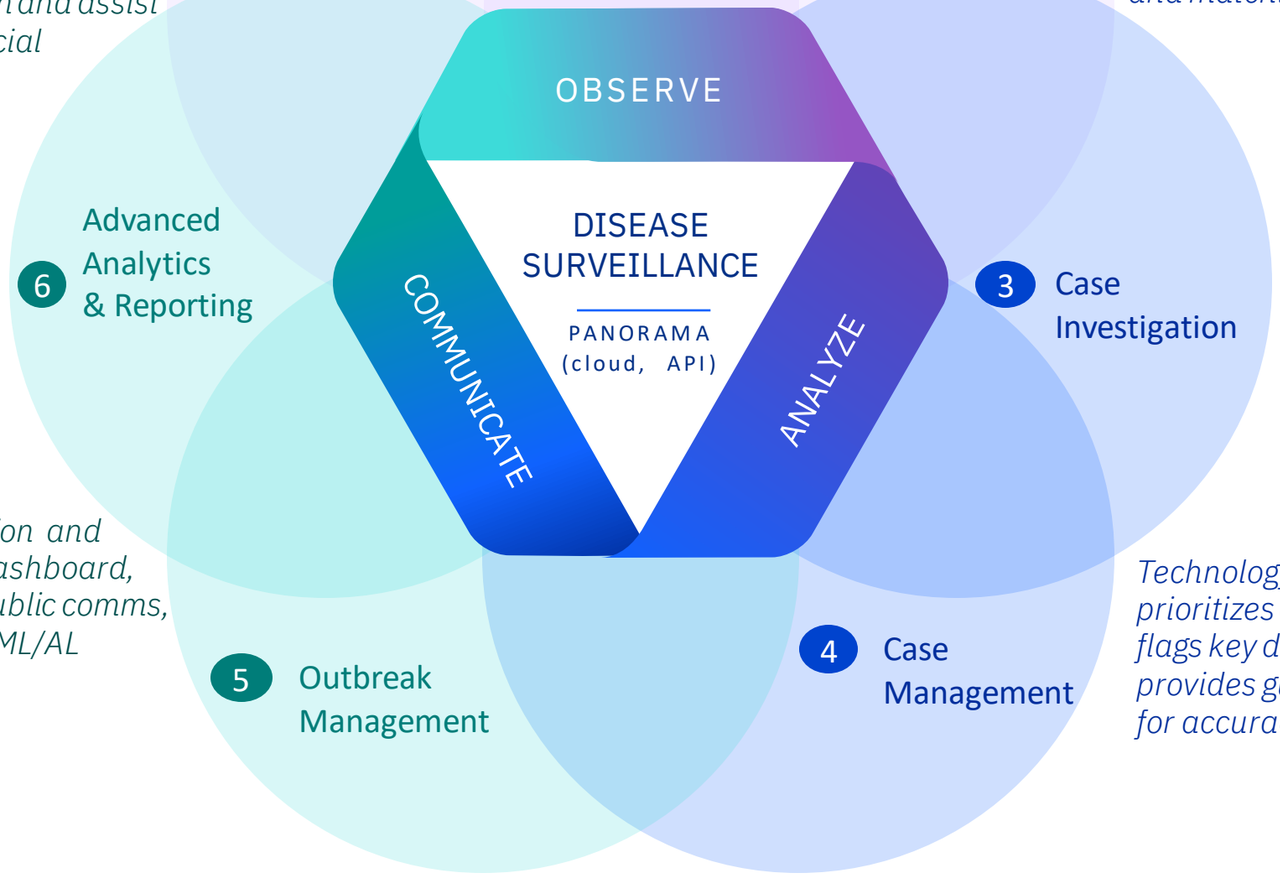
Electronic data exchange via FHIR reduces manual entry to minimize human error and meet standard minimum requirements

1 Disease Incident Creation

2 Data Import & Cleaning

Speed and accuracy driven by central data hub de-duplication and matching

Dashboard provides insights and predictive capability to protect vulnerable population and assist policy creation for social determinants



6 Advanced Analytics & Reporting

3 Case Investigation

Strategic prevention and control through dashboard, leadership and public comms, vaccination, and ML/AL

Technology prioritizes cases, flags key data points, provides guidance, for accuracy

