**Supplemental Table 1.** The Association of Changes in Lung Function (adjusting for both FEV1 and Airflow Obstruction) and MOS Physical Health Score Stratified by HIV Status*

| HIV Strata | Per 15% Decrease in FEV$_1$ % Predicted | | Presence of Airflow Obstruction | |
| --- | --- | --- | --- | --- |
| | Mean Change in PHS(95% CI) | P value | Mean Change in PHS(95 % CI) | P value |
| HIV Negative | -0.45 (-0.77 , -0.13) | **0.005** | 0.39 (-0.17, 1.01) | 0.25 |
| HIV Positive(VL <400) | -0.48 (-0.96,  0.00) | 0.050 | -0.75 (-1.96, 0.46) | 0.22 |
| HIV Positive(VL >400-100000) | -1.56 (-1.96, -0.45) | **0.002** | 1.55 (-0.49, 2.64) | 0.133 |
| HIV Positive (VL >100000) | -1.16 (-2.98, 0.66) | 0.211 | -2.67 (-0.88, 3.98) | 0.211 |

*Adjusted for age, sex, African American Race, Smoking Status (current smoking and pack years), comorbidities (cardiac disease, hypertension, stroke, obesity, renal disease, diabetes), HCV status, insurance status, injection drug use, education

**Supplemental Table 2. The Association of Changes in Lung Function and MOS Physical Health Score Stratified by CD4 count***

| HIV Strata | Per 15% Decrease in $FEV_1$ % Predicted | | Presence of AirFlow Obstruction |
|---|---|---|---|
| | Mean Change in PHS (95 % CI) | p-value | Mean Change in PHS (95 % CI) |
| HIV Negative | -0.38 (-0.69 , -0.09) | **0.011** | 0.16 (-0.47, 0.79) |
| HIV Positive (CD4 count >500) | -0.71 (-1.35, -0.08) | **0.028** | -0.39 (-2.11, 1.32) |
| HIV Positive (CD4 count >200-500) | -0.90 (-1.45, -0.35) | **0.001** | -1.15 (-2.79, 0.50) |
| HIV Positive (CD4 count <200) | -0.30 (-1.20, 0.59) | 0.50 | -0.42 (-2.82,1.98) |

*Adjusted for age, sex, African American Race, Smoking Status (current smoking and pack years), comorbidities (cardiac disease, hypertension, stroke, obesity, renal disease, diabetes), HCV, injection drug use, health insurance coverage, education

**Supplemental Table 3.** The Association of Changes in Lung Function (change $FEV_1$/FVC ratio and the presence of Airflow Obstruction) and MOS Physical Health Score Stratified by HIV Status*

| HIV Strata | Per 0.10 Decrease in $FEV_1$/FVC Ratio | | Presence of Airflow Obstruction | |
|---|---|---|---|---|
| | Mean Change in PHS(95% CI) | P value | Mean Change in PHS(95 % CI) | P value |
| HIV Negative | 0.19 (-0.17, 0.54) | 0.30 | 0.11 (-0.51, 0.73) | 0.72 |
| HIV Positive(VL <400) | -0.19 (-0.81, 0.31) | 0.56 | -1.15 (-2.34, 0.05) | 0.061 |
| HIV Positive(VL >400-100000) | -0.49 (-1.41, 0.44) | 0.31 | -0.04 (-1.76, 1.69) | 0.97 |
| HIV Positive (VL >100000) | -2.98 (-2.98, 0.66) | **0.002** | -4.70 (-8.60, -0.80) | **0.018** |

*Adjusted for age, sex, African American Race, Smoking Status (current smoking and pack years), comorbidities (cardiac disease, hypertension, stroke, obesity, renal disease, diabetes), HCV status, insurance status, injection drug use, education

**Supplemental Table 4.** Association of Changes in FVC and Odds of Healthcare Utilization Stratified by HIV Status

| HIV Strata | Odds of ER Visit | | Odds of Inpatient Hospitalization | |
|---|---|---|---|---|
| | OR (95% CI) | P Value | OR (95% CI) | P Value |
| **Per 15% Decrease in FVC% Predicted** | | | | |
| Overall Cohort | **1.08 (1.01, 1.15)** | **0.023** | 1.12 (1.04, 1.21) | **0.004** |
| HIV Negative | 1.01 (0.94, 1.09) | 0.81 | 1.07 (0.97, 1.18) | 0.170 |
| HIV Positive | 1.22 (1.10, 1.37) | **<0.001** | 1.26 (1.12, 1.42) | **<0.001** |
| HIV Positive (VL<400) | 1.21 (1.06, 1.37) | **0.003** | 1.21 (1.04, 1.40) | **0.013** |
| HIV Positive (VL>400) | 1.26 (1.05, 1.52) | **0.015** | 1.44 (1.23, 1.71) | **<0.001** |

