Results. 780 patients met study inclusion criteria and 86% (667/780) received vaccine. Characteristics of PLWH with and without vaccine are presented in Table 1. Older age, lower HIV viral load, and virologic suppression had a statistically significant ($p< 0.05$) association with vaccine receipt in unadjusted analysis. Only older age ($p< 0.01$) was significantly associated with vaccine in logistic regression modeling (Table 2), however this relationship was non-linear.

Table 1. Characteristics of patients living with HIV during the 2020-2021 Influenza vaccination season

	No Vaccine N=113	Vaccine N=667	p-value
Age, years, median [IQR]	46 [37;60]	54 [41;61]	**0.013**
Gender			0.324
Male	63 (55.8%)	423 (63.4%)	
Female	49 (43.4%)	238 (35.7%)	
Transgender MtF	1 (0.9%)	5 (0.8%)	
Transgender FtM	0 (0.0%)	1 (0.2%)	
Race, n (%)			0.432
Black	82 (72.6%)	482 (72.3%)	
White	31 (27.4%)	173 (25.9%)	
More than one race	0 (0.0%)	12 (1.8%)	
Ethnicity, n (%)			0.807
Black	81 (71.7%)	474 (71.1%)	
Non-Hispanic White	18 (15.9%)	121 (18.1%)	
Hispanic	14 (12.4%)	70 (10.5%)	
More than one race	0 (0.0%)	2 (0.3%)	
Insurance, n (%)			0.210
Medicaid	54 (47.8%)	260 (39.0%)	
Private	32 (28.3%)	222 (33.3%)	
Medicare	27 (23.9%)	185 (27.7%)	
HIV Status			1.000
CDC-defined AIDS	68 (60.2%)	398 (59.7%)	
HIV-positive (not AIDS-defined)	45 (39.8%)	268 (40.2%)	
HIV-positive, status unknown	0 (0.0%)	1 (0.2%)	
% Federal Poverty Level, median [IQR]	90 [0;177]	103 [0;212]	0.142
CD4 Count, cells/μL, median [IQR]	454 [313;730]	503 [303;745]	0.660
Viral Load, copies/mL, median [IQR]	20 [20;105]	20 [20;40]	**0.010**
Viral Load Suppression, n (%):			**0.020**
Yes	96 (85.0%)	615 (92.2%)	
No	17 (15.0%)	52 (7.8%)	

Table 2. Multivariable Analysis of Baseline Characteristics

Characteristic	Odds Ratio (95% Confidence Interval)	p-value
Age[a]		**0.002**
% Federal Poverty Level[b]		0.719
Virologic Suppression		
No: Yes	0.65 (0.34,1.22)	0.179
Sex		
Female: Male	0.77 (0.50,1.18)	0.466
Race		
White: Black	0.87 (0.55,1.40)	0.822
AIDS-defined		
No: Yes	1.17 (0.74,1.84)	0.497
Insurance		0.692
Medicare: Medicaid	1.10 (0.57, 2.12)	
Private: Medicaid	1.31 (0.72, 2.36)	

[a] Age was found to be associated with vaccine, with increasing likelihood of vaccine up to 55 years of age and decreasing likelihood in those over 55 years of age based on flexible restricted cubic spline of age in model

[a]Due to skewness of data, the log of %FPL was used in calculations

Conclusion. A very high rate of PLWH received vaccine, far exceeding local and national benchmarks, with EMR data unlikely to have fully captured all vaccines. The role of the COVID-19 pandemic in vaccine amongst PLWH is not yet known. While older age was associated with vaccine in adjusted analysis, the number of unvaccinated patients was small, confidence intervals wide, and associations consequently weak. Larger studies are needed to further investigate factors associated with vaccine receipt amongst PLWH.

Disclosures. **Deborah A. Kahal, MD,MPH, FACP**, **Gilead** (Speaker's Bureau)**Viiv** (Speaker's Bureau)

12. Modeled Impact of the COVID-19 Pandemic and Associated Reduced Adult Vaccinations on Herpes Zoster in the United States

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Session: P-02. Adult Vaccines

Background. During the COVID-19 pandemic, adult vaccination in the United States (US) decreased substantially in 2020. Unlike other vaccine-preventable diseases where individuals may have experienced reduced risk due to COVID-related mitigation efforts (e.g., lockdown restrictions, use of face masks), individuals remained at risk of herpes zoster (HZ). This study projects the impact of reduced recombinant zoster vaccine (RZV) use on HZ cases and complications in the US.

Methods. A multi-cohort Markov model estimated the impact of missed RZV vaccinations, by comparing scenarios with and without missed vaccinations between Apr-Dec 2020, on cases of HZ, postherpetic neuralgia (PHN), and quality-adjusted life-years (QALYs) among US adults aged ≥ 50 years. Epidemiology, RZV efficacy, and utility inputs were obtained from standard US sources, clinical trial data, and published literature. Missed doses were estimated using data on RZV doses and an assumed 43% reduction in RZV vaccinations during the pandemic, based on publicly available data. Deterministic sensitivity and scenario analyses were conducted.

