



Tech Can Help!



Data Visualizations Combat Tennessee's Opioid Overdose Crisis

August 2017 – September 2018

NASCIO Award Category: Data Management, Analytics & Visualization

Submitting State: State of Tennessee

Contact: Addy Newsom, Project Coordinator CIO Office



Strategic
Technology Solutions

Executive Summary

The misuse and abuse of prescription drugs, along with the associated morbidity and mortality, has been identified as one of the most serious and costly issues facing Tennesseans today. The State of Tennessee is geographically and culturally situated in the middle of the national prescription drug overdose (PDO) epidemic. Opioid use is disproportionately high in the northeastern (Appalachian) region of the state, while heroin use is highest in the southwestern (Memphis) area, reflecting disparities for both geographic and racial/ethnic segments of the population. In 2015, TN had the tenth highest drug overdose mortality rate in the US, most of which was due to prescription drugs.

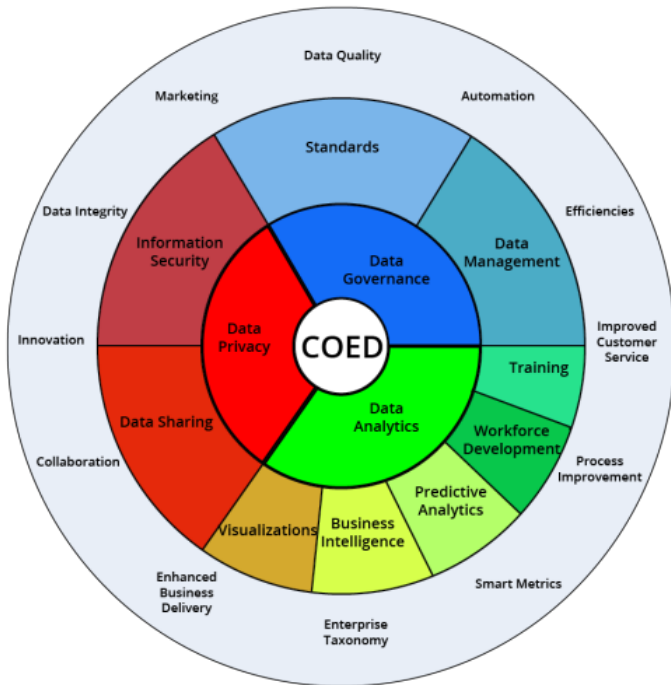
In order to develop a plan to effectively combat this identified epidemic, Tennessee's Department of Health (TDH) knew that they needed accurate data to do just that. Accordingly, they enlisted the help of Strategic Technology Solutions' Center of Excellence for Data (STS Center of Excellence for Data) to assist them with creating the *Tennessee Drug Overdose Dashboard*. Once completed, this dashboard provided state, regional and county-level data on fatal overdoses, non-fatal overdoses and drug prescribing in the State of Tennessee.

The *Tennessee Drug Overdose Dashboard* provided a visual tool that brought understanding to the trends contributing to the opioid epidemic in Tennessee. Visual analytics were used to identify the most vulnerable patient populations. In turn, this assisted the Tennessee's Department of Health (TDH) with forecasting and allocation.

Upon completion, the *Tennessee Drug Overdose Dashboard* data showed that almost three-fourths of the 1,268 drug overdose deaths in Tennessee, were associated with opioids in 2017. Further analysis of that data revealed that 644 were associated with prescription opioids for pain, which included drugs such as hydrocodone, oxycodone, morphine and codeine. Utilizing the *Tennessee Drug Overdose Dashboard* alerted TDH that prescription opioids for pain were associated with more overdose deaths than any other group of drugs in 2017. Talk about a life-altering statistic!

