

2020 NPCR FLORIDA CANCER DATA SYSTEM SUCCESS STORY

STORY CATEGORY: Public Health Impact

STORY TITLE: Designing an Interactive Data Dashboard to Improve Communication of Cancer Data in Florida

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SUMMARY

In 2019, the Florida Cancer Data System (FCDS) implemented a new data visualization dashboard to display data on the cancers most diagnosed in Florida. Since then, the dashboard has been viewed over 3,000 times. The main objective is to make cancer data easier to access and understand for a lay public audience. It also serves as a platform to teach users how to understand cancer statistics in general. Simultaneously, an internal process for updates was developed which will allow the data to be updated annually with minimal effort from FCDS staff, thus making it sustainable.

CHALLENGE

The users of the FCDS data have varied levels of understanding of cancer data and statistics. The Central Cancer Registry already provides data in numerous formats, including annual reports, monographs focused on special studies like survival or racial/ethnic background, and an interactive query tool that is useful for cancer professionals with specific questions about the data.

However, users with less experience seeing and interpreting cancer data may not find these existing tools helpful. When data tools and reports use jargon and statistical terminology that are difficult for a lay audience to understand, misinterpretations can occur. Preventing such misinterpretations is a central goal in visualizing data and can reduce concerns from the public. Furthermore, clearly communicating the burden of cancer is an essential building block for cancer prevention and control from a broader public health perspective. Without an understanding of the extent of the burden, the trends, and the populations most impacted by cancer, we cannot expect cancer advocates, coalitions, and partners in chronic disease prevention to make data-informed decisions.

Finally, when publishing cancer data from year-to-year, much time and effort can be spent on updates to the data, archiving out-of-date static reports, or changes to layout and design. This can become an extra burden on central cancer registry operations.

SOLUTION

The FCDS worked with One Health Insights (OHI), a public health consulting firm, to design a data visualization dashboard on the top cancer sites in Florida. Statistics included state-level cancer incidence, mortality, stage, and trend analysis. County-level counts, rates, and stage distribution data were also included. In the design of the dashboard, we took into consideration data visualization best practices such as the use of easily understood chart types, a simple color palette, and clear language choices.

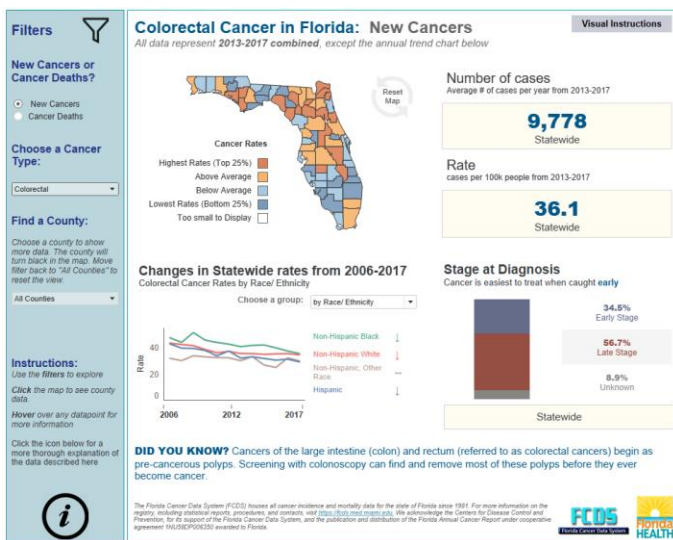
Importantly, we kept a constant focus on the target audience for the dashboard, which is the lay public and non-cancer professionals. We worked to present statistical information in a way that is easy to understand and provides explanations of common cancer terminology.

We felt it was critical to design a dynamic dashboard that could be updated seamlessly and annually, without affecting the original format and structure. First, the data are pulled and pre-aggregated from the FCDS database. We developed custom scripts to allow the data to be easily updated in future years. The data were then uploaded into Tableau software, where all visualizations for the dashboard were developed. The use of a data visualization software program that pulls data from an external source means that updates can easily be performed in future years by simply updating the data on the back end. This eliminates the need to archive outdated static reports and provides the most relevant and up-to-date information to the public.

Testing the dashboard with users and designing new iterations based on feedback were an especially important part of the process. FCDS completed hour-long individual interviews with four users to see how they interacted with the dashboard. This helped to inform us about things that did not function as expected. After making changes to the design based on these initial in-depth interviews, a second round of feedback was solicited from eighteen more individuals. This helped us to further refine the tool and feel confident that people with no background in cancer could understand the data.

RESULTS

After several rounds of testing and improvements, the dashboard was embedded onto the FCDS website and made public in 2019. The website is tracked using Google Analytics to help determine how the use of the dashboard is impacted by things like press releases, email blasts, and presentations at meetings. Continual evaluation of the use of the dashboard will help the team to understand who is using the tool and make improvements in the future.

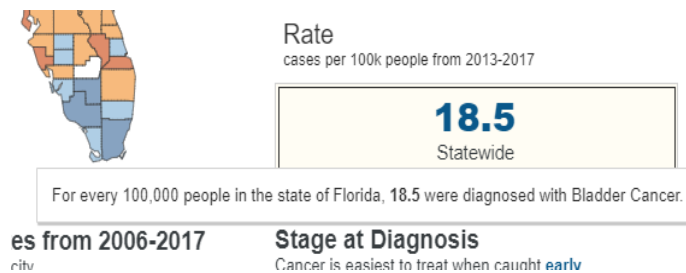


A screenshot of the dashboard showing colorectal cancer data

Here are a few examples of how our team designed the dashboard in unique ways to encourage understanding by viewers who do not have a background in cancer and/or statistics.