*Adjusted for age, sex, African American Race, Smoking Status (current smoking and pack years), comorbidities (cardiac disease, hypertension, stroke, obesity, renal disease, diabetes), HCV status, insurance status, injection drug use, education

**Supplemental Table 5. Association of Changes in Lung Function and Odds of Healthcare Utilization Stratified by HIV Status**

| HIV Strata | Per 0.10 Decrease in $FEV_1$/FVC Ratio | | Presence of Airflow Obstruction | |
|---|---|---|---|---|
| | OR (95% CI) | P Value | OR (95% CI) | P Value |
| **Odds of ED Visit** | | | | |
| Overall Cohort | 1.10 (1.02, 1.20) | **0.017** | 1.10 (0.96, 1.26) | 0.175 |
| HIV Negative | 1.08 (0.97, 1.20) | 0.147 | 1.02 (0.87, 1.21) | 0.73 |
| HIV Positive | 1.14 (1.01, 1.29) | **0.042** | 1.26 (0.98, 1.61) | 0.070 |
| **Odds of Hospitalization** | | | | |
| Overall Cohort | 1.16 (1.04, 1.29) | **0.008** | 1.26 (1.05, 1.51) | **0.011** |
| HIV Negative | 1.05 (0.90, 1.22) | 0.56 | 1.12 (0.89, 1.40) | 0.33 |
| HIV Positive | 1.30 (1.14, 1.53) | **<0.001** | 1.56 (1.15, 2.11) | **0.004** |

*Adjusted for age, sex, African American Race, Smoking Status (current smoking and pack years), comorbidities (cardiac disease, hypertension, stroke, obesity, renal disease, diabetes), HCV status, health insurance coverage, injection drug use, education

**Supplemental Table 6. Association of Changes in Lung Function and Odds of Pneumonia by HIV Status**

| HIV Strata | Per 15% Decrease in $FEV_1$ % Predicted | | Presence of Airflow Obstruction | |
|---|---|---|---|---|
| | OR (95% CI) | P Value | OR (95% CI) | P Value |
| **Odds of Reporting Pneumonia** | | | | |
| Overall Cohort | 1.68 (1.46, 1.95) | **<0.001** | 1.82 (1.24, 2.68) | **<0.001** |
| HIV Negative | 1.48 (1.19, 1.84) | **<0.001** | 1.36 (0.82, 2.26) | 0.24 |
| HIV Positive | 1.72 (1.43, 2.07) | **<0.001** | **2.25 (1.28, 3.95)** | **0.005** |

*Adjusted for age, sex, African American Race, Smoking Status (current smoking and pack years), comorbidities (cardiac disease, hypertension, stroke, obesity, renal disease, diabetes), HCV status, health insurance coverage, injection drug use, education

**Supplemental Table 7. Association of a 15% Decline in $FEV_1$% predicted with MOS Physical Health and Mental Health Quality of Life Scores for Participants with 5 years of followup data**

