

Data Science @ Westat

Data Visualization

Westat develops cutting-edge visual analytics using the scientific principles of visual data communication. In developing visualizations, our aim is to provide clients with actionable insights into their data, inform data collection procedures, and support decision-making. Our data experts use data visualization techniques to track and report on progress in large-scale surveys, interactively analyze geospatial epidemiological data, illustrate student growth and progress towards educational achievement indicators, and consistently monitor performance across research sites in clinical trials.

Domains and Expertise

- **Large-scale health surveys:** Westat uses interactive dashboards to monitor household and school-based interview progress as well as interviewer performance and to optimize data collection. These dashboards provide an intuitive way for clients to understand project status and support real-time decision making.
- **Education studies:** Westat uses novel methods of data visualization to effectively communicate student progress in reading and mathematics and to track school performance across key performance indicators. By presenting data in a succinct and visually appealing format, educators can understand and track student and school system performance, and use these insights to inform curriculum and policy decisions.
- **Public health and epidemiological research studies:** Westat uses geospatial techniques to analyze cancer incidence. Interactive dashboards allow users to drill-down to different geographic levels and filter by demographics and cancer type. This flexible approach supports a range of ad hoc epidemiological analyses.
- **Clinical trials:** Westat uses interactive data visualization techniques to monitor site performance against key performance indicators, document audit performance, and produce camera-ready graphics for publication. These techniques serve to improve both trial efficiency and participant safety.

Tools and Technologies

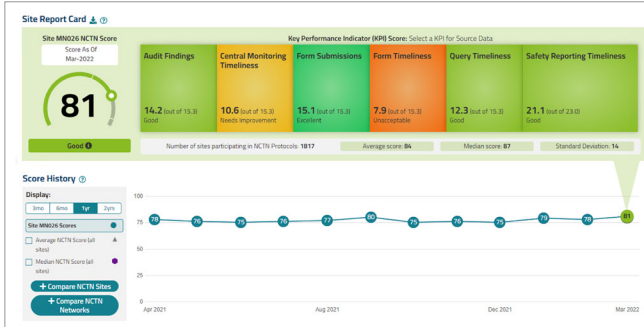
In collaboration with clients, Westat data scientists create innovative data visualizations using the following specific tools and techniques:

- Commercial off-the-shelf packages, including Tableau, Microsoft Power BI, SAS, and Amazon QuickSight
- Open-source applications, including R Shiny and custom graphing libraries (e.g., ggplot2)
- Custom built web-based applications using a range of modern web-frameworks, including JavaScript frameworks (e.g., Angular, ReactJS) and libraries (e.g., D3.js), Python, and Microsoft technologies (ASP.NET)
- Our Platform for Dynamic Decisions Dashboard (Pd3), which is our proprietary data visualization platform used to power many field operations and multimode dashboards at Westat

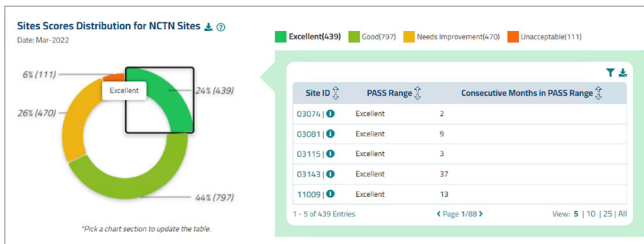
Illustrative Projects

Performance Assessment Score for Sites (PASS) uses data visualization tools to present performance data for clinical trial sites.

- **Site Report Card** represents the overall performance score of clinical sites, the score of a site on each KPI, and the history of site score over the last two two years.

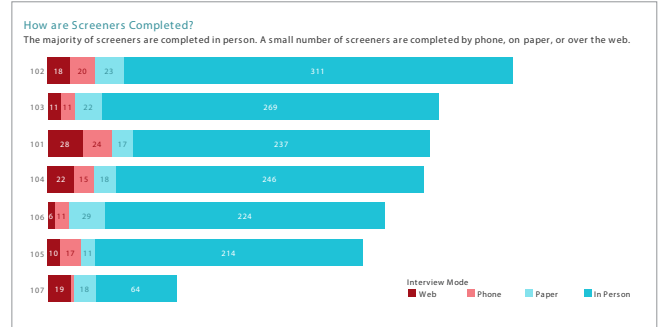


- **Site Score Distribution** represents the number of sites in different score buckets. In the screenshot, the user has selected “Excellent” pie in the graph to show the list of 25 sites in the table on the right.

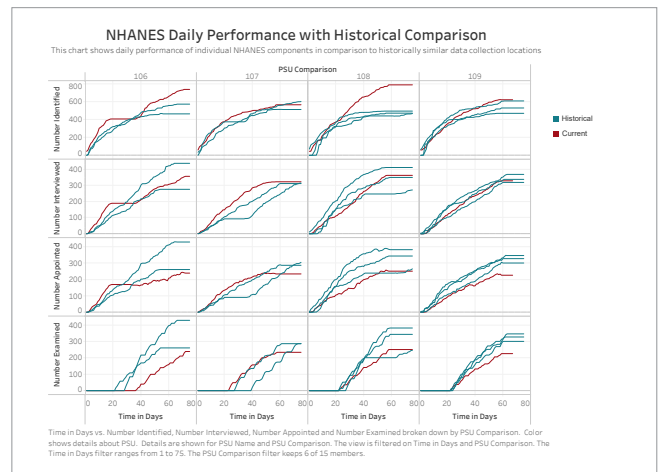


National Health and Nutrition Examination Survey (NHANES) uses data visualization tools to monitor the progress of data collection across multiple locations.

- **Multimode Screener Summary** facilitates real-time monitoring of the NHANES household screening instrument and breaks down completion by mode: web, phone, paper, or in person.



- **Component Progress Dashboard** uses the small multiples approach to display real-time completion information for each component of the NHANES survey across time for each data collection location. This dashboard gives staff quick and easy access to progress data to determine next steps.



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