

# Best Practices

IN EMERGENCY SERVICES

## Crunching the Numbers

In Sedgwick County, data collection leads to increased efficiency and better patient care.

BP Focus

One of the most significant changes in EMS in recent years is a growing understanding about the importance of gathering data on response times, demand trends and patient outcomes, which can then be used to improve patient care and operational efficiency. Under the direction of EMS Chief Steven Cotter, Sedgwick County EMS, which includes the city of Wichita, Kan., is taking its use of data to a new level.

When Cotter was hired by Sedgwick County two years ago, he knew the agency and its staff were doing many things well. He also recognized the need for updated technology to better serve the region's 480,000 residents, who were spread out over 1,000-plus square miles. "The process of sending an ambulance to a sick person is on the surface very simple," Cotter says. "But when you dig into what makes it go well every time, it's a very complex process and you need a lot of information and a lot of data at your fingertips to make timely decisions."

Sedgwick is a third-service EMS agency and the exclusive provider of 911 and non-emergency transport in the county. As part of its contract, responders must meet response time guidelines that vary according to urban, suburban and rural areas. There was room for improvement: While the contract called for 90 percent of calls to fall within the guidelines, responders were getting to about 85 percent of calls on time.

To see where they were falling short, Cotter and his team needed to know more about what was causing the "exceptions."

### Gathering the data ...

After requesting the previous months' data from dispatch, the operations manager had to comb through the information;

categorize each call as urban, suburban or rural; and compute average and 90th percentile responses. Not only was there a 45- to 60-day lag between the call and analysis, but there was little information about individual calls. With more than 50,000 calls a year, memories fade quickly, which made it difficult to determine what had caused the delay or how to improve.

"We had no way to examine why we were late, and we knew nothing about trends and patterns," Cotter says. "We could not take an individual occurrence of being late and immediately analyze it to understand what happened. Did we not have enough ambulances? Were they not in the correct position? Are there areas of the city or the county that are problematic for us? Were the late responses occurring during our busy or slow times? We knew none of that in a timely manner."

Shortly after he arrived in Sedgwick County, Cotter made a case to his county commissioners for investing in First-Watch, which offers real-time data analysis and surveillance information about trends in call volume and location, as well as detailed response time information broken down into chute time, time in transit, time at the hospital, and so on. One of the first things they learned was that it was time to shift two longstanding strategic street-corner posts to better match call-volume patterns.

Knowing immediately about a late response allowed Cotter and his team to follow up right away with responders. In doing so, they discovered something surprising: Responders used map books for navigating routes, yet Wichita is crisscrossed by train tracks and flood control canals—often, what looks like a direct route is actually a dead end. About 30 percent of

late responses could be explained by responders making poor route choices. "We had to take a best guess about the most expedient route, and we weren't always right," Cotter says.

Armed with that information, he appealed to the commissioners

“The process of sending an ambulance to a sick person is on the surface very simple. But when you dig into what makes it go well every time, it's a very complex process and you need a lot of information and a lot of data at your fingertips to make timely decisions.”

— Sedgwick County EMS Chief Steven Cotter

Continued on next page

to invest \$230,000 to outfit 26 ambulances and six command vehicles with MARVLIS (Mobile Area Routing & Vehicle Location System), which interfaces with the CAD system to determine where ambulances are located and which is best positioned to respond. The system also includes on-board GPS and real-time routing instructions that take into account road closures, construction and traffic congestion.

### ... Seeing the results

After implementing FirstWatch last spring and MARVLIS last fall, Sedgwick's response time compliance is running upwards of 92 or 93 percent, and average response times have been reduced by nearly a minute. "We look at every exception, every day," Cotter says. "The deployment manager comes in and provides a daily report and explains where it occurred, why it occurred and what we need to do to make sure it doesn't happen again."

Another technological change is the recent introduction of the Sansio electronic patient care reporting (EPCR) system, in which crews begin the documentation process using laptops while on the call. About 85 percent of calls are now documented by the time the patient arrives at the hospital, giving doctors in the emergency department immediate access to the information and the medical control director and EMS clinical manager the ability to know right away if proper protocols were followed, lessons that can then be used in continuing education.


Since going to the new EPCR, net revenue from user fees has increased by about 12 percent, while call volume has increased by only about 5 percent. Cotter believes the revenue

To find out more about FirstWatch, visit [www.firstwatch.net](http://www.firstwatch.net). For more on MARVLIS, visit [www.bcs-gis.com](http://www.bcs-gis.com). And for more on Sansio, visit [www.sansio.com](http://www.sansio.com).

bump is because the billing office now has the information it needs to invoice Medicare and insurance companies within three to five days of the call, rather than a month or more later. Prompt invoicing means Medicare billing windows aren't missed and more bills are collected on from private insurers.

Sedgwick County was fortunate to escape some of the drastic budget cuts that other municipalities around the nation have been experiencing recently, Cotter says. But given the financial environment, each request to invest in new technology had to be explained in business terms—either the purchase would provide a return on investment or increase productivity.

"For us, productivity is being more effective and efficient in our delivery of service," Cotter says. "I couldn't go to the commissioners and say, 'I'm not making response times. I need more units,' when I didn't know how effectively we were using our current ambulance fleet.

"The technology has opened our eyes to be able to understand how we are performing, where we are deficient in our performance and how we can make changes quickly and adapt to a changing environment." 

— Jenifer Goodwin, associate editor