5 Outbreak Management

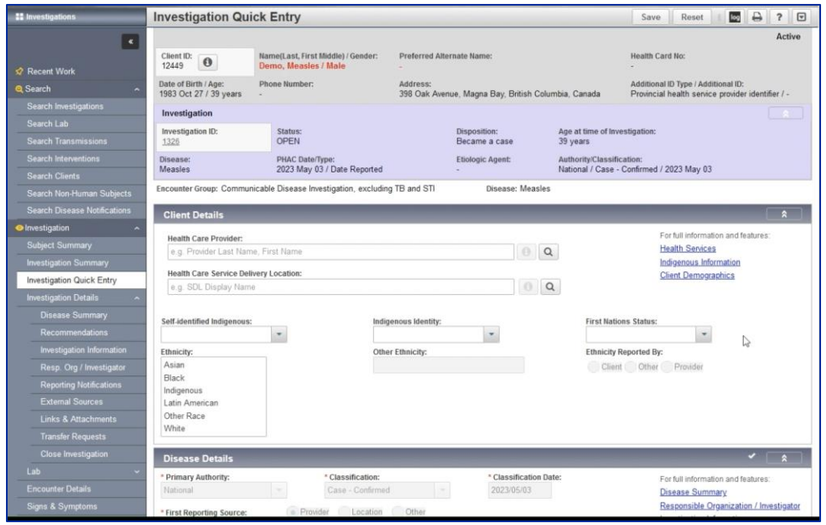
4 Case Management

Tactical health monitoring focused on policy alerts and informed by real-time data at advanced processing speed.

Disease Surveillance with IBM Panorama

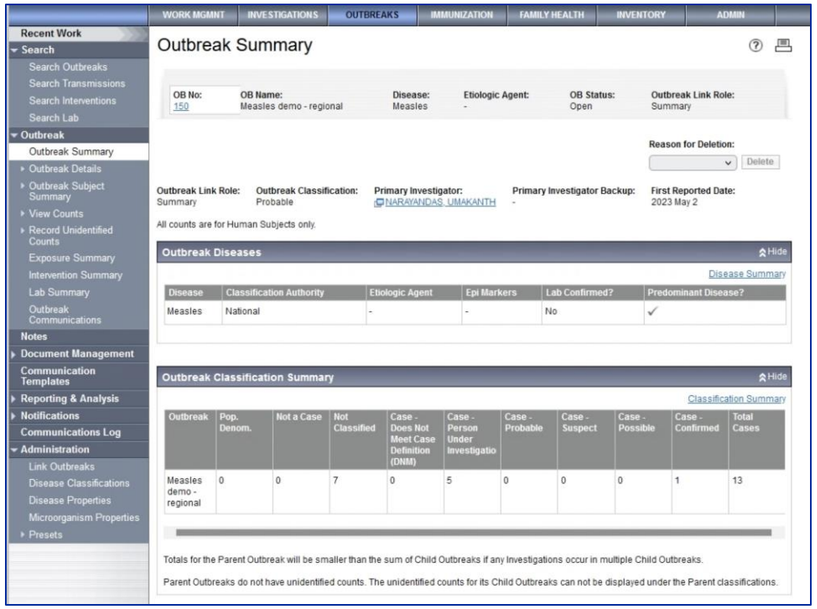
- ✓ Longitudinal view of the public health record
- ✓ Automated exposure reporting
- ✓ Web-based human-centered user experience
- ✓ Disease management at client support and surveillance levels
- ✓ Tools to help contain a disease and reduce risk to the public
- ✓ API integration with 3rd party providers and labs

Investigation Management



- Identify, investigate, analyze, and report on cases and contacts of communicable diseases
- Track individual and group encounters, exposures, and transmission events
- Create targeted public health interventions
- Manage relevant current and historical medication history

Outbreak Management

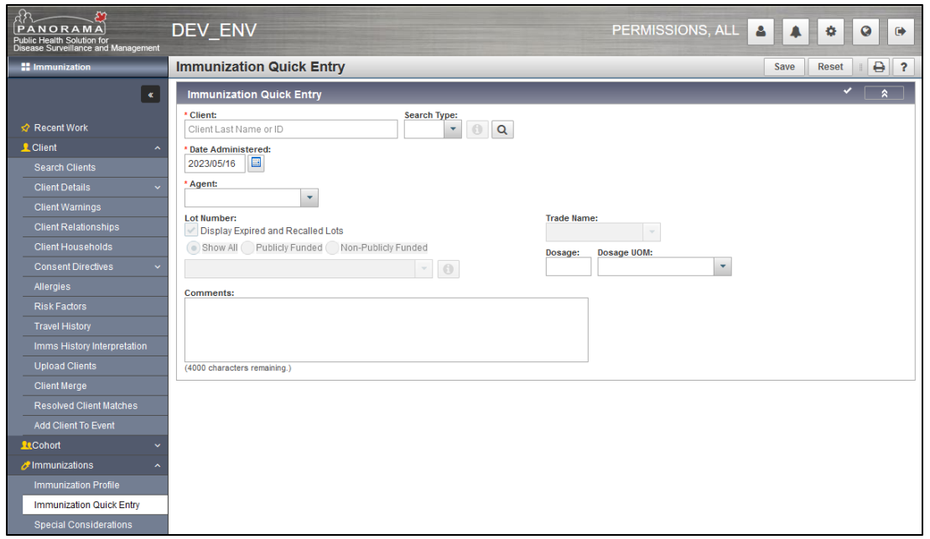


- Centrally create and manage records for instance of small disease cluster or outbreak
- Collect, share, and analyze health information as diseases and outbreaks move across geographic regions