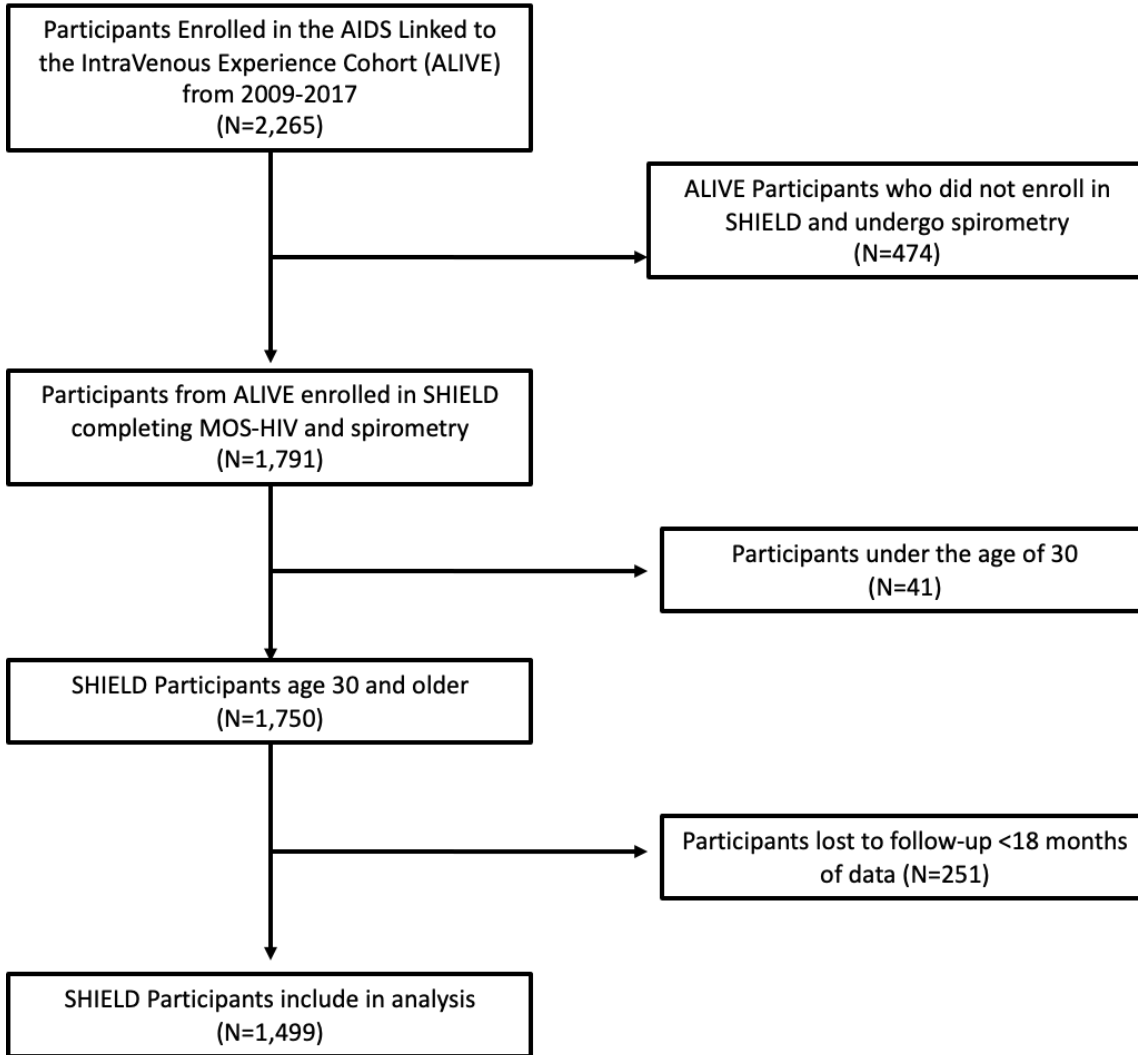| Predictor | Change in PHS | | Change in MHS | |
|---|---|---|---|---|
| | Mean Difference (95% CI) | p-value | Mean Difference (95% CI) | p-value |
| Decrease in $FEV_1$ | -0.51 (-0.79 to -0.21) | **<0.001** | -0.11 (-0.37 to 0.16) | 0.44 |
| Age (per 10 year) | -3.03 (-3.76 -2.29) | **<0.001** | -0.26 (-0.96 to 0.42) | 0.44 |
| Female Gender | -3.26 (-4.65 to -1.87) | **<0.001** | -2.65 (-4.05 to -1.25) | **<0.001** |
| Black Race | 3.78 (1.69 to 5.89) | **<0.001** | 5.48 (3.38 to 7.59) | **<0.001** |
| High School Education | 0.88 (-0.43 to 2.20) | 0.188 | 1.89 (0.59 to 3.17) | **0.004** |
| Current Smoker | -0.18 (-0.37 to 0.72) | 0.53 | 0.25 (-0.31 to 0.80) | 0.38 |
| Current Injection Drug Use | -1.18 (-1.76 to -0.60) | **<0.001** | -2.21 (-2.82 to -1.60) | **<0.001** |
| # Comorbid Conditions | -1.42 (-1.77 to -1.06) | **<0.001** | -0.60 (-0.92 to -0.28) | **<0.001** |
| HIV Status | -1.54 (-2.86 to -0.22) | **0.022** | -0.07 (-1.49 to 1.35) | 0.93 |

*Adjusted for age, sex, African American Race, HIV status, current smoking status, pack years, comorbidities (cardiac disease, hypertension, stroke, obesity, renal disease, diabetes), HCV status, health Insurance Status, injection drug use

