Background. Influenza and respiratory syncytial virus (RSV) are recognized as important causes of hospital-acquired infection. Increased use of multiplex molecular diagnostic testing is shedding light on the incidence of other hospital-associated respiratory virus infections (HA-RVI). However, the incidence and clinical impact of HA-RVI are not well understood.

Methods. We identified hospitalized patients admitted between July 1, 2017 and June 30, 2018 who were clinically tested to diagnose respiratory virus infections. HA-RVI were defined as respiratory virus positivity beginning more than 48 hours after hospital admission. The clinical outcomes of HA-RVI were compared with respiratory virus infections that were not considered hospital-associated (non-HA-RVI).

Results. Respiratory virus testing was performed on 4,690 individuals during 5,942 inpatient encounters. At least 1 virus was identified in 1,871 (31%) encounters, and 229 (12%) were defined as HA-RVI (median hours from admission to positivity [IQR]: 154 [79, 308]). Among the patients with a respiratory virus infection, 56% were adults, 52% were male, 77% were non-Hispanic white, and the median Charlson score was 2 (IQR: 1, 4); HA-RVI patients were more likely to be male (59% vs. 51%, P = 0.01) and had higher median Charlson scores (3 vs. 2, P = 0.001). All 14 respiratory viruses in the diagnostic panel were positive for at least one HA-RVI (Figure 1), but rhinovirus/enterovirus (99), influenza A (27), human metapneumovirus (22) and respiratory syncytial virus (20) were most common. Compared with non-HA-RVI patients, those with HA-RVI had longer post-infection lengths of stay (median: 9 vs. 4 days, P < 0.001) and were more likely to die during hospitalization (odds ratio [95% confidence interval]: 3.4 [2.6, 5.7]) (Table 1).

Conclusion. A substantial number of HA-RVI were identified during the 2017–2018 respiratory virus season, and they were associated with a striking number of severe outcomes. More in depth analyses are required to determine whether severe outcomes are a direct result of HA-RVI or whether HA-RVI are more common in critically ill patients and serve as a marker for severe morbidity. A broader understanding of HA-RVI transmission and prevention strategies is needed.

Table 1. Demographics Characters and Clinical Outcomes of Patients with Hospital-Associated Respiratory Virus Infections (HA-RVI) and Non-Hospital-Associated Respiratory Virus Infections (Non-HA-RVI)

| Character | Non-HA-RVI | HA-RVI | P value |
|-----------|-----------|--------|---------|
| Age category, No. | (1250) | (1229) | 0.09 |
| <1 years | 847 (68) | 862 (70) | 0.09 |
| 1-17 years | 248 (20) | 242 (20) | 0.89 |
| 18-64 years | 510 (41) | 496 (41) | 0.06 |
| ≥65 years | 282 (23) | 297 (25) | 0.01 |
| Gender, No. | (811) | (949) | 0.09 |
| Female | 416 (51) | 473 (50) | 0.09 |
| Male | 395 (49) | 476 (49) | 0.09 |
| Race/ethnicity, No. | (1024) | (185) | 0.76 |
| Black or African American | 122 (12) | 24 (13) | 0.01 |
| Other | 902 (88) | 161 (87) | 0.01 |
| Charlson score, median (IQR) | 2 (1-3) | 2 (1-3) | 0.01 |

Conclusion. This meta-analysis clearly favors the use of daily chlorhexidine bath in the prevention of ventilator-associated pneumonia.