Immunization Services with IBM Panorama

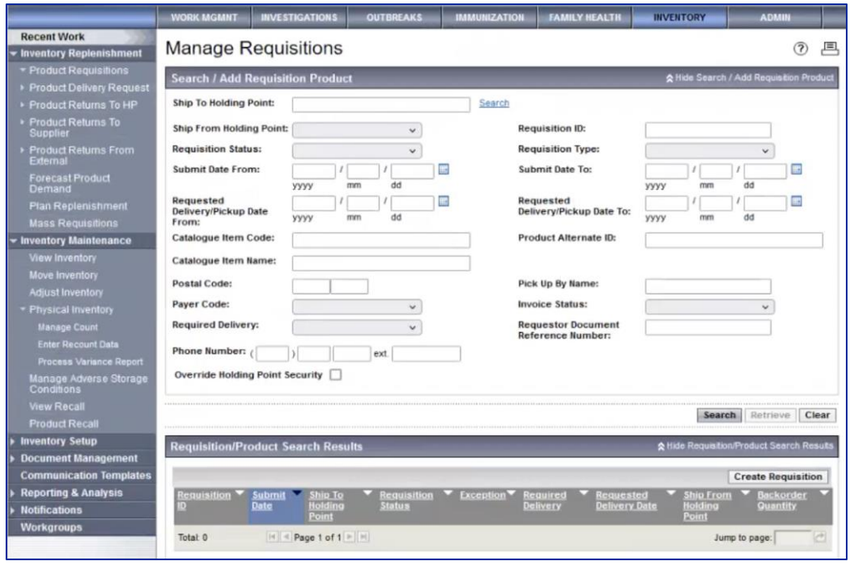
- ✓ Longitudinal public health record
- ✓ Immunization forecasting and event management
- ✓ Integrated communications
- ✓ Configurable and OOTB reporting for clinical decision support/immunization forecasting
- ✓ Web-based user experience and guided workflows
- ✓ API integration with 3rd party providers and distribution centers / holding points

Immunization Management



- End-to end oversight of individual and mass immunization events from planning to execution and tracking
- Manage immunization schedules and forecast eligibility
- Capture adverse reactions, precautions, contraindications, and exemptions for individuals or populations
- Targeted communications for eligible cohorts

Inventory Management



- Central management of distribution center locations and product tracking
- Prepare, requisition, receive, distribute, and administer immunization products

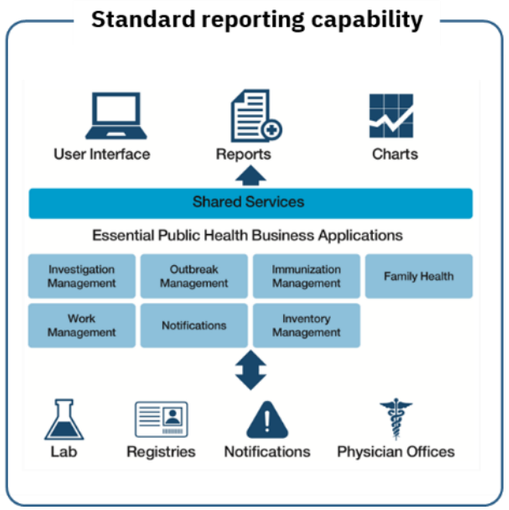
Panorama Insights

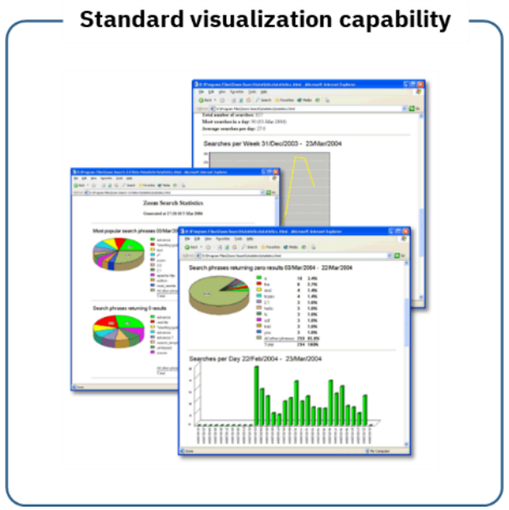
“...Everything was done by paper and through fax machines. So, in the midst of a pandemic, we were building a system to deal with, and manage, the number of increased cases, and it was very, very difficult.”