**Supplemental Table 8. Association of Changes in Lung Function and Odds of Healthcare Utilization Stratified by HIV Status for Participants with 5 years of followup data**
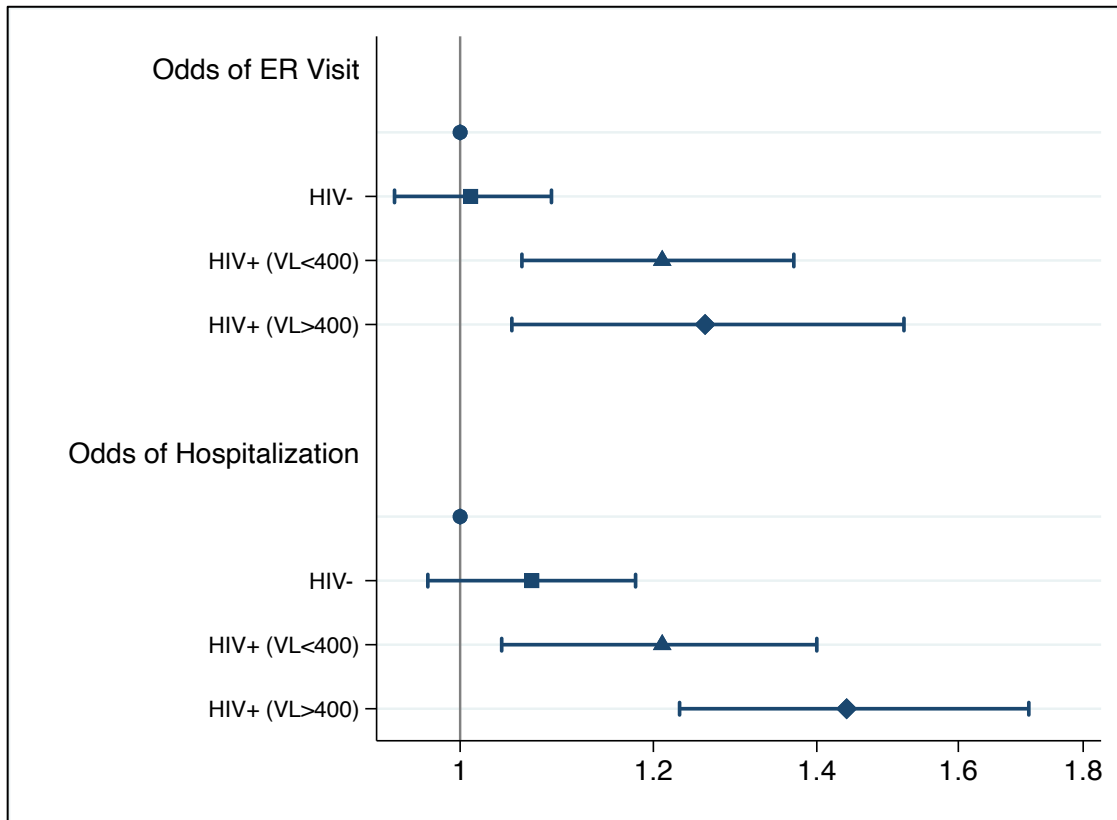
| HIV Strata | Per 15% Decrease in FEV % Predicted | | Presence of Airflow Obstruction | |
|---|---|---|---|---|
| | OR (95% CI) | P Value | OR (95% CI) | P Value |
| **Odds of ED Visit** | | | | |
| Overall Cohort | 1.08 (1.01, 1.16) | **0.049** | 1.07 (0.91, 1.26) | 0.40 |
| HIV Negative | 1.07 (0.92, 1.16) | 0.76 | 1.02 (0.84, 1.23) | 0.83 |
| HIV Positive | 1.21 (1.08, 1.35) | **0.001** | 1.19 (0.89, 1.60) | 0.23 |
| **Odds of Hospitalization** | | | | |
| Overall Cohort | 1.18 (1.08, 1.29) | **<0.001** | 1.29 (1.05, 1.60) | **0.018** |
| HIV Negative | 1.09 (0.97, 1.22) | 0.17 | 1.15 (0.89, 1.40) | 0.31 |
| HIV Positive | 1.30 (1.15, 1.48) | **<0.001** | 1.66 (1.16, 2.39) | **0.006** |

*Adjusted for age, sex, African American Race, Smoking Status (current smoking and pack years), comorbidities (cardiac disease, hypertension, stroke, obesity, renal disease, diabetes), HCV status, health insurance coverage, injection drug use, education

**Supplemental Figure 1:** Study Design

Participants Enrolled in the AIDS Linked to the IntraVenous Experience Cohort (ALIVE) from 2009-2017 (N=2,265)

→ ALIVE Participants who did not enroll in SHIELD and undergo spirometry (N=474)

Participants from ALIVE enrolled in SHIELD completing MOS-HIV and spirometry (N=1,791)

→ Participants under the age of 30 (N=41)

SHIELD Participants age 30 and older (N=1,750)

→ Participants lost to follow-up <18 months of data (N=251)

SHIELD Participants include in analysis (N=1,499)

**Supplemental Figure 2.** Odds of Acute Care Events Associated with a 15% Decline in Percent Predicted of Forced Vital Capacity (FVC) (Presented as Odds Ratio [95% CI])



*Adjusted for age, sex, African American Race, Smoking Status (current smoking and pack years), comorbidities (cardiac disease, hypertension, stroke, obesity, renal disease, diabetes), HCV status, insurance status, injection drug use, education