Executive level dashboards like the *Tennessee Drug Overdose Dashboard* are essential for enabling and empowering business leaders to periodically monitor, measure, analyze and improve their business programs based on actionable metrics and key performance indicators (KPIs). The STS Center of Excellence for Data was created specifically with this essentiality in mind. By partnering with State of Tennessee Departments, the STS Center of Excellence for Data strives to align business and IT by promoting the methodical use, collection, storage, and sharing of data to assist in continuous improvement across our State. The Center of Excellence for Data has provided advanced capabilities at an enterprise level to our Departments, rather than requiring each Department to hire their own data analytics resources. This collaborative model has resulted in improved efficiencies and capabilities, while also reducing replication of resources across the State of Tennessee.

STS Center of Excellence for Data



The Center of Excellence for Data is located within the State of Tennessee’s central IT division, Strategic Technology Solutions. The STS Center of Excellence for Data is a cross-functional team that supports and promotes the methodical data use, collection, storage, and sharing to assist in continuous improvement across the State through better data usage and fluency. The Center of Excellence for Data aligns business and IT, recognizing data as an asset to improve business outcomes through data-driven decisions. With a focus on helping stakeholders with the challenges that accompany Data Sharing, Data Privacy, Data Quality, and Advanced Analytics. The Center of Excellence for Data operates under the three main headings of Governance, Privacy, and Analytics.

The realized benefits of Departmental collaboration with Center of Excellence for Data are numerous:

- *DECISION MAKING: Decisions, both strategic and operational, are made on the basis of the data provided. Poor quality data will inevitably result in flawed decisions. The provision of authoritative and accurate data facilitates informed decision making.*
- *OPERATIONAL EFFICIENCY & AGILITY: Getting the right resources in the right place at the right time depends on the provision of accurate, timely and readily available data.*
- *CROSS-DEPARTMENT COLLABORATION: Accessing new troves of data yielding new information and ease of knowledge transfer to the benefit of citizens.*
- *SOLUTION DELIVERY: Better understanding of the data, how it is structured, where it is held, its lifecycle and lineage facilitates accurate impact assessment and more predictable estimation and solution development.*
- *LEGISLATIVE COMPLIANCE: More readily achieved if data is well structured understood and effectively managed and governed.*

The STS Center of Excellence for Data strives to align State business and State IT by supporting and promoting the methodical use, collection, storage, and sharing of data to aid continuous improvement across the State of Tennessee. In August of 2017, the Tennessee Department of Health (TDH) partnered with resources from the STS Center of Excellence for Data in order to create a visual tool that would provide better understanding of the opioid epidemic in the State of Tennessee.

Project Collaboration & Concept

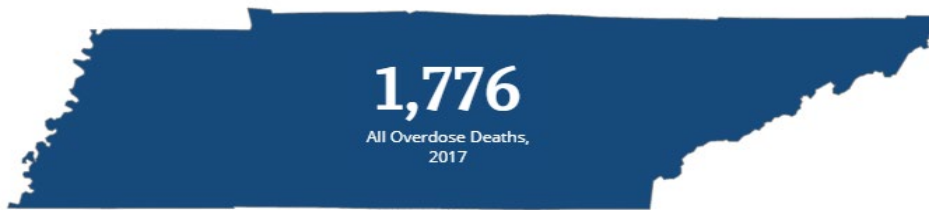
The referenced project was part of an overall initiative called *TN Together*, which was a comprehensive plan to end the opioid crisis in Tennessee. *TN Together* was a multi-faceted initiative comprised of legislation, \$30 million in state and federal funds from former Governor Haslam's proposed budget, and assorted other executive actions. *TN Together* was created to combat the State of Tennessee's opioid epidemic through three major components: Prevention, Treatment and Law Enforcement.

In order to fulfil the mission of *TN Together* most effectively, the Tennessee Department of Health (TDH) knew that they needed a reliable tool they could utilize to educate people on the statistics behind the opioid crisis that was plaguing the State of Tennessee. The Department's first choice was an off-the-shelf dashboard product, but they soon discovered the technology lacked the depth and agility needed for the task. So, in August of 2017 TDH partnered with the State's enterprise IT organization to develop an in-house solution that would best meet their needs. Thus began the collaboration known as the *Tennessee Drug Overdose Dashboard* project.