-Kristine Campagna, Chief Operating Officer for COVID Operations for the State of Rhode Island

Manually creating reports from paper forms with potentially missing data	Quickly generate reports with **data from across systems**, based on **pre-configured templates**
Adapting existing data visualizations because existing dashboards have limited interactive capabilities	Run **self-serve analytics** on high-quality, timely and integrated data to produce **actionable insights**
Maximizing and explaining the value of our data to varied stakeholders	View and modify pre-made **descriptive and predictive analytics**, using a **repository of tools**

Panorama provides robust analytics that enable more informed public health decisions

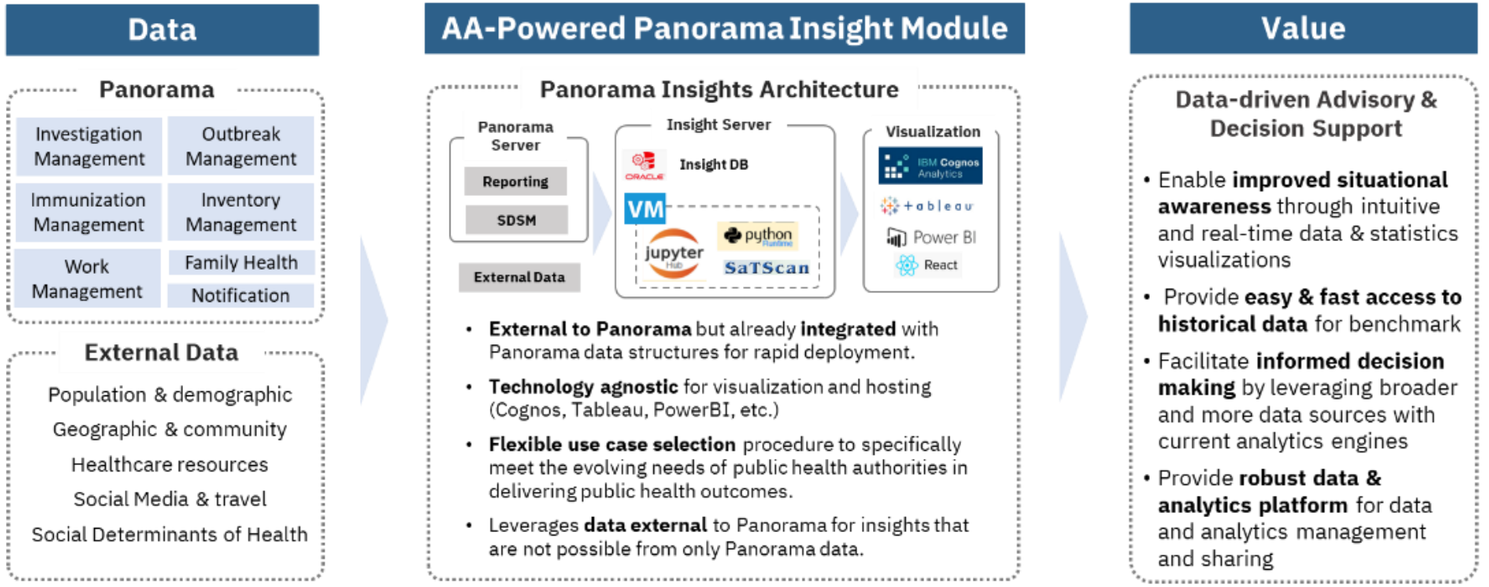




Panorama provides basic tools for reporting and data import/export including:

- Built-in Reports
- Ad hoc Reports
- Immunization & Disease Surveillance Reports
- Client and Immunization Uploads
- Geographic Information System Linkages

Panorama can feed a data and analytics platform enabling advanced analytics for advisory & decision support



A unified view of outbreak risk for all notifiable diseases and conditions allows for proactivity

3 Configurable outbreak risk scores derived from multiple data sources: case rates, test positivity, hospitalization rates, fatality rates, syndromic surveillance, wastewater surveillance.

