Public health laboratories play a critical role in assuring the early diagnosis of HIV-infected babies to facilitate prompt intervention and optimal health outcomes. The CDC estimates that more than 6,700 children under age 13 are living with HIV/AIDS in the 33 US states with confidential HIV-infection reporting. The vast majority of these children were infected before or during childbirth.

New York has perhaps the country's highest number of babies at risk of acquiring HIV infection from their mothers during pregnancy and childbirth.

Thanks to the health department’s comprehensive perinatal HIV prevention program, the state has documented a dramatic decline in mother-to-child transmission: just 1.4% in 2007, compared to 10.9% in 1997. However, hundreds of babies continue to be born at risk for HIV infection each year.

The Wadsworth Center, the state public health laboratory, tests all of the roughly 250,000 babies born in New York annually for HIV as part of a mandatory newborn screening program. The screening test, however, identifies only the presence of HIV antibodies—indicating HIV exposure, but not necessarily HIV infection.

Since 1995, the Wadsworth Center has operated a special pediatric testing service to definitively confirm or rule out HIV infection in the 600 or so babies born to HIV-infected mothers in New York each year.

An early diagnosis is critically important. Often, HIV-infected mothers are in difficult situations and their babies are born premature and ill. Even if babies are found to be free of infection, the test result is helpful because physicians can discontinue prophylactic therapies for opportunistic infections and focus on other health problems.

Getting an early diagnosis—which requires two positive test results on two separate infant blood specimens—is a complex matter.

Most mother-to-child transmission occurs during labor and delivery, and there is a delay before the virus shows up in an infant’s blood. Thus, Wadsworth Center scientists try to get blood specimens at different points in time: within 48 hours of birth and at 2 weeks, 4 weeks, 8-10 weeks and 4 months or later.

Monica Parker, PhD, who directs the Center’s Bloodborne Viruses Laboratory, said, “The goal is for all babies to complete testing. Often these babies enter foster care, making this particularly challenging.”

To achieve this goal, Parker’s staff worked with Wadsworth’s in-house software group to develop an enhanced follow-up program. The laboratory’s information management system generates automatic reminder letters when a specimen is overdue. If specimens are still not received, the lab follows up with a second computer-generated letter and then a phone call.

The new system has made a huge difference. In 2005-2006, 75 to 79% of HIV-exposed babies completed testing. At least 90% do today.

The Wadsworth Center has been helping its young charges in other ways, too. Scientists recently switched to a new RNA detection test to diagnose HIV infection.

Said Parker, “We’re always trying to validate methods to use as little blood as possible to make it easier on the baby and physician.” Moreover, the new test can detect HIV in truly infected babies earlier than the old test.

Finally, to maximize the value of the stored infant blood specimens, Wadsworth scientists have conducted retrospective studies to determine the percentage of babies with drug-resistant HIV. They found that 12% of HIV-infected infants born in 1998-1999 had drug-resistant HIV, compared to 19% of those born in 2001-2002, suggesting that drug-resistant HIV is becoming more prevalent in this population.

Without the laboratory, no one would know this for sure.

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