Background: Data on COVID-19 Susceptibility among PLHIV is Mixed

Background:

- Most cohorts show similar or lower COVID-19 incidence among PLWH
- SARS-CoV-2 IgG assesses past SARS-CoV-2 → under-ascertainment common
- Systematic testing of remnant laboratory specimens useful when large population-based serosurveys not feasible (i.e. 2009 H1N1 epidemic[1])

Study objectives:

Using remnant samples from an outpatient cohort of PLWH and an age and date-of-collection matched cohort of those without HIV in a municipal/safety-net health system:

1. Compare prevalence of IgG to SARS-CoV-2 spike receptor binding domain (RBD) among PLWH vs those not with HIV
2. Quantify IgG Levels, surrogate virus neutralization titers (sVNT), and anti-RBD avidity to characterize serological responses among the 2 groups

1. Hoschler K, Thompson C, Andrews N, et al. *Emerg Infect Dis*. 2012;18(11):1894-1897.

Methods: Matched Serologic Testing of Remnant Specimens

Study Design: PLWH receiving outpatient lab testing over 3 months (Aug-Oct/2020) matched to 1-2 outpatients without HIV on age (+/- 5 years) and date of collection at San Francisco General Hospital (SFGH)

Testing: 1. SARS-CoV-2 Anti-RBD IgG (BT Healthcare)
- In 79 outpatients and inpatients, 89% sensitivity 21days after symptoms; 100% specficity[1]
2. IgG Levels,[1] Pseudovirus neutralization (sVNT),[2] % Anti-RBD Avidity[3]

Analysis: -Seroprevalence adjusted for test sensitivity
- Mixed-effects logistic (seroprevalence), linear (IgG levels), interval (sVNT), and median regression models (neutralization), accounting for matched structure of data, all adjusted for birth sex

1. Lynch KL Clin Infect Dis. 2020 Jul 14 : ciaa979 2. Luo YR et al medRxiv 2021.01.19.21250137 3. Luo YR et al Clin Infect Dis. 2020 Sep 14:ciaa1389

Results: 52% Lower Odds of SARSCoV-2 IgG among PLHIV, but more Severe Disease

Overall: 955 PLWH vs. 1062 people without HIV tested at SFGH;
Median age 58, 64% men, 13% Black, 33% Latinx

Seroprevalence: PLWH **3.7%** (95% CI: 2.4-5.0%)
People without HIV **7.4%** (95% CI: 5.7-9.2%)
AOR **0.48** (95% CI: 0.34-0.71) for PLWH vs. without HIV
Only **48%** had prior positive PCR; (PLWH: median 66 days vs. 56 days prior, p=0.48)

No association with type of antiretroviral used (i.e. TAF vs. TDF vs. ABV)

Latinx vs. White race/ethnicity **AOR 7.7** (95% CI: 3.5-17.0)

Severe Disease: 10% (5/50) among PLWH vs. **2%** (2/94) HIV Negative; p=0.04)
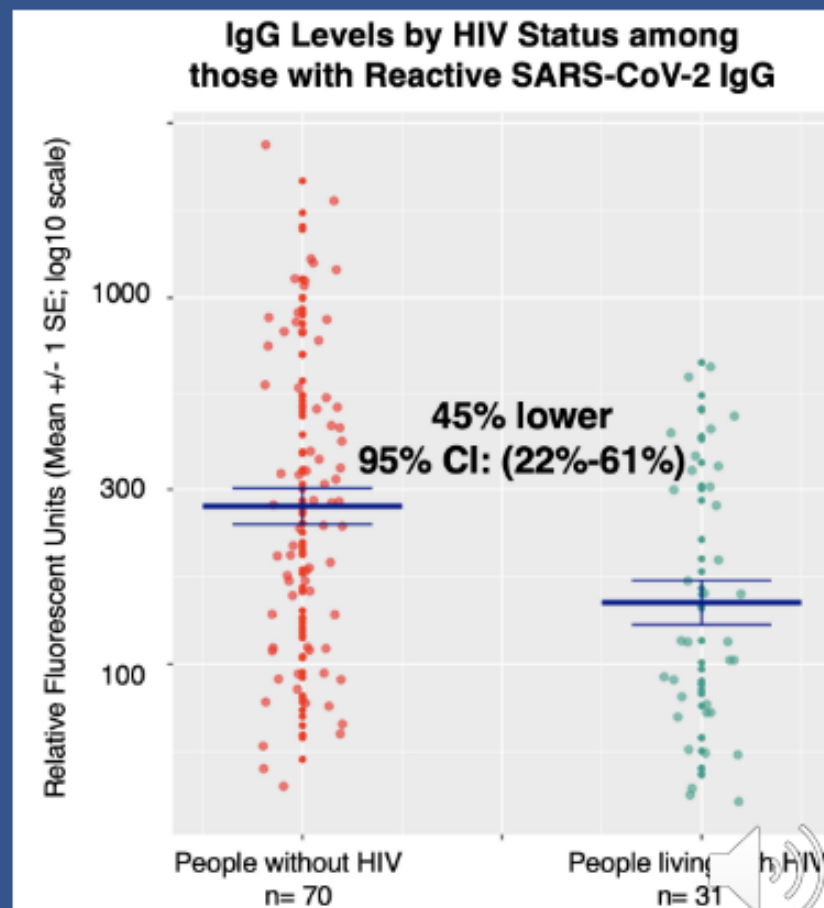**Among PLWH with Severe Disease: 3/5** CD4<200

Results: Lower IgG Levels and Neutralizing Ab Titers among PLWH exposed to COVID-19

IgG Levels: **45% lower among PLWH vs. those without HIV with past infection** (95% CI: 22%-61% lower)

Neutralizing Ab titers: **63% lower among PLWH vs. those without HIV with past infection** (95% CI: 2%-78% lower)

Avidity: **No difference** (+7.9%; 95% CI: -4%; +20%)

IgG Levels by HIV Status among those with Reactive SARS-CoV-2 IgG

45% lower
95% CI: (22%-61%)

Relative Fluorescent Units (Mean +/- 1 SE; log10 scale)

1000

300

100

People without HIV
n= 70

People living with HIV
n= 31

Conclusions: Lower IgG Levels and Neutralizing Antibodies among PLWH despite more severe disease

- Overall, ~50% lower seroprevalence among PLHIV possibly due to greater NPI adherence among a population with experience of the HIV epidemic

- Among those exposed, lower IgG and neutralizing antibody response, despite more severe disease
  - Similar avidity likely represents similar time since infection[1]

- PLWH may mount lower magnitude or less durable IgG response to natural infection

- PLWH should be followed after vaccination–with antibodies/T cells measured to ensure they mount sufficient response

1. Luo YR et al Clin Infect Dis. 2020 Sep 14:ciaa1389