1 Disease surveillance professionals can select configurable disease groups of interest.

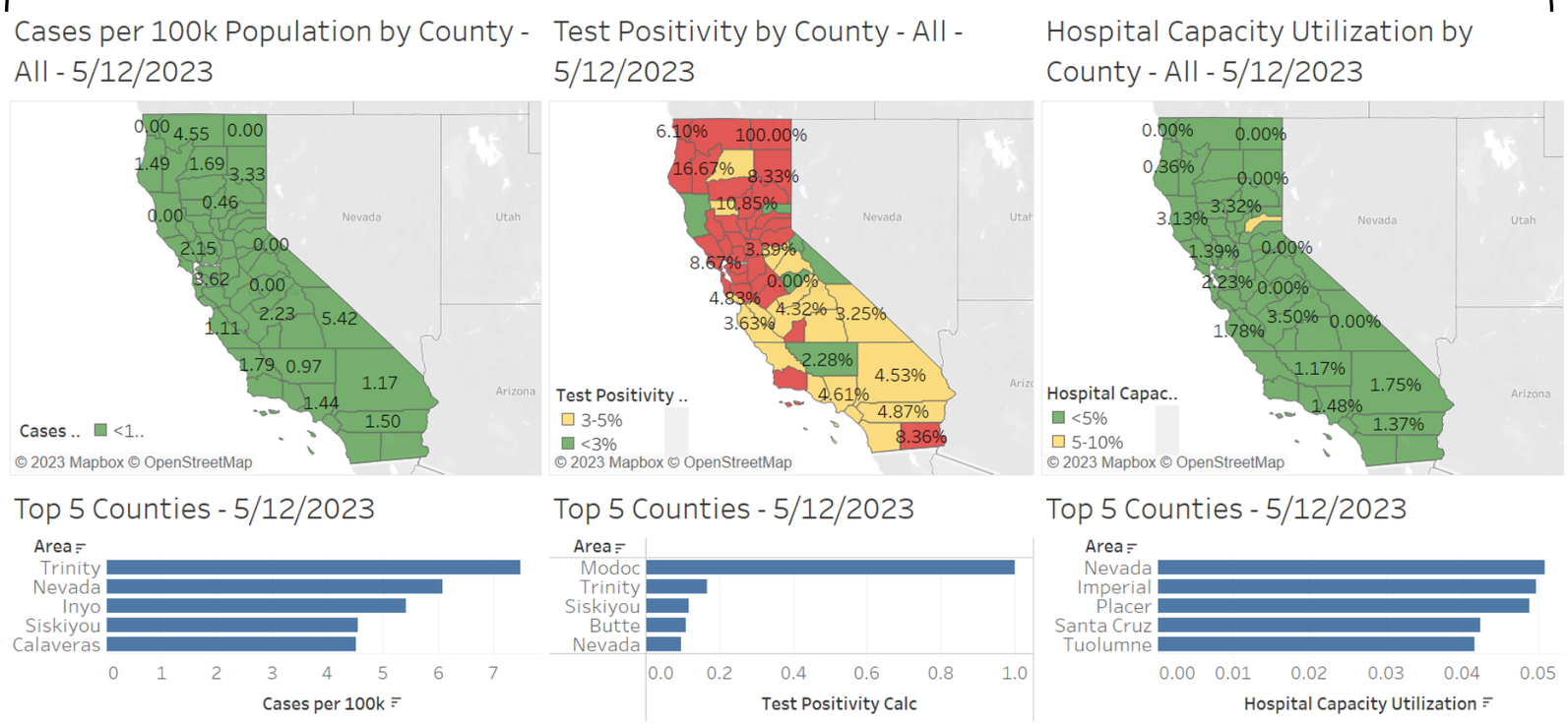
2 A single view of detailed information for 100+ notifiable diseases and conditions.

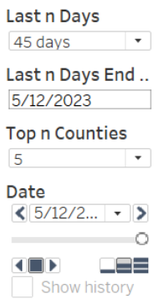
4 Color-coded trends to quickly identify diseases and conditions of highest risk.

Demonstrative

Rich & intuitive analytics to track current conditions for disease surveillance

2 Multiple disease surveillance indicators, configurable by disease.





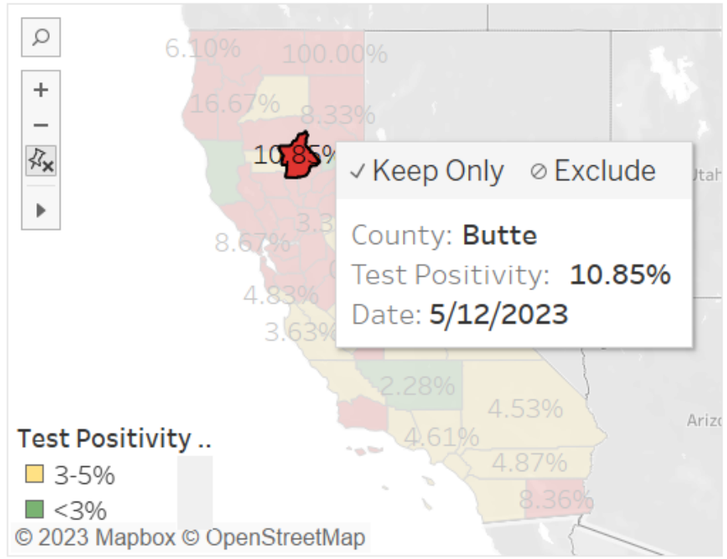
1 Configurable current conditions dashboard to show past 45/90/180 days.

3 Map- and graph-based visualizations for intuitive insights.

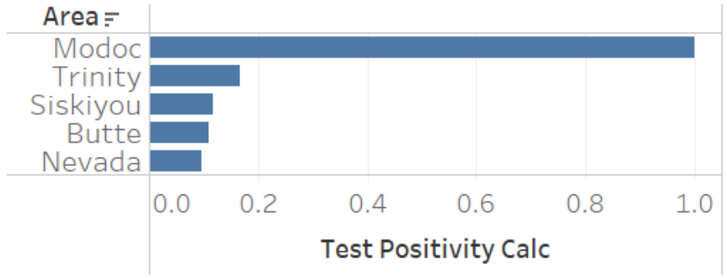
4 Heat map animation for an intuitive weather-app-like display of current disease conditions.

