

Uptake of COVID-19, Influenza, and Pneumococcal vaccines among people living with HIV: Findings from the Ontario HIV Treatment Network Cohort Study

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Conflicts of interest

- I have no conflict of interest to declare





Background

- It is important that people living with HIV (PLWH) receive all routinely recommended immunizations as part of their care.
- Studies have shown sub-optimal uptake of various vaccines among PLWH, including COVID-19, Influenza, Pneumococcal vaccines (Menza et al, 2022; Imp et al, 2023; Sulis et al, 2022; Bailey et al, 2008; Gallagher et al, 2007)
- A better understanding of factors associated with uptake of vaccines is important to design strategies that can improve uptake
- The main objectives of the current study were to:
 1. Assess uptake of COVID-19, Influenza, and Pneumococcal vaccines, three vaccines that are recommended for PLWH and are available free of charge
 2. Identify sociodemographic factors associated with uptake of these vaccines





Methods

- Study sample included PLWH participating in the Ontario HIV Treatment Network Cohort Study (OCS).
- OCS is a community-governed longitudinal cohort of PLWH receiving care in 15 clinics across Ontario.
- In 2022, OCS participants were asked if they have received:
 - COVID-19 vaccine
 - Primary series – 1st and 2nd doses
 - A booster dose - 3rd or 4th dose
 - Influenza vaccine in the past year (Yes vs. No)
 - Pneumococcal vaccine, life time (Yes vs. No)
- Logistic regression modelling was used to calculate odd ratios (OR) and confidence intervals (CI)





Sample characteristics (N=2208)

Age in years

20-29	72 (3.3%)
30-39	272 (12.3%)
40-49	423 (19.2%)
50-59	674 (30.5%)
60-69	588 (26.6%)
70+	179 (8.1%)

Education

Less than high school completion	233 (10.6%)
Completed high school	318 (14.4%)
Trade/Tech/some college	241 (10.9%)
Completed college/Some Univ.	612 (27.7%)
Completed University	773 (35.0%)
Unknown	31 (1.4%)

Gender/Sexual Orientation

Woman/Transwoman	459 (22.5%)
Men-Heterosexual	297 (13.5%)
Men-Gay or Bisexual	1396 (63.2%)
2S/Gender Queer/Other	20 (0.9%)