1. Avoid jargon whenever possible.

Terms such as “rates” and “statistical significance” are not intuitively understood by members of the lay public. Whenever possible, we replaced terminology with phrases that are easier for any viewer to understand. For example, the term “incidence” was replaced by “new cancers.” Where we could not avoid using a term that might not be easily understood (e.g., rate), we provided explanations and descriptions alongside these terms to help communicate their meaning. Tooltips, like the one shown below, allow users to read an explanation of the data in plain text when they hover their mouse over the data.



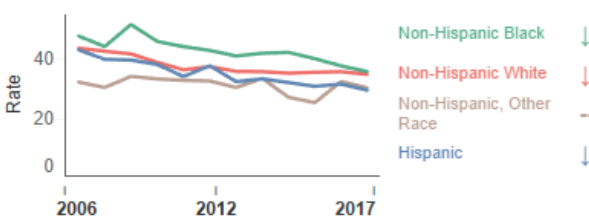
2. Be clear about increases or decreases in cancer rates without requiring an understanding of statistical significance.

The dashboard shows the change in incidence and mortality rates over time. This chart can be viewed for a cancer site overall or stratified by sex or race/ethnicity (shown below). Joinpoint analysis was used to determine whether the changes in rates over time are statistically significant, and then a simple up or down arrow was displayed to help users interpret the change, regardless of their understanding of statistics. In the example below, you can see that colorectal cancer incidence rates have dropped significantly for all racial/ethnic groups except the “Non-Hispanic, Other Race” group, which has not significantly increased or decreased.

Changes in Statewide rates from 2006-2017

Colorectal Cancer Rates by Race/ Ethnicity

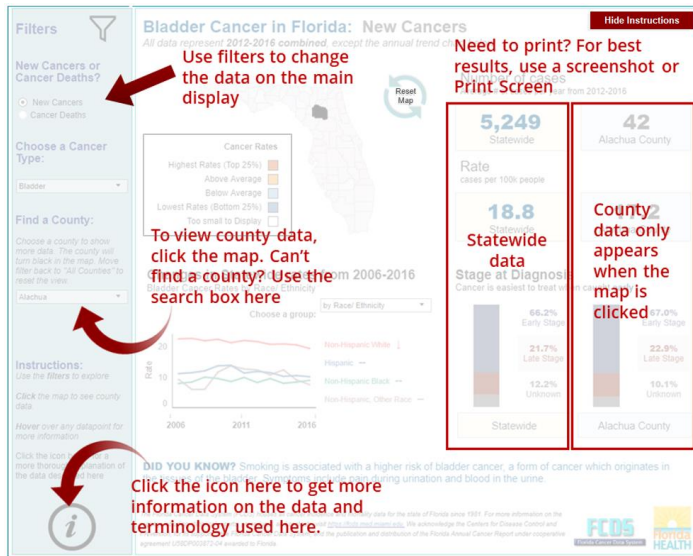
Choose a group:



3. Use your words.

There are numerous examples throughout the dashboard that show how the use of text can make the data easier to understand. For example, the sub-title for the Stage at Diagnosis chart explains *why* stage data are important (because cancer is easiest to treat when caught at an early stage). One unique

example is the creation of a “visual Instructions” button, which guides the users on how to use the dashboard. These instructions toggle on and off using the button in the top right corner and provide a general layout of the tool.



4. Avoid overwhelming the reader.

There are hundreds of ways that cancer registry data could be sliced and diced to deliver a different story. However, including every possible data point or filtering by too many variables on a dashboard can be overwhelming and confusing. Therefore, we tried to stick to some key points that would communicate the overall burden of cancer.

Since the launch of the dashboard on the FCDS website, feedback on the tool has been positive and its use has been steady. We plan to maintain the success of the dashboard by updating data when new diagnosis years are published, and by adding dashboards that relate to local public health efforts. For example, we have recently added cervical cancer to the dashboard to align with Florida’s statewide effort to eliminate cervical cancer.¹

SUSTAINING SUCCESS

Now that the framework has been built, updates and additions to the dashboard are relatively simple. Future visualization efforts will also expand beyond the dashboard described here. FCDS plans to roll-out a series of visualizations on the status of cancer screening in Florida. For each new project, we are keeping detailed notes on the processes involved in data management so that the next updates can be done with little effort. This will allow us to eventually build a library of visualizations and data tools to help ensure that FCDS data are easily accessible and understandable by all who need them.

REGISTRY CONTACT INFORMATION

Main phone line: 305-243-4600
<https://fcds.med.miami.edu/>

1. Florida Cancer Control and Research Advisory Council (CCRAB). 2021. 2020-2025 Florida Cancer Plan. Accessed on 1/15/2021 from https://www.ccrab.org/_cache/files/0/9/0998608c-ba7b-4d23-aa27-f012e2257910/351F15AAED65D21F20FCBBC2B1E8E96B.flacancerplan-2021lowres.pdf.