Background. The Pragmatic Assessment of Influenza Vaccine Effectiveness in the DoD (PAIVED) is a multicenter study assessing influenza vaccine effectiveness in active duty service members, retirees, and dependents. PAIVED recently completed its third year and offers a unique opportunity to examine influenza-like illness (ILI) trends prior to and during the COVID-19 pandemic in a prospective, well-defined cohort.

Methods. During the 2018-19, 2019-20, and 2020-21 influenza seasons, PAIVED enrolled DoD beneficiaries participating for annual influenza vaccination. After collecting baseline demographic data, participants were randomized to receive egg-based, cell-based, or recombinant-derived influenza vaccine. Weekly throughout the influenza season, participants were surveyed electronically for ILI, defined as (1) having cough or sore throat, plus (2) feeling feverish/having chills or having body aches/fatigue. Participants with ILI completed a daily symptom diary for seven days and submitted a nasal swab for pathogen detection.

Results. Over the three seasons, there were 10,656 PAIVED participants: 1514 (14.2%) in 2018-19, 5876 (55.1%) in 2019-20, and 3266 (30.6%) in 2020-21. The majority were male (68-73% per year) with a mean age of 34±14.8 years at enrollment. During the 2018-19, 2019-20, and 2020-21 influenza seasons, PAIVED enrolled DoD beneficiaries participating for annual influenza vaccination. After collecting baseline demographic data, participants were randomized to receive egg-based, cell-based, or recombinant-derived influenza vaccine. Weekly throughout the influenza season, participants were surveyed electronically for ILI, defined as (1) having cough or sore throat, plus (2) feeling feverish/having chills or having body aches/fatigue. Participants with ILI completed a daily symptom diary for seven days and submitted a nasal swab for pathogen detection.

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34,200 deaths in the US in the 2018-2019 season. The burden of rhinovirus among adults hospitalized with ARI is less well known. We compared the burden of influenza and rhinovirus from 2 consecutive winter respiratory viral seasons in hospitalized adults and healthy controls pre-COVID-19 and one season mid-COVID-19 to determine the impact of rhinovirus as a pathogen.

Methods. From Oct 2018 to Apr 2021, prospective surveillance of adults ≥50 years old admitted with ARI or COPD/CHF exacerbations at any age was conducted at two Atlanta hospitals. Adults were eligible if they lived within an eight-county region around Atlanta and if their symptom duration was <14 days. In the season from Oct 2018 to Mar 2020, asymptomatic adults ≥20 years old were enrolled as controls. Standard of care test results were included and those enrolled contributed nasopharyngeal swabs that were tested for respiratory pathogens using BioFire FilmArray® Respiratory Viral Panel (RVP).

Results. During the first two seasons, 1,566 hospitalized adults were enrolled. Rhinovirus was detected in 7.5% (118) and influenza was detected in 7.7% (121). Rhinovirus was also detected in 2.2% of 466 healthy adult controls while influenza was detected in 0%. During Season 3, the peak of the COVID-19 pandemic, influenza declined to 0% Control. Rhinovirus also declined (p=0.01) but still accounted for 5.1% of all ARIIs screened (Figure 1). Rhinovirus was detected at a greater rate in Season 3 than in asymptomatic controls in the first 2 seasons (p=0.008). In the first two seasons, Influenza was detected in 8.6% (2476) of those admitted to the ICU. Rhinovirus was detected in 6.1% (1727) of those admitted to the ICU but declined to 3.1% (8258) in Season 3.

Figure 1. Percent Positive Cases of Influenza and Rhinovirus between Season 1&2 and Season 3 (hospitalized and healthy controls) vs Season 3 (hospitalized).

Conclusion. Dramatic declines occurred in influenza in adults hospitalized with ARI, CHF or COPD in Atlanta during the COVID-19 pandemic and with enhanced public health measures. Although rhinovirus declined during the COVID-19 pandemic, it continued to be identified at a rate higher than in historical controls. Additional data are needed to understand the role of rhinovirus in adult ARI, CHF and COPD exacerbations.

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1341. Relative Vaccine Effectiveness Against Influenza-related Hospitalizations and Respiratory Events During the 2019/20 Influenza season in U.S. Children and Adults. A Real-World Evidence Comparison Between Quadrivalent Cell-based and Egg-based Influenza Vaccines

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Background. Non-egg-based influenza vaccine manufacturing reduces egg adaptation and therefore has the potential to increase vaccine effectiveness. This study evaluated whether the cell-based quadrivalent influenza vaccine (QIVc) improved relative vaccine effectiveness (rVE) compared to standard-dose egg-based quadrivalent influenza vaccine (QIVe-SD) in the United States of America (U.S.) (IQVIA Pharametrics Plus). Inverse probability of treatment weighting (IPTW) was used to adjust for baseline confounders. Post-IPTW, the number of events and rates (per 1,000 vaccinated subject-seasons) of influenza-related hospitalizations/ER visits, respiratory-related hospitalizations/ER visits and all-cause hospitalizations were assessed. Poisson regression was used to estimate adjusted rVE. To avoid any influenza outcome misclassification with COVID-19 infection, the study period ended March 7, 2020. A sub-analysis for a 12-month, non-COVID-19 URI tract infection (UTI) hospitalization was assessed as a negative control endpoint.

Results. During the 2019/20 influenza season, 1,150,134 QIVc and 3,924,819 QIVe-SD recipients were identified post-IPTW. Overall adjusted analyses (4-6 years old) found that QIVc was associated with a significantly higher rVE compared to QIVe-SD against influenza-related hospitalizations/ER visits (5.3% [95% CI 0.5%-9.9%]), all-cause hospitalizations (14.5% [95% CI 13.1%-15.8%]) and any respiratory-related hospitalization/ER visit (8.2% [95% CI 6.5%-9.8%]). A similar trend was seen for the high-risk subgroup, for instance, rVE for QIVc compared to QIVe-SD against influenza-related hospitalizations/ER visits was 10.5% [95% CI 2.9%-17.4%]. No effect was identified for the negative control outcome.

Conclusion. QIVc was significantly more effective in preventing influenza-related and respiratory-related hospitalizations/ER visits, as well as all-cause hospitalizations, compared to QIVe-SD.

Disclosures. Stephen I. Pelton, MD, Sequir (Consultant) Maarten Postma, Dr.; Sequir (Consultant) Victoria Divino, PhD, Sequir (Consultant) Joaquin F. Mould-Quevedo, PhD; Sequir (Employee) Mitchell DeKoven, PhD, Sequir (Consultant) myron J. Levin, MD, GSK group of companies (Employee, Research Grant or Support)