

If you lived in Milwaukee in early April 1993, you would have found an unusual sight in many of the pharmacies around town. Row after row of anti-diarrheal medications were missing from shelves, bought up in a frenzy by citizens suffering from acute abdominal pain, diarrhea, vomiting, and fever. The chief virologist and the commissioner of health received calls from worried residents and the press inquiring about reports of widespread gastrointestinal (GI) illness among residents.

Responding to this information, the health commissioner began calling local hospital microbiology laboratories and emergency rooms to determine the extent of the GI illness around the city. The department determined much higher rates of emergency room visits for GI distress and a larger number of tests ordered for enteric diseases. It was on day three of this outbreak that the first positive test for *Cryptosporidium* was found in stool samples.

On April 7, 60 hours after the first indication of the outbreak, the mayor issued a water

advisory, which included boiling of all water used for consumption. The public water supply for the more than 800,000 residents was contaminated putting the those who were immunocompromised at the greatest risk.

In the days and weeks that followed, 11 investigatory teams studied the outbreak to document the largest waterborne outbreak to ever hit the

U.S. One team originated with the Centers for Disease Control and Prevention (CDC), which dispatched Epidemic Intelligence Service (EIS) officers to the scene to help in the investigation.

Origin of the disease detectives

In a response to the threat of biological warfare during the Korean War, in 1951 the federal government established the EIS training program. EIS officers soon became known as disease detectives, looking for the next infectious disease threat. In 1955, EIS officers established a national surveillance system that identified 260 polio cases that were traced to unsafe vaccines made by a single California pharmaceutical company. Identifying the cause of the illness allowed other manufacturers to claim their vaccines as being safe and restored public confidence in the immunization program, saving hundreds of children from a lifetime of disability.

In 1957, EIS officers continued to demonstrate the importance of a national surveillance system as the country struggled to respond to the Asian flu epidemic. Today, EIS officers research infectious, chronic, and occupation-related illnesses while providing assistance around the world to government health departments struggling to understand disease outbreaks.

Another type of surveillance

What does this have to do with analytics? The key to making analytics valuable to an organization requires managers to apply surveillance techniques, first proven effective by EIS officers 60 years ago, to their reports.

The power of data analytics software combined with the abundance of data sets creates an environment where the volume of reports

Analytics: Act Like an EIS Officer

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overwhelms the ability of managers to parse the reports to obtain valuable, actionable information.

Therefore, analytics software presents a growing ever-present danger to organizations that do not understand how to best utilize the reports generated. Careful governance rules must be followed to best use the software to improve quality of care and reduce costs.

Set objectives: Effective data governance requires that an overall objective for the analytics be set in advance of running reports. Organizations need to consider the purpose of the reports and the expected outcome. Objectives include items such as improvements in medication error rates, length of stay, operating room time for hip replacement surgery, and emergency ward wait times.

Focus reports on manager's role and responsibility: Rather than allow managers to run an unlimited number of reports at will, reports must focus in on delivering information relevant to managing to a specific objective that the manager controls.

For example, a manager tasked with managing wait time in the emergency ward requires reports that track patient wait time, staffing, time to service delivery (e.g., imaging, phlebotomy), and other activities that may impact emergency ward throughput. By limiting reports to those only relevant to the organization's objective under the manager's purview, managers can focus on reports that provide valuable, actionable information useful in directing department activities.

Reports as a surveillance tool: To create focused reports requires adherence to the principles of typical public health surveillance activities. Rather than wait for an epidemic to grow large enough that it can no longer be ignored, public health officials established surveillance activities that continually collect data on a variety of diseases. By tracking the diseases this way, any abnormality in the disease reporting pattern generates the effort to further investigate the change. Most disease surveillance reports lead to no action, which is the expected response to most reports.

This same "no action required" approach to analytical reporting offers the best means

to get value from analytics. Reports should focus the manager's attention on only those activities that may be a problem, with most reports indicating "all is going well." Only when the report indicates a potential problem

learns what data and means of presentation prove the most valuable. The software also "experiments" by providing additional reports that can be judged by the manager as either valuable or not. This iterative process of review and feedback allows for a change in the reports generated as department needs change.

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does the manager investigate the anomaly through the generation of addition reports and review of related clinical and administrative workflow.

Build the reports and response into workflow: Effective use of analytical reports builds the review and response to reports into the daily workflow of the manager. This ensures that the reports are utilized and evaluated regularly. Over time, unhelpful reports get replaced with those that provide valuable and actionable information.

Introduce machine learning to enhance surveillance: Machine learning offers a means to enhance the surveillance value of targeting reports. By feeding back to the analytical software the value of different reports and the internal data points presented, the software

Valuing analytics software as a surveillance tool for clinical and administrative activities offers a better way to leverage these tools to improve quality of care and financial outcomes. There is great value in not following the next bright shiny object, but rather focusing on the information that truly matters. *

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