The project's stakeholders included: the Governor, Legislators, the Commissioner of the Department of Health, as well as executive management, regional directors, county leaders, and ultimately the citizens of Tennessee. The communication and education for this tool was driven through one-on-one meetings and demonstrations with county and regional officials. Meetings with various state, regional, and county level stakeholders were held on a weekly basis for approximately one year from 2017 to 2018. These efforts took place in order to define and refine exactly what data needed to be utilized as input, and how it should be displayed visually as an output on the dashboard.

Following requirements gathering, STS Center of Excellence for Data and TDH decided to leveraged Tableau technology for this project, because it offered the best flexibility and the sophistication needed for the job. Tableau dashboards are interactive, animated, and highly responsive which are essential components in supporting the TDH's lofty mandate to address and educate the public concerning the dangers of opioids and the impact of the opioid crisis on Tennesseans. The dashboard required approximately 10,000 man-hours to complete, and seven team members. It was decided that the *Tennessee Drug Overdose Dashboard* would be housed on the State's public website TN.gov -- thus providing excellent accessibility, transparency, while ensuring the utmost security of that data and allowing for 100% oversight and management by the State (<https://www.tn.gov/health/health-program-areas/pdo/pdo/data-dashboard.html>).

Visualization Samples (retrieved from the Tennessee Drug Overdose Dashboard)



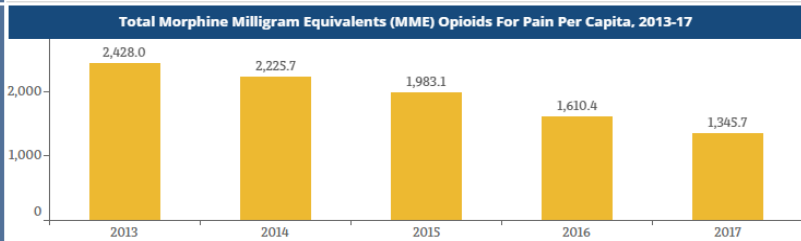
In 2017, Anderson County had a rate of 470 Short-Acting Hydrocodone prescriptions per 1,000 persons.

- Short-Acting Hydrocodone ↓ 36.4%
- Short-Acting Oxycodone ↓ 6.6%
- Short-Acting Tramadol ↑ 30.3%

Rate of Top 3 Filled Prescription Opioids per 1,000 persons					
	2013	2014	2015	2016	2017
Short-Acting Hydrocodone	738.7	707.1	610.6	539.4	469.6
Short-Acting Oxycodone	498.5	521.4	539.0	501.3	465.9
Short-Acting Tramadol	123.0	138.3	161.3	165.2	160.3

In 2017, Anderson County had 102,651,564 total MME for pain. (1,346 MME/Tennessean)

↓
44.6%



Significance & Impact

The goal for the *Tennessee Drug Overdose Dashboard* project was to create an interactive, animated and highly responsive tool to be utilized for providing drug overdose education and data demonstration for the citizens of TN. In September 2018, STS delivered the completed dashboard product to THD. The dashboard's success has been clearly defined by a reported 99% success rate from the TDH, and by the fact that the dashboard is operating at a 100% adoption rate on regional and county levels to date.

Prior to implementation, opioid analysis was clunky at best and offered only rudimentary data. The *Tennessee Drug Overdose Dashboard* product provided a deeper reach for data, additional transparency, animation, interactivity, and responsiveness.

The worthiness of this effort is unquestionable, as the dashboard has enabled efforts to meet the State of Tennessee's goal of reducing the number of overdoses through relevant education. It has done so by turning complicated datasets into visualizations that have been utilized for the education of Tennessee legislators, physicians, hospitals, and Tennesseans alike. As for innovation, STS was among the few states to first utilize Tableau technology for its dashboards. Not only that, but the Center for Disease Control (CDC) has requested to use the *Tennessee Drug Overdose Dashboard* as a model for other states to follow. What an honor!

"More Tennesseans have died from drug overdoses than from automobile crashes. Few of us have escaped a direct impact of this crisis in experiencing the tragic death of a family member, loved one or friend." -Former TDH Commissioner John Dreyzehner

*...and tech
can help!*