Optimize and easily coordinate between state and local public health authorities with detailed place-based analysis

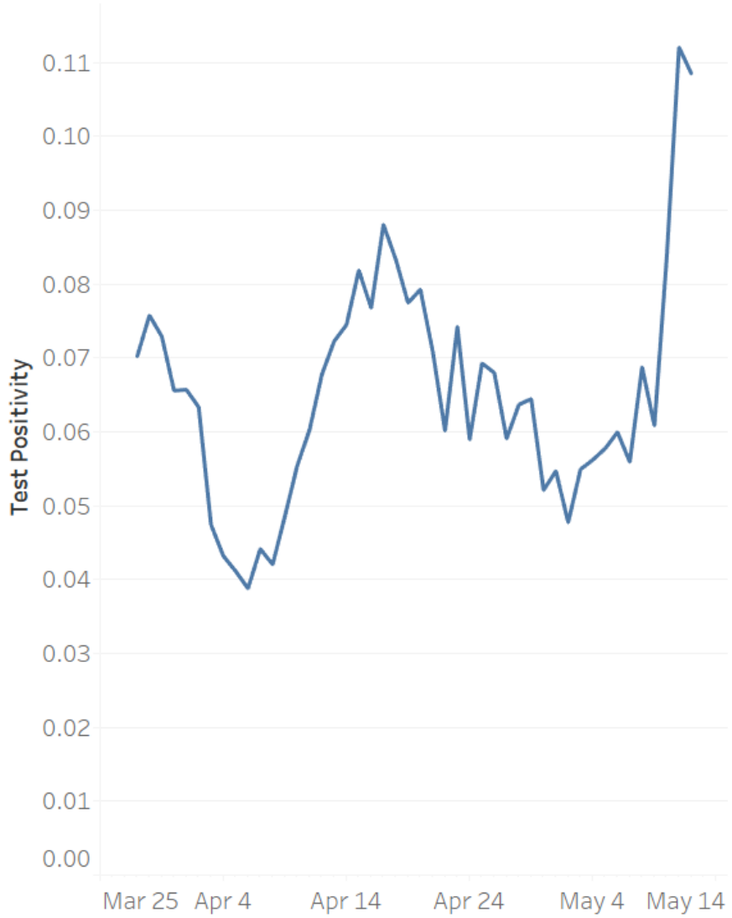
Test Positivity by County - All - 5/12/2023