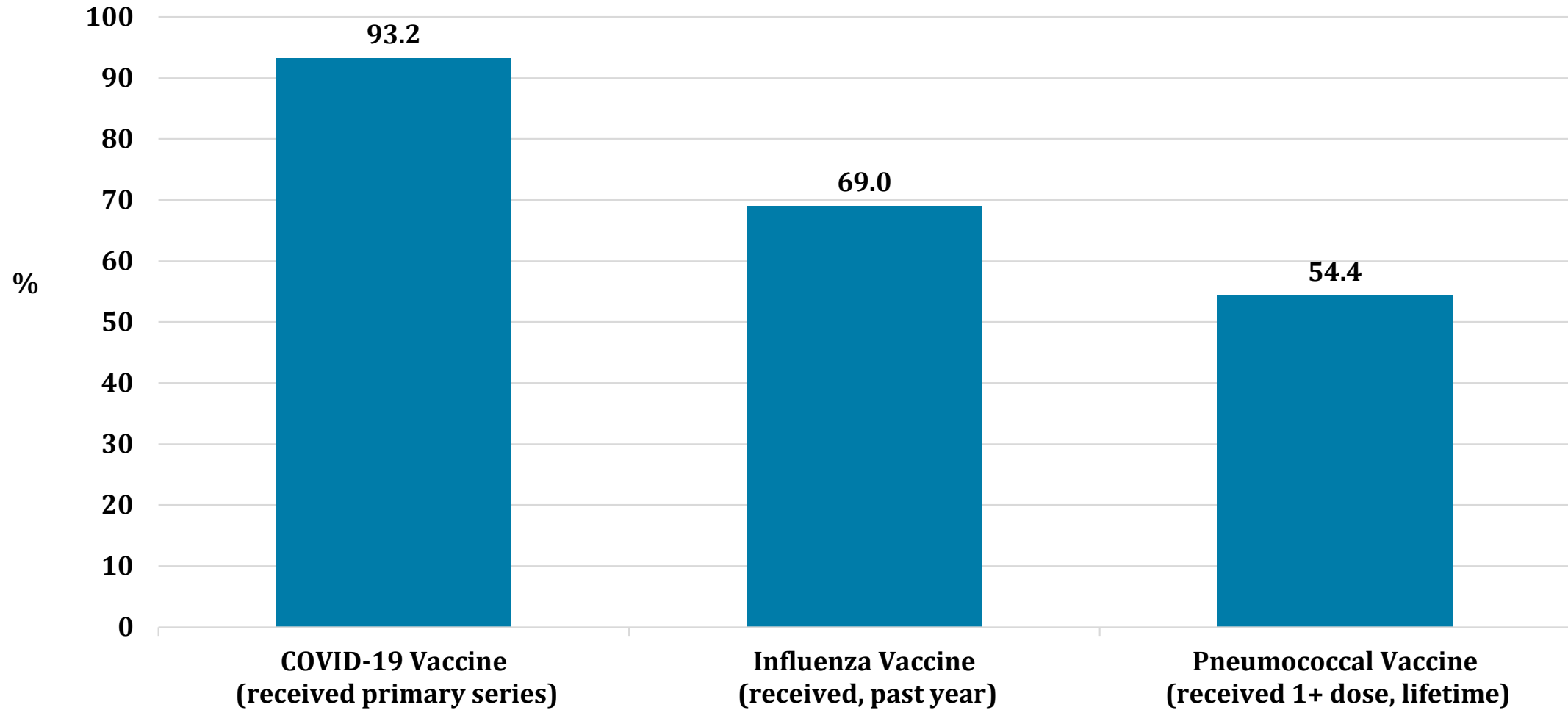
Race/Ethnicity

Arab/West Asian	26 (1.2%)
Black	457 (20.7%)
East/South East Asian	95 (4.3%)
Indigenous	55 (2.5%)
Latinx	98 (4.4%)
South Asian	69 (3.1%)
White	1308 (59.2%)
Multi-race	57 (2.6%)
Other/Unknown	43 (2.0%)



