

# DETECTING DEADLY DISEASE— BEFORE IT KILLS

The Public Health Lab was critical to the City's rapid response to Ebola.



**N**ew York City's first Ebola patient arrived at the NYC Health + Hospitals Bellevue Hospital. He was getting sicker.

His contacts, the media and the public had been alerted to the probable diagnosis. Soon, the New York City Health Department's "disease detectives" would start tracking down everyone who had direct contact with him and calling each one twice daily to monitor their well-being. For many weeks, the detectives conducted the same surveillance on other individuals arriving at the airport from Ebola-impacted countries. They kept at it until each traveler exited the virus's 21-day incubation period.

The press, from the *New York Daily News* to *Infection Control Today*, was covering the exciting disease detective story in detail.

But another, less visible entity was equally critical to the rapid detection and response to Ebola: the Health Department's Public Health Laboratory, which confirmed that the patient indeed had

the disease—and did so fast enough to get ahead of the swift and vicious virus.

If there's a disease in the world, it's likely to turn up in this global city—and be tested in the Public Health Lab. That's one reason the lab is among the elite facilities that the federal Centers for Disease Control and Prevention's Laboratory Response Network (LRN) trusts with its most complex and consequential laboratory evaluations—the procedures that find a deadly substance in a biological sample—including the one for Ebola.

Luckily for the patient, the Public Health Lab is also right across the street from Bellevue Hospital.

*"We work with some pretty nasty bugs. But Ebola is a different beast."*

For months, the laboratorians had trained and practiced. “We work with some pretty nasty bugs, things that will kill you in 24 hours,” said the lab’s Assistant Commissioner. But due to the fragility of the virus, its deadly nature and the exacting assay it requires, “Ebola is a different beast.”

Outside Bellevue that night, the avenue was lined with TV vans. To avoid them, police drove the Health Department’s chief microbiologist to the hospital’s back entrance. The microbiologist helped pack the specimen according to strict regulations.

Back at the lab, technicians set up the vessels, trays and machine. Those doing the test were protected by full Tyvek suits, gowns, gloves, masks, hoods, booties and respirators—not the outfit of choice for delicate maneuvers involving calibrated instruments, tiny test tubes and an incurable, fatal virus. The microbiologist returned to the lab within the hour. Public Health Lab staff started the testing procedure the minute the specimen was inside the door.

Three hours later, the Public Health Lab reported positive Ebola test results. For the patient, his contacts and a city on edge, those three-plus hours were the critical period. But the job wasn’t finished.

The positive result had to be confirmed by the Centers for Disease Control and Prevention in Atlanta. Staff packed a duplicate specimen in a leak-proof tube inside a bleached bag inside another bag in a hard container inside a box.

A CDC staff member inspected the box. A misplaced word on the label could warrant rejection. With police lights and sirens blaring, he drove to a chartered plane on the tarmac at LaGuardia Airport.

At midnight, the Assistant Commissioner went downstairs to go home. “The Public Health Lab just diagnosed Ebola,” she recalled. “The cameras were facing the other way.” The reporters’ attention was trained on Bellevue Hospital. To them, she was just a woman hailing a cab.

## Impact

- The NYC Public Health Lab diagnosed Ebola infection in record time: less than 3 hours. The lab is prepared to handle specimens from patients suspected of having highly infectious diseases such as Ebola on an emergency basis, 24 hours a day, 7 days a week, 365 days a year.
- During emergencies—for instance, while handling high volumes of specimens during the H1N1 influenza outbreak in the spring of 2009—the lab maintained normal operations and testing for other public health threats without interruption.

## Critical Need

- Trained and experienced Public Health Lab personnel available 24/7 to test for bio-threat agents, high-consequence pathogens (like Ebola and pandemic influenza) and other public health threats, such as food-borne diseases and vaccine-preventable diseases like measles.
- Well-maintained testing instruments and adequate supplies on hand at all times.
- Implementation and maintenance of automated lab systems to rapidly detect diseases and minimize spread.



## A Life-Saving Process in 3 Hours

Each critical step had to be executed by the Health Department’s Public Health Lab without any mistakes.



### Delicate transfer

of specimen from patient to Lab



### Complex testing

that followed strict safety procedures



### Rapid lab results

confirming Ebola



### Careful packaging

of specimen for final confirmation by CDC

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NYC Public Health and Healthcare Preparedness and Response REPORT

