

A Health Care Data Revolution – The Case for Data Visualization



With data volumes increasing exponentially, health care can no longer rely on antiquated data presentation tools like spreadsheets and tables. What's needed are new and creative means of data visualization to help users more effectively determine findings and trends, communicate analytical results, and make better business decisions.

As seen in [Healthcare Business & Technology](#).

With big data now used for everything from consumer marketing to weather forecasting, it should be no surprise that big data has also become a big deal in health care. [According to AHIMA](#) (American Health Information Management Association), the health care industry is in the midst of a big data revolution, storing more information than ever before. Health care data volumes are increasing at a 49 percent clip annually, according to a [recent report](#) in CIO Magazine.

With data volumes increasing exponentially, health care can no longer rely on antiquated data presentation tools like spreadsheets and tables any more than modern computers can still use transistors. Spreadsheets and tables are outdated means of data-sharing which are time-consuming to produce and ineffective to consume, particularly with large amounts of data.

No wonder so many business leaders have issues properly understanding and applying data. A [recent survey](#) revealed that 70 percent of organizations struggle to find critical data insights or get data into the right hands to

drive decision-making.

What's needed are new and creative means of data visualization (DV) to help users more effectively determine findings and trends, communicate analytical results, and make better business decisions.

Data Visualization (DV) Defined

What is DV, as well as its affiliate, data storytelling? According to Dipti Patel-Misra, Ph.D., chief data and analytics officer for Vituity, DV is a “gift to recipients” in the sense it makes vast amounts of data easier for others to experience, comprehend and act upon.

“Data visualization is the process of analyzing large amounts of data and communicating the results in visual context so that the audience can more easily digest and act upon the information,” Patel-Misra said.

Data storytelling goes beyond DV and includes a combination of visual and non-visual data analysis results and narrative information to tell a “story” to more effectively communicate the results or position related to health care data analysis. Often health care organizations present DV in either a PowerPoint presentation or printable form. DV can also be used within dashboards, which are online representations of data analysis and often interactive.

DV Examples in Health Care

Where can DV be used within health care? A few examples:

- **Board presentations** – Provider and health plan board presentations often provide an excellent opportunity to use DV techniques and data storytelling to present financial and other information like patient satisfaction results. Stories become more impactful when presented via DV, as opposed to solely using dull tabular columns.
- **Public health presentations** – Public health data, frequently vast and complicated, is easier to understand via DV. For example, scientists at Blue Cross Blue Shield of Tennessee [used DV](#) to address the problem of opioid abuse. From years of insurance and pharmacy data, they were able to identify 742 risk factors to accurately predict the risk of opioid abuse.
- **Sepsis management** – Sepsis, the leading cause of death in U.S. hospitals, affects 1.6 million patients in the United States each year, and is growing 8 percent annually. Sepsis is the leading cost of hospitalization in the United States, and the leading cause for readmissions. Health care systems are [using DV to more effectively identify and mitigate the risk of sepsis](#).
- **Social determinants of health** – Less than 20 percent of mortality rates are affected by an individual's clinical care. Much of the remainder is based on sociological and economic risk factors – e.g. ethnicity, place of residence, education level, etc. Health care systems and organizations are [using DV to track and identify](#)

[these social determinants of health](#) in order to potentially positively influence them.

[See this DV example](#). Note the “at-a-glance” usefulness of the data and information provided.

Where to Start?

Organizations interested in leveraging DV techniques should consider the following six steps:

1. **Identify a pilot project** – Select a project with: 1) high organizational visibility; 2) a high probability of value and success; 3) sponsorship with participation availability; and 4) a deliverable of 90 days or less. Projects longer than 90 days risk losing momentum.
2. **Find the data sources** – Create an inventory or list of current data sources which are pilot project candidates. Capture the data owner for each and attributes such as file type, storage location, data owner, data size, refresh frequency, etc.
3. **Create a data visualization model** – This is where the creative “magic” takes place. Hold brainstorming sessions with stakeholders to create “wireframe” versions of new data visualizations. Often these will take the form of multiple dashboards or graphical representations. Identify the targeted audience for each data visualization and the delivery method (e.g. PowerPoint, online dashboard, etc.). Initially draw the wireframes or outlines of the new data visualizations on whiteboards or flip charts and then transform the diagrams into a software tool such as Tableau, Microsoft PowerBI or Excel. When data stories are part of the project, link each data visualization together to create the meaningful “story.”
4. **Prepare the data** – Your data sources will likely need data transformation to be usable for DV. Data preparation can account for 50 to 80 percent of overall DV development. Data preparation tools can configure workflows to automate the data preparation steps.
5. **Develop the DV** – Select a visualization tool, configure it to build each part of the DV, meet with stakeholders to review and adjust the configuration and prepare the DV for testing.
6. **Test and deploy** – Engage end-users in user acceptance testing. Present and gain final approval, train users, then deploy the new DV. Implement data refresh and support processes. Collect suggestions for improvement and plan additional releases.

Summary

Data in health care, especially big data, is meaningless without context. That is why DV is increasingly appearing in health care communications – in board and public presentations and division and department meetings – as a means of helping recipients more readily understand and intelligently act upon the information presented.

The greatest current need in health care data is no longer in production but around consumption. By providing recipients with critical context in DV form, forward-thinking health care organizations and their leaders will more

likely enhance their culture, operations and performance.