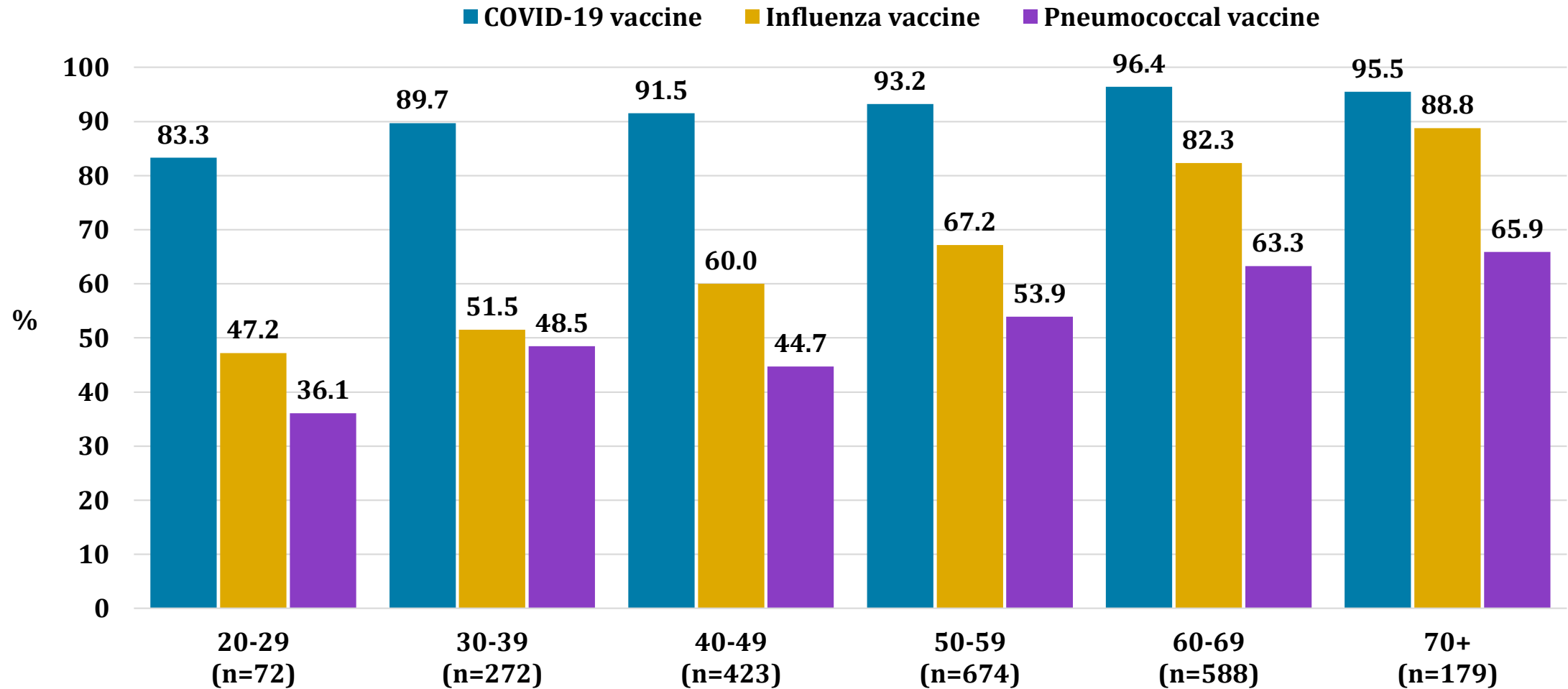


Overall uptake of vaccines



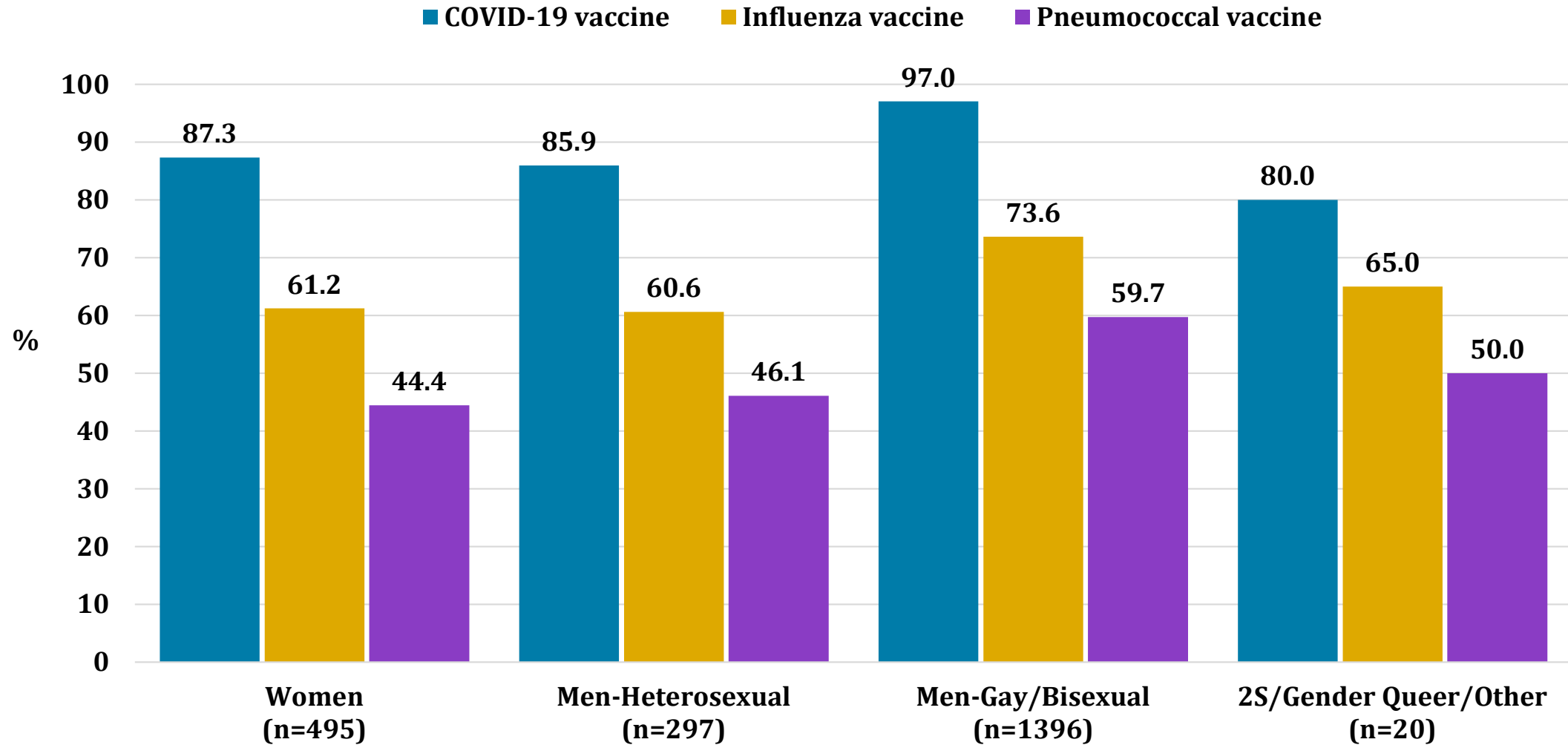


Uptake of vaccines increased with age



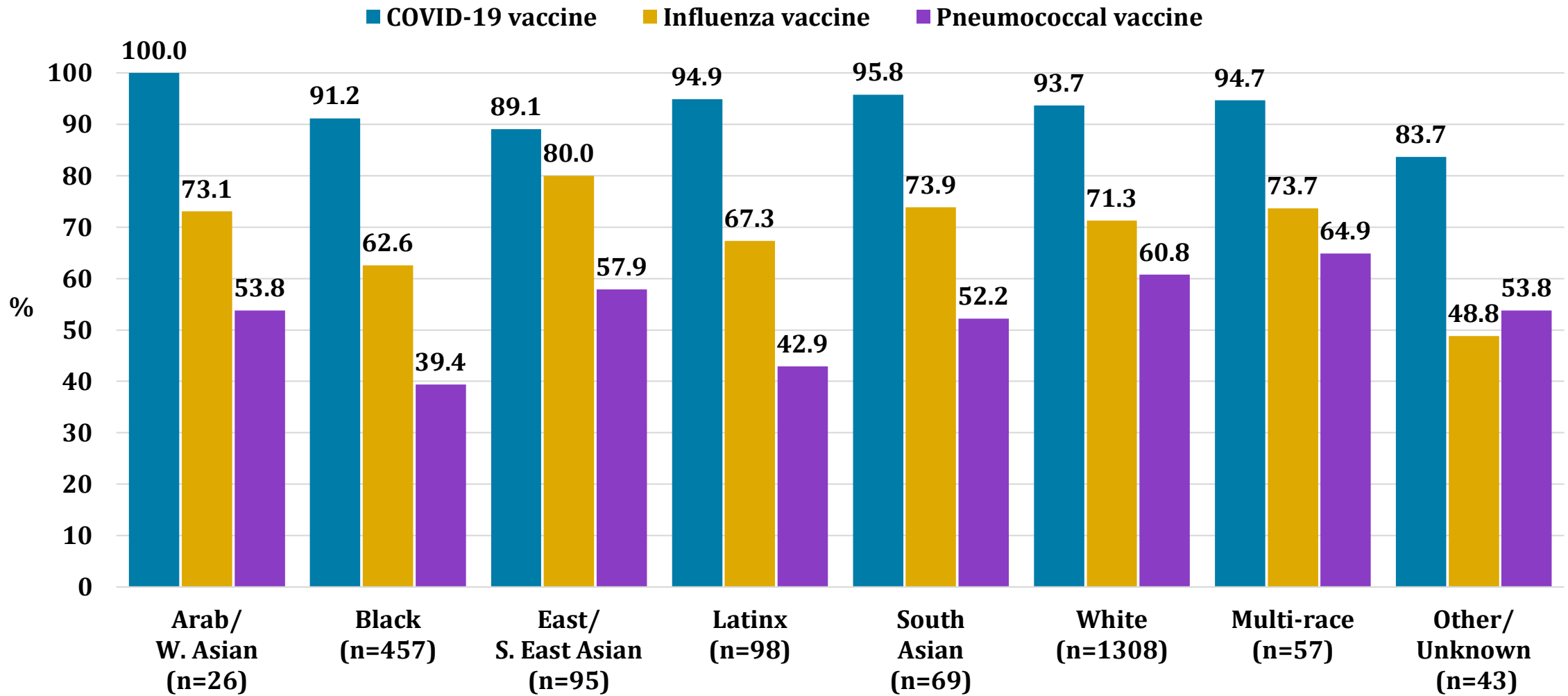


Gay or Bisexual men had higher uptake of vaccines





Uptake of vaccines varied by race/ethnicity

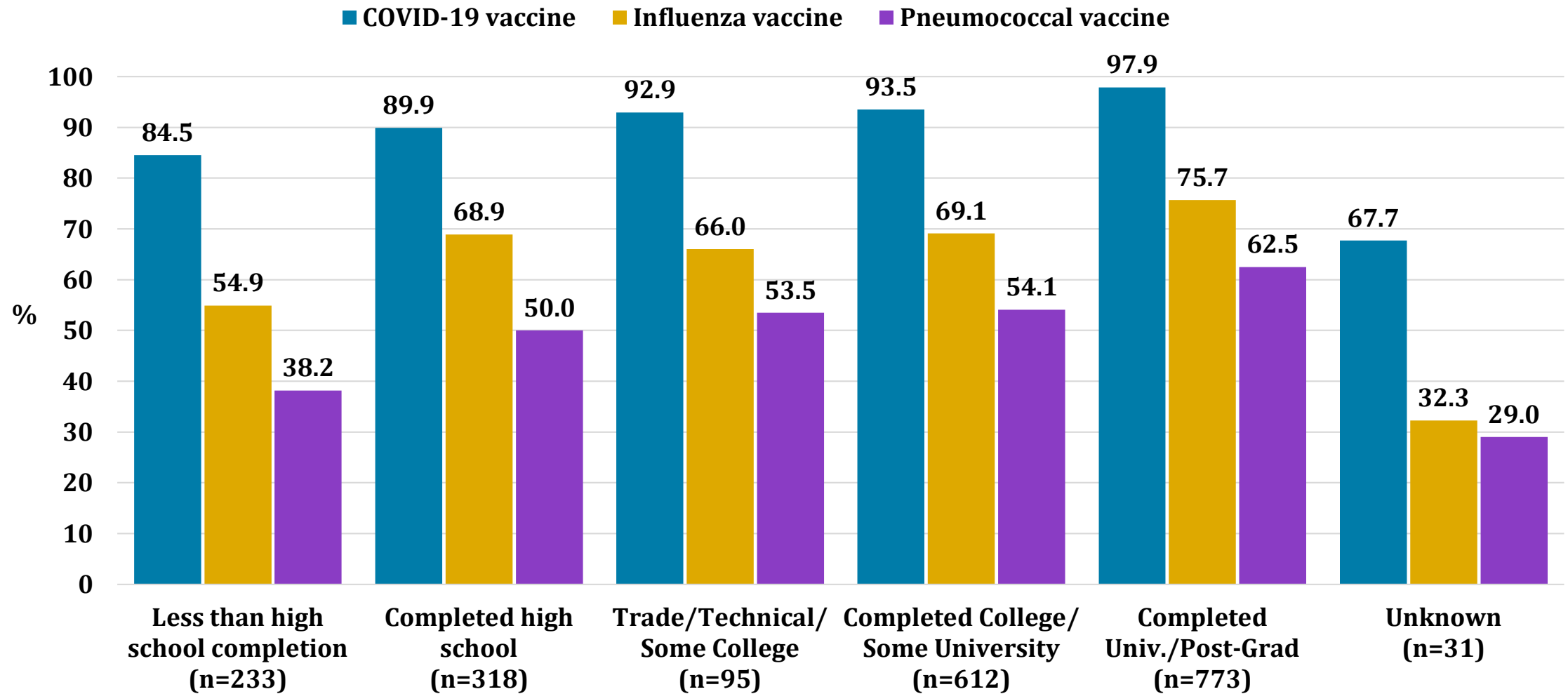


Note: Data do not include Indigenous PLWH





Uptake of vaccines increased with education





Age and education were associated with uptake of Influenza and Pneumococcal vaccines

Demographic variable	COVID-19 vaccine (primary series)	Influenza Vaccine (received, past year)	Pneumococcal vaccine (received ≥1 dose, lifetime)
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Age at interview			