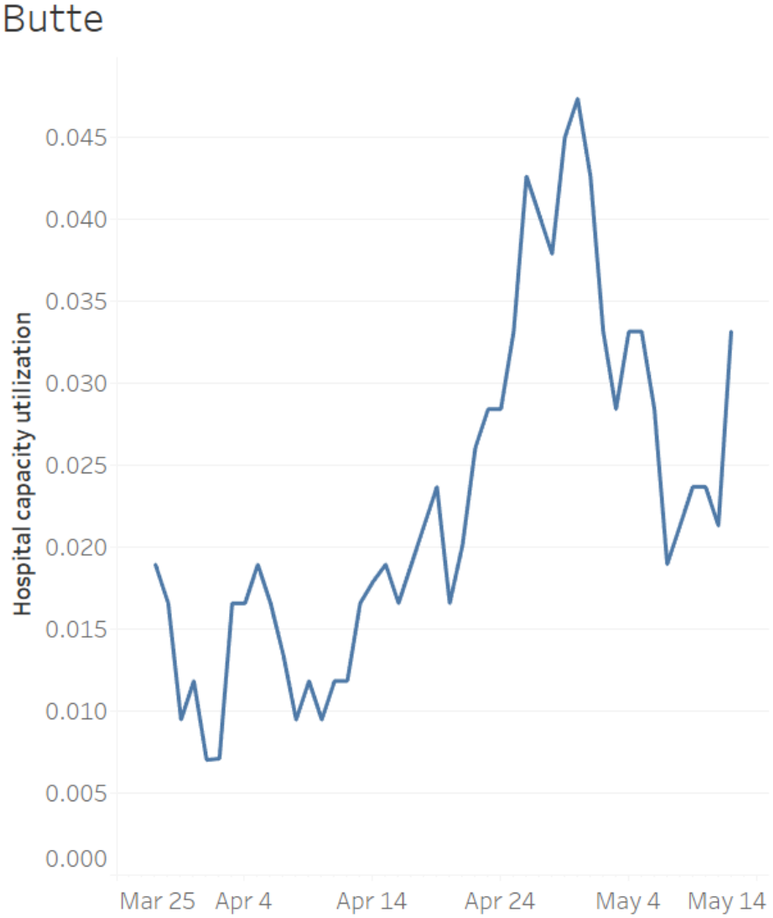
Top 5 Counties - 5/12/2023



Test Positivity Over Time - Butte



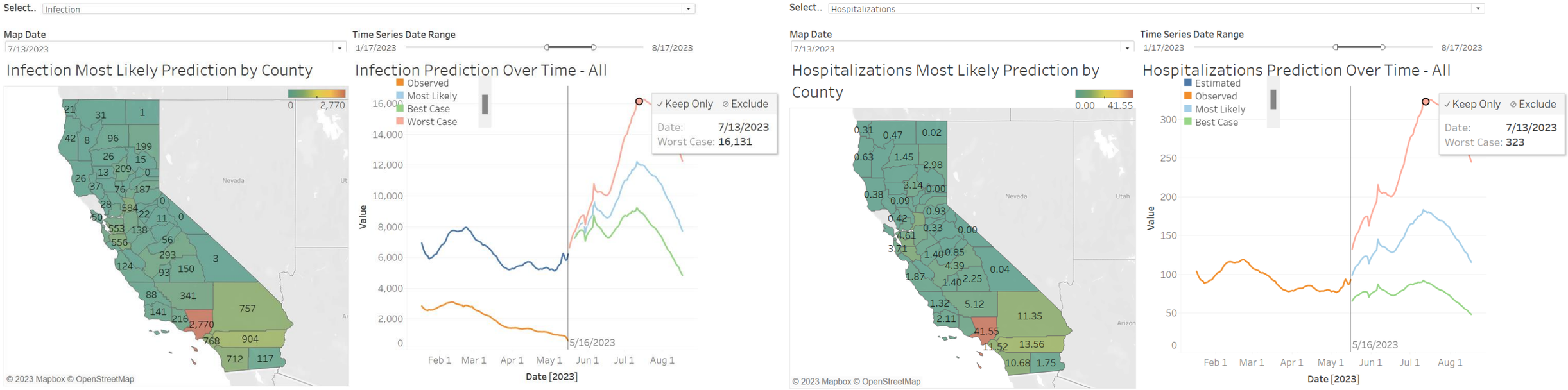
Hospital Capacity Utilization Over Time - Butte



Demonstrative

Panorama Insights provides disease surveillance outlooks so public health authorities can see what the future might bring

1 Disease forecasting leverages multiple models: SIR-based augmented with machine learning for smart ensembles. Forecasts for incidence, morbidity and mortality.

