

Rapid-Test Sensitivity for Novel Swine-Origin Influenza A (H1N1) Virus in Humans

TO THE EDITOR: The Naval Health Research Center serves as the Navy hub for the Department of Defense's Global Emerging Infections Surveillance and Response System (GEIS), in which it monitors influenza-like illness among recruit trainees of all military services, military dependents, and crew members of large Navy ships (population, >1000). The center works in collaboration with the Border Infectious Disease Surveillance Project of the Centers for Disease Control and Prevention (CDC), which monitors populations located on the border between California and Mexico. The first two human cases of novel swine-origin influenza A (H1N1) virus (S-OIV), known as swine flu, in the United States were detected through these programs.¹ In the first case, an untypeable influenza A strain was identified at a surveillance site of the Naval Health Research Center by a new diagnostic device. The test results were forwarded per protocol to the study reference laboratory for polymerase-chain-reaction (PCR) confirmation and were subsequently forwarded to the CDC for identification by sequencing. In the second case, a sample that was obtained at a border surveillance site was found to contain an untypeable influenza A strain on PCR testing at the center. Further characterization by PCR assay and electrospray ionization mass spectrometry indicated a swine-origin virus, and sequence data that were sent to the CDC revealed that the viruses in the two samples were identical. In response, surveillance activities of all programs were enhanced to include increased sampling rates, more clinical sites, decreased turnaround time in the laboratory, and rapid influenza testing with the use of QuickVue Influenza A+B (Quidel).

From April 20 through May 30, 2009, the center processed 3066 specimens with the use of a real-time reverse-transcriptase PCR (RT-PCR) assay,² which revealed 273 confirmed cases of S-OIV (8.9%), 18 cases of H1N1 seasonal influenza (0.6%), and 31 cases of H3N2 influenza (1.0%) (Fig. 1). All suspected cases of S-OIV were confirmed with the use of the CDC's S-OIV assay.² All specimens were collected from patients with influenza-like illness who met the CDC's guidelines for screening. Rapid-test results for 767 patients during this influenza season were available

for comparison and were positive for 20 of 39 patients who had positive results for S-OIV on RT-PCR assay (sensitivity, 51%; 95% confidence interval [CI], 35 to 67), for 12 of 19 patients who had positive results for H1N1 seasonal influenza on RT-PCR (sensitivity, 63%; 95% CI, 39 to 82), and for 6 of 19 of patients who had positive results for H3N2 influenza on RT-PCR (sensitivity, 31%; 95% CI, 14 to 57). The specificity of the test, as compared with that of RT-PCR, was 99% in all cases.

Uyeki et al. described the poor sensitivity of the Quidel test (mean, 27%; range, 19 to 32) for influenza during the 2007–2008 season.³ During the 2008–2009 season, we also found a low sensitivity of the test for seasonal influenza strains that were cocirculating with S-OIV, although Uyeki et al. did not differentiate among subtypes. The performance of current influenza rapid antigen tests in diagnosing S-OIV is unknown.⁴ Our findings suggest that rapid-test sensitivity may vary according to the influenza A subtype. Further investigation is needed to confirm this finding and evaluate possible explanations.

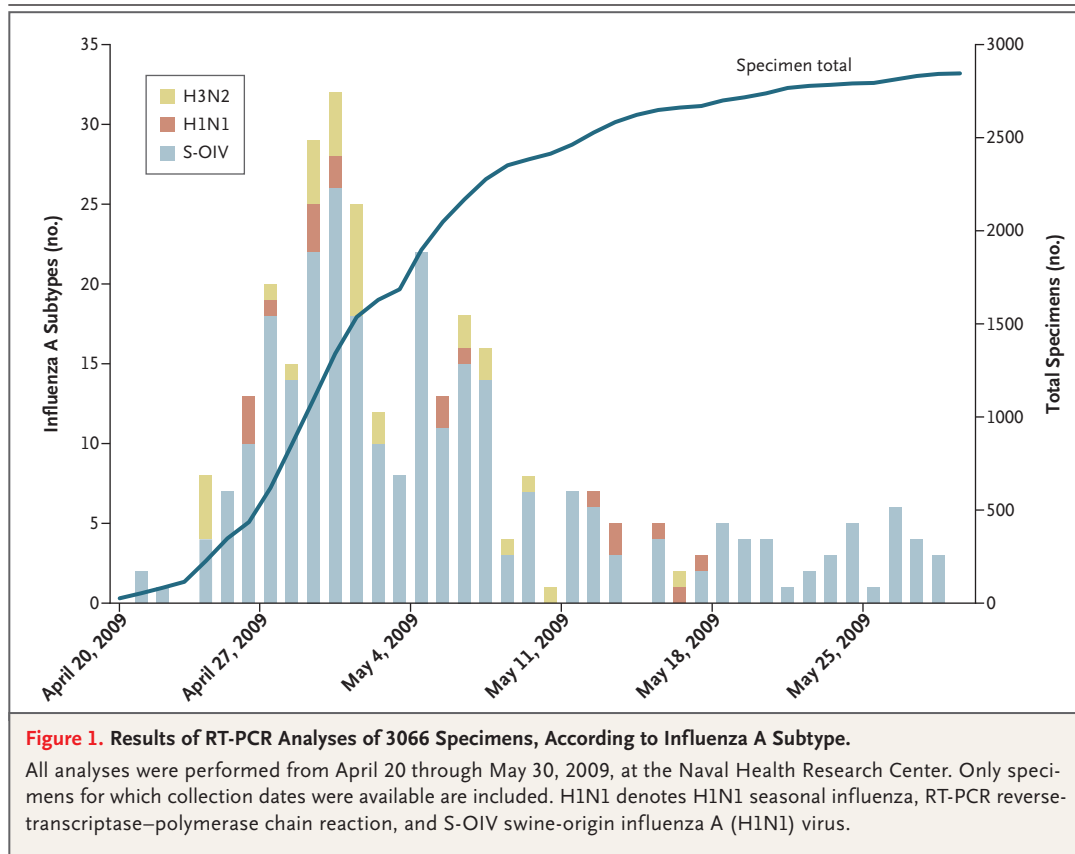
The identification of S-OIV in Southern California highlights the use of multiple, complementary surveillance systems in detecting and validating unusual disease activity. Specifically, the early detection of two epidemiologically unrelated cases of S-OIV in two surveillance systems was instrumental in quickly alerting public health officials and mobilizing an effective response.

S-OIV continues to cocirculate with seasonal influenza strains but may be differentially detected by rapid influenza tests. This finding has implications for the diagnosis and treatment of patients with influenza-like illness now and during the next influenza season. As seasonal and zoonotic influenza viruses continue to drift and shift, we must continuously assess the sensitivity and specificity of available diagnostic tests.

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