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Perspective

Saving Specimens after Sandy

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On a Friday 6 months ago, a hurricane and two storms were on course to converge over New York. In preparation at the laboratory that day, we made contingency plans in case of a power outage.

Three of us would come in as soon as it was safe to check the freezers and incubators. Our laboratories were on the 18th floor of the Veterans Affairs (VA) New York Harbor Healthcare System, part of the New York University (NYU) School of Medicine complex on the banks of the East River in Manhattan. Here, our group was working on the development of HIV vaccines and new diagnostic tests for tuberculosis.

The news Sunday was that the confluence of the storms, a full moon, and an unusually high tide were going to result in a tidal storm surge on Monday evening. Heeding the warnings, the hospital administrators at the VA evacuated all inpatients and animals in advance of the storm. Since the hospital's backup generators were tested regularly, I was confident that the laboratory was secure.

I worked at home on Monday, writing a paper. At 8:20 p.m., we lost power at our home, which is near the hospital. The next morning, it was still rainy and windy, but the storm had mostly passed. We learned from our crank radio that NYU Langone Hospital had lost electricity and had evacuated patients during the storm. Having heard no alarming news about the VA, I assumed that our laboratories were fine, but I set out to check them, as planned.

On my way, I saw concrete telephone booths knocked over and no working traffic lights. As I approached the VA, I saw two generator trucks with power cords running into the lobby, and I soon learned that the basement and ground floor of our building had been destroyed by the force of flooding waters from a 14-ft tidal surge. Much of the infrastructure supplying electricity and heat to the building had been destroyed — which meant there was no power in our laboratories. I realized that without electricity, the contents of our freezers, including specimens that had been collected and generated over a period of 25 years, were in jeopardy.

Since there was no elevator and no fire suppression in the building, I was told I couldn't go upstairs. But when my two colleagues and I approached the hospital administrator and explained that it was critical to determine whether our HIV and tuberculosis cultures were secure and posed no threat, permission was granted, and with a flashlight to illuminate the stairwell, we climbed the 18 flights.

As expected, the freezers and

incubators were useless without electricity. We began to set priorities: first, we needed to top off the 15 liquid nitrogen storage tanks containing patient specimens and cell lines with whatever liquid nitrogen we had. Beyond that, there was little we could do, so we trekked back down 18 floors. We then realized that the next critical step was to stabilize our freezers with dry ice. A Google search that evening yielded the name of a nearby party-supplies dealer that could deliver dry ice the next day — but since the next day happened to be Halloween, dry ice was in short supply. The company could provide 350 lb, enough to stabilize only a few freezers.

On Halloween morning, we took delivery of seven 50-lb blocks of dry ice. Since cash was required for payment, the laboratory personnel who were at the hospital chipped in to come up with the needed $380. Again, access to the building was reluctantly granted, and this time we climbed the 18 flights weighed down with the blocks of dry ice. We packed some of our 19 freezers but didn't have anywhere near enough ice for all of them. That night, with no competition from Halloween parties the next day, we were able to order an additional 1000 lb.

The ice truck arrived the next morning with 20 blocks of dry ice. Clearly, 1000 lb of dry ice placed in the hospital lobby would have created an asphyxiation hazard, so we stacked the blocks outside in a shady spot. Given the continuing absence of fire suppression in the building, the hospital administrator was again reluctant to give us access, but faced with about a dozen determined scientists wielding our most persuasive arguments, she acknowledged the need to avert the meltdown of freezers full of HIV and tuberculosis specimens. Up we went — two people to each 50-lb block of ice. We packed the rest of the freezers, which gave us 1 to 2 days to plan our next step. By now, it was clear that the hospital would be closed for months, so all specimens had to be moved out.

I e-mailed many colleagues, and one pointed me to a biostorage company in Indianapolis. When contacted, the company miraculously assured me that on Saturday morning they would be at the hospital with an 18-wheeler truck filled with –80°C freezers and dry ice. We mobilized the entire laboratory, along with many spouses, NYU students, and a stranger who was walking by and volunteered to help. We numbered each freezer and tank, and as each was emptied, we filled out a form with the "address" of the specimens (the freezer number and the number of the rack within the freezer) and then reversed the process of the previous few days, carrying the specimens down 18 flights and transferring them into the waiting truck. In the truck, one of our technicians, whom I wouldn't allow to climb the stairs since she had recently undergone radiation and chemotherapy for cancer, completed each form with the new address for each rack as it was placed in a freezer. We worked all day Saturday and half the day on Sunday, moving the specimens onto the trucks, which then transported them to storage facilities in New Jersey and Indiana.

Now we were faced with a nonfunctional laboratory and no place to work. Over the next 2 weeks, about half of our group was invited by colleagues associated with Rockefeller University to share their laboratories, and over the next 2 months, additional laboratories were identified where we could work. Currently, and until the VA reopens fully, we are conducting our work as best we can at nine locations in Newark, Manhattan, and Brooklyn.

The personal and professional significance of this saga was illuminated recently when we needed to retrieve and thaw a frozen cell line in order to continue studies of the HIV-specific antibodies produced by these cells. This cell line had been derived from the blood of one of our very first HIV-infected volunteers in the early 1980s, a volunteer whom I came to regard as a friend and whose funeral I attended. This cell line, from this generous and kind man, continues to provide antibodies that are helping us to understand the structure of the virus and design a vaccine that will prevent more deaths from HIV. This small part of my friend is still alive, and he's still part of the HIV-vaccine effort because of the determined efforts of members of the laboratory, the kindness of strangers, and the generosity of neighboring institutions. These cells and the thousands of other specimens that were saved provide the incandescent silver lining to the storm clouds that nearly destroyed our work.

Disclosure forms provided by the author are available with the full text of this article at NEJM.org.

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