

► BUILDING CAPACITY



Darryl Booth, MBA

Analytics Build Capacity for Health Departments Combatting Rodent Infestations

Editor's Note: A need exists within environmental health agencies to increase their capacity to perform in an environment of diminishing resources. With limited resources and increasing demands, we need to seek new approaches to the business of environmental health.

Acutely aware of these challenges, NEHA has initiated a partnership with Decade Software Company called *Building Capacity*. *Building Capacity* is a joint effort to educate, reinforce, and build upon successes within the profession, using technology to improve efficiency and extend the impact of environmental health agencies.

The *Journal* is pleased to publish this bimonthly column from Decade Software Company that will provide readers with insight into the *Building Capacity* initiative, as well as be a conduit for fostering the capacity building of environmental health agencies across the country.

The conclusions of this column are those of the author(s) and do not necessarily represent the views of NEHA.

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Analytics, the computational analysis of data, have made their way into our daily lives. Common apps exist that track our dietary choices, our running routes, even our sleep. With real-time information about things that are important to us, we can make changes—behavioral or environmental changes targeted at improving those data. Consider the popular Fitbit, an inexpensive device worn as a wristband, which feeds continuous streams of data to an online repository where they are crunched, compiled, and

presented as easy-to-read graphs, serving as a competitive “nudge” by pitting you against yourself or your friends.

This personal concept of a “quantified self” is relevant and even more compelling at a larger scale, as business analytics. And so it is perfectly appropriate to examine municipal analytics as a means to build capacity. Utilizing analytics, health departments can better guide their decision-making procedures and be more open and transparent with their citizens.

Health departments already collect vast quantities of data by virtue of their regular business services; for example, data produced by 311 requests. In what ways do local governments further utilize this data after an initial work order is closed? In this column, I discuss how health departments have successfully employed targeted analytics to be more efficient and effective in managing rodent baiting activities.

We all acknowledge that rodents are a public health concern, particularly in urban areas. Cities such as Chicago, Illinois, and Somerville, Massachusetts, are now effectively using 311 data and predictive analytics to track rodent activity and guide their treatment efforts.

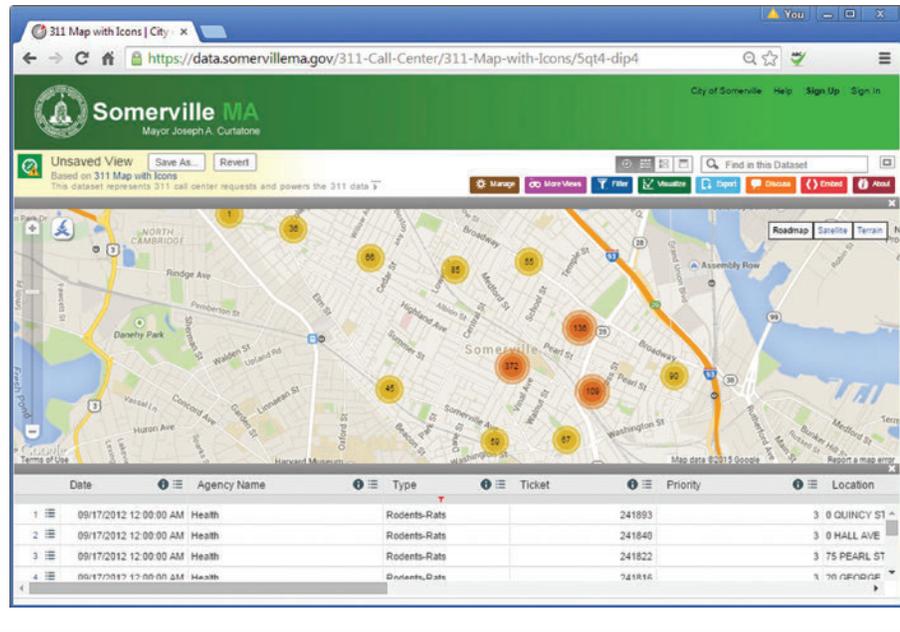
Previously, Chicago's preventative rodent control procedures, beyond responding to individual 311 calls for private and public locations, was limited to proactively baiting locations that were known to be prone to infestation (e.g., a cluster of restaurants).

Through a partnership between the Department of Streets and Sanitation (DSS) and the Department of Innovation and Technology (DoIT), Chicago launched a pilot automated preventative rodent baiting program in October 2013. The program models data captured by the city's 311 service and analyzes 31 different service request data points, such as abandoned buildings, weed complaints, stray animals, or overflowing trash cans to guide the timing and location of preventative baiting services. Based on this information, the data forecasts potential rodent activity and automatically generates a baiting schedule.

