

Economics of public safety

By now, the tragic saga of the lead-contaminated drinking water in Flint, Michigan, is well known. Unlike some disasters, this one was not inevitable, and there were many warning signs that could have halted it much sooner. In the developed world, citizens have come to trust that basic public services such as water, power, and sanitation will be provided, for a fee, safely and reliably. Therefore, Flint is not just a nightmare for its 100,000 residents, because it causes all citizens to question whether public officials, who are entrusted with providing essential services, have health and welfare in mind. With criminal investigation of the Flint crisis now under way, my focus is not on assigning blame but on how to prevent a tragedy like this from happening again.

One strong recommendation is to involve scientists early on in major decisions that affect public health or safety. The city of Flint faced a \$15 million budget shortfall, so it examined options for saving money by disconnecting from the Detroit municipal water system. The interim solution, while waiting for a pipeline to be built to a new water source, Lake Huron, was to use water from the Flint River. The plan should have factored in costs to limit the corrosion of lead from the aging pipe system. The water that Flint received from Detroit had been treated to prevent chloride from leaching lead from the pipes; Flint River water has eight times as much chloride, but was not treated as such.

Just as important, public safety needs to be put into perspective with other costs. What is inexcusable in the Flint case is the apparent failure by the Michigan Department of Environmental Quality to weigh the costs of corrosion control against the harm to public health, despite informing the U.S. Environmental Protection Agency (EPA) of their intent to control corrosion. For the 2 years that the Flint River water would be temporarily used, the total cost of corrosion control would have been about \$1 per resident of Flint, so about

\$100,000. Surely residents have spent many times that on bottled water. By comparison, Governor Snyder of Michigan sought \$28 million to fix the problem that his office created.

In cases of major issues affecting public health and safety, U.S. federal agencies should consider having policies that involve mandatory reporting to regional or national headquarters, if they do not already. Many federal agencies benefit greatly from local presence and good relations with their counterpart state agencies, but it can create too cozy a relationship that prevents confrontation.

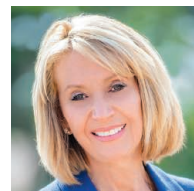
When EPA water-quality experts detected lead in the Flint River water up to 1000 times in excess of the federally accepted level, the agency apparently tried to work with the state privately to address the problem. But the state tried to undermine the EPA science, delaying any further action on the problem by many months.

The Flint situation offered many opportunities for the research community. Within months of switching to the Flint River in the spring of 2014, local doctors reported signs of adverse reactions such as rashes and hair loss, all coincident with the tap water looking and smelling strange. By

fall, General Motors publicly announced that it would stop using the water because it corroded engine parts at its Flint plant. A year later, the first academic reports of water-quality and human health impacts became public and were probably instrumental in prompting the switch back to Detroit municipal water. Researchers could rebuild public trust if scientists identify issues affecting public safety early, complete good-quality research quickly, and publicly release their findings.

Flint is a disaster of many proportions, from the illnesses of its victims to the questions it raises about the integrity of government officials and science agencies. Has trust in science been poisoned, along with the water? I can no longer drink a glass of tap water without thinking about either.

– Marcia McNutt



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