20-29	1.07 (0.80 - 1.43)	0.54 (0.37 - 0.78)**	0.65 (0.42 - 1.01)
30-39	1.11 (0.84 - 1.47)	0.57 (0.45 - 0.72)**	0.83 (0.65 - 1.08)
40-49	1.13 (0.86 - 1.48)	0.69 (0.56 - 0.84)**	0.76 (0.60 - 0.97)*
50-59	1.16 (0.88 - 1.53)	0.77 (0.64 - 0.92)**	0.89 (0.72 - 1.10)
60-69	1.14 (0.84 - 1.54)	0.93 (0.78 - 1.12)	0.99 (0.80 - 1.22)
70+ (Ref group)	-	-	-
Education level			
Less than high school completion	0.90 (0.76 - 1.07)	0.79 (0.65 - 0.98)*	0.68 (0.53, 0.86)**
Completed high school	0.93 (0.81 - 1.08)	0.96 (0.82 - 1.13)	0.83 (0.69, 1.00)*
Trade/Technical/Some College	0.97 (0.83 - 1.13)	0.91 (0.76 - 1.09)	0.87 (0.71, 1.06)
Completed College/Some University	0.96 (0.86 - 1.08)	0.94 (0.83 - 1.07)	0.89 (0.77, 1.03)