The pilot program has since been fully adopted. “What we noticed after six months

FIGURE 1

Example of Somerville's "Heat Map" Created From 311 Call Data



of half our teams using the automated model and the other half following our regular procedure,” says Molly Poppe, spokesperson for DSS, “is that the automated model was boosting personnel efficiency by 20%. Supervisors and crews used to have to come in and spend at least an hour every morning in planning, saying, ‘Ok, we were in this neighborhood, and we noticed these issues, this might start to become a problem, so let’s get people out there.’ The automated model saves us that planning time, and allows us to have crews out on the streets faster and longer. Rather than reacting to infestations, we are able to get out ahead of them.”

Through this program, DSS became so effective that they were trusted by their city council to expand the program and add more teams.

Chicago is a big city with many resources, but analytics are not out of reach for smaller municipalities. Somerville, an urban satellite of Boston with a population of 80,000 residents, offers a compelling perspective on the smaller version of municipal analytics. Another city that has fully embraced data, Somerville employs analysts to use data to inform decision making and implement new ideas (www.somervillema.gov/departments/somerstat).

Somerville launched an aggressive approach to its rodent problem via a 311 data-based rodent abatement program and extensive community outreach, prompted in part by a surge in rodent complaints. In 2012 a record number of rodent complaints occurred: 698 reported sightings, compared with 282 sightings just two years earlier. Denise Taylor, director of communications, notes that communities across the region experienced a similar increase. But, she says, Somerville is different. “Everybody has rats—what’s different is we have rat data and we have a rat plan.”

Somerville established the rodent action team (appropriately acronym-ed RAT), which uses 311 call data to create “heat maps” showing where rodent complaints are being made (Figure 1). The 311 data is exported and manipulated using commercially available statistical software with mapping functionalities. The team then investigates, analyzing other data sets and trends to determine what factors might be causing or contributing to rodent outbreaks. Based on these insights, Somerville’s Inspectional Services Department (ISD) knows where and when to respond and can do preventative work.

“With any mobile biological vector, of course, it can be difficult to get clear data on

where the rats actually are,” says Ellen Collins, operations manager for ISD. “We bait catch basins, which is pretty standard practice. But when we started tracking reinspection data, we found that though the calls continued to come in, the bait tended to not be disturbed. As we are a mostly residential city, this was the evidence we used to dedicate more resources towards addressing residential waste, which is a rodent food source.”

With support from the mayor and city government, Somerville started a financial assistance residential program in 2014 allowing one-time inspections and education for qualifying residents. The city also distributed waste bins with attached lids. “The idea was that rats won’t go into a sewer to eat bait if there’s food in your garbage or rotting fruit from your tree in your backyard,” explains Taylor. “We knew based on the data that we weren’t getting to them through the sewers and we knew people with private property either didn’t know how to reduce food sources or couldn’t afford private exterminators. The residential program allowed us to get to those properties where we knew we could be more effective, rather than bait the sewer where we knew they weren’t going.”

Between the summers of 2013 and 2014, a 41% decrease in calls occurred, compared to only a 2.7% decline from 2012 and 2013. “It was a colder winter, so we can’t say definitively that it was all due to our measures, but it’s such a large decrease that we feel quite positive,” says Collins. “These data are incredibly useful; they help us identify the problem, help us in our decision making, and over time they will help us determine if we’ve actually taken the right steps to address it. Without the data at any of those steps, I think that we would have had a much tougher time making and evaluating our decisions.”

Predictive analytics have many applications in the public sphere, as well as many challenges. Though at its most basic the metrics are generally the same across the country (the number of rodent calls locals make) opportunity exists for incongruity. That’s why Somerville is currently developing data standards with the neighboring cities of Cambridge and Boston to ensure the highest level of data accuracy.

“It’s very helpful when other cities are working on the same datasets and sharing them,” notes Taylor. “Comparing to other cities, espe-

cially cities with similar weather patterns, is helpful in our analysis of what the overarching issues may be and if our programs are having an impact. Recently we've seen our data shift away from the pattern in Boston in particular, and it coincides with some of the measures we've been taking, potentially proving that beyond variables outside of our control, like weather, we are having an impact."

Constituents expect a high degree of transparency and efficiency, and technology application is rising to meet the occasion. Budgets

are still tight, but right-minded collaboration with internal technology and innovation departments as well as with other health departments can foster high-impact and low-cost results. By using health data in innovative ways, health agencies can be not only more efficient in their practices, but also more precise in how they strategize, allocate funding, or make requests of governing entities. I am especially drawn to this concept simply because agencies naturally collect these types of data every day.

Let's continue this conversation. Tell us how municipal analytics have benefitted you at <http://tinyurl.com/DiscussAnalytics>.

If you are interested in pursuing a project like this, find more resources at www.decadesoftware.com/Column. 🐼

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