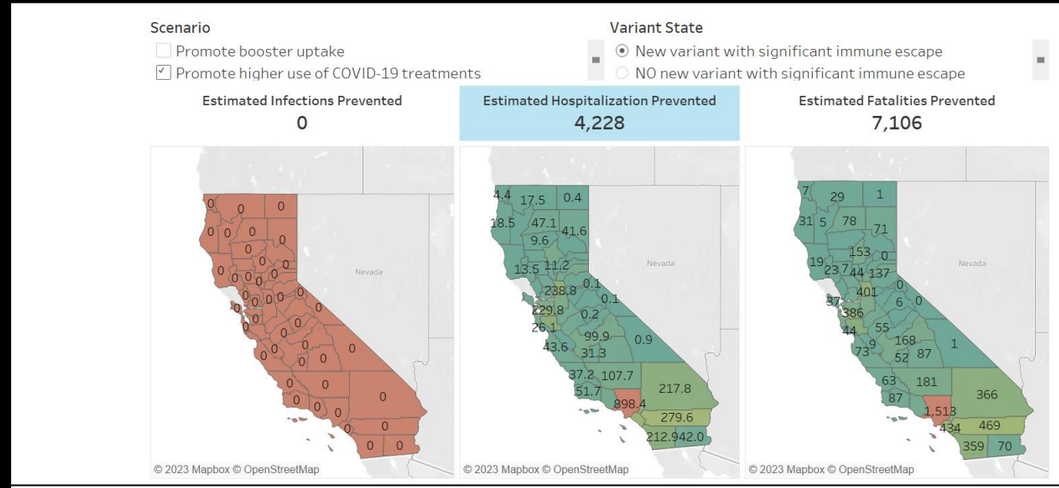
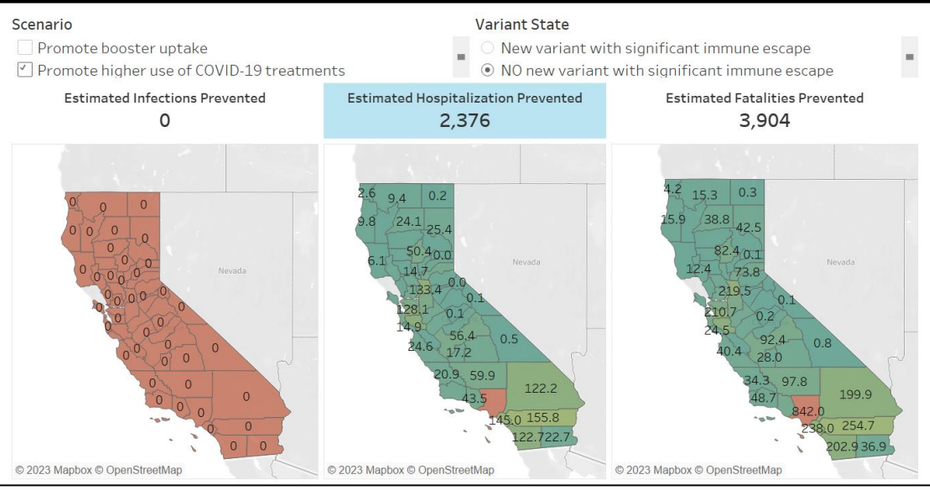
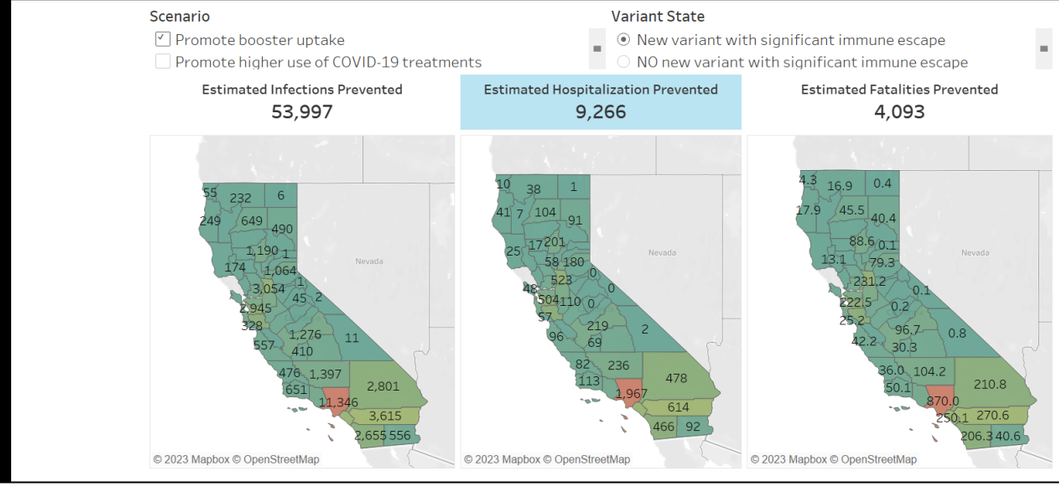
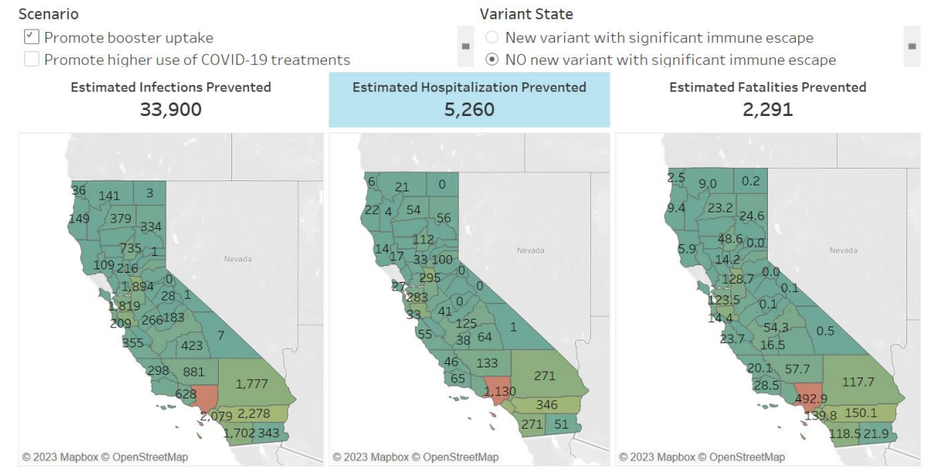


2 Map based views of forecast data to identify likely hot spots.

3 Intuitive trends to visualize anticipated peaks, best-case, and worst-case scenarios.

Demonstrative

Enhance disease containment using what-if scenario modeling

	New Variant With Significant Immune Escape	NO New Variant With Significant Immune Escape
Promote Treatments		
Promote Boosters		

A Summary of Best Practices for Data and Analytics Modernization

1. Public health officials must be **trained as storytellers**, able to communicate with various stakeholders.

2. Technology solutions with **intuitive, modern user experiences inclusive of domain-specific configurable workflows** enable success for experienced and non-experience users alike.

3. High-quality data that is **clean, consistent, and real-time** is the key to decision making.

4. Systems should **integrate via APIs, offer cloud-based scalability, and electronic data exchange in standard HL7 and FHIR format** to move us away from paper and able to handle data volumes with timely responsiveness.

5. A proven, robust **public health data model is imperative** for better clinical decision support across the public health continuum.

A comprehensive solution...

...that supports a full array of public health services.

Panorama Public Health core manages disease surveillance and immunization workflows, inclusive of a rules engine and streamlined user interactions.

Panorama Interoperability and Integration enables data feeds across systems through use of its out-of-the-box APIs.

Panorama's UX allows choice of it's native modern, human-centered web-based UI or Salesforce, to deliver a modern, simple and user-friendly experience for experienced and non-experience public health users.

Panorama Insights provides robust analytics leveraging data from multiple feeds, allowing for descriptive, predictive, and prescriptive analytics, and dashboards for storytelling with data.