Unknown/Prefer not to answer	0.70 (0.44 - 1.11)	0.46 (0.24 - 0.90)	0.57 (0.29, 1.10)
Completed University (ref group)	-	-	-

* p<0.05 ** p<0.01

Note: Estimates are from 3 separate multivariable regression models (1 for each vaccine) and do not include data for Indigenous PLWH (N=2153).

OR = Odds ratio; CI = confidence interval





Race/Ethnicity was associated with uptake of Pneumococcal vaccine

Demographic variable	COVID-19 vaccine (primary series) OR (95% CI)	Influenza Vaccine (received, past year) OR (95% CI)	Pneumococcal vaccine (received ≥1 dose, lifetime) OR (95% CI)
Gender/Sexual orientation			
Women/Transwomen	0.91 (0.80 - 1.03)	0.91 (0.78 - 1.07)	0.96 (0.81, 1.15)
Men-Heterosexual	0.90 (0.78 - 1.04)	0.89 (0.75 - 1.05)	0.92 (0.76, 1.11)
2S/Gender Queer/Other	0.84 (0.50 - 1.43)	1.15 (0.65 - 2.05)	1.20 (0.64, 2.26)
Men-Gay or Bisexual (Ref group)	-	-	-
Race/Ethnicity			
Arab/West Asian	1.08 (0.73 - 1.60)	1.14 (0.72 - 1.80)	0.91 (0.53, 1.55)
Black	1.05 (0.92 - 1.20)	1.05 (0.90 - 1.23)	0.73 (0.61, 0.88)**
East Asian/South East Asian	1.02 (0.82 - 1.26)	1.21 (0.96 - 1.54)	0.95 (0.72, 1.25)
Latinx	1.02 (0.82 - 1.27)	1.04 (0.81 - 1.34)	0.72 (0.52, 0.98)*
Multi-race	1.04 (0.79 - 1.37)	1.18 (0.87 - 1.62)	1.16 (0.83, 1.63)
Other/Unknown	0.92 (0.66 - 1.28)	0.74 (0.48 - 1.14)	0.91 (0.60, 1.38)
South Asian	1.07 (0.83 - 1.37)	1.16 (0.87 - 1.55)	0.91 (0.65, 1.29)
White (Ref group)	-	-	-