Results. In 2020, approximately 21 million (M) RZV distributed doses were expected, including an estimated 9.2M RZV series initiations in Apr-Dec. An estimated 3.9M RZV series initiations were missed, resulting in 31,945 projected HZ cases, 2,714 PHN cases, and 610 lost QALYs projected over a 1-year follow up. If individuals with missed RZV initiations remain unvaccinated in 2021, avoidable HZ cases will increase to 63,117 over 2 years. Further, if the same number of RZV initiations are missed in 2021, 95,062 avoidable HZ cases are expected. In a sensitivity analysis assuming 30% RZV reduction, 18,020 avoidable HZ cases and 1,531 PHN cases were observed over 1 year.

Conclusion. Adding to the substantial COVID-19 infection-related morbidity and mortality, reduced RZV use during the pandemic resulted in further burden from avoidable HZ cases. Health care providers should continue to emphasize the importance of vaccination against HZ and other preventable diseases during the pandemic.

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13. The Efficacy and Effectiveness of Pneumococcal Vaccines against Pneumococcal Pneumonia among Adults: A Systematic Review and Meta-Analysis

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Session: P-02. Adult Vaccines

Background. Two pneumococcal vaccines are currently recommended for use in U.S. adults: 23-valent pneumococcal polysaccharide vaccine (PPSV23) and 13-valent pneumococcal conjugate vaccine (PCV13). Recommendations for adult PCV13 use were supported by a large randomized-controlled trial (RCT) demonstrating PCV13 efficacy against pneumococcal pneumonia (PnPn) and vaccine-type (VT) PnPn in older adults. New pneumococcal conjugate vaccines are expected to be licensed for adults in late 2021 and recommendations for use among adults will be reviewed and revised, as needed. We conducted a systematic review to summarize evidence on the vaccine efficacy and effectiveness (VE) of PPSV23 and PCV13 against PnPn among adults.

Methods. We conducted a search of literature published from 1998 to February 2021 on PCV13 and PPSV23 VE studies using eight reference databases. Studies targeting adults with immunocompromising conditions were excluded. VE results with 95% confidence intervals (CI) were abstracted and stratified by vaccine product, outcome evaluated (PnPn and VT PnPn), study design, and effect measure. When applicable, random effects models were used to estimate pooled VE and I-squared statistic was reported to assess heterogeneity.

Results. Of 3,422 screened studies, we included 15 studies: three on PCV13 and 12 on PPSV23 (Table 1). In addition to the RCT, we identified two observational studies for PCV13 (Table 1); however, pooled VE of the observational studies was not estimated due to differences in methods for reporting results. Pooled PPSV23 VE against PnPn from two RCTs was 63% (95% CI: 31, 80 I^2=0%). Pooled VE of PPSV23 against VT PnPn from three observational studies was 18% (95% CI: -35, 35 I^2=38%). PPSV23 effectiveness against PnPn was limited with a pooled VE of 25% (95% CI: 7, 39 I^2=78%) from nine observational studies.

Table 1. Vaccine Efficacy and Effectiveness of 13-Valent Pneumococcal Conjugate Vaccine and 23-Valent Pneumococcal Polysaccharide Vaccine Against Pneumococcal Pneumonia Outcomes.

Author	Study Design	NB VT PnPn or VT PnPn VE % (95% CI)	NB PnPn or PnPn VE % (95% CI)
PCV13			
Bonten 2015	RCT	45 (14 to 65)	24 (-6 to 46)
McLaughlin 2018	TND	68 (-6 to 90)	
Prato 2018[1,2]	TND	38 (-132 to 89)	33 (-107 to 82)
PPSV23			
Alfageme 2006[2]	RCT		91 (-62 to 99)
Maruyama 2010	RCT		60 (25 to 79)
Kim 2019	Case-control	-2 (-40 to 26)	10 (-15 to 30)
Suzuki 2019[2]	Case-control		77 (34 to 92)
Vila-Corcoles 2009	Case-control		42 (14 to 61)
Lawrence 2020[1]	TND	20 (-5 to 40)	
Suzuki 2017[1,2]	TND	34 (6 to 53)	27 (3 to 46)
Wiemken 2014[2]	TND		37 (16 to 60)
ElSherif 2020[2]	Cohort		28 (11 to 42)
Ochoa-Gondar 2014	Cohort		48 (8 to 71)
Vila-Corcoles 2006	Cohort		39 (-6 to 65)
Vila-Corcoles 2020[2]	Cohort		-8 (-19 to 2)

Abbreviations: CI: confidence interval; NB: non-bacteremic; PnPn: pneumococcal pneumonia; RCT: randomized-controlled trial; TND: test negative design; VE: vaccine efficacy or effectiveness; VT: vaccine-type

[1]Study reported vaccine effectiveness for vaccine-type pneumococcal pneumonia, not specifically non-bacteremic vaccine-type pneumococcal pneumonia.

[2]Study reported vaccine efficacy or effectiveness for pneumococcal pneumonia, not specifically non-bacteremic pneumococcal pneumonia.