* p<0.05 ** p<0.01

Note: Estimates are from 3 separate multivariable regression models (1 for each vaccine) and do not include data for Indigenous PLWH (N=2153).
OR = Odds ratio; CI = confidence interval





Age, gender, and race/ethnicity were associated with an uptake of a booster dose of COVID-19 vaccine

Demographic variable	Received a booster dose of COVID-19 vaccine		Demographic variable	Received a booster dose of COVID-19 vaccine	
	%	OR (95% CI)		%	OR (95% CI)
Age at interview			Gender/Sexual orientation		
20-29	46.6	0.53 (0.35 - 0.81)**	Women/Transwomen	62.6	0.81 (0.70 - 0.95)**
30-39	64.7	0.70 (0.56 - 0.87)**	Men-Heterosexual	71.3	0.85 (0.72 - 1.00)
40-49	71.4	0.81 (0.66 - 0.99)*	2S/Gender Queer/Other	57.1	0.77 (0.38 - 1.55)
50-59	93.2	0.90 (0.75 - 1.07)	Men-Gay/Bisexual (Ref group)	89.2	-
60-69	91.6	0.97 (0.81 - 1.15)	Race/Ethnicity		
70+ (Ref group)	96.5	-	Arab/West Asian	84.6	1.02 (0.67 - 1.56)
Education level			Black	60.7	0.85 (0.72 - 0.99)*
Less than high school completion	66.5	0.84 (0.68 - 1.03)	East Asian/South East Asian	87.9	1.06 (0.84 - 1.34)
Completed high school	76.5	0.92 (0.79 - 1.08)	Latinx	79.6	0.97 (0.77 - 1.24)
Trade/Technical/Some College	79.6	0.96 (0.81 - 1.14)	Multi-race	77.8	1.00 (0.73 - 1.37)
Completed College/Some University	80.9	0.96 (0.85 - 1.08)	Other/Unknown	91.7	1.08 (0.76 - 1.53)
Unknown/Prefer not to answer	52.6	0.71 (0.38 - 1.33)	South Asian	75.8	0.96 (0.72 - 1.28)
Completed University (ref group)	88.0	-	White (Ref group)	87.9	-

* p<0.05 ** p<0.01

Note: Estimates are from a multivariable regression model. Sample included PLWH who have received 2+ doses only (N=2,008). Data for Indigenous PLWH were not included in the regression analyses. Overall, 81.1% of the sample have received a booster dose.

OR = Odds ratio; CI = confidence interval





Summary and conclusions

- No significant difference in uptake of Primary series of COVID-19 vaccine by demographic characteristics, but Women, Black and younger PLWH were less likely to receive a booster dose
- PLWH who are 20-59 years of age had significantly lower uptake of Influenza vaccine than PLWH who were 70 years or older
- Uptake of Pneumococcal vaccine was significantly lower among PLWH aged 40-49 years, who identified as Black or Latinx, and with lower education
- Quality improvement initiatives in primary care are needed to ensure that PLWH are up-to-date with all recommended immunizations, including booster doses.
- Next steps: Examine uptake of vaccines among Indigenous PLWH and assess long-term effects of COVID-19 infection on health outcomes





Limitations

- **Social-desirability bias**
 - Our data come from interviewer-administered questionnaires and may be subject to social desirability bias.
- **Recall bias**
 - Retrospective assessments of vaccine uptake may be subject to recall bias, particularly for Pneumococcal vaccine.
- **Generalizability**
 - Our sample are PLWH receiving care and findings may not be generalizable to PLWH who are not in care.





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- The opinions, results and conclusions are those of the authors and no endorsement by the Ontario HIV Treatment Network or Public Health Ontario or Public Health Ontario is intended or should be inferred.





Thank you!

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